Identifying and Reducing Corruption in Public Procurement in the EU

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Development of a methodology to estimate the direct costs of corruption and other elements for an EU-evaluation mechanism in the area of anti-corruption





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Corrupt acts have to be detected and prosecuted
and offenders have to be punished and deprived of their illicit proceeds.

At the same time, opportunities for corrupt practices have to be reduced
and potential conflicts of interest have to be prevented
through transparent and accountable administrative structures
at legislative, executive and judicial level as well as in the private sector.

Comprehensive integrity-enhancing strategies, exchange of best practices
and institutional safeguards should ensure that decisions in the public sector
are solely taken in the public interest.

Commission Communication on a comprehensive EU policy against corruption (28 May 2003)

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Abstract

The overall objective of this study is to provide information, methodologies and tools for the European Commission and Member States' authorities for the implementation of the EU anti-corruption policies. For the purpose of this study, corruption has been defined as "*the abuse of power for private gain*". This study focuses on public procurement where corruption generates an economic loss for the public – the costs of corruption. The focus in this study is on the direct costs: the public loss as a consequence of suboptimal performance – which is due to decisions (e.g. procurement choices) or project implementation (e.g. overspending) – that can be attributed to corruption. The focus is thus neither on indirect costs (costs as results of effects of corruption on public institutions, the environment, psychological costs, and costs to civil society), nor on the private gain, i.e. not on the bribe that has been paid or the kick back that has been received.

In this study, a methodology has been developed to estimate the direct costs of corruption in public procurement. This methodology has been tested in 5 selected sectors of the economy where EU Funds are spent (road & rail construction, water & waste, urban & utility construction, training and R&D/high tech/medical products). Although this methodology builds on elements of existing ways of measuring risks and costs of corruption, it is new and innovative in many respects. The methodology confirms the assumption that public procurements which are corrupt differ in characteristics from public procurements that are 'clean'. Many variables from the literature point towards indicators, or 'red flags', that signal a higher probability that a procured product, service or work is corrupt. 27 red flags were identified for the purpose of this methodology. In 8 EU Member States, 192 'corrupt', 'grey' and 'clean' cases in the selected sectors of the economy were assessed on these 27 indicators. Corrupt and grey cases turned out to be very similar in terms of characteristics, but both differ markedly from the clean cases. The involvement of EU funding significantly reduces the risk of corruption. On the basis of this assessment, it was determined which combination of red flags proved to be the strongest predictors for a higher probability of corruption in a procurement case, especially when found in a combination:

- Strong inertia in composition of evaluation team;
- Multiple contact points;
- Contact office not subordinated to tender provider;
- Contact person not employed by tender provider;
- Shortened time span for bidding process;
- Accelerated tender;
- Tender exceptionally large;
- Complaints from non-winning bidders;
- Award contract has new bid specifications;
- Substantial changes in project scope/price after award;
- Connections between bidders;
- All bids higher than projected overall costs;
- Award contract and selection documents not public;
- Awarding authority not filled in all fields in TED/CAN and other missing information.

Subsequently, an estimate of the performance of these projects was made as well as the public loss due to corruption. Thereto, differences in effectiveness and efficiency between corrupt and grey cases on the one hand and clean cases on the other hand were assessed, taking into account elements such as cost overruns, delays and quality considerations. The analysis confirmed the assumption that corrupt/grey procurement cases are less performing than 'clean' procurements, although the latter could also suffer from efficiency and effectiveness concerns. In the sample of 192 cases, a clearly higher public loss in the corrupt and grey cases was identified: whereas clean cases generate a public loss of 5% of their projected costs, corrupt/grey cases generate a public loss of 18%. Thus, 2/3rd of the performance problems in corrupt/grey procurements (13% of budgets involved) can be attributed to corruption.

The identified predictive red flags were in a next stage tested on a random sample of 113 procurements of specific product groups in the same selected sectors. This sample of cases – for which it was not known whether corruption was involved – was collected in the same 8 EU Member States for the period 2006-2010. Most data was not available in EU or national databases, but had to be collected via the procuring authorities. Based on the collected sample, it is possible to estimate the probability of corruption within different confidence bandwidths. The estimated probability in public procurement of *construction work for motorways* (11–21%) and *railway track construction materials and supplies* (9-18%) lies within rather confined confidence bandwidths, due to the high number of cases studied. Furthermore, the two product groups selected appear to be typical for the broader sector. The estimated probability of corruption in *waste water treatment plants* is higher, with 28–43%. The estimated probability of *(airport) runway construction works* (urban/utility construction) amounts to 37–53%.

The estimates for *radiotherapy, mechanotherapy, electrotherapy and physical therapy devices* (R&D/high-tech/medical) suffer from a limited number of cases in the sample (10–32% estimated probability of corruption). This limitation applies even more to the procurement cases in *staff development services* (training), which results in a very large bandwidth (0–46% estimated probability of corruption).

Levels of probability of corruption in the product groups within rail and road have also been analysed at Member State level. The main finding here is that the probability of corruption is not only confined to one or two Member States, but that the phenomenon appears to be more structural across the Member States studied.

With the possibility to predict the probability of public procurements being corrupt, an attempt was made to make an ex-post estimate of the probability of corruption for public procurements that are recorded in the Tender Electronic Daily (TED) database. In the TED, all EU and national public tenders above specific contract values must be published. Only 8 of the 11 red flags mentioned above are available in the TED, but the overall explanatory power of these variables combined is found already to be rather strong.

According to the performed analysis of TED-data for the selected product groups, the product group with the highest probability of corruption are the *staff development services* (23–28%) and *construction of waste water plants* (22–27%). Probability of corruption is estimated to be lower for *rail* (15–19%) and for *road* (11–14%), *radiotherapy, mechanotherapy, electrotherapy and physical therapy devices* (also 11–14%) and *(airport) runway construction works* (urban & utility construction): (11–13%).

The two approaches appear to come to comparable results, especially in the case of road and rail construction as well as waste water treatment. Taken together, and by extrapolating the above estimates to the procurements published in the Official Journal, **the overall direct costs of corruption in public procurement in 2010 for the five sectors studied in the 8 Member States constituted between 2.9% to 4.4% of the overall value of procurements in the sector published in the Official Journal**, or between EUR 1 470 million and EUR 2 247 million. It should be noted that the estimated value of tenders published in the TED in 2010, as percentage of the total value of public expenditure on works, goods and services in the 8 selected EU Member States, is 19.1%, but it is not known what this percentage is for the individual sectors of the economy studied.

When using and interpreting the above figures, caution is required for various reasons. The econometric model here developed is able to explain 55% of the corruption/grey status, which still means that 45% remains unexplained. Furthermore, results include both estimates for sectors as well as product groups. Finally, it is important to recall that types of corruption differ between sectors and Member States and no estimates can therefore be provided for Member States and sectors not studied. Besides, the absolute estimates of the direct costs of corruption only take into account the volume of public procurement which is published in the Official Journal. Furthermore, indirect costs of corruption such as effects on public institutions, the environment, psychological costs, and costs to civil society have not been estimated.

Nevertheless, the above findings indicate that public procurement is an activity in the economy and in the public administration which is at higher risk. Although the research points towards corruption being lower in procurement cases supported by EU Funds, it was not possible to distinguish corruption related to EU Funds from other funds in the eight EU Member States in scope.

In addition to the methodology to estimate the direct costs of corruption in public procurement, an analysis was made of prices of standardised units. If from prices of products, services or works typically procured with the support of EU Funds, prices per unit can be deducted, and these unit prices differ between procurements of the same authority, between procuring authorities or between regions or Member States, and no other explanation can be found for these price differences, than an explanation might be corruption. The price of standardised unit can thus, from a theoretical point of view, be envisaged as a tool for detecting and preventing potential cases of corruption. However, from a practical point of view, the limitations bring discredit on the use of a price of standardised unit considering the actual data availability and quality. The main reason for rejecting this approach is that it does not allow for the extreme diversity of conditions under which projects are implemented in practice, including location, topography, institutional differences and many others. Although prices of standardised units are in practice not an appropriate indicator for preventing or detecting possible cases of corruption, they are helpful for estimating procurement prices.

It is almost impossible to draw valid conclusions on the effectiveness of anti-corruption measures and programmes as it proved almost impossible to empirically measure the scale of corruption in public

procurement precisely – the comprehensive methodology developed in his study provides the very first estimates – and it was therefore not possible to measure change in corruption levels either. Furthermore, it is difficult to establish causality between anti-corruption reforms and changes in corruption levels: did these changes occur in spite of or thanks to anti-corruption efforts? For only a few measures, laboratory and field experiments provide some first insights that they actually cause some effect. But then, how should the contribution of individual measures to changing levels of corruption be determined?

It is however possible to identify practices that in theory can work as a positive or as a negative practice as regards to the prevention, detection and investigation of corruption and which help to prevent or detect activities, behaviour and/or circumstances that lead to the appearance of red flag-situations. The main positive practices identified in this study that also help to prevent and detect the strong predicting red flags are:

- Corruption risk management that not only focuses on the contractors, but also on subcontractors and others involved in the proper execution of the contract;
- No shift (outsourcing) of public procurement activities from public entities to either private or public enterprises that are not subjected to public procurement laws;
- Proper screening of contractors and beneficiaries, especially their ultimate beneficiary owners;
- Pre-employment screening and periodical in-employment screening of all involved in public procurement: public officials as well as temporary staff and external parties hired to facilitate public procurement;
- Specialised, well-trained public procurement staff who share their expertise, knowledge and (market) intelligence, also across Member States' borders;
- A structured market analysis and sharing of market intelligence, also across EU Member States' borders;
- Optimal transparency in the entire public procurement process, maximal public availability of procurement information;
- Independent audits and evaluations performed according to good, EU-wide audit and evaluation standards, where corruption is one of the objectives and results are shared, also between EU Member States;
- Data analysis of easily accessible, relevant and good quality data on public procurement to detect potential irregularities, fraud and corruption.

When compared, it can be concluded that some of the 27 EU Member States (this study was finished before the accession of Croatia on 1 July 2013) have more of these and/or other measures, practices and policies in place than others. Whether having these measures in place results in e.g. a lower level of corruption in public procurement or higher rate of prosecuted cases of corruption in public procurement cannot be concluded at this moment since no accurate data on (changes in) corruption levels are available. It is however to be recommended to improve and periodically repeat the benchmark of the EU Member States: when more empirical data becomes available on corruption levels and how these evolve over time. Additional research on causality and effectiveness of individual measures to prevent, detect and investigate corruption in public procurement will contribute to performance measurement of policies and practices in the Member States.

Effective detection and prevention of corruption in public procurement is possible if the administrative data on tenders, bidders, projects and contractors are collected and stored in a structured way, accessible for controls, investigations and analyses. These structured databases could allow ex-ante monitoring and ex-post analysis of indicators of corruption (red flags). New data mining techniques can be used to detect anomalies in the data that perhaps point at potential cases of fraud or corruption. A few outcomes of the benchmark of the public procurement systems of the EU Member States are in this light relevant for policy development:

- Only in four Member States do most e-procurement platforms contain a module designed for the detection of corruption;
- Although there are central and/or local databases for public procurement in the majority of the 27 Member States, only half of the Members States analyse such data on unusual patterns;
- Only a few Member States develop and/or use indicators that point to possible cases of corruption.

At EU level, there is a high number of different IT tools and systems to generate, structure, process and store data and documentation on public procurement in use within the EU institutions, all developed to facilitate the process of public procurement. The level of use differs from DG to DG and even not all procurement data at EU level is stored electronically at every step of the procurement cycle. The multi-functionality of the existing systems is under-developed and most of the systems are not linked to each other. Moreover, these systems are not developed with the objective to respond to the need of anti-corruption measures. The systems require for

that purpose standardisation and restructuring of data storage. This would enable computerised corruption detection and prevention based on the data stored in local and central databases which are interlinked.

The context of corruption in public procurement is fragmented: there are many very different actors involved in the consecutive stages of public procurement and in the prevention, detection and investigation of corruption. For none of these actors, fighting corruption in public procurement is its sole or main task, and there are no authorities at national or EU-level that coordinates all parties involved, or that collect and integrate all data on public procurement which is relevant for the prevention, detection and investigation of corruption.

In the light of all the above findings, the following is recommended to all EU and national authorities responsible for public procurement and the prevention, detection and investigation of corruption therein:

Data collection

1. *Perform the developed comprehensive methodology to estimate the costs of corruption in public procurement* in a similar way in other sectors and other Member States to further strengthen the results and their reliability.
2. As part of public procurement procedures, *ensure the timely and complete filling out of the TED procurement database*, including contract award notices, thus reduce the often large number of blank spaces/delays/mistakes.
3. Further develop the *central collection of public procurement data*, also explicitly driven by the objective to prevent, detect and investigate corruption in public procurement. *Add data fields in the central procurement databases* (including TED) to collect data on significant indicators and other information that allow for a better quick-scan of corruption.
4. Develop *central collection of meaningful, accurate and detailed statistics on corruption in public procurement*, to help increase the overall understanding of corruption and the effect of counter measures and allow for EU comparison and analysis, as well as for national, tailored policies and interventions.
5. Construct *copies of (or provide access to) relevant databases (e.g. TED database) for OLAF and other audit and investigative bodies* to filter – with help of the identified significant indicators – procurements with a higher probability of corruption.
6. Support *measures that increase the transparency of public procurement*; not only for future measurement purposes, but also as a preventive tool.

Policy research

7. Explore the *indirect effects of corruption in public procurement* as this will most likely reveal other connections between corruption, the economy and society as a whole.
8. Develop and implement *adequate tools and methods for audits and evaluations* to acknowledge and signal the presence of corruption.
9. Invest in the *research on ways to measure causality and effectiveness of instruments and practices to prevent, detect and investigate corruption*.

Analysis, audits and evaluations to prevent, detect and investigate corruption in public procurement

10. Contracting authorities should make all necessary efforts to *perform market analyses and collect market intelligence* to ensure that public procurements are market-based, generating sufficient (not necessarily maximum) amount of tenders, and that services are obtained in the most effective and efficient manner.
11. Improve *performance audits and evaluations* that review the substance of projects (performance-based monitoring and evaluation) rather than check procedural compliance, and extend the focus from the actual procurement to the preparation and implementation stage, and focus on high probability cases.
12. Develop and implement more and better *Self-Monitoring, Analysis, and Reporting Technology* anti-fraud and anti-corruption tools at EU level, and put these at the disposal for use by EU Member States.

Organisation of the fight against corruption in public procurement

13. Invest in *effective deployment of practices that help to prevent and detect red flag-situations* in public procurement processes and/or which - also based on experiment findings - contribute to reducing (costs of) corruption in public procurement, in particular: centralised/joined public procurement, professional staff in public procurement functions that is adequately paid, screening of this staff and others involved in public procurement and job-rotation.
14. Further invest in *good functioning systems for whistle blowers*, including proper protection of whistle blowers.
15. Stimulate the establishment of *competent and independent investigating agencies with focus on investigation of corruption in public procurement*, with sufficient investigative competencies and *adequate sharing of information and intelligence, at national and at EU-level*.

Executive summary

(In the interest of the readability, this executive summary contains no references to sources; all sources can be found in the main report and its annexes)

A study on identifying and reducing the costs of corruption in public procurement involving EU Funds

Introduction

In 2011 the European Commission adopted two Communications outlining its future policy in fighting fraud and corruption. First, the Communication on Fighting Corruption in the EU served to set up an EU anti-corruption reporting mechanism for periodic assessment of the Member States, the so called 'EU Anti-Corruption Report'. Secondly, the Communication on an Anti-Fraud Strategy provides a framework for fighting fraud affecting the EU financial interests. In 2011 the Commission also adopted its proposals on public procurement as part of an overall programme aimed at an in-depth modernization of public procurement in the European Union.

The impact assessment working paper of the Commission on establishing the EU Anti-Corruption Report states that there is currently no clear picture available of variations in the levels of corruption and trends across the EU, due to the fact that EU Member States do not collect statistics concerning instances of corruption and corruption levels in a unified way. According to the impact assessment, an instrument (one general or several specific instruments) should be adopted for the harmonisation of the definition of corruption as well as for the measurement of corruption. Public procurement is mentioned as a priority and a critical domain in which corruption should be defined and measured. Therefore, a methodology should be developed in order to measure the costs of corruption or provide close estimates of this cost in public procurement in certain sectors of the economy which are in the scope of EU Cohesion Policy.

Public procurement is the process by which national, regional and local governments as well as other bodies governed by public law purchase products, services and public works. The economic significance of public procurement in Europe is considerable: in 2010 a total of EUR 2 406 billion – or around one fifth of EU GDP – was spent by government, public sector and utility service providers on public works, goods and services. A very large and heterogeneous population of public authorities spends this money – over 250 000 contracting authorities in Europe manage procurement budgets of different sizes – each of them with very different administrative capacities. Moreover, public procurement serves many purposes: besides achieving value for money and cost reduction, public procurement is an instrument for e.g. stimulating innovation, supporting SME, and achieving objectives in social and environmental policy and corporate social responsibility.

The EU Structural and Cohesion Funds contribute substantially to public procurement. The total budget for these Funds over the period 1 January 2007 – 31 December 2013 amounts to EUR 347 billion, which is 0.40% of the EU-27 GDP of 2010. When EU Funds are involved, national, regional and local governments can consider 'under spending' as a risk: if Member States do not fully and timely use all the EU Funds allocated to it, the European Commission may reallocate them – thus increasing an urge to spend. Combined with the variety of objectives of public procurement, this could reduce incentives and thus efforts to make sure that these funds are spent efficiently, effectively and rightfully, which in turn gives way for fraudulent practices like corruption.

Objective of this study

The overall objective of this study on identifying and reducing the costs of corruption in public procurement involving EU Funds is to provide information, methodologies and tools for the European Commission and Member States' authorities for the implementation of the EU anti-corruption policies. Before this study, no empirically founded methodology was available to estimate the (changes in the) level of corruption in public procurement. The primary objective of this project is to present a methodology to estimate the costs of corruption in public procurement in sectors of the economy where EU Funds are spent. As a secondary objective, the study provides information and tools which may feed into the EU Anti-Corruption Report in order to improve the (application of) public procurement rules and practices, as well as to promote the implementation of the Commission's Anti-Fraud Strategy in the Member States.

PwC, Ecorys and the University of Utrecht performed this study on identifying and reducing the costs of corruption in public procurement involving EU Funds for OLAF, on behalf of the European Commission, between March 2012 and May 2013. The study project was governed by a steering committee composed of representatives from various Commission Directorates General and presided by OLAF. Ms. Macovei MEP provided feedback on part of the research approach, preliminary results and drafts of this final report. An external expert panel, experts from the European Court of Auditors and OECD as well as experts from PwC, Ecorys and University of Utrecht reviewed (parts of the) drafts of this final report.

Definitions

Corruption in this study is defined as ***the abuse of power for private gain***. Power is the ability to influence the behaviour of people. In public procurement, abuse of power can lead to a secret *vertical* relationship between one or more bidders and the procurement official that materialises into a conflict of interest, bribery or kickback. Another dimension of abuse of power for private gain is a secret *horizontal* relationship between bidders, especially with the involvement of a corrupt inside official (collusion, bid rigging). Since corruption and collusion frequently occur in tandem and have ultimately the same effect - a public contract is awarded on a basis other than fair competition and the merit of the successful contractor, so that maximum value for public money is not achieved – and since it is difficult to determine a public official's involvement, both corruption and collusion are taken into account in this study. Private gain must be interpreted widely, but in most instances takes the form of bribes and kickbacks to a corrupt public official, his friends or relatives, a company, political party or other organisation.

Corruption generates a public loss. The public loss that can be attributed to corruption is a consequence of suboptimal performance due to suboptimal decisions (e.g. procurement choices) or project implementation (e.g. overspending).

In this study, the focus is only on the direct material costs of corruption: the immediate monetary consequences for the national (including regional and local) budget and, when EU Funds are involved, the EU budget – the focus is not on private gain. The public loss investigated is the estimated monetary amount lost to corruption when a public procurement case turns out to be corrupt. This estimated monetary amount includes the following components:

- **Ineffectiveness**: the project does not (or not fully) reach its objectives. This is the case if procurement of works, goods or services generates *lower than intended (or even negative) public value* ("waste");
- **Inefficiency**: the outputs of a project are not in line with the inputs. Inefficiency occurs when goods, services and works are procured at *higher prices* than competing bids that offer similar or higher quality ("excessive price"), or when procurement takes place at similar prices but with *lower quality* than competing bids ("inferior quality").

The fragmented context of prevention, detection and investigation of corruption in public procurement

Corruption is in itself a vast subject, as it can occur at different levels of government, involve a variety of sectors and actors and take many forms. The context of *prevention, detection and investigation of corruption in public procurement* can be described as fragmented, as the many different actors involved with a variety of objectives lack a comprehensive view of the problem, let alone an integrated approach of prevention, detection and investigation of corruption. Contracting authorities may take multiple aspects into account besides value for money or cost reduction through optimal competition.

Data and information on the procurement processes are collected and analysed by a myriad of institutions. Their systems are developed to facilitate, monitor and control public procurement – but not to prevent or detect corruption. Moreover, procurement systems and databases are manifold and differ in the selection, quantity and quality of data, as well as in accessibility. Public audits focus on irregularities in the public procurement process, not on the necessity or the performance of projects for which services, goods or works are procured. When fraud and corruption are suspected, the cases are transferred to investigative bodies and are no longer the competence of the audit authorities. Investigative bodies that fight corruption have in almost all instances to deal with a broad variety of corruption, and corruption in public procurement is but one aspect of their task. None of the EU Member States has a dedicated authority for investigations of corruption in public procurement alone, and many Member States do not have dedicated authorities for investigations of corruption in general.

This implies that in the priority setting, cases of suspected corruption in public procurement will be weighed against cases of other forms of suspected corruption or even against cases in other (financial) crime areas.

This fragmentation in the context of the fight against corruption in public procurement is not helpful for an efficient and effective prevention, detection and investigation of corruption in public procurement. It also results in a scattered picture of the problem, lack of dedicated, good and comparable data for analysis and therefore many difficulties when an attempt is made to estimate the costs of corruption in public procurement.

A comprehensive methodology to estimate the costs of corruption

The methodology that has been developed and applied in this study to estimate the costs of corruption in public procurement builds on existing, diverse literature on measuring costs of corruption. Findings across various research strands disclose substantial differences in the estimated or perceived size of corruption. For example, strong differences appear between survey-based approaches and audits or investigations.

The comprehensive methodology that has been developed through this study is above all an *econometric* methodology. Although it does contain elements of an investigative approach, it should not be treated as a forensic method geared towards the detection of individual cases of corruption. The comprehensive methodology builds in various ways on the existing literature:

- It combines the strength of both micro- and macro-level approaches;
- It combines the dimensions of indicators, costs of corruption and probability;
- It allows for differentiation of findings between Member States and sectors.

Overview of the comprehensive methodology

The comprehensive methodology in this study is based on several stages that build on each other and that ultimately provide an estimate of the direct costs of corruption in sectors and Member States studied.

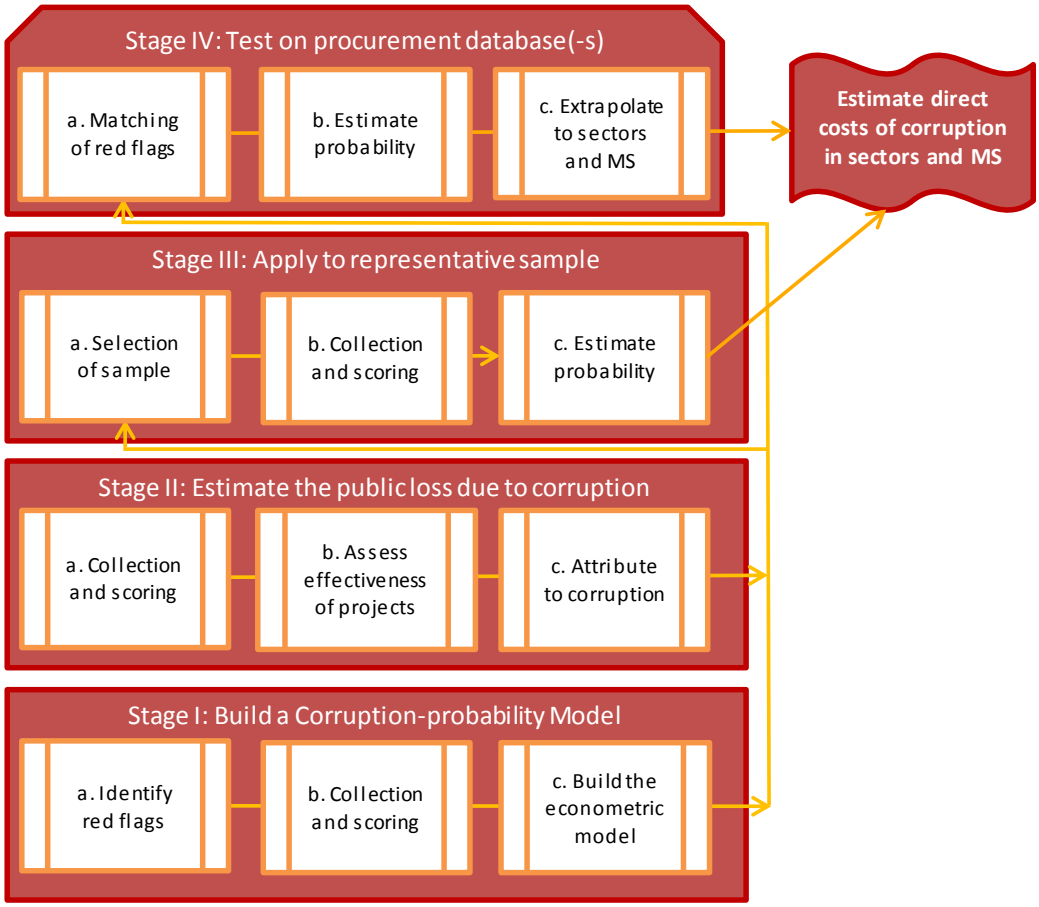
Assumptions behind the comprehensive methodology

The comprehensive methodology is built on several assumptions that can be derived from the literature: the value of indicators and the importance of costs.

The value of indicators

At the most fundamental level, all those involved in corruption seek to hide their behaviour. All efforts to estimate the extent or the costs of corruption are based on one specific assumption, namely that some aspects of corruption can be detected, even though the full picture of corruption is unknown. The comprehensive methodology builds on this assumption, namely that differences in characteristics – measurable appearances or representations – will emerge between corrupt cases and 'clean' cases. These characteristics can be measured using *indicators* of corruption – the so called '*red flags*'. An indicator provides specific information on the state or condition, in this case of the procurement process. In the context of this study, a red flag provides information on the chance of corruption being present. More red flags indicate a higher chance of corruption. Two *caveats* are in place. First of all, the red flags indicate a *chance* of corruption in a procurement which says nothing on the actual presence of corruption in an individual case. Procurements with multiple red flags – and thus a high chance of corruption – may be non-corrupt, while procurement with no red flags – and thus a low chance of corruption – may still turn out to be corrupt. While in individual cases the chance of corruption and actual presence of corruption may be misaligned, the chance of corruption does allow for estimates to be made on the total number of corrupt cases in a larger group of cases.

The Measurement House: Overview of the comprehensive methodology to estimate the costs of corruption in public procurement



For this study, 27 identified red flags that converged across sources have been retained. They have been structured along the lines of the public procurement process and defined in such a way that assessment of data on procurement cases against these 27 indicators is possible (see table below):

Overview of red flags identified - including assumptions about patterns of corruption		
	Assumption	***Shorter name***
1	Strong inertia in the composition of the evaluation team of the tender supplier	Strong inertia in composition of evaluation team
2	Any evidence for conflict of interest for members of the evaluation committee (for instance because the public official holds shares in any of the bidding companies)	Conflict of interest for members of evaluation team
3	Multiple contact offices/ persons	Multiple contact points
4	Contact office is not directly subordinated to the tender provider	Contact office not subordinated to tender provider
5	Contact person not employed by the tender provider	Contact person not employed by tender provider
6	Any elements in the terms of reference that point at a preferred supplier (e.g. unusual evaluation criteria or explicit mentioning of the brand name of the good instead of general product characteristics)?	Preferred supplier indications
7	Shortened time span for bidding process (e.g. request on a Friday for a bid to be sent the following Monday)	Shortened time span for bidding process
8	Procedure for an accelerated tender has been applied	Accelerated tender

Overview of red flags identified - including assumptions about patterns of corruption (*cont.*)		
	Assumption	***Shorter name***
9	Size of the tender exceptionally large (average value plus two times the standard deviation)	Tender exceptionally large
10	Time-to-bid allowed to the bidders not in conformity with the legal provisions	Time-to-bid not conform the law
11	Bids submitted after the admission deadline still accepted	Bids after the deadline accepted
12	Few offers received	Number of offers
13	Any artificial bids (e.g. bids from non-existing firms)	Artificial bids
14	Any (formal or informal) complaints from non-winning bidders	Complaints from non-winning bidders
15	Awarded contract includes items not previously contained in the bid specifications	Award contract has new bid specifications
16	Substantial changes in the scope of the project or the project costs after award	Substantial changes in project scope/costs after award
17	Any connections between bidders that would undermine effective competition	Connections between bidders undermines competition
18	All bids higher than the projected overall costs	All bids higher than projected overall costs
19	Not all/no bidders informed of the contract award and on the reasons for this choice	Not all/no bidders informed of the award and its reasons
20	Contract award and the selection justification documents not publicly available	Award contract and selection documents public
21	Inconsistencies in reported turnover or number of staff	Inconsistencies in reported turnover/number of staff
22	Winning company not listed in the local Chamber of Commerce	Winning company not listed in Chamber of Commerce
23	No EU funding involved (as % of total contract value)	% of EU funding (= 0)
24	Share of public funding from the MS is involved (as % of total contract value)	% of public funding from MS
25	Awarding authority not filled in all fields in TED/CAN	Awarding authority not filled in all fields in TED/CAN
26	Audit certificates issued by unknown/local auditor with no credentials (cross-check reveals external auditor is not registered, not active or registered in a different field of activity)	Audit certificates by auditor without credentials
27	Any negative media coverage about the project (e.g. failing implementation)	Negative media coverage

The notions of public loss, performance and costs

A second assumption is that 'corrupt' and 'clean' cases differ in terms of performance, due to ineffectiveness and/or inefficiency. It is therefore assumed that for the same product, service or work procured, the performance of a corrupt case will be lower than of a 'clean' case.

These two assumptions lead to the following approach:

- When an average difference in performance (effectiveness or efficiency) between corrupt and 'clean' cases in a certain sector or product group can be estimated, and
- The overall probability of corruption in the same sector or product group can be distilled, based on the match of significant indicators with data on the procurement cases, then
- The two can be combined to an overall estimate of the costs of corruption in public procurement in this sector or product group.

Data requirements and challenges

The data requirements for the development and application of the comprehensive methodology are substantial, and exceed in terms of volume and complexity any specific data source on corruption that is known to us. Basically, three types of data are required:

1. A sample of 'corrupt/grey' and 'clean' procurement cases;
2. A representative sample of procurement cases with unknown levels of corruption; and,
3. Comprehensive (national and/or EU) procurement database(s).

1. A sample of corrupt/grey and clean cases

The first step in the development of a comprehensive methodology to estimate the costs of corruption in public procurement was to identify known 'corrupt' and 'clean' cases and assess these for the 27 indicators. In this study, a distinction has been made between corruption in its narrower criminal law sense and corruption in a broader socio-economic sense. This distinction is necessary because, in accordance with rule of law principles, criminal law provisions require unambiguous and precise language, whereas the concept of corruption can be more general for the purpose of estimating the costs of corruption. Since this is a socio-economic study, a corrupt case does not necessarily have to be a convicted case of corruption. In this study, 4 categories of cases in public procurement are distinguished in the context of corruption:

a) Corrupt cases: cases where in a final ruling, not open for appeal anymore, a procurement case was defined as corrupt, and cases where a validated confession of one of the parties involved (preferably with underlying evidence) could be presented;
b) Cases with strong indications of being a 'corrupt' case: cases where, based on many reliable and verified sources (but where no verdict from the highest court nor confession is available) could be concluded that these are likely to be corrupt cases – e.g. certain settlements, verdicts from lower courts;
c) Cases with weaker indications of being corrupt – for which no explicit evidence is presented from the opposite – are considered as being 'grey' cases. These grey cases are taken into account, since cases of the two categories "corrupt cases" were not available in sufficient amounts. The use of grey cases in the analysis here was explicitly proposed and approved by the Commission. Whenever possible, these grey cases are explicitly separated from non-corrupt cases to rule out any possible bias. Where grey cases are used, this is explicitly mentioned in the text.
d) Cases with no (reliable) indications of being a 'corrupt' case. These cases are treated as 'clean' cases.

Both categories a) and b) are referred to as 'corrupt' cases in the analysis here, while cases in category c) are considered grey cases. Taken together, the categories a), b) and c) are called corrupt/grey cases. The clean cases (category d) are used as a control group, allowing for a comparison with the set of corrupt/grey cases.

Data have been collected for a set of 96 corrupt/grey and 96 clean cases in 8 EU Member States in 5 sectors of the economy where EU Funds are spent (and thus not necessarily public procurement cases *involving EU Funds*). The 8 selected Member States are France, Hungary, Italy, Lithuania, the Netherlands, Poland, Romania and Spain. The 5 selected sectors of the economy are presented in the table below:

Overview of selected sectors and product groups

	Sector	*Product group*
Infrastructure construction	Road/rail construction	Railway track construction materials and supplies
		Construction work for highways
Civil construction	Water/waste	Construction waste water plants
Civil construction	Urban/utility construction	(Airport) Runway construction works
Social employment support	Training	Staff development services
Health	R&D/High tech/Medical products	Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices

Depending on the Member State and region, investments in these sectors are eligible for EU-support from ERDF, Cohesion Fund, ESF and/or FP7. In the 8 selected Member States, 192 cases of public procurement in the 5 selected sectors of the economy have been collected, divided over the three categories: 'corrupt', 'clean' and 'grey' cases. This sample of corrupt/grey and clean cases covers public procurement governed by public procurement laws at different levels of administration, regardless whether they are above the thresholds of EU public procurement Directives or whether or not they are included in the TED.

Cases collected in each category		
	Category name	*Number of cases collected*
a) + b)	*'Corrupt' cases*	*24*
c)	*'Grey' cases*	*72*
a) + b) + c)	**Corrupt/Grey cases**	**96**
d)	**'Clean' cases**	**96**
	TOTAL	**192**

2. A representative sample of procurement cases for which corruption is unknown

A second, representative sample of procurement cases for which corruption is *not known* was collected in a second data collection phase. In total, a population of 183 cases has been covered, all procured within the period 2006-2010. These cases come from 6 precisely defined product groups that fit within the 5 broader sectors of the economy where EU Funds are spent and are collected in the same 8 selected Member States. This second sample of cases covers public procurement practices governed above the thresholds of EU public procurement Directives and which are published in the Official Journal and therefore included in the TED database. This was necessary to know the entire population in order to calculate a representative sample. The TED database served only as a starting point, additional data were collected in the Member States. Due to data collection challenges (see below), the necessary information could only be obtained for 113 cases, whilst a fully representative sample would have required 124 cases. This has led to varying levels of accuracy and bandwidths, depending on the size of the sample available.

3. EU and national procurement databases

An inventory and analysis was made of appropriate national procurement databases, however these proved to have only little or no value added compared to the EU TED procurement database – which records since 2006 all procurements in accordance with EU public procurement rules. The database at the consortium's disposal contains the information as published in the Official Journal, and includes EU-wide more than 500 000 tenders (from 2006 until mid-2010).

Data collection challenges

The collection of data required has been excessively difficult and resource-intensive, particularly regarding the collection for the representative sample. The precise strategy for contacting the contracting authorities was adjusted to local circumstances, but always included a combination of e-mail and telephone. The main reason for the burdensome collection process lies in a range of operational hurdles ('archives in another building', 'approval necessary from hierarchy', 'person responsible left the organisation') that were identified and that had to be overcome throughout the process. Of great importance was the fact that the consortium for this study had no coercive or investigative powers, and that cooperation of contracting authorities was therefore on a voluntary basis.

Development of the methodology – Stage I and II

From indicators to a Corruption-probability model (Stage I)

An assessment of the collected information of the corrupt/grey and clean cases has pointed to significant correlations between the occurrence of red flags and the (corrupt/grey) status of a case: 18 out of the 27 red flags appeared to be statistically significant. Corrupt and grey cases turn out to be very similar in terms of characteristics (scoring 4.6 and 4.5 red flags respectively), but both differ markedly from the clean cases (scoring 1.8 red flags only). The involvement of EU funding significantly reduces the risk of corruption.

Bid rigging (a contract is promised to one party, although for the sake of appearance other parties also present a bid) is observed in almost half (48% of cases observed) of the practices and most present in Water & Waste and R&D projects. Bid rigging is encountered more frequently in Hungary, Poland, Lithuania and Italy. Kickbacks (a portion of the sum that a winning contractor received that is designated for the official in exchange for betraying the public) are encountered in about 1 out of 3 cases. This practice appears to be rather equally spread across all sectors. Kickbacks are the most frequent form of corruption encountered in Spain and Romania. Conflict of interest practices were encountered in around 1/5th of cases and across all sectors, though slightly more frequent in the Training and Urban/utility construction sector. There is a possibility that the indicators selected in the comprehensive method may have a stronger predictive power for bid rigging than for kickbacks and conflict of interest.

A Corruption-probability Model has then been constructed, which assigns values to each of the red flags. This allows for an estimate of the probability of corruption at the level of individual cases. Overall, the explanatory power of the model – using a total of 15 red flags – is 0.55. This implies that the model is able to answer 55% of the question whether a case is corrupt/grey or not. This percentage can be considered high, given the concealed nature of corruption and the variety in patterns of corruption between countries and sectors.

Estimates of performance and public loss due to corruption (Stage II)

It is highly problematic to isolate corruption from other causes: corruption is a root problem which influences other problems, including those of a technical, economic, institutional as well as project management nature. Therefore, the performance of the corrupt/grey projects has been compared to a set of clean cases – a so-called control group. The direct public loss encountered in corrupt/grey cases amounted to 18% of the budgets. For the control group of clean cases, the direct public loss due to performance issues is estimated to be 5% of budgets involved. Therefore, the overall (net) direct public loss due to corruption is estimated to be 13% of the budgets involved. Corruption is thus expected to explain over 2/3rd of the direct public losses in corrupt/grey cases concerned.

The performance analysis of the corrupt/grey cases points to higher share of budgets lost in smaller projects than in larger projects. In relative terms, the highest direct public losses due to inferior performance are encountered in training projects, followed by urban/utility construction.

An important source of performance loss for corrupt/grey projects is inefficiency due to cost overruns (either at the time of contract award or through additions to/extensions of the initial contract). These occurred in 53% of corrupt/grey cases, amounting to 22% of the total average budget involved. The average overrun per corrupt/grey project amounted to 28% of the average budget. The relative size of overrun is highest in the case of small tenders, e.g. in the area of training.

Delays of implementation, another source of inefficiency, affected 30% of corrupt/grey cases, and the related loss is estimated to be 6% of the total budget for corrupt/grey projects analysed. The average cost of delay affected represents 9% of the total budget of an average corrupt/grey project concerned. Delays are rather equally spread across the sectors, with road & rail encountering a higher share of cases (59%), followed by urban/utility construction (38% of cases analysed).

An overall 48% of the corrupt/grey cases analysed encountered further performance issues in the form of ineffectiveness, e.g. they did not meet their original objectives. An estimated 3% of the total budget analysed is considered lost due to ineffectiveness. Training and R&D projects appear to be most problematic from an effectiveness point of view, as respectively 75% and 69% of the corrupt/grey projects encountered such performance issues.

Application of the methodology – Stage III and IV

Estimating the probability of corruption in public procurement within the EU is amongst the least developed aspects of the measurement of corruption. In this study, two complementary approaches have thereto been used.

Estimates of the probability of corruption by applying the comprehensive methodology on a representative sample (Stage III)

The first approach has been to apply the Corruption-probability Model on the representative sample of procurement cases. The focus has been on specific product groups within the broader sectors already studied (see *Overview of selected sectors and product groups* here above). In total, a population of 183 cases for which was not known whether they were corrupt or not was studied, all procured in the period 2006-2010.

The necessary information could be obtained for 113 cases. The results are to a certain extent influenced by the (lack of) cooperation of the procuring authorities. The difference in level of cooperation creates a bias in the selection of cases, meaning the selection of cases for which information is obtained is not truly random anymore, which impacts the validity of the results. Under the reasonable assumption that cooperation is worse in case of corruption, the figures presented below should be considered as lower bound estimates of the actual level of corruption.

Based on the collected sample, it is possible to estimate the probability of corruption within different confidence bandwidths. The estimated probability in **construction works for motorways** (11–21%) and **railway track construction materials and supplies** (9–18%) lies within rather confined confidence bandwidths, due to the high number of cases studied. Furthermore, the two product groups selected appear to be typical for the broader sector (infrastructure construction). The estimated probability of corruption in **waste water treatment plants** is higher, with 28–43%. The estimated probability of **(airport) runway construction works** (urban/utility construction) amounts to 37–53%. The estimates for **radiotherapy, mechanotherapy, electrotherapy and physical therapy devices** (R&D/high-tech/medical) suffer from a limited number of cases in the sample (10–32% estimated probability of corruption). This limitation applies even more to the procurement cases in **staff development services** (training), which results in a very large bandwidth (0–46% estimated probability of corruption).

Levels of probability of corruption in the product groups within rail and road have also been analysed at Member State level. The main finding here is that the probability of corruption is not only confined to one or two Member States, but that the phenomenon appears to be more structural across the Member States studied.

A broader review of the findings points to a range of possible considerations, issues and uncertainties which are partly generic to the collection of data, and partly specific to product groups and Member States. Taking these into account, it is considered appropriate to test these results with an alternative approach to estimate the probability of corruption, namely through the use of an EU-wide procurement database – the final Stage IV of the comprehensive methodology.

Estimates of the probability of corruption by testing on an EU procurement database (Stage IV)

In the second approach a further testing of the probability of corruption has taken place at the level of product groups. This has been done by tailoring the Corruption-probability Model from Stage I to the EU-wide Tender Electronics Daily (TED) procurement database. This testing is based on the operationalisation of a limited number of red flags only – namely those for which data are available in the procurement database. Only 8 of the 11 red flags mentioned above are available in the TED, but the overall explanatory power of these variables combined is found already to be rather strong.

According to the performed analysis, the product groups with the highest probability of corruption are the staff development services (23–28%) and construction of waste water plants (22–27%). Probability of corruption is estimated to be lower for railway track construction materials and supplies (15–19%). Corruption probability is considered somewhat lower for the construction works for highways (11–14%), radiotherapy, mechanotherapy, electrotherapy and physical therapy devices (also 11–14%) and (airport) runway construction works (11–13%).

The testing of the methodology in Stage IV has a number of limitations. Most important, the testing is limited to the procurement phase, as the TED database (as well as many national databases) only contains information on this phase in the procurement process. With the expansion of available information to the pre-procurement phase and the post-procurement phase, more elaborate analysis may be possible in the future.

Another point of attention for the applied method is that the operationalisation of the red flags had to take place by means of benchmarking against corruption indices. As the indices used are more or less based on circumstantial evidence or subjective opinions, this fully reflects in the selection of red flags. This approach can be improved if corrupt cases could be identified in the TED-database, allowing for econometric analysis on the characteristics of corrupt cases. This would also open doors for the identification of new red flags that are not yet identified in the literature.

Extrapolation of direct costs due to corruption in selected sectors and Member States

In summary, both the Stage III and the Stage IV approach have their advantages and disadvantages. The Stage III approach builds upon the literature about audits and investigations. Although the information per case is relatively rich, the number of procurement cases studied is limited. The Stage IV approach builds upon the literature about performance analysis. It can handle only limited information for each case, but the number of cases analysed is large. This approach can be implemented in a resource-efficient manner.

The two approaches appear to come to comparable results in the case of road and rail construction. When taking into account the size of the representative sample, the robustness of these estimates can be considered relatively high. The estimates for waste water treatment are also pointing towards convergence: both approaches estimate an average probability of corruption around 25%. In R&D and in urban/utility construction, the representative sample approach arrives at a higher estimated probability of corruption than the TED-based approach. It is expected that corrupt practices in these two product groups studied are not sufficiently captured by the selected red flags from the TED database. Due to the limited number of cases within the product group 'staff development services', extrapolation for the sector training is only indicative.

The direct cost due to corruption in public procurement (2010) can now be extrapolated to sectors and Member States studied by multiplying the overall public procurement amounts published in the Official Journal (OJ) by the probability of corruption and the direct public loss due to corruption as % of the volumes procured. These extrapolations are presented in the two tables below.

Direct costs of corruption in procurement for selected sectors and Member States (2010)

Sector (product group)	*% of overall O/J procurement value (sectors)*	*Total public procurement in OJ (bln.) (sectors)*	*% of EU Funds *) (sectors)*	*Probability of corrupt cases*		*Direct public loss due to corruption as % of volume (product groups)*
				low	***high***	
	%	*(Col. C)*	*(Col. D)*	*(Col. E)*	*(Col. F)*	*(Col. G)*
Road & Rail *(Construction work for motorways, railway track construction materials and supplies)*	12.4%	€ 26.1	12.4%	11%	17%	17%
Water& waste *(Construction waste water plants)*	0.7%	€ 1.6	4.8%	25%	35%	7%
Urban/utility construction *((Airport) Runway construction works)*	8.2%	€ 17.3	6.7%	24%	33%	20%
Training *(Staff development services)*	0.1%	€ 0.5	6.5%	11%	37%	43%
R&D/High-tech/Medical *(Radiotherapy, etc.) **)*	2.8%	€ 5.8	5.6%	10%	23%	17%
All sectors studied	24.3%	€ 51.1	36.0%	n.a	n.a	13%
All other sectors	75.7%	€ 159.1	64.0%	n.a	n.a	n.a
Total (all sectors)	100%	€ 210.2	100%	n.a	n.a	n.a

* Certified expenditure in Obj. 1 and 2 in the period 2000-2006 as % for all MS;
** The direct public loss for this sector is estimated on basis of average case budgets.

Direct costs of corruption in procurement for selected sectors and Member States (2010)				
	Low estimate		High estimate	
	*% of total procured value in OJ (Col. E*G)*	*Total per sector (mln.) (Col. C*E*G) (mln.)*	*% of total procured value in OJ (Col. F*G)*	*Total per sector ('000) (Col. C*F*G) (mln.)*
Road & Rail *(construction work for motorways, railway track construction materials and supplies)*	**1.9%**	€ 488	**2.9%**	€ 755
Water& waste *(Construction waste water plants)*	**1.8%**	€ 27	**2.5%**	€ 38
Urban/utility construction *((Airport) Runway construction works)*	**4.8%**	€ 830	**6.6%**	€ 1 141
Training *(Staff development services)*	**4.7%**	€ 26	**15.9%**	€ 86
R&D/High-tech/Medical *(Radiotheraphy, etc.)*	**1.7%**	€ 99	**3.9%**	€ 228
All sectors studied	**2.9%**	*€ 1 470*	**4.4%**	*€ 2 247*
All other sectors	n.a	n.a	n.a	n.a

The direct costs due to corruption in public procurement in the year 2010 for **road & rail** in the 8 Member States studied together is estimated at **1.9 % to 2.9%** of the overall value of procurements in the sector published in the Official Journal, EUR 488 million to EUR 755 million.

The estimated direct costs due to corruption in public procurement in the year 2010 for **water & waste** in the 8 Member States studied together is estimated at **1.8% to 2.5%** of the overall value of procurements in the sector published in the Official Journal, EUR 27 million to EUR 38 million.

The estimated direct costs due to corruption in public procurement in the year 2010 for **urban/utility construction** in the 8 Member States studied together is estimated at **4.8% to 6.6%** of the overall value of procurements in the sector published in the Official Journal, EUR 830 million to EUR 1 141 million.

The direct costs due to corruption in public procurement in the year 2010 for **training** in the 8 Member States studied together is estimated at **4.7 % to 15.9%** of the overall value of procurements in the sector published in the Official Journal, EUR 26 million to EUR 86 million. These numbers are only indicative and the inaccuracy of these figures is large due to the small number of training cases that could be studied.

The estimated direct costs due to corruption in public procurement in the year 2010 for **R&D** in the 8 Member States studied together is estimated at **1.7% to 3.9%** of the overall value of procurements in the sector published in the Official Journal, EUR 99 million to EUR 228 million.

Taken together, **the overall direct costs of corruption in public procurement in 2010 for the five sectors studied in the 8 Member States constituted between 2.9% to 4.4% of the overall value of procurements in the sector published in the Official Journal**, or between EUR 1 470 million and EUR 2 247 million.

It should be noted that the estimated value of tenders published in the TED in 2010, as percentage of the total value of public expenditure on works, goods and services in the 8 selected EU Member States, is 19.1%, but it is not known what this percentage is for the individual sectors of the economy studied.

Broader reflection on the estimates of corruption

The above findings indicate that public procurement is an activity in the economy and in the public administration which is at higher risk. After all, the costs within the sectors and Member States studied point to levels (2.9–4.4%) which are substantially above the more general estimate of the overall costs of corruption within the EU, namely a 1% of GDP-level across all Member States, all sectors and all types of corruption according to the European Commission.

The following points need to be borne in mind as well when further interpreting the above findings:

- The absolute estimates of the direct costs of corruption only take into account the volume of public procurement which is published in the Official Journal. However, the overall amounts of public procurement are substantially higher. For example, the broadest available estimate of the total expenditure of the government public sector and utility service providers on public works, goods and services is up to 5 times higher;
- Public procurement is carried out by a variety of actors, each with different competencies. A crucial difference needs to be made between levels of government, and in particular between central expert bodies and decentralized local authorities. From this perspective, the assessment of sectors such as water & waste and urban/utility construction points to market structures where contracted companies can have an advantage over (decentralized) procurement bodies in terms of information, experience and/or competence;
- The direct involvement of EU Funds differs between Member States and sectors. Overall, within the sectors and Member States studied, the probability of corruption in public procurement is lower when EU Funds are directly involved. Nevertheless, the sectors studied have been amongst the priority axes of EU Structural and Cohesion Policy (together they accounted for 36% of Structural Funds spent in the previous programming period, period 2000-2006);
- The estimates on direct costs of corruption only refer to the corruption that could be detected through the comprehensive methodology given available data, and not to undetected corruption – a share which is expected to grow with increasingly complex and sophisticated forms of corruption being practiced. It is therefore expected that a more in-depth analysis of individual cases would most likely lead to larger direct public losses.
- Furthermore, indirect costs of corruption are not accounted for. In particular, effects on public institutions, the environment, psychological costs, and costs to civil society have not been estimated. Neither have effects of corruption on the international investment climate and trade been estimated.

Ways to prevent and detect corruption

Prices of standardised units

Another objective of this study was to explore the possibility of using the procurement price of standardised units in order to prevent or to detect possible cases of corruption when a certain type of product/service is procured by a public administration. The overall findings are based on a literature and database review, experience from some Member States and a data collection exercise to set up a price of standardised units for the same, above product groups selected. In the context of the general objective of this study, it was explored whether prices of standardised units could serve as a standalone tool and/or indicator in the previously presented comprehensive methodology to prevent or detect possible cases of corruption when a certain type of product/service is procured by a public administration. Therefore, a critical assessment of relevant studies and databases in the field of prices of standardised units has been performed, as well as the development of a theoretical methodology to calculate prices of standardised units and a quantitative analysis on the basis of a sample of collected procurement cases, and finally a qualitative analysis of market prices (the same representative sample of cases as in stage III of the comprehensive methodology).

From a purely theoretical perspective, the analyses performed demonstrate that a price of standardised unit can be envisaged as a tool and/or indicator for detecting and preventing potential cases of corruption. However, from a practical point of view, the limitations to the approach – primarily due to limited data availability and quality – bring discredit to the use of a price of standardised unit. Moreover a direct link between the price of standardised unit and corruption has not been demonstrated.

The literature agrees that it is difficult to collect relevant and highly detailed information (i.e. with an appropriate level of granularity) from the different economic actors to construct prices of standardised units with statistical significance. In addition, the data is often heterogeneous and impacted by different factors (such as project and site conditions that lead to variations in specifications, production location, size, equipment used, etc.). Moreover, the quality of the existing data is not sufficient enough from a general point of view. Consequently the comparison across projects within a particular product group is typically very complex. The diversity in terms of types of projects and methods of implementation makes it extremely difficult to arrive at a numerical definition of a price of standardised unit. These limitations and difficulties are corroborated by the database analysis.

Furthermore, the theoretical methodology and quantitative analysis on the basis of a sample of collected cases have highlighted several limitations, particularly linked to the homogenity of projects within a product group, which has an impact on project comparability, data collection, data granularity, data quality and data management. Despite the limitations encountered, a price of standardised units has been calculated for some product groups. However, it should be noted that these prices of standardised units cannot be considered as statistically significant (meaning that an extrapolation exercise cannot be performed) and that they have been calculated for information purposes only.

In general, the different product groups that have been analysed have a rather large variance and exhibit a considerable difference between the average and median price of standardised units. It indicates that the sample is possibly skewed upwards by a number of outliers. Also the reported standard deviation is rather large, which means that there is a big spread in the data. Therefore, no significant conclusions can be drawn from the quantitative analysis. As a consequence, the findings are not significant and robust enough to support any findings and/or conclusions in terms of corruption detection or prevention in general.

Given the previous conclusions regarding the limitations and difficulties of constructing prices of standardised units, it can be recommended that a number of (organisational) conditions need to be met in order to use a price of standardised unit as an additional source of information which could support the prevention and/or detection of corruption:

- Data collection (general): A centralised procurement administration to which contractors and contracting authorities are obliged to systematically report highly detailed project data and progress (in a standardised format) should be created, in order to facilitate the data collection and treatment on a European level. However, an intermediate level on the national level (i.e. decentralised collection point) could be introduced in order to facilitate the data collection exercise, given the language differences and the local characteristics (such as regional responsibilities).
- Data collection (database): The highly detailed project data and progress reports need to be stored in a database that is applicable to perform calculations. At this moment, the TED database is the closest database on the European level that could be used for the purpose of this study. However it does not contain enough information in its current format. Therefore, it should be assessed whether the current TED-database can be expanded with a number of qualitative fields that provide the possibility of constructing a more accurate price of standardised units (i.e. measure of unit, project/site characteristics, detailed cost information, etc.) vs. the construction of a new database.
- Data quality (definitions): It is necessary to arrive at generally accepted cost and price definitions and to make several assumptions for technical, organisational, micro and macro realities that influence the development of the average price.
- Data collection (dataset): A database with a large amount of procurements/projects is necessaryand considerable resources (in terms of time and employees to collect and treat the data) have to be made available to fill and maintain this database. Overall, this represents a cost to public administration (and the tax payer) which needs to be weighed vis-à-vis the added value of corruption prevention and/or detection.
- Comparability (project and site characteristics): Our analyses have demonstrated that project and site characteristics impact prices of standardised units. Therefore, it is opportune that information related to project and site characteristics is collected, which would allow the creation of relatively homogeneous project groups in order to compare projects.
- Future development: A database for calculating prices of standardised units will need to be maintained and regularly updated in order to retain its relevance.

Identified positive and negative practices in public procurement

A sound public procurement system is based on rules, encourages competition in bidding for government contracts, promotes transparency, strengthens accountability, is economic (value for money) and is efficient. Overall, 5 key instruments to manage the risk of corruption help to ensure that the basic principles for a sound public procurement system can be achieved and monitored:

1. A corruption risk management programme;
2. Periodical risk assessments;
3. Prevention techniques;
4. Detection techniques;
5. A reporting and investigation process.

As mentioned, this study provides the first empirical methodology to measure corruption in public procurement. This methodology, when improved and used in all sectors and Member States, could provide a first overall picture of the level of corruption. Since this methodology was not fully available to date, and it was therefore impossible to measure change in corruption levels either, it was not possible to draw valid conclusions on the effectiveness of anti-corruption measures and programmes. Furthermore, it is difficult, if not impossible, to establish causality between anti-corruption reforms and changes in corruption levels: did these changes occur in spite of or thanks to anti-corruption efforts?

For only a few measures, laboratory and field experiments provide some first insights that they actually cause some effect. But then: how should the contribution of individual measures to changing levels of corruption be determined? Moreover, many anti-corruption measures are not solely aimed at fighting corruption in public procurement but at fighting corruption in a broader domain, and therefore these measures can e.g. be effective in one or more areas, but not in public procurement.

Therefore it is only possible to identify practices that in theory can work as a positive or as a negative practice as regards to the prevention, detection and investigation of corruption. A few of these – in theory – positive practices that were identified in this study and that also help to prevent and detect the strong predicting red flags are:

Corruption risk management policy: a firm (legal, institutional, technical) basis to protect public procurement against corruption

- An anti-corruption policy or program with clear objectives that focuses the efforts of the various actors involved in the fight against corruption in public procurement;
- Ethical Codes of Conduct, either incorporated into civil service legislation or independently that encompass not only government officials and civil servants, but contractors as well;
- A comprehensive corruption risk management program for public procurement, that is implemented in the entire public procurement process and periodically maintained/updated;
- Corruption risk management that not only focuses on the contractors, but also on subcontractors and others involved in the proper execution of the contract [*also helps to recognise connections between bidders that undermines competition, red flag 17*];
- No shift (outsourcing) of public procurement activities from public entities to either private or public enterprises that are not subjected to public procurement laws, nor bound by similar explicit rules or agreements for executing such activities [*this practice is also very relevant in the light of two red flags: contact office not subordinated to tender provider (red flag 4) and contact person not employed by tender provider (red flag 5)*].

Corruption prevention techniques

- Proper screening of contractors and beneficiaries, especially their ultimate beneficiary owners [*this might also prove relevant to recognise connections between bidders that undermines competition, red flag 17*];
- Adequate implementation of the debarment obligation in the EU procurement directive;
- Pre-employment screening and in-employment screening of all those involved in public procurement: public officials, civil servants, as well as temporary staff and external parties hired to facilitate public procurement, including periodical update of the screening and an obligation for all staff to report changes in their personal circumstances and not only focused on job qualifications and formal background antecedents, but also on intrinsic motivation [*this practice is also very relevant in the light of two red flags: contact office not subordinated to tender provider and contact person not employed by tender provider, red flags 4 and 5*];

- Job rotation – performed in the right balance between costs of job-rotation when compared to estimated costs of (potential) corruption;
- A formalised financial disclosure/assets declaration system that regulates who has to declare, the type of information requested from the filer, the frequency of the declarations and public access to disclosed information;
- Specialised, well trained public procurement staff that share their expertise, knowledge and (market) intelligence, also across Member States' borders [*professional staff should be able to structure the procurement process in such a way that tenders are not exceptionally large, to prevent amending the bid specification after contract awarding as well as prevent substantial changes in the project scope/costs afterwards, to recognise artificial bids and to prevent that not all/no bidders are informed of the award and its reasons - red flags 9, 13, 15, 16 and 19*];
- Centralised or joined procurement, especially for small organisations and for unordinary procurements, also as an enabler for the professionalisation of the public procurement function;
- A structured market (price) analysis and sharing of market intelligence, also across EU Member States' borders;
- Institutionalised awareness raising programmes for the public sector, specifically aimed at public procurement and with more emphasis on the costs of corruption and the harm corruption does to society, which may help to change the value system of public officials;
- Optimal transparency in the entire public procurement process, maximal public availability of relevant, easy to access and easy to use procurement information [*to avoid that award contracts and selection documents are not public and to avoid that not all information is filled in TED or national public procurement databases, red flags 20 and 25*].

Corruption detection techniques and corruption investigation and reporting

- Independent audits and evaluations performed according to good audit and evaluation (EU-wide) standards and qualification levels for civil servants and auditors involved in the management, control and audit of public procurement), where corruption is one of the objectives and results are shared, also between EU Member States [*this practice should be focussed especially also on all the identified significant red flags, as well as on the outcome of the application of the methodology on samples of public procurements, in order to raise efficiency and effectiveness of audits and evaluations*];
- Data analysis of easily accessible, relevant and good quality data on public procurement [*including use of significant red flags as indicators as well as applications of the comprehensive methodology to estimate probability of corruption*], to detect potential irregularities, fraud and corruption, such as:
    - Needs assessments of the projects;
    - Breakdown of the main components of a project with, where available, a statement on standard prices per component;
    - Information on the bids received (number of bids, names of companies involved etc.);
    - Number and reasons of bids terminated;
    - Key outputs offered in the winning proposals;
    - Detailed information on contract modifications;
    - Monitoring and evaluation reports of the projects;
    - Detailed information on the companies the state has contracted (e.g. ownership, number and value of contracts won etc.); and
    - An overview of the companies blacklisted (due to e.g. corruption).
- Links to experiences with detecting tax evasion through detection with help of data analysis, as well as experiences with *fusion centres*, inter-organisational cooperation centres where databases and knowledge/experience of staff from different authorities are joined to fight (tax-)fraud;
- Good functioning system for whistle blowers, including proper protection of whistle blowers;
- Good functioning leniency and voluntary disclosure programmes, with adequate sanctions;
- Collection of meaningful, accurate and detailed statistics on corruption, especially on corruption in public procurement, to help increase the overall understanding of corruption and the effect of counter measures and allowing for EU comparison and analysis, as well as for national, tailored policies and interventions;
- Competent and independent investigating agencies with focus on investigation of corruption in public procurement, with sufficient investigative competencies, adequate sharing, at national and at EU-level, of information and intelligence.

Benchmark of procurement systems in all 27 EU Member States

Since until to date, no empirically founded conclusions could be made about the (changes in the) level of corruption in public procurement, a benchmark of all 27 EU Member States on a number of indicators for aspects of their procurement systems can only demonstrate that certain policies and practices are in place. And, when compared, it can be concluded that some Member States have more or other practices and policies in place than others. But whether this results in anything – lower level of corruption in public procurement, higher rate of prosecuted cases of corruption in public procurement – cannot be concluded, at this moment.

It is however relevant to start, to improve and to repeat this benchmark over time, for at least two reasons:

- If practices and policies to prevent, detect and/or investigate corruption are *in theory* good to fight corruption in public procurement, there is no harm in implementing these in public procurement in those sectors of the economy where EU Funds are involved – provided that the costs of these measures are perceived as being in balance with their respective benefits;
- Since a first estimate of the probability of corruption in public procurement has been developed and tested in this study, it might become possible in the future to measure levels of estimated probability of corruption (and their estimated costs), as well as the development of these levels over time and in comparison between Member States. This might allow finding policies and practices that appear to contribute to low or decreasing estimated levels of probability of corruption in public procurement (and are absent in situations with high estimated levels of corruption). For these policies and practices, it could be worthwhile to further investigate their causality and their correlation with the level of corruption in public procurement.

A benchmark of elements with regard to the prevention, detection and investigation of corruption in public procurement requires a broad variety of data and information, scattered over a broad range of actors that mostly have only a limited view over the whole chain. Stimulating Member States to get a complete overview, or a more targeted approach that focuses on specific topics could help to get a better, more in-depth picture of the state of affairs in the respective Member States.

The benchmark that was performed for this study showed that when looking at the legal, institutional and technical situation in most of the EU Member States a firm basis to protect public procurement against corruption exists. With regard to the *legislation on whistle-blowing* as well as to the *protection of whistle-blowers*, respondents of almost half of the Member States replied that this was not well regulated yet.

When looking at the systems and methods of the EU Member States in use for *risk assessment of corruption in public procurement*, respondents pictured that in most Member States review bodies independent from procuring agents exist and that these bodies are adequately resourced. E-procurement improves transparency, exchange of information and communication in almost all Member States. However, only four Member States have these *e-procurement platforms* which contain a *module designed for the detection of corruption*. And although there are central and/or local databases in the majority of the 27 Member States, only half of the Members States analyse such data on unusual patterns. When it comes to *storage of data on all corruption cases in public procurement*, authorities from only three Member States replied that such a database on central and/or local level exists.

Most Member States have preventive measures in place against corruption in public procurement. *Screening of civil servants* (involved in public procurement) is a common practice in a number of Member States, but *selecting* civil servants on a specialised education or training is less common than screening on their competence and susceptibility to corruption. Rules and procedures of *debarment* are clearly documented and publicly accessible in almost all of the Member States. This is also the case for the *public availability of debarment lists* and reasons with reference to the debarment rules.

The picture with regard to *awareness-raising* in the Member States, by means of training of staff on national anti-corruption policies and establishing centres of expertise on anti-corruption is mixed. Since awareness programmes are on average not very resource intensive and easy to develop, this would be the likely place for improvement in a number of Member States.

The same goes for the *collecting of data and statistics in the field of public procurement* useful for detecting possible irregularities or even corruption, as well as for the use of indicators that point to possible cases of corruption: both are implemented only in a few Member States.

With regard to *investigation of corruption*, most of the EU Member States which provided inputs stated that an independent judicial system for corruption investigations is existent. Also, the law enforcement has adequate powers to investigate corruption in public procurement in most of these EU Member States. However, in many Member States complaints were voiced about *insufficient priority given to the investigation and prosecution of corruption*, also in public procurement, due to a variety of reasons. Additional research is recommended to assess the effectiveness and efficiency of the judiciary systems in this regard.

Widely known *hotlines for reporting corruption*, including in public procurement, exist in 14 EU Member States. There are 10 EU Member States that indicate that there are corruption investigation units in all relevant government institutions.

Data collection and innovative tools and methodologies for prevention, detection and investigation at EU level

Effective detection and prevention of corruption in public procurement is possible if the administrative data on tenders, bidders, projects and contractors are collected and stored in a structured way, accessible for controls, investigations and analyses. These structured databases could allow ex-ante monitoring and ex-post analysis of indicators of corruption ('red flags'). New data mining techniques can be used to detect anomalies in the data that perhaps point at potential cases of fraud or even corruption. Moreover, based on the comprehensive methodology to measure the costs of corruption in public procurement these databases can also enable a more detailed analysis of not only the probability of corruption, but also a more accurate estimate of the costs of corruption.

Public procurement systems and databases for the collection of data at EU level are developed in order to facilitate the process of public procurement. They also answer to the need for the collection of information for transparency and information on an equal treatment of all potential bidders. Neither a database nor a procurement system currently being used with the explicit objective to facilitate public procurement *and* to prevent or detect corruption has been found. However, most databases and systems contain data and information that *can* be used for prevention, detection and investigation purposes.

Based on the data collected on central and local IT tools currently used in EU Institutions, an analysis has been performed on the potential use of these tools in order to detect and prevent corruption in public procurement. These tools provide a number of possibilities in terms of data collection on EU public procurement. However, these systems are not developed with the objective to respond to the need of anti-corruption measures. For that purpose, these systems require standardisation and restructuring of data storage, enabling computerised corruption detection and prevention based on the data stored in local and central databases which are interlinked. The procedures for collection and management of procurement data also needs to be standardised in order to achieve this goal.

The analysis shows that the main objective of the units using an IT tool for procurement is to follow the management of the procedural steps and workflow rather than data storage and processing. Procurement is a complex process within the EU institutions. Whereas there are financial regulations setting the main rules, Directorates General (DGs) and units have the liberty to develop their own processes that are most suitable to their own structure and working methods. The high number of units and individuals involved in the procurement cycle makes the process management difficult. Therefore an automated system for process management comes as one of the priorities when DGs decide to develop an IT tool for procurement. The fundamental information concerning the EU procurement procedures such as the deadline for submission of the proposal, the date of the tender opening session and the name of the contractor is the most collected type of data.

A high number of IT tools and systems exist for generating, structuring, processing and storage of data and documentation on public procurement used within the EU institutions. The level of use of corporate systems related to public procurement differs from DG to DG and even from unit to unit within the same directorate. Whereas some DGs benefit from the functionalities of certain centralised tools at the maximum level, there are others that don't go beyond the minimum required data that needs to be entered to the system. In addition, not all procurement data at the EU level is stored electronically at every step of the procurement cycle. Proposals are a good example for this practice being stored only as hard copy. The multi-functionality of the existing systems is under developed. Most of the systems are not linked to each other.

The data collected on public procurement can only help to prevent and detect corruption if it can be used to extract knowledge and patterns that provide hints and red flags to investigate further or develop preventive structures. In spite of the shortcomings, the data collection on public procurement at EU level provides a basis for the development and implementation of more and better Self-Monitoring, Analysis, and Reporting Technology (S.M.A.R.T.) anti-fraud and anti-corruption tools. These tools are able to structure, process and analyse available data on public procurement. Huge collections of data create new needs to help to make better managerial choices. These are automatic summarisation of data, extraction of the "essence" of information stored, and the discovery of patterns in raw data. The challenge of extracting knowledge from data draws upon research in statistics, databases, pattern recognition, machine learning, data visualization, optimization, and high-performance computing, in order to deliver advanced business intelligence and web discovery solutions.

The area of data analytics is one of the most effective methods to prevent or detect corruption and/or fraud, e.g.:

- *Data analysis* is the process of cleaning, transforming, testing and modelling of data with the goal of highlighting useful information, suggesting conclusions and supporting decisions;
- *Data mining* is the application of statistical algorithms to data in order to identify patterns and systematic relationships within data sets, and subsequently applying detected patterns to new subsets of data to make predictions:
- *Data visualisation* is a technique used to represent data in an intuitive graphical format which communicates information to the viewer more effectively. Tableau for example is such a data visualisation tool;
- *Third party monitoring (TPM)* is another method which utilises consolidated publicly available information in order to identify relevant information such as financial information, propensity to go bankrupt, adverse media and relationship checking;
- *Real time transaction monitoring (RTTM)* is another technique which can be used to detect corruption and/or fraud. RTTM is the identification of transactions in real time, thus allowing an early identification and appropriate response to be taken. Advantages of RTTM include besides the ability to minimise both financial and reputational damage also the improvement of controls and processes in order to mitigate risks.

Conditions and key actors for the prevention, detection and investigation of corruption

Although coordination and supervision of public contracts is often assigned to designated public authorities, these bodies tend not to focus specifically on detecting corruption. Incidents of suspected fraud and corruption are detected by national audit institutions through the audits on procurements involving national and European funds, even though auditors are not necessarily geared towards the detection of corruption either.

With regard to the EU Structural Funds, designated bodies (i.e. Managing Authority, Certifying Authority and Audit Authority) have been set up in Member States in order to prevent, detect and correct irregularities and suspected fraud, and recover amounts unduly paid. However, these actors are not geared towards the detection of corruption, and neither are the evaluators of these programmes.

Member States studied each have their own landscape of anti-corruption bodies, many focusing on investigation, but some focusing on prevention and detection as well. Most agencies include corruption in public procurement, amongst other forms of corruption as well.

The fight against corruption is however not only carried out by formal public institutions, but increasingly so by informal networks, such as NGOs, press and citizens. Especially in a context of high unemployment, scarce public resources and fiscal austerity, citizens and businesses alike appear to be less and less tolerant vis-à-vis fraud, money laundering and corruption. Such a change in attitude has at least three major consequences. Firstly, decision-makers are under increasing pressure to ensure transparency and reinforce, update and coordinate the national and international anti-corruption agendas. Secondly, private and civil actors are increasingly detecting corruption and denouncing corrupt behaviour to the competent authorities. This trend is supported by the creation of whistle-blower systems and protection programmes, which represent a real incentive to share and denounce illegal behaviour, both in private companies and in public institutions. It is also supported by political will, free and properly resourced press, and active social media networks. Thirdly, these societal trends and in particular the rise of social media networks provides new opportunities for formal investigators as well, who see an increase in the amount of leads and data to be pursued from informal sources.

National Investigative Agencies, entitled with both enforcement and investigative powers, vary considerably across Member States in terms of resourcing, independence and effectiveness. Thanks to international

arrangements and initiatives, Member States have progressively established integrated anti-corruption institutions, with powers in prevention, detection and investigation. For instance, on the basis of the recommendations issued by the Council of Europe's Group of States against Corruption (GRECO), Member States have been actively identifying deficiencies in national anti-corruption policies, prompting the necessary legislative, institutional and practical reforms.

Because criminal acts including corruption are increasingly characterised by cross-border (and international) networks of individuals and organisations, cooperation at both the European and the international level becomes increasingly important. It requires bilateral cooperation between Member States as well as excellent cooperation with institutions such as Eurojust, Europol and OLAF.

Conclusions

Corruption is a broad and largely hidden phenomenon, and only elements of corruption related to public procurement in a number of Member States and sectors has been studied. The need to measure the costs of corruption is broadly felt, as a foundation for the design and implementation of effective, efficient and proportional anti-corruption policies and practices.

Taken together, the overall direct costs of corruption in public procurement in 2010 for the five sectors studied in the 8 Member States constituted between 2.9% to 4.4% of the overall value of procurements in the sector published in the Official Journal, or between EUR 1 470 million and EUR 2 247 million. It should be noted that the estimated value of tenders published in the TED in 2010, as percentage of the total value of public expenditure on works, goods and services in the 8 selected EU Member States, is 19.1%, but it is not known what this percentage is for the individual sectors of the economy studied. When using and interpreting the above figures, caution is required because the results derived are of an econometric nature. They include both estimates for sectors (related to the public loss due to inferior performance) as well as for product groups (probability of corruption). Types of corruption differ between sectors and Member States and the analysed cases relate to the period 2006-2010, and today's figures might be different from these.

The findings on the direct costs of corruption point to substantial differences between sectors, not only in terms of procurement amounts concerned, the probability and the costs of corruption, but also in terms of the types of corruption (e.g. bid ridding versus kickbacks or conflicts of interest). These types of corruption appear to be related to the specifics of product and service markets, in terms of demand and supply structures and (power) relationships. Although the research points towards corruption being lower in procurement cases supported by EU Funds, it was not possible to distinguish corruption in public procurement related to EU Funds from corruption in public procurement funded by other – national – funds in the 8 selected EU Member States.

Transparency has turned out to be a crucial factor for the measurement of corruption: the amount of information available is an essential element.

Hence, the costs of corruption can be regarded substantial and provide a basis for further measurement efforts. However, implementation of such a comprehensive methodology requires:

- High requirements of data which are only partially in the public realm;
- Cooperation from a range of actors, including those who are potentially corrupt;
- Accessibility to public procurement files – which is often difficult for operational reasons (e.g. change of staff, reorganisations, etc.);
- Databases to be filled in with actual, reliable, complete and correct data.

Based on the experiences to date, the measurement of costs of corruption can be considered resource-intensive and time-consuming. However, in order to maximise the return of the reduction of the cost of corruption to the benefit of the taxpayers, by insuring effective and efficient use of the scarce public funding, the implementation of (technological) tools and processes and the maintenance of those tools and processes to measure the cost of corruption should be carefully planned for - including an assessment of the related costs - and implementation in all EU-institutions and EU Member States should be fostered.

Maintaining unit cost benchmarks (of outturn ex-post costs not ex-ante tendered prices) at a national (or even EU) level is a good practice for estimating costs of procurements, but cannot be used in itself as an indicator of corruption.

Recommendations

As mentioned before, the context of corruption in public procurement is fragmented and there are many very different actors involved in the consecutive stages of public procurement and in the prevention, detection and investigation of corruption. None of these actors has fighting corruption in public procurement as its sole or main task, and there are no authorities at national or EU-level that link or integrate parties involved. Nor are there authorities that link or integrate all data on public procurement which is relevant for the prevention, detection and investigation of corruption. It is therefore difficult to attribute specific recommendations to specific authorities or organisations.

In the light of all the above findings, the following is thus recommended to all EU and national authorities responsible for public procurement and the prevention, detection and investigation of corruption therein:

Data collection

1. *Perform the comprehensive methodology to estimate the costs of corruption in public procurement* in a similar way in other sectors and other Member States to further strengthen the results and their reliability.

2. As part of public procurement procedures, *ensure the timely and complete filling out of the TED procurement database*, including contract award notices, thus reducing the often large number of blank spaces/delays/mistakes.

3. Further develop the *central collection of public procurement data*, also explicitly driven by the objective to prevent (and detect and investigate) corruption in public procurement. *Add additional data fields in the central procurement databases* (including TED) to collect data on significant indicators and other information that allow for a better quick-scan of corruption, such as:

    - Number and details of (formal or informal) complaints from non-winning bidders (red flag 14);
    - Number and details of substantial changes in the scope of the project or the project costs after award (red flag 16);
    - Qualitative fields that provide the possibility of constructing a more accurate price of standardised units (i.e. measure of unit, project/site characteristics, detailed cost information, etc. – a separate, designated database for the purpose of analysing prices of standardised units can also be considered).

4. Develop *central collection of meaningful, accurate and detailed statistics on corruption in public procurement*, to help increase the overall understanding of corruption and the effect of counter measures and allow for EU comparison and analysis, as well as for national, tailored policies and interventions.

5. Construct *copies of (or provide access to) relevant databases (e.g. TED database) for OLAF and other audit and investigative bodies* in order to filter – with the help of the identified significant indicators – procurements with a higher probability of corruption.

6. Support *measures that increase the transparency of public procurement*, not only for future measurement purposes, but also as a tool for prevention and detection. Examples of such measures are the introduction of (mandatory) e-procurement, broader use of forensic audits, strengthening investigation and enforcement capacity, voluntary disclosure programmes, external monitoring, reporting and access to information and information sharing.

Policy research

7. Explore the *indirect effects of corruption in public procurement* as this will most likely reveal other connections between corruption, the economy and society as a whole; relevant within the context of the EU 2020 strategy. Angles which appear particularly relevant include:

    - Effects on the reputation of public institutions and their trustworthiness;
    - Effects on public goods, including the environment, civic society;
    - Effects on the international investment climate and trade.

8. Develop and implement *adequate tools and methods for audits and evaluations* to acknowledge and signal the presence of corruption in public procurement processes.

9. Invest in the *(experimental) research on ways to measure causality and effectiveness of instruments and practices to prevent, detect and investigate corruption*.

Analysis, audits and evaluations to prevent, detect and investigate corruption in public procurement

10. Contracting authorities should make all necessary efforts to *perform market analyses and collect market intelligence* to ensure that public procurements are market-based, generating sufficient (not necessarily maximum) amount of tenders, and that services are obtained in the most effective and efficient manner.

11. Improve *performance audits and evaluations* that review the substance of projects (performance-based monitoring and evaluation) rather than check procedural compliance, and extend the focus from the actual procurement to the preparation and implementation stage, and focus on high probability cases. Relevant indicators are:

    - Improper splitting up of contract amounts, in order to stay within the limits of negotiated procedures;
    - False urgency; abuse of accelerated public procurement procedures without adequate justification;
    - Use of eligibility criteria as quality criteria; thus reducing the competition on formal grounds;
    - Strange price reductions; abnormally low tenders;
    - Unjustified need: lack of a concrete justification by the public administration of the impossibility to carry out those services internally.

12. Develop and implement more and better *Self-Monitoring, Analysis, and Reporting Technology* (S.M.A.R.T.) anti-fraud and anti-corruption tools at EU level, and put these at the disposal for use by all EU Member States (and even third countries).

Organisation of the fight against corruption in public procurement

13. Invest in *effective deployment of practices that help to prevent and detect red flag-situations* in public procurement and/or which - also based on experiment findings - contribute to reducing (costs of) corruption in public procurement, in particular centralised/joined public procurement, professional staff in public procurement functions that is adequately paid, screening of this staff and others involved in public procurement and job-rotation.

14. Further invest in *good functioning systems for whistle blowers*, including proper protection of whistle blowers.

15. Stimulate the establishment of *competent and independent investigating agencies with focus on the investigation of corruption in public procurement*, with sufficient investigative competencies and *adequate sharing of information and intelligence, at national and at EU-level*.

1. Introduction

The overall objective of this study on identifying and reducing the costs of corruption in public procurement involving EU Funds is to provide information, methodologies and tools for the European Commission and Member States authorities for the implementation of the Commission/EU anti-corruption policies. Until to date, no empirically founded conclusions could be made about the (changes in the) level of corruption in public procurement. The primary objective of this project is to present a methodology to estimate the costs of corruption in public procurement in sectors of the economy where EU Funds are spent. As a secondary objective, the study provides information and tools which may feed into the EU Anti-Corruption Report in order to improve the (application of) public procurement rules and practices, as well as to promote implementation of the Commission Anti-Fraud Strategy in the Member States.

PwC, Ecorys and the University of Utrecht performed this study on identifying and reducing the costs of corruption in public procurement involving EU Funds for OLAF, on behalf of the European Commission, between March 2012 and June 2013. We studied a vast amount of reports and literature, we interviewed numerous people at EU and national level, and we conducted several surveys and collected data in 8 EU Member States and at EU level. The project to develop and apply a new methodology to estimate the costs of corruption in public procurement turned out to be an exploration of new grounds, meaning that it was difficult to plan and manage. And although the original deadline has not been met, we are confident that this final report is worth all the additional time invested in the study.

The study project was governed by a steering committee composed of representatives from various Commission Directorates General and presided by OLAF. Ms. Macovei MEP provided feedback on preliminary results, drafts and part of the research approach. An external expert panel, experts from the European Court of Auditors and OECD as well as experts from PwC, Ecorys and University of Utrecht reviewed (parts of the) drafts of this final report.

We would like to thank the European Commission for entrusting PwC and Ecorys with carrying out this study, which we consider as being of strategic significance. We are also grateful for the very valuable input provided by the European Commission in the course of the Study. The close collaboration we enjoyed during our contacts and meetings proved to be of extreme importance for reaching our objectives and results.

In accordance with the Statement of Work and our discussions, we are pleased to present the European Commission with our final report.

2. Research objectives, scope and methodology

2.1. Research objectives

The objective of this study is to provide information, methodologies and tools for the Commission to implement or to assist Member States' authorities with the implementation of the Commission/EU anti-corruption policies.

In 2011 the Commission adopted two Communications outlining its future policy in fighting fraud and corruption. First, the Communication on Fighting Corruption in the EU[1] served to set up an EU anti-corruption reporting mechanism for periodic assessment of the Member States, the so called 'EU Anti-Corruption Report'[2]. Second, the Communication on an Anti-Fraud Strategy[3] provides a framework for fighting fraud affecting the EU financial interests. In 2011 the Commission also adopted its proposals on public procurement[4] as part of an overall programme aimed at an in-depth modernization of public procurement in the European Union.

The impact assessment working paper produced by the Commission on establishing an "EU Anti-Corruption Report"[5] states that there is currently no clear picture available of variations in the levels of corruption and trends across the EU. This is due to the fact that EU Member States do not collect statistics concerning instances of corruption and corruption levels in a unified way. According to the impact assessment, an instrument (one general or several specific instruments) should be adopted to harmonise the definition of corruption and measure corruption. Public procurement is mentioned as a top priority and a critical domain in which corruption should be defined and measured. Therefore, a methodology should be developed in order to measure the costs of corruption or provide close estimates of this cost in public procurement in certain sectors of the economy which are within scope of EU Cohesion Policy.

The primary objective of this project is to present a methodology to estimate the costs of corruption in public procurement in sectors of the economy where EU Funds are spent. The study further aims to provide tools which may feed into the EU Anti-Corruption Report, improve the application of public procurement rules as well as promote implementation of the Commission Anti-Fraud Strategy in the Member States.

[1] EUROPEAN COMMISSION (2011) Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee on Fighting Corruption in the EU. COM (2011) 308 final. Available from: http://ec.europa.eu/home-affairs/news/intro/docs/110606/308/1_EN_ACT_part1_v12[1].pdf.

[2] Commission Decision establishing an EU anti-corruption reporting mechanism for periodic assessment ("EU Anti-corruption Report") was adopted together with the Communication (COM(2011)3673).

[3] EUROPEAN COMMISSION (2011), *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Court of Auditors on the Commission Anti-Fraud Strategy*. COM (2011) 376 final. Available from: http://ec.europa.eu/anti_fraud/documents/preventing-fraud-documents/ec_antifraud_strategy_en.pdf..

[4] EUROPEAN COMMISSION (2011), *Proposal for a Directive of the European Parliament and of the Council on Public Procurement*. COM (2011) 896 final. Available from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0896:FIN:EN:PDF.

[5] EUROPEAN COMMISSION (2011), *Commission staff working paper, accompanying document to the draft Commission Decision on establishing EU Anti-Corruption reporting mechanism for periodical evaluation ("EU Anti-Corruption Report)*, Impact Assessment, SEC(2011).

Based on the terms of reference, the research objectives are as follows:

1. Formulate common definitions of corruption and related aspects of conduct in the area of public procurement, such that relevant data could be collected and compared in a coherent manner, both at EU level and in the different MS (*chapter 3*).
2. Identify quantitative and qualitative indicators of corruption in public procurement projects ("red flags"), which signal increased project costs, corrupt practices and losses for public budgets, as well as the most suitable tools whereby they can be detected. These should cover tools and mechanisms, which are applied at national, regional or local levels, wherever EU Funds are managed (*chapters 6 and 7*).
3. Identify smart and innovative tools or methodologies that are able to structure, process and analyse available data on public procurement projects. Such tools may uncover irregularities or divergences in the application of procurement rules among comparable sectors, regions, authorities etc. They may originate from the relevant authorities, judiciary, private sector or non-profit organisations including academia. The project will also look into possible modalities of improving or making better use of the current systems of collecting administrative data at the EU level (public procurement related) in order to detect and prevent corruption, and to centralise information on corrupt practices detected in public procurement and their follow-up (*chapters 4 and 5*).
4. Develop a comprehensive methodology to measure the real costs of corruption (or to provide very close estimates) in selected sectors of the economy. The calculation of costs should distinguish direct costs for the public budgets, which should be easier to identify, from other indirect costs for the society and focus on the former. Identify and describe existing methods, measures and systems of measuring costs of corruption, as a basis for this methodology, which could be characterized as best practices. List relevant surveys and studies on this subject, in particular studies and research already procured by the EU institutions. Identify data regarding market prices held by statistical and other authorities or entities and identify and analyse methodologies used by the judiciary for the calculation of the costs of corruption (*chapter 6 and 7*).
5. Apply/test the methodology in 5 selected sectors of the economy (including the civil and infrastructure construction sectors, the social/employment support sector and the health sector), which are of concern in relation to the EU cohesion policy, each in 8 Member States (*chapter 7, 8, 9 and 10*).
6. In the tested sectors, where costs are calculated for a particular period of time, identify the costs which have effectively been recovered by the authorities or provide an estimate for the cases which are still on-going (*chapter 9 and 10*).
7. Analyse the procurement prices for standardised units of 5 particular sets of products/services, typically procured with the support of EU Funds across all Member States. Among the sets of products selected for these comparative case studies are the costs of road infrastructure, retraining courses, and medical hospital equipment (*chapter 11*).
8. Identify negative procurement practices, which contribute to the increase of overall corruption costs, as well as positive and / or best practices that lead to prevention of corruption and to lower corruption costs, in the whole tender/grant cycle (preparation, selection, and implementation). In particular, the study will analyse best practices in leniency/voluntary disclosure programs (*chapter 12*).
9. Set a number of benchmarks, based on the identified best practices, against which the procurement systems of all Member States should be tested. The study should analyse the rules and practices in all Member States and recommend improvements where the benchmarks are not met (*chapter 13*).
10. Analyse the behaviour of key actors for detection and investigation of the cases in 8 Member States. Here is identified which actors detect corruption and in what proportion (controls of responsible authorities, whistle-blowers, investigative journalists etc.). Also material, legal and other conditions for the effective enforcement of existing rules and procedures were identified. Special attention has been given to the analysis of the incentives/disincentives to investigate corruption cases and to recover misused funds (*chapter 14*).

2.2. Scope

2.2.1. Direct costs

The focus of this study is on the direct material costs of corruption: the immediate monetary consequences for the national budget (and, when EU Funds are involved, the EU budget) resulting from of a public procurement case being corrupt. The public loss investigated is the estimated monetary amount lost to corruption in the event that a public procurement case turns out to be corrupt. This estimated monetary amount includes the following components[6]:

1. **Ineffectiveness**: the project does not (or not fully) reach its objectives. This is the case if procurement of works, goods or services generates *lower than intended (or even negative) public value* ("waste");
2. **Inefficiency**: the outputs of a project are not in line with the inputs. Efficiency is a concern when sources of public loss include procurement at *higher prices* than competing bids, which offer similar and not higher quality ("excessive price"), or when procurement takes place at similar prices but with *lower quality* than competing bids ("inferior quality").

Indirect costs have not been taken into account. Such costs include misallocation of public spending, distortions of markets and competition, delay in the duration of procedures and implementation of projects, projects that are never completed, general distrust in formal and informal institutions, the costs of anti-corruption policies themselves and eventual non-material costs. For further information see section 0.

2.2.2. Corruption

For the purpose of this study, the classic definition of corruption: ***the abuse of power for private gain*** is used as the working definition. Chapter 3 presents a more detailed elaboration of this working definition.

2.2.3. Public procurement

Public procurement is a multi-step process. It involves the full cycle from needs assessment through the preparation of the procurement, documentation and awarding of the contracts, the implementation and monitoring of the project. Numerous authors and institutions, such as the OECD, Plummer and Cross, and Transparency International, have made a step-by-step analyses of the procurement process and the risks in each phase.[7] This study will adopt the following basic three-stage classification:

Table 1: Public procurement stages

Pre-bidding	Decision to contract (needs assessment)
	Definition of contract characteristics
Bidding	Contracting process
	Contract award
Post-bidding	Contract implementation and monitoring (including contract outcomes)

2.2.4. EU Funds

The scope of this study is corruption in *public procurement in those sectors of the economy where EU Structural and Cohesion Funds are spent*. The total budget for these funds over the period 1 January 2007 - 31 December 2013 amounts to EUR 347 billion – which is 0.40% of the EU-27 GDP (see table 2 below). The Structural Funds consist of the European Regional Development Fund (ERDF) and the European Social Fund (ESF). The Structural Funds and the Cohesion Fund make up the great bulk of EU funding (approximately 36%), and the majority of total EU spending.

[6] The entire concept of public loss as a consequence of corruption in described in more detail in chapters 6 and 8.

[7] OECD (2007), *Bribery in Public Procurement. Methods, Actors and Counter-Measures*; PLUMMER, J. and P. CROSS (2007), *Tackling Corruption in the water Sanitation in Africa: Starting a dialogue*, in: Campos, J. and S. Pradhan (eds), *The Many Faces of Corruption*, Washington, 2007; TRANSPARENCY INTERNATIONAL (2010), *Corruption and Public Procurement*, Working paper 05/2010.

The main responsible Directorates-General (DGs) for the spending of these funds are the Directorate General for Regional Policy (DG REGIO) for the ERDF and the Cohesion Fund and the Directorate General for Employment, Social Affairs and Inclusion (DG EMPL) for the ESF. Over 80% of these funds is spent in 10 Member States: Poland (EUR 67 billion), Spain (EUR 35 billion), Italy (EUR 28 billion), Czech Republic (EUR 27 billion), Germany (EUR 26 billion), Hungary (EUR 25 billion), Portugal (EUR 22 billion), Greece (EUR 20 billion), Romania (EUR 20 billion) and France (EUR 14 billion).

Table 2: EU Structural & Cohesion Funds: 2007-2013 program spending (and TI index)

Member State	*Year of EU entry*	*GDP (million €) (2011)*	*EU Structural and Cohesion Funds 2007-2013 (million €)*	*EU Funds / GDP (annualised)*	*Corruption Perception Index (score [rank]) 2012*
Austria	1995	286 197	1 461	0.07%	69 [25]
Belgium	1952	354 378	2 258	0.09%	75 [16]
Bulgaria	2007	36 034	6 853	2.72%	41 [75]
Cyprus	2004	17 334	640	0.53%	66 [29]
Czech Rep	2004	149 313	26 692	2.55%	49 [54]
Denmark	1973	234 005	613	0.04%	90 [1]
Estonia	2004	14 305	3 456	3.45%	64 [32]
Finland	1995	180 253	1 717	0.14%	90 [1]
France	**1952**	**1 932 802**	**14 319**	**0.11%**	**71 [22]**
Germany	1952	2 476 800	26 340	0.15%	79 [13]
Greece	1981	227 318	20 420	1.28%	36 [94]
Hungary	**2004**	**97 095**	**25 307**	**3.72%**	**55 [46]**
Ireland	1973	155 992	901	0.08%	69 [25]
Italy	**1952**	**1 548 816**	**28 811**	**0.27%**	**42 [72]**
Latvia	2004	17 975	4 620	3.67%	49 [54]
Lithuania	**2004**	**27 535**	**6 885**	**3.57%**	**54 [48]**
Luxembourg	1952	40 267	65	0.02%	80 [12]
Malta	2004	6 164	855	1.98%	57 [43]
Netherlands	**1952**	**588 414**	**1 907**	**0.05%**	**84 [9]**
Poland	**2004**	**354 310**	**67 284**	**2.71%**	**58 [41]**
Portugal	1986	172 799	21 510	1.78%	63 [33]
Romania	**2007**	**121 941**	**19 668**	**2.30%**	**44 [66]**
Slovakia	2004	65 906	11 588	2.51%	46 [62]
Slovenia	2004	35 416	4 205	1.70%	61 [37]
Spain	**1986**	**1 062 591**	**35 217**	**3.31%**	**65 [30]**
Sweden	1995	346 855	1 893	0.08%	88 [4]
UK	1973	1 700 145	10 614	0.62%	74 [17]
EU-27		**12 250 960** (100%)	**346 099** (100%)	**0.40%**	**64** (*43 is the average score worldwide*)
Selected 8 MS		**5 733 504** (56.8%)	**199 398** (57.6%)	**0.58%**	**59**

Sources: Eurostat, Transparency International[8]

[8] TRANSPARENCY INTERNATIONAL (2012).

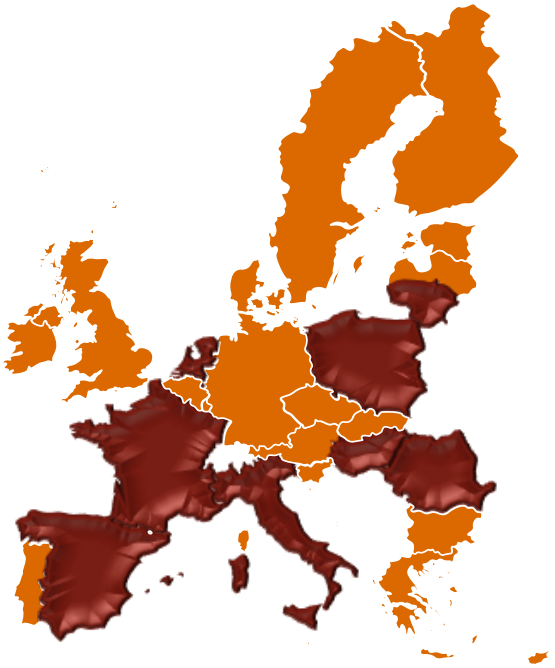
2.2.5. *Focus on eight EU Member States*

For a number of objectives, data and information was required for eight selected EU Member States. Based on several criteria (see below) and after discussions with and approval of the Commission, the choice was made to direct efforts on the following 8 Member States: France, Hungary, Italy, Lithuania, the Netherlands, Poland, Romania and Spain.

The selection of Member States is based on several criteria:

- A balanced geographical diversification across the EU;
- A balanced diversification across the old EU-15 and new EU-12 Member States;
- Inclusion of both small and large Member States (in terms of absolute levels of GDP);
- The absolute levels of EU Structural and Cohesion Funds subsidy;
- The economic dependency on EU Structural Funds subsidy (expressed as a % of GDP);
- Different *perceived* levels of corruption (scores and ranking according to the TI Corruption Perception Index[9], see table 3):
  - Two countries with relatively higher than average *perceived* levels of corruption: Italy and Romania
  - Four Member States (Poland, Spain, Hungary and Lithuania) with average to moderate levels of corruption;
  - Two countries with moderate to low *perceived* levels of corruption: the Netherlands and France.

Figure 1: Geographical division of the selected eight Member States



The quantitative selection criteria are listed in table 2. In 2011 the eight selected Member States together had a GDP of EUR 5 733 504 million, or 56.8% of the EU27 GDP. The eight countries received EUR 199 398 million from the EU Structural and Cohesion Funds during the period 2007-2013, which is more than 57.6% of the total of the Funds spent in this period.

9 TRANSPARENCY INTERNATIONAL (2012), Corruption perception index 2012 (Berlin).

In table 3, expenditure on works, goods and services as well as the number and value of tenders published in TED and Official Journal (OJ) for the 8 selected Members States are presented and compared to the total EU27, GDP and – tenders – to total expenditure. These figures are the basis for extrapolations in the following chapters:

Table 3: Expenditure on works, goods and services, number and value of tenders (8 selected Member States, 2010)

	Total expenditure on works, goods and services (2010) (Billion €)	*Total expenditure on works, goods and services (2010) (% of Total EU27)*	*Total expenditure on works, goods and services (2010) (% of GDP)*	*Estimated value of tenders published in the TED (2010) (Billion €)*	*Estimated value of tenders published in the TED (2010) (% of Total EU27)*	*Estimated value of tenders published in the TED (2010) (% of total expenditure*)*	*Number of tenders published in the OJ (2010)*	*Number of tenders published in the OJ (2010) (% of Total EU27)*	*The value of calls for tender published in the OJ (2010) (% of GDP)*
France	364.73	15.2%	18.9%	66.71	14.9%	18.3%	45 315	27.8%	3.5%
Hungary	22.54	0.9%	22.9%	5.52	1.2%	24.5%	2 741	1.7%	5.6%
Italy	252.47	10.5%	16.3%	53.12	11.9%	21.0%	9 699	5.9%	3.4%
Lithuania	4.95	0.2%	18.1%	1.33	0.3%	26.9%	1 809	1.1%	4.9%
Netherlands	180.3	7.5%	30.6%	10.92	2.4%	6.1%	4 032	2.5%	1.9%
Poland	72.63	3.0%	20.5%	30.9	6.9%	42.5%	18 507	11.3%	8.7%
Romania	32.58	1.4%	26.7%	7.6	1.7%	23.3%	3 676	2.3%	6.2%
Spain	171.01	7.1%	16.1%	34.06	7.6%	19.9%	10 539	6.5%	3.2%
TOTAL 8 selected MS	1101.21	45.8%	26.3%	210.16	47.0%	19.1%	96 318	59.1%	~
TOTAL EU27	**2406.98**	**100.0%**	**19.7%**	**447.03**	**100.0%**	**18.6%**	**163 058**	**100.0%**	**3.7%**

Source: EUROPEAN COMMISSION (2011), *Public procurement indicators 2010*. * Total expenditure on works, goods and services, second column.

Note that the total expenditure on works, goods and services for the 27 EU Member States (EUR 2 406 billion in 2010 (second column), or 19.7 % of EU-GDP (fourth column)) includes also areas, which are not covered by public procurement rules, the main areas being[10]:

- **Health, social services and education spending**: the sectors health, social services and education have all high levels of expenditure, but – for various reasons - low levels of publication in OJ/TED: a Commission comparison of public expenditure by functions of government with contracts advertised reveals that around 94% of expenditure in the health or social services sector is not spent through contracts advertised in the OJ/TED. In the education sector, 84% of expenditure seems not to be advertised in the OJ/TED. Estimates for the sectors in this section are based on data for 2008. These findings deserve careful analysis and consideration: the net result is that, of the 5% of GDP spent by governments on health, social security and education, only a marginal amount is subject to publication in the OJ. It should be noted that there may also be some double counting with the below threshold figures as some contracts for health and education may be included within the below threshold estimate.
- **Supply of energy or of fuels for the production of energy**: A major exemption is the supply of energy or of fuels for the production of energy, when procured by entities themselves active in the energy sector. This very large exemption can be estimated from input/output tables. Extrapolating on this basis from the latest figures available, the EU 27 electricity, gas, steam and hot water supply sector may have procured energy or fuels for the production of energy to the value of EUR 307 billion in 2008, or almost 2.5% of GDP.[11]

[10] Overview provided by DG MARKT.

[11] The source of data for these estimates is the input/output tables (use table) supplied to Eurostat. In general, the latest data are for 2006 (except for Bulgaria, Latvia and the United Kingdom 2004, Belgium and Poland 2005, Germany and Finland 2007, Greece and Luxembourg 2008). Figures for 2006, for which data are not yet available are estimates provided by linear extrapolation of the data for the last three years available. No data are yet available for Malta or Cyprus. Source: DG MARKT.

- **Defence procurement**: Defence procurement is also significant. Not all Defence procurement is exempt from the scope of the Classic Directive, only "arms, munitions and war material". The estimated total expenditure on Defence procurement in the EU in 2008 was about EUR 80 billion (approximately 0.6% of GDP) according to Eurostat data, of which about EUR 6 billion (approximately 0.05% of GDP) was awarded after competitive tendering following publication in the OJ. This exemption therefore probably amounts to around EUR 75 billion.
- **Purchase of water for supply of drinking water**: The exemption for the purchase of water for supply of drinking water is available from input output tables in the same way as fuel for the production of energy. For example in Germany in 2006 the water industry consumed water to the value of EUR 57 million (at purchasers' prices). Extrapolating on this basis from the available data the EU 27 water industry consumed EUR 2 billion worth of water in 2008.

This implies that when the figures from table 3 are being used in this report for extrapolation purposes, these limitations – especially of the data available in the TED – will be taken into consideration and percentages can never be read as a percentage of the total expenditure on works, goods and services as presented in column 2 of table 3; only as a percentage of a (much) lower figure of expenditure on works, goods and services falling under public procurement rules.

2.2.6. *Sectors of the economy where EU Funds are spent*

The focus of this study is on sectors of the economy where EU Funds are spent. To narrow this broad scope, five sectors of the economy where EU Funds are spent were defined. The following criteria were used:

1. Pre-selection in the terms of reference: Civil and infrastructure construction sectors, the social-employment support sector and the health sector;
2. Availability of data and information on (corrupt) procurement cases. The selection of cases to be assessed in detail was made based on the availability of cases, which subsequently lead to the definition of the five sectors.

The list of 5 defined sectors thus reads as follows:

Table 4: Selected sectors of the economy

Broader sector of the economy	*Defined sector (see annex F for more details/CPV-codes included)*	*Product group studied within defined sector*	*% of overall O/J procurement value*	*Total public procurement in OJ (bln.)***	*% of EU Funds *)*
Infrastructure construction	**Road & Rail Construction**	Construction work for motorways, railway track construction materials and supplies	12.4%	€ 26.1	12.4%
Civil construction	**Water Supply / Waste Water Treatment / Water Management**	Construction waste water plants	0.7%	€ 1.6	4.8%
Civil construction	**Urban & Utility Construction**	(Airport) Runway construction works	8.2%	€ 17.3	6.7%
Social employment support	**Training**	Staff development services	0.1%	€ 0.5	6.5%
Health	**Research & Development / High Tech Products and Services**	radiotherapy, mechanotherapy, electrotherapy and physical therapy devices	2.8%	€ 5.8	5.6%
	All sectors studied		24.3%	€ 51.1	36.0%
	All other sectors		75.7%	€ 159.1	64.0%
	Total (all sectors)		100%	€ 210.2	100%

* Certified expenditure in Obj. 1 and 2 in the period 2000-2006 as % for all MS. Applies to sectors.

** No figures of total public procurement divided over the sectors of the economy defined for this study are available: although there are estimates on total public expenditure, it is not possible to extrapolate the available figures per sector for public procurement in the OJ to figures for total public procurement, including (below threshold) procurements not included in the OJ, since e.g. the ratio above threshold/below threshold is not known (and differs per sector).

2.3. Methodology

2.3.1. Data collection

For this study, data was first collected and studied theories of corruption and public procurement as far as relevant for the above mentioned objectives of this study. Most efforts concentrated on fieldwork and collecting empirical evidence; both at EU-level and in the 8 selected Member States. For identifying good policies and practices on preventing and detecting corruption and opportunities to improve data management, data and information has been collected from relevant stakeholders at EU level and in 8 selected Member States: public authorities, the private sector and civil society organisations and the media.

Six main types of methods of data collection were used for this study:

1. Literature review: academic literature, online media sources and policy documents were studied for this study, with a focus on sources published in the last 10 years. The complete list of sources used can be found in Annex 0 of this report;
2. Interviews: interviews with officials at EU, national- and even regional/local-level, experts in the field of public procurement and/or corruption, media, non-governmental organisations, private sector and academia were held. A complete list of organisations and individual experts interviewed can be found in Annex E;
3. Surveys: to collect data and information on innovative tools and methodologies to detect and investigate corruption, for data on prices of standardised units and to collect data for the benchmark of the procurement systems of all Member States, questionnaires were sent out to more than 1100 national and EU-authorities and to other organisations and experts (see Annex F);
4. Collection of data and analysis of existing databases – data from EU- and national databases that are publicly available as well as from non-public databases was collected, standardised and analysed;
5. Assessment of procurement cases: in two separate phases data and information has been collected on public procurement cases:

    - In the first phase, more than 190 public procurement cases in 8 EU Member States were collected and assessed in detail;
    - In the second phase, an additional collection and analysis of data and information on over 100 public procurement cases was performed.

6. Benchmark of Member States: based on identified best practices, the procurement systems of all Member States were tested against a number of benchmarks.

The data collection in the Member States was conducted by country teams, including national experts from PwC and Ecorys. A quick scan in EU-27 Member States on procurement practices and availability of data was executed by the European Criminal Law Academic Network (ECLAN).

2.3.2. Difficulties in data collection

The development and application of a methodology to estimate the costs of corruption in public procurement is highly dependent on the availability of (proven and suspected) cases and other relevant data (statistical data, market data, interviews, etc.). Availability *and* accessibility of cases and data proved to be the main challenge of this study. In the relevant chapters the difficulties encountered in obtaining data and information from public authorities is described, either caused by absence of sophisticated tools to retrieve data or by reluctance or legal limitations to cooperate (or both).Overall, it can be concluded that the application of the research methodology proved extremely time and resource intensive.

2.3.3. Analysis

To analyse the information and data collected, a number of statistical, econometrical and other methodologies were used. In each chapter, the specific methodologies are described in brief.

2.4. Organisation of the project

2.4.1. Expert panel

A panel of experts in the fields of criminology, anti-corruption policies and corruption law, economics and statistics and law enforcement and prosecution has been in place to review draft versions of formal project deliverables. Expert meetings were held on 6 June 2012 and on 8 October 2012 to elaborate on the findings of the research and discuss the approach, methodologies, analyses and recommendations in a forum together with representatives of the Commission. The experts also reflected on drafts of this report; their general comments on a first version of the draft final report (dated 12 January 2013) are reflected in Annex 0. The members of the expert panel are:

Table 5: Expert panel	
Ms. A. Mungiu-Pippidi	Professor of Democracy Studies at the Hertie School of Governance
Mr. D. Kos	Chairman of Group of States against Corruption (GRECO), chairman of the Commission for the Prevention of Corruption, Republic of Slovenia
Mr. M. Levi	Professor of Criminology at the Cardiff University, member of the Council of Europe Criminological and Scientific Council
Mr. E. Savona	Professor of Criminology at the Università Cattolica del Sacro Cuore in Milan and Director of Transcrime
Mr. C. Zeyen	Vice-President of Eurojust and National Member for Luxembourg in Eurojust

2.4.2. Steering Committee and supervision from OLAF

In addition to the expert panel, the defined approach, methodologies, analyses, findings and recommendations were also intensively discussed with the Commission Steering Committee. This committee consists of representatives from OLAF (Chair), DG HOME, DG REGIO, DG MARKT, DG EMPL and DG BUDG, in different compositions. Formal meetings of the Steering Committee were held:

13 March 2012	Kick off meeting
10 May 2012	Meeting on Inception Report
6 June 2012	1st Expert meeting (with Steering Committee)
8 October 2012	2nd Expert meeting (with Steering Committee)
17 June 2013	Meeting on draft Final Report

The supervision of this project was attributed to OLAF. Regular meetings were held with representatives of OLAF, and regular email and telephone communication kept them informed about the progress of the project and any obstacles encountered.

2.4.3. Progress meetings with the European Parliament

This project has been followed with great interest by the European Parliament, in particular by Ms Monica Macovei MEP. At the request of OLAF and Ms Macovei MEP, two meetings (on 25 January 2013 and 19 February 2013) were held at her office to inform her about the progress of the study and its preliminary findings. On these occasions, Ms Macovei MEP provided suggestions for additional research.

2.4.4. *Project team and quality assurance*

This study is a product of PwC and Ecorys, with support of the University of Utrecht. Notwithstand , the project was an effort of many people from various organisations in many countries. The core team for this project, composed of staff members of PwC, Ecorys and the University of Utrecht, included:

Table 6: Core project team

PwC	
Rudy Hoskens	Responsible partner
Wim Wensink	Overall project manager
Helen de Roo	
Özge Iskit	
Michael Wagemans	
Bart Vandeweyer	
Caroline Cleppert	
Anna Rys Sypkens Coutinho	
Ecorys	
Jan Maarten de Vet	Project manager for Ecorys
Patrick de Bas	
Matteo Bocci	
Erik Canton	*(until February 2013)*
Jakub Gloser	
Maarten van der Wagt	
Utrecht University	
Joras Ferwerda	Project manager for the Utrecht University
Ioana Sorina Deleanu	

Quality Assurance

All project documents, including this final report, have been subject to internal review by the consortium's subject matter experts:

Table 7: Quality assurance team	
PwC	
Ine Lejeune	Global Relations Partner for the EU Institutions
Prof. Dr. Jacques de Swart	Professor at Nyenrode University, director of the quantitative analysis group in PwC the Netherlands *(chapters 7, 8, 9 & 10)*
Dr. Jan Wille	Lecturer at Erasmus University, principal manager of the quantitative analysis group in PwC the Netherlands *(chapters 7, 8, 9 & 10)*
Ecorys	
Roelof-Jan Molemaker	EU27 Market Director *(chapter 11)*
University of Utrecht	
Prof. Brigitte Unger	Professor of Economics *(chapters 7, 8, 9 & 10)*

3. Definitions

For the development of an EU Evaluation Mechanism in the area of Anti-Corruption with a particular focus on identifying and reducing the costs of corruption in Public Procurement involving EU Funds, a targeted but flexible concept of corruption is required. Furthermore, the concept used for "costs of corruption" requires a clear definition. The definitions used are further presented in this chapter.

3.1. Public procurement

Public procurement is the process by which governments and regional and local public authorities or bodies governed by public law purchase products, services and public works[12]. The economic significance of public procurement in Europe is considerable: every year around one fifth of EU GDP is spent by different levels of government (central and sub-central), bodies governed by public law and utility service providers to procure goods, works and services, or EUR 2 406 billion in 2010 terms[13]. This money is spent by a very large and heterogeneous population of public authorities - over 250 000 contracting authorities in Europe managing procurement budgets of different sizes and possessing very different administrative capacities.[14] Public procurement is regulated by two separate EU Directives: the Public Sector Directive on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts; and the Utilities Directive, coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors.[15]

Total cost of public procurement in Europe is estimated at about 1.4 per cent of purchasing volume. Businesses account for 75 per cent of these costs. Competition is considerable: each public tender is estimated to receive on average 5.4 offers.[16] This implies that there is a substantial incentive for businesses to win public tenders and one could reason that this could lead – for some potential bidders – to look for means to by-pass public procurement rules or to influence the final decision: by means of bribery or other appearances of corruption for instance.

The use of the term "public procurement" in this report refers more specifically to "public procurement in those sectors of the economy where EU Structural and Cohesion Funds are spent".

3.2. Definitions of corruption and related aspects of conduct

3.2.1. Working definition of corruption

While performing desk-top research and interviewing EC representatives, different and sometimes conflicting opinions on the definitions of corruption were encountered.

For the purpose of this study, the definition of corruption: **the abuse of power for private gain**[17] has been used as the working definition.[18]

[12] ESSIG, M., J. FRIJDAL, W. KAHLENBORN and CHR. MOSER (2011), *Strategic Use of Public Procurement in Europe. Final Report to the European Commission MARKT/2010/02/C*, p. 7.

[13] In 2010, the total expenditure of government, the public sector and utility service providers on works, goods and services was estimated at EUR 2 406 billion (i.e. 19.7 % of EU GDP); see: Public Procurement Indicators 2010 (Brussels, 4 November 2011), Available at: http://ec.europa.eu/internal_market/publicprocurement/docs/indicators2010_en.pdf [Accessed 18 May 2013].

[14] EUROPEAN COMMISSION, DG MARKT (, *EU public procurement legislation : delivering results. Summary of evaluation report Impact and Effectiveness of EU Public Procurement Legislation* (SEC(2011) 853 final), p. 6.

[15] Directives 2004/18/EC (Classical) and 2004/17/EC (Utilities)

[16] PwC, LONDON ECONOMICS and ECORYS (2011), *Public Procurement in Europe: Costs and Effectiveness*. Study commissioned by EC DG MARKET. Available from: http://ec.europa.eu/ internal_market/publicprocurement/docs/modernising_rules/cost-effectiveness_en.pdf [accessed 12 May 2013], pp. 5-6.

[17] Commission Communication on a comprehensive EU policy against corruption from 2003 (COM(2003) 317 final), p.6 and Commission Communication on Fighting Corruption in the EU of June 2011 (COM(2011) 308 final, p3, footnote 1.

[18] This definition is also used in the Terms of Reference for this study, see: http://ec.europa.eu/anti_fraud/ programmes/tenders/index_en.html.

This broad definition covers – unlike the traditional definition: "*the use of one's public position for illegitimate private gains*" - both the entire public and private sector. It thus includes, in addition to bribery, any other relevant misconduct in the public and private sectors (e.g. conflict of interest, favouritism, nepotism, cronyism, market rigging etc.).

Private gain: bribes and kickbacks

"Private gain" must be interpreted widely, including gains accruing e.g. to an economic actor's close family members or friends, company, political party and in some cases to an independent organisation or charitable institution in which the economic actor has a financial or other interest. [19] Private gains in most instances take the form of bribes and kickbacks.

Sometimes a distinction is made between 'bribes' and 'facilitation payments'[20], where bribes are labelled as larger amounts given to senior public officials, whereas facilitation payments refer to smaller amounts paid to usually lower level officials to accelerate or facilitate a decision. In this study both forms were taken into account (although only bribes were identified in the cases that were assessed).

A kickback typically occurs when a company that wins a public contract 'kicks back' a bribe to the government official(s) who influenced the awarding of the contract (voluntary or under duress) to that company. Generally the kickback is a percentage of the contract and in highly corrupt environment it becomes an added cost that all bidders must take into consideration when bidding public contracts.

Vertical and horizontal corruption

Power is the ability to influence the behaviour of people. The term authority is often used for power perceived as legitimate and attributed to one's public position. In public procurement, this form of power can, when abused, lead to a *vertical* relationship between one or more bidders and the procurement official that materialises in a conflict of interest or bribery.

In the working definition, the power abused can also regard economic power: e.g. a market position or ownership of specific information that can influence prices and outcomes of procurement processes. Abuse of such power will manifest in a secret *horizontal* relationship between bidders, which restricts competition and harms the public purchaser. With collusion agreements these bidders try to manipulate the award decision in favour of one of their members, and are especially relevant for this study when this collusion involves a corrupt inside official.

The OECD acknowledges that vertical corruption and horizontal collusion are distinct problems within procurement. However corruption and collusion will frequently occur in tandem and have mutually reinforcing effects. And "*ultimately, however, these discrete offences have the same effect: a public contract is awarded on a basis other than fair competition and the merit of the successful contractor, so that maximum value for public money is not achieved.*"[21] They are best viewed, according to the OECD, as concomitant threats to the integrity of public procurement. Both vertical and horizontal abuse of power, and all constituent elements of corruption linked to them are included in the working definition for this study.

Bid Rigging

Bid rigging is a form of collusion. It occurs when a public tender – which has its purpose open and fair competition – is manipulated in such a way that a preselected bidder wins the tender. Bid rigging agreements can include for example, assigning 'turns' among collusive members for winning bids, or agreeing to internal compensation payments for submitting high or other 'failed' bids.

Bid rigging can take place with and without involvement of a public official. It can be either:

- Manipulation among all or some of the bidders without the knowledge of the public official;
- Public official(s) actively participating in the manipulation.

[19] TRANSPARENCY INTERNATIONAL (2006), *Handbook for Curbing Corruption in Public Procurement*.
[20] Ibidem.
[21] OECD (2010), *Policy Roundtable on Collusion and Corruption in Public Procurement*.

Bid rigging can take many subtle forms (which are not mutually exclusive):

- *Bid suppression*: some of the conspirators agree not to submit a bid so that another conspirator can successfully win the contract;
- *Complementary bidding (also labelled as 'cover bidding' or 'courtesy bidding')*: some of the bidders bid an amount knowing that it is too high or contains conditions that they know to be unacceptable to the agency calling for the bids;
- *Bid rotation*: bidders take turns being the designated successful bidder
- *Customer or market allocation*: bidders agree to divide up customers or geographical areas;
- *Lowballing*: submitting the lowest bid with the understanding of the public official that, one awarded, the contract will be amended to increase the contract price;
- *Subcontract bid rigging*: some of the conspirators agree not to submit bids, or to submit cover bids that are intended not to be successful, on the condition that some parts of the successful bidder's contract will be subcontracted to them.

Active and Passive Corruption

Corruption can be divided in active and passive corruption. In the context of the development of an overall corruption-prevention policy as provided for in the Action Plan to combat organised crime of 28 April 1997[22], the Council sets down some common definitions for the policy of combating corruption in the private sector at Member State level:

- "The deliberate action of a person who, in the course of his business activities, directly or through an intermediary, requests or receives an undue advantage of any kind whatsoever, or accepts the promise of such an advantage, for himself or for a third party, for him to perform or refrain from performing an act, in breach of his duties, constitutes passive corruption in the private sector" (Article 2).
- "The deliberate action of whosoever promises, offers or gives, directly or through an intermediary, an undue advantage of any kind whatsoever to a person, for himself or for a third party, in the course of the business activities of that person in order that the person should perform or refrain from performing an act, in breach of his duties, constitutes active corruption in the private sector" (Article 3).

Both these definitions of active and passive corruption fit into the OECD definition of corruption. This distinction is relevant for development, implementation and evaluation of anti-corruption measures: some measures focus on people *in* the organisation who risk the danger of slipping into passive corruption (focus on own staff members); other measures are being implemented to protect the organisation and its people and processes against external corruption threats (focus on third parties). Of course, the two sets of measures can be closely linked to each other. In this study, both active and passive corruption are taken into account.

Corruption in public procurement

Our study focuses on a specific type of corruption: *corruption in public procurement*. In accordance with the Commission, the definition of corruption is used as presented in the previous paragraph, but with the primary focus on corrupt vertical relationships between one or more bidders and the procurement official.

However, horizontal corruption (collusion and bid rigging not involving a public official) are taken into account as well since these forms of corruption cause a public economic loss as well.

Focus on corruption in public sector

Corruption in procurement can take place in the private sector as well as in the public sector. The focus of this study is on corruption in *public* procurement, and therefore on the public sector, while taking into account some valuable good practices and lessons learned from the fight against corruption in the private sector.

3.2.2. *Irregularities, fraud and corruption*

EU Member States are required to report all 'irregularities' involving more than EUR 10 000 of EU Funds to the EC. They are required to identify those reported irregularities in which they suspect 'fraud'. The following definitions, provided by the EC[23], are used:

[22]Joint Action 98/742/JHA of 22 December 1998 adopted by the Council on the basis of Article K.3 of the Treaty on European Union, on corruption in the private sector [Official Journal L 358, 31.12.1998].

[23]See for example: EUROPEAN COMMISSION DG REGIONAL POLICY (2009), *Information Note on Fraud Indicators for ERDF, ESF and CF*, Final version of 18/02/2009.

- An **irregularity** is any infringement of an EU provision by an economic operator which has, or would have, the effect of prejudicing the EU's financial interests.
- **Fraud** is as an irregularity committed intentionally with the aim of illicit gain which constitutes a criminal offence.

There is, however, no separate provision for 'corruption'. Corruption is often considered as *a subset of fraud*. The Association of Certified Fraud Examiners (ACFE) distinguishes three fraud types: *(i) Intentional manipulation of financial statements; (ii) misappropriation of tangible or intangible assets; and (iii) corruption (such as (bribery, bid rigging, undisclosed conflict of interest, and embezzlement).*[24]

The focus of this study is solely on corruption, but irregularities that point at possible cases of corruption, as well as fraud that clearly includes corrupt practice are also analysed where possible and when in line with the selected working definition of corruption.

3.2.3. *Corruption and conflict of interest*

In *Managing conflict of interest in the public service*, the OECD adopts a definitional approach which is deliberately simple and practical to assist effective identification and management of conflict situations, as follows:

"A "**conflict of interest**" involves a conflict between the public duty and private interests[25] of a public official, in which the public official has private-capacity interests which could improperly influence the performance of their official duties and responsibilities."

A conflict of interest can be current, or it may be found to have existed at some time in the past. The private interest, however, has *in fact* compromised the proper performance of a public official's duties. Only those specific situations of conflict of interest that can be regarded as an instance of misconduct or "abuse of office", or even an instance of corruption, are relevant for this study. However, not all cases of conflict of interest can be judged as corruption. Therefore, in this study, conflict of interest is only used when relevant as a starting point for detecting potential cases of corruption.

3.3. Degrees of solidity in corruption cases

Even when an accusation of corruption surfaces, this provides no certainty that the case is actually corrupt. One must take into account false accusations, confusion of terminology (e.g. fraud or conflict of interest instead of corruption) and other grounds before accepting something to be true. The opposite is true as well: not all cases that are not linked to corruption are "clean" cases of public procurement. Very often, corruption is a hidden offence, with – in most instances - no obvious victims, damage and with most importantly, two or more parties involved that have everything to gain by being silent and acting discreetly.

If the offence – corruption – and its consequences remains concealed and the offenders are hidden as well, it is difficult to find and analyse cases of corruption. Indicators that point towards cases that can be referred to as being "corrupt" have to be found, their degree of solidity tested. In this paragraph, an overview of common indicators and their usefulness in pronouncing specific cases as "corrupt" is presented.

3.3.1. *Corrupt and non-corrupt cases*

In the end, there are only two varieties of cases relevant for this study: corrupt cases of procurement and non-corrupt cases of public procurement.

A corrupt case of procurement is a case where, at some stage in the procurement process, any power has been abused for private gain. In a non-corrupt case of public procurement, nowhere in the procurement process has any power been abused for private gain.

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[24] Derived from: EUROPEAN COMMISSION DG REGIONAL POLICY (2009), Information *Note on Fraud Indicators for ERDF*, ESF and CF, Final version of 18/02/2009, Page 6.

[25] In this definition, "private interests" are not limited to financial or pecuniary interests, or those interests which generate a direct personal benefit to the public official. A conflict of interest may involve otherwise legitimate private-capacity activity, personal affiliations and associations, and family interests, if those interests could reasonably be considered likely to influence improperly the official's performance of their duties. A special case is constituted by the matter of post-public office employment for a public official: the negotiation of future employment by a public official prior to leaving public office is widely regarded as a conflict-of-interest situation. OECD, *Managing conflict of interest in the public service. OECD Guidelines and country experiences* (2003).

In this study, a distinction has been made between corruption in this narrower criminal law sense and corruption in a broader socio-economic sense. This distinction is necessary because, in accordance with rule of law principles, criminal law provisions require unambiguous and precise language, whereas the concept of corruption can be more general while responding to the purposes of crime prevention or estimating the costs of corruption.[26] Since this is a socio-economic study, a corrupt case does not necessarily have to be a convicted case of corruption (see 3.3.4).

3.3.2. *Indications of corruption*

In finding corrupt and non-corrupt cases of public procurement, a distinction has been made between indications that lead to possible corrupt and possible non-corrupt cases (of public procurement).

Corruption indicators can be direct (the "red flags" as presented in chapter 7) and circumstantial. Circumstantial indications are not found in the procurement process, but are indicators that can be found beyond the procurement process: e.g. accusations, confessions, convictions, and settlements related to cases of public procurement.

As mentioned above, the scope of this study is public procurement in those sectors of the economy where EU Structural and Cohesion Funds are spent. Also possible circumstantial indications are explored that lead to possible corrupt and possible non-corrupt cases within this domain.

As with circumstantial indications of corrupt cases, circumstantial indications for non-corrupt cases could also be formulated. As opposed to circumstantial indications like accusations, confessions, convictions, settlements that point to possible corrupt cases, circumstantial indications of non-corrupt cases can be "praises": cases that are presented as an example or best practice.

Besides a specific indication, the absence of convincing explanations for cases indicated as being odd can also be a circumstantial indication for possible corrupt cases. If no convincing explanation can be found for a certain condition (decision, output, and outcome) and that same condition can be explained as the consequence of corrupt behaviours or acts, then the absence of these explanations is a circumstantial indication in its own right. If, for instance no convincing explanation can be found for a project being inefficient (more/higher costs) or ineffective (no rational necessity or need) in cases of fraud, incompetent beneficiaries, economic motives, external factors, this could be an indication for corrupt practices. A prerequisite for this reasoning is that *all* possible explanations for a certain condition should be known, in order to be able to condemn all these and isolate corruption as the sole possible explanation.

Any indication will have an absolute or relative weight with regard to its reliability, in this case – since no absolute and known quantity exists – a relative weight. This leads to an ordinal categorisation of circumstantial indications, where each category of circumstantial indications can be denominated as more or less reliable. For instance, as explained more in detail below, a conviction has more weight (because is more reliable) as an indication than a mere accusation. The more reliable a circumstantial indication is, the more certainty one can have that the case is in fact a corrupt / non-corrupt case.

3.3.3. *Indications are only indications*

A strong (most weight) circumstantial indication or a mix of circumstantial indications, preferably pointing in the same direction, will increase the probability that an actual case is indeed a corrupt (or non-corrupt) case. However, it will remain a probability unless there is a verdict from the highest court stating that in a particular case corrupt behaviour or act has been proven beyond any reasonable doubt (and thus not wrongfully convicted), or that a validated confession has been made by one of the actors in a corrupt case.

Our analyses will not, in any instance, judge that cases are corrupt or non-corrupt. This study will merely identify cases that could, by conviction by the highest court or validated confession, be denominated as being corrupt cases. This study will also identify cases that, based on circumstantial and/or direct indicators, were pointed out as possibly being linked to corruption (or as highly likely not linked to corruption). All statements with regard to corrupt or non-corrupt cases have to be understood in this way.

[26] See also: Commission Communication on a comprehensive EU policy against corruption from 2003 (COM(2003) 317 final).

3.3.4. *The solidity of circumstantial indications of corruption*

As stated, a strong (most reliable) circumstantial indication or a mix of circumstantial indications, preferably pointing in the same direction, can point towards a case that is potentially corrupt (or non-corrupt). However, in order to prove that these indications are correct, additional analysis of each identified case should be conducted. This analysis should check the facts and statements as indicated: was there a conviction or formal settlement? Was there a confession and how reliable was this confession? Have the accusations lead to any formal investigations and what were the results of these investigations? Is it possible to check the accusations in any other possible way? Are there indications in the procurement process that a corrupt practice occurred?

Some of these cross checks are easy to execute: a formal verdict can be obtained, a validated confession as well. More problems will arise when analysing accusations, investigations and settlements: to find proof for uninvestigated accusations and to get access to investigative data and data underlying settlement agreements is difficult if not impossible (e.g. because of the secrecy of the judicial investigations). If no supporting evidence can be found in the procurement process itself or if any oddities in the procurement process can also be explained by other causes, there is hardly or no reliable ground to pronounce such a case a corrupt case.

In this study, 4 categories of cases in public procurement in the context of corruption are distinguished:

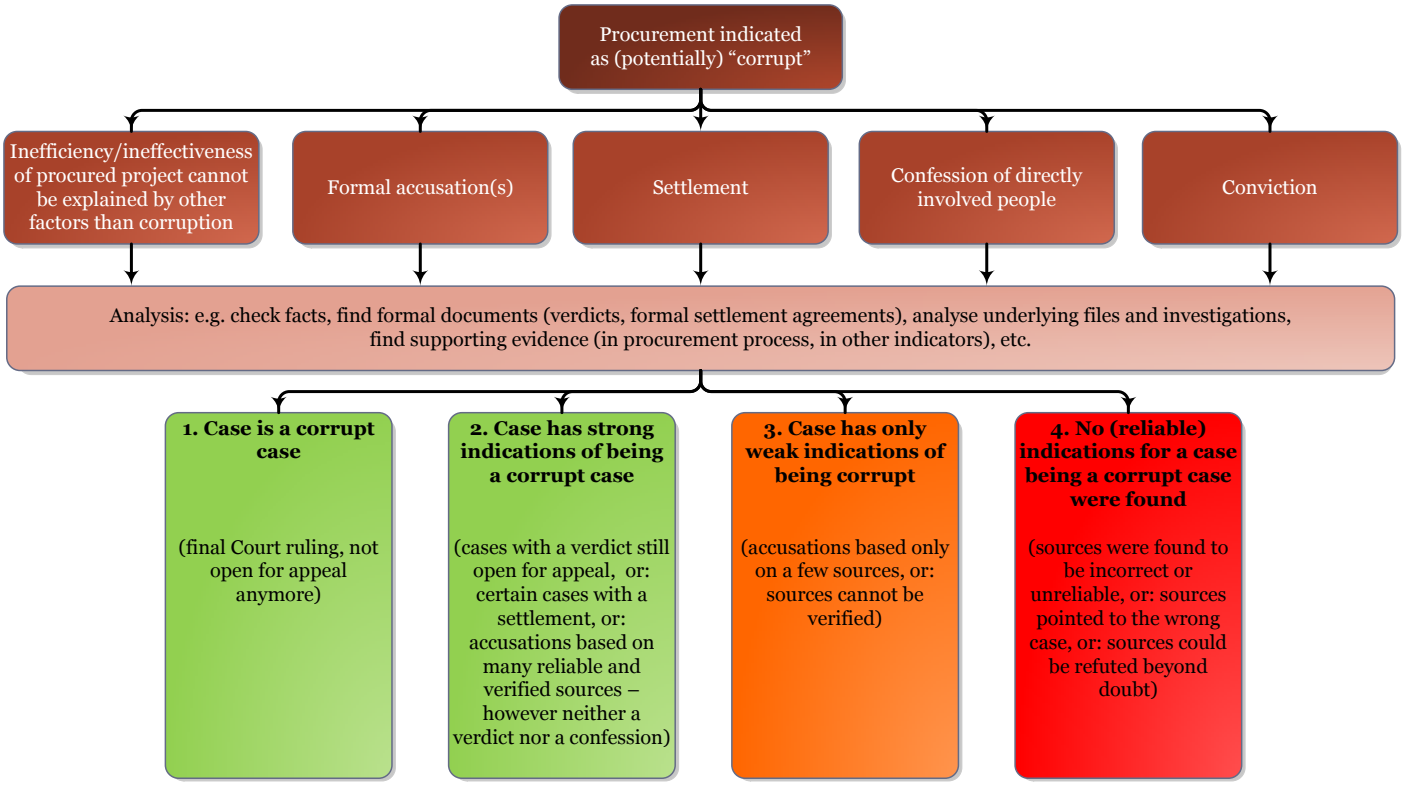
1. **Corrupt cases**: cases where in a final ruling, not open for appeal anymore, a procurement case was defined as corrupt, and cases where a validated confession of one of the parties involved (preferably with underlying evidence) could be presented;
2. **Cases with strong indications of being a "corrupt case"**: cases where, based on many reliable and verified sources (but where no verdict from the highest court nor confession is available) could be concluded that these are likely to be corrupt cases – e.g. certain settlements, verdicts from lower courts;

Both categories 1 and 2 (green categories in Figure 2) are referred to as 'corrupt cases' in this analysis.

3. Cases with only weak indications of being corrupt – for which no explicit evidence is presented from the opposite – are considered as being **"grey cases"** (orange category in Figure 2).These grey cases are in some parts of the study taken into account provide sufficient case-material, since cases of the two categories "corrupt cases" were not available in sufficient amounts. The use of grey cases in this analysis was explicitly proposed and approved by the Commission. Whenever possible, these grey cases are explicitly separated from non-corrupt cases to rule out any possible bias. Where grey cases are used, this is explicitly mentioned in the text.

4. Cases with no (reliable) indications of being a "corrupt case". These cases are treated as '**clean cases**' (red category in Figure 2).

Figure 2: Corruption indications in procurement



3.3.5. *Challenges in judging indications*

A non-exhaustive list of potential challenges in analysing and judging different types of indications and cases is presented in this section.

3.3.5.1. Settlements

When, after mere accusations or even an investigation, a settlement is reached between two parties on a case that was linked to corruption, in many cases the charges are dropped and/or the allegations are officially confirmed nor denied (see examples). These cases are not formally considered cases of corruption. However, the underlying facts could prove that there were in fact strong indications or even evidence that corrupt practices in such cases indeed occurred. Only when it is possible to obtain enough of this underlying information from the parties involved and/or from the investigative bodies, could such cases be analysed as if they were cases of corruption. At the same time, these cases cannot be treated as being "corrupt cases", since they are not from a legal perspective. These cases are therefore treated as cases with strong indications of being a "corrupt case".

3.3.5.2. Confessions

If, without a conviction or a settlement, one of the parties involved in a corrupt case admits this corrupt behaviour, such a case can be treated as being a corrupt case as well. However, any supporting evidence of this corrupt behaviour is to be preferred, as well as an analysis of the reasons and conditions under which this confession was brought forward. Furthermore, for all confessions, additional inquiries into the reasons for not investigating or prosecuting the confessing party should be made, as well as into the reasons for the aggrieved party not to sue the party who confessed. A confession alone is thus insufficient to qualify a case as being a 'corrupt case'. Therefore, these cases are also treated as cases with strong indications of being a "corrupt case".

3.3.5.3. Convicted but appeal is possible

Although convictions of corruption will bring the hardest degree of solidity, not all convictions are equally hard. Convictions in first instance can, in appeal, be dismissed. Depending on the dismissal grounds, such cases could be treated as corrupt cases or not: if corrupt behaviour has been proven beyond reasonable doubt but the case is dismissed due to procedural technicalities, the case can be used as if it was a corrupt case. However, other grounds can also lead to a dismissal, for instance due to new facts or circumstances that weaken the evidence for the case being a corrupt case. This implies that all judgments not pronounced by the highest possible court were treated with some caution. After careful study, some of these cases are treated as cases with strong indications of being a "corrupt case", while some are dismissed as being 'cases with no (reliable) indications of being corrupt'.

3.3.5.4. Accusations leading to an investigation, but investigation stopped

In cases where accusations lead to investigations, the results of such investigations are of the essence. This concerns not only the outcome, but also the files underlying this outcome.

In all eight EU Member States that were assessed in more detail, it proved impossible to obtain access to files of formal investigative institutions. Some highly suspicious cases are neither prosecuted nor convicted for corruption. Also when no formal conclusive outcome of the investigation is presented, it was necessary to analyse such cases in more detail in order to determine to what extent corrupt behaviour or acts were indeed absent. In these instances as well as in all other attempts to be granted access to files or databases of investigative institutions, such an analysis was not possible because access to the relevant files was not granted. Therefore, cases were dismissed as potential cases of corruption for this study where they were formally investigated but where investigations did not lead to a prosecution for corruption and no formal information was disclosed.

3.3.6. *Collected 'corrupt', 'grey' and 'clean' cases*

In Poland, Spain, Italy, Hungary, Romania, France, Lithuania and the Netherlands, cases of public procurement in those sectors of the economy where EU Structural and Cohesion Funds are spent (and thus not necessarily public procurement cases *involving EU Funds*) have been collected, ensuring an equal division between 'corrupt' and 'grey' cases at the one hand and 'clean' cases at the other:

Table 8: Cases collected in each category in the initial data collection

	Category name	*Number of cases collected*
a) + b)	*'Corrupt' cases*	*24*
c)	*'Grey' cases*	*72*
a) + b) + c)	**Corrupt/Grey cases**	**96**
d)	**'Clean' cases**	**96**
	TOTAL	**192**

Details on the cases included in each category are presented in chapter 7. Obstacles and difficulties encountered in the data collection in the Members States are described in chapter 10.

3.4. Costs of corruption and public loss

Our working definition of corruption, *the abuse of power for private gain*, implies that private gain generates a public loss. This public loss is a consequence of suboptimal decisions (e.g. procurement choices) or project implementation (e.g. overspending). Public loss can entail a variety of material and immaterial consequences of corruption:

Table 9: Material and immaterial consequences of corruption

Material			Immaterial
Competitive distortions	Lack of public resources	Lower settlement and investment attractiveness	Decay of norms and values
Emergence of monopolies and oligopolies Innovation inhibitions Too high prices for non-timely products	Higher price level Loss of purchasing power Possibly need for more social spending Higher interest rates Tax increases Low performance Loss of retail turnover	Declining job opportunities Stagnating housing construction Declining consumption Reducing tax revenues	Absence of legal awareness Soil for spread of corruption Acceleration of the decline of moral values and ethical standards

Source: ARNOLD, U. and N. TRUCK (2004), Gesamtwirtschaftliche Schäden von Korruption.[27]

In this study, the focus is only on direct material costs of corruption: the immediate monetary consequences for the national budget and, when EU Funds are involved, the EU budget, of a public procurement case being a corrupt case. The public loss investigated is the estimated monetary amount lost to corruption in case a public procurement case turns out to be corrupt. This estimated monetary amount includes the following components[28]:

- **Ineffectiveness**: the project does not (or not fully) reach its objectives. This is the case if procurement of works, goods or services generates *lower than intended (or even negative) public value* ("waste");
- **Inefficiency**: the outputs of a project are not in line with the inputs. Efficiency is a concern when sources of public loss include procurement at *higher prices* than competing bids, which offer similar and not higher quality ("excessive price"), or when procurement takes place at similar prices but with *lower quality* than competing bids ("inferior quality").

There is a clear relation between efficiency and effectiveness, which implies that it is not always easy to distinguish between efficiency and effectiveness. In most cases, the public loss far exceeds the private gain (e.g. the amount of a bribe) and the extent of private gain has almost no relevance for estimating the costs of corruption.

The focus is thus neither on indirect costs (costs as results of effects of corruption on public institutions, the environment, psychological costs, and costs to civil society), nor on the private gain, i.e. not on the bribe that has been paid or the kick back that has been received.

[27] ARNOLD, U. and N. TRUCK (2004), Gesamtwirtschaftliche Schäden von Korruption. In: *e-Vergabe – Korruptionsprävention bei der elektronischen Vergabe* (Beschaffungsamt des Bundesministeriums des Innern und Bundesverband Materialwirtschaft, Einkauf und Logistik e.V.). Available from: http://www.bme-rmr.de/downloads/2004-03-18_BME-Korruptionsleitfaden.pdf [accessed: 12 May 2013].

[28] The entire concept of public loss as a consequence of corruption in described in more detail in chapters 6 and 8.

4. Collection of administrative data on public procurement at EU level

More effective detection and prevention of corruption in public procurement is possible if the administrative data on tenders, bidders, projects and contractors are collected and stored in a structured manner, and accessible for controls, investigations and analyses. These structured databases could allow ex-ante monitoring and ex-post analysis of corruption indicators ('red flags'). New data mining techniques could be used to detect anomalies in the data that perhaps point at potential cases of fraud or even corruption. Moreover, based on the comprehensive methodology to measure the costs of corruption in public procurement (see Chapters 6 to 10), such databases could also enable a more detailed analysis of not only the probability of corruption, but could also provide a more accurate estimate of the costs of corruption.

This chapter will present the data collection at EU level and elaborate on the type of procurement data being collected, the tools and methods to gather and store data, and the use of this data for decision making and internal controls for the tenders directly managed by the EU institutions. It will also shed light on the capacity of current systems and applications, how they can be used for the detection and investigation of corruption and how they can be improved for a better and more structured data collection and storage

4.1. Added value of public procurement systems and databases to fight against corruption

Public procurement systems and databases for the collection of public procurement data at the EU level are developed in order to facilitate the process of public procurement. They also answer the need for information to be collected for transparency purposes and to ensure the equal treatment of all or potential bidders. The study has identified neither a database nor a procurement system currently being used with the explicit objective to facilitate public procurement *and* to prevent or detect corruption. However, most databases and systems contain data and information that *can* be used for prevention, detection and investigation purposes.

For the potential use of these systems to prevent corruption the data they contain on companies or persons (ultimate beneficiary owners) involved in suspicious cases or even convicted of corruption is very important. New cases could be matched against such data and a preventive scanning could be conducted thanks to this already collected data.

In order to use these systems and databases for the detection of corruption, the data fields with relevant indicators could provide the first relevant elements to check whether any suspicious signs occur in a new or running project. Indicators for corruption can be direct indicators, so called "red flags". Such indicators could be found in data collected by the procurement authorities at national and EU level. These red flags are indicated and elaborated in Chapter 9 of this study.

In order to use these systems to investigate corruption, information necessary for forensic research could be found in the data gathered by using existing tools. Such information would help to detect and/or reveal connections between people, companies, documents and money flows, etc.

In this chapter an inventory of a selection the most important systems at the EU level are presented and assessed based on their added value to fight corruption.

4.1.1.1. Data quality

Making full use of these IT tools is not only a matter of the volume of available data. The quality of the data is equally important, regardless of the purpose of a database or data processing system. Data quality has several dimensions:

Table 10: Data quality		
Data quality dimension[29]	*Definition*[30]	*Application on public procurement data*
Accessibility	The extent to which data is available, or easily and quickly retrievable	Is, at national and at EU-level, all relevant data on public procurement online retrievable?
Appropriate amount of data	The extent to which the volume of data is appropriate for the task at hand	How much data is collected per procurement in structured databases? Does this cover all needs? Is the administrative burden not too heavy?
Completeness	The extent to which data is not missing and is of sufficient breadth and depth for the task at hand	Are all relevant data fields filled with enough data at the appropriate level of detail? Are (automated) controls built in to check missing data (or reject incomplete uploads)?
Comprehensibility	The extent to which data is easily comprehended	Is (technical) information formulated in an understandable way? Are objectives or subjects of procurements not formulated in too general terms?
Concise representation	The extent to which data is compactly represented	Appropriate use of encoding, such as "Common Procurement Vocabulary" (CPV).
Consistent representation	The extent to which data is presented in the same format	Are standard data, such as dates, amounts, etc. entered in the same format (not *dd-mm-yyyy* and *yymmdd* together) in all MS?
Credibility	The extent to which data is regarded as true and credible	Is the uploaded data in public procurement databases a good representation of reality? Are enough controls in place to check credibility/truth?
Ease of manipulation	The extent to which data is easy to manipulate and apply to different tasks	Can data be used for procurement process management, audit and detection and investigation of fraud and corruption (especially when most databases and systems are built for only one of these purposes, mainly *not* for detection and investigation of fraud and corruption)?
Free-of-error	The extent to which data is correct and reliable	What controls are built in to check data on errors: spelling/language checks, logical checks (e.g. whether a date exists, is possible given start and deadlines in a process, whether a product code fits to a procurement description), checks on double entries, etc.?
Interpretability	The extent to which data is in appropriate languages, symbols, and units and the definitions are clear	Especially relevant in the multi-lingual EU context: is data available in all relevant languages *and* correctly translated into others? Are definitions the same in all these languages? Are units (metric system, imperial system) clear for all product groups?
Objectivity	The extent to which data is unbiased, unprejudiced and impartial	Who enters the data into the system? Who updates the data and runs checks on facts, accuracy and relevant details concerning all data entered into the system? Is the data and the database solely managed by one organisation or is it a shared system with a balanced influence?
Relevancy	The extent to which data is applicable and helpful for the task at hand	Are there standards for the data entering process and the content? What does the data contain as information? How were the standards set? What is the data collected for?
Reputation	The extent to which data is highly regarded in terms of its source or content	Which organisation or department manages the database and is in charge of the data in the system? How influential is this public body in terms of decision-making, legislation and executions concerning public procurement? Do other organisations consult this authority in regard to the management of public procurement and relevant data collection?

[29] PIPINO, LEE and WANG (2002), Data Quality Assessment, p. 212.
[30] Ibid.

Security	The extent to which access to data is restricted appropriately to maintain its security	Who has access to the data? How is data security ensured? What data security and privacy laws are applicable?
Timeliness	The extent to which the data is sufficiently up-to-date for the task at hand	Are there regular updates in place? How is the timeliness of data ensured?
Value-added	The extent to which data is beneficial and provides advantages from its use	What type of data is entered into the system? How is the data collected and structured? What reports are expected from the database to be conducted? Are the data and the system applicable for automated checks and reports?

The better the data quality and storage structure in databases and systems, the more effectively and efficiently they can be used to detect and investigate corruption. Procurement data that is not accurate, not timely (entered and processed too long after the actual procurement acts), not complete or that misses relevant data elements, has limited value for the detection and investigation of corruption. Poor data quality also effects the calculation of the costs of corruption in a negative way (see chapters 7 to 10).

4.1.1.2. Public procurement rules and standards for data collection

Public procurement rules of the European Institutions are set by the Financial Regulation (FR)[31]. The FR lays down the rules for the establishment and implementation of the general budget of the European Union and the presentation and auditing of the accounts. In particular, it defines the rules for accounting, public procurement, award of grants and other financial instruments. The liability of authorising officers, accounting officers and internal auditors is also covered under the FR. It also sets out the rules and conditions for external control and the discharge procedure[32].

Whereas the rules are clear and uniform for the EU institutions, the research reveals that their implementation varies based on the operational needs of individual DGs, as each DG has its own structure of public procurement processes. The differences in approach and practice lead to divergence in the type and amount of procurement data stored. Procurement procedures define the method of data collection and the necessary IT tools are developed and implemented accordingly.

In the case of the European Commission (EC) the EC rules and main standards remain the same for data collection and storage[33], even if there is variation in the tools and methods used for data collection. These EC rules apply to document management, archival description standards, archival metadata standards, General International Standard Archival Description, International Standard Archival Authority Record for Corporate Bodies, Persons and Families[34], International Standard for Describing Functions[35], Reference Model for an Open Archival Information System[36], Modular Requirements for Records Systems.[37]

[31]REGULATION (EU, EURATOM) No 966/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002 (Official Journal of the European Union L 298/1 of 26.10.2012.

[32]Europa - Official website (2013), *Financial Regulation* [WWW], Available from: http://europa.eu/legislation_summaries/budget/l34015_en.htm [Accessed 11/03/2013].

[33]Natalia Aristimuño-Pérez (2012), European Commission's Document Management (Policy, IT, Security & Privacy) [WWW], EC.DIGIT.B1; Available from: http://www.gsebelux.com/system/files/files/C06%20-%20European%20Commission's%20Document%20Management%20.pdf [Accessed 11/03/2013].

[34]International Council of Archives (2011), ISAAR (CPF): International Standard Archival Authority Record for Corporate Bodies, Persons and Families, 2nd Edition [WWW], Available from: http://www.ica.org/10203/standards/isaar-cpf-international-standard-archival-authority-record-for-corporate-bodies-persons-and-families-2nd-edition.html [Accessed 11/03/2013].

[35]International Council of Archives (2011), *ISDF: International Standard for Describing Functions* [WWW], Available from: http://www.ica.org/10208/standards/isdf-international-standard-for-describing-functions.html [Accessed 11/03/2013] .

[36]Consultative Committee for Space Data Systems (2012), Reference Model for an Open Archival Information System (OAIS) [WWW], Available from http://public.ccsds.org/publications/archive/650x0m2.pdf [Accessed 11/03/2013].

[37]MoReq2010 (2010&2011), Volume 1 Core Services and Plug-in modules [WWW], Available from: http://moreq2010.eu/pdf/moreq2010_vol1_v1_1_en.pdf [Accessed 11/03/2013].

4.1.1.3. Centralised data

Centralised data is key for the prevention and detection of corruption using IT tools. In order to conduct certain checks and generate the relevant type of reports, the data must be collected centrally and structured accordingly. This goes hand in hand with the improvement of data quality. Therefore, many common aspects link centralised data and data quality, such as the interoperability and ability to communicate with other procurement systems and external databases, standardisation of data, data exchange and entry structured via rules and legislation based on agreed harmonization.

4.2. Collection of procurement data

The data for this chapter has been collected via desk research with a focus on related EU reports and documentation, interviews with EU officials and a survey[38] targeting procurement, legal, finance and IT officers in the EU institutions[39]. As the desk research and the first round of interviews highlighted a wide variety in data collection methods and a high number of IT tools currently used within the Commission, the major part of the research has been dedicated to the identification of these practices with a special focus on innovative IT tools.

The interview results show that the traditional method of data storage for public procurement processes at the EU level consists of the collection and filing of hard copy documents. In certain cases electronic document storage methods were also identified, which mainly consist of scanned documents and draft text documents saved in a directory on a computer or a shared drive with limited access for single or multiple officials. For both methods, procurement data is neither preserved nor accessible in a structured, let alone centralised way. This makes data analysis and reporting quite difficult. Therefore the research focused on those IT systems and databases which collect and contain data electronically, that are broadly accessible and can be, in theory, useful to detect and investigate cases of (possible) corruption. These are:

- Electronic databases;
- Advanced file sharing systems;
- IT tools to generate tender documents via data entry;
- Electronic reporting tools;
- IT tools with advanced search, filter and list functions.

Our research identified two main groups of IT tools currently used for public procurement:

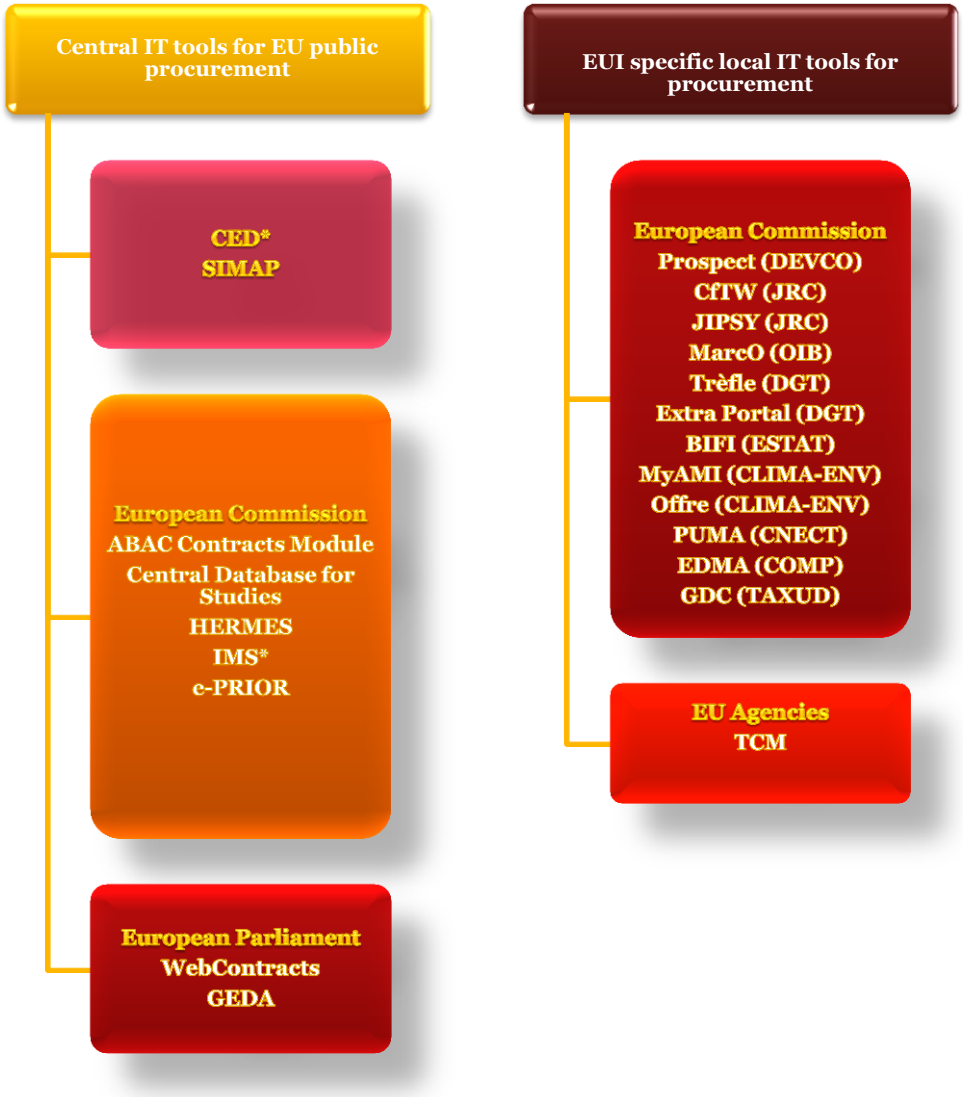
- Central IT tools and systems of the EU institutions (EUI);
- Local IT tools developed for the specific needs of the DG.

[38]The survey was sent to 69 EU officials and 11 completed questionnaires were received as input for the study.

[39]Interviews with 40 EU officials from 5 EU institutions including 12 Directorates General (DGs) of the European Commission, European Parliament, European Court of Auditors and 2 EU agencies.

An overview of the identified tools is presented in the figure below:[40]

Figure 3: Overview of identified tools used for public procurement[41]



The findings of the research are further detailed in the sections below. The tools are briefly described in terms of their objectives, managing authority, functions, data origins and quality, and the interoperability of the system. Each description concludes with some remarks on the usefulness of the system or database for the prevention, detection and investigation of corruption.

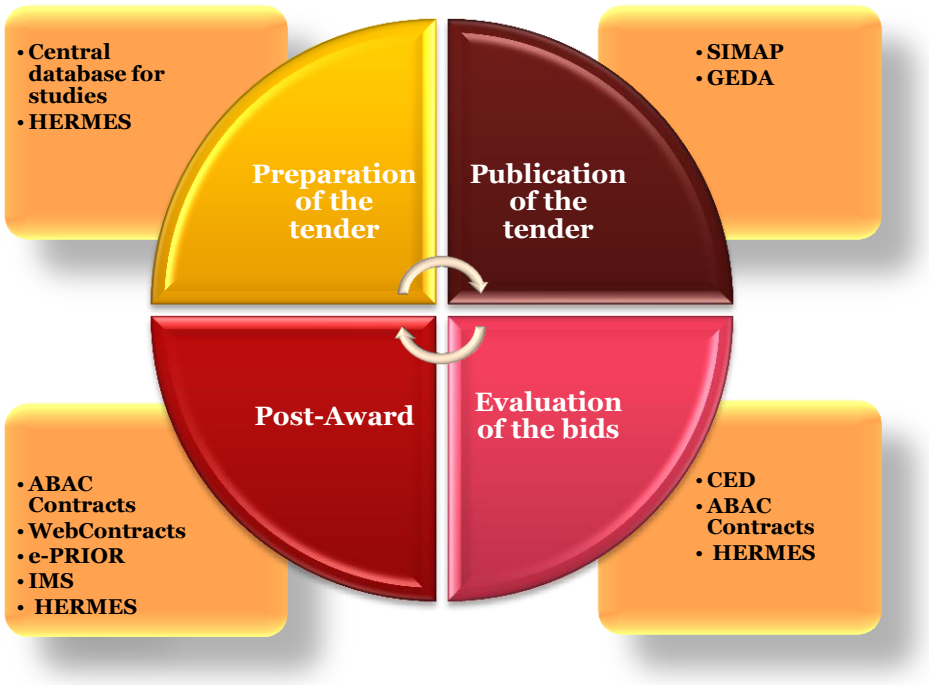
[40]The tools are identified based on the input of the EU officials via project interviews and survey.

[41]CED and IMS are also accessible by the managing authorities of the Member States.

4.3. Identified Central IT tools and databases for public procurement data collection

The central IT tools address the general needs of the EU institutions in different phases of the procurement cycle. They can be categorised based on their use in the applicable procurement phase as presented in the figure below:

Figure 4: IT-tools and databases at EU level per phase of the procurement process



In addition to the phases of the procurement cycle, central IT tools can also be analysed based on their accessibility to the EU institutions and their added value for fighting corruption in public procurement, as presented in subsequent chapters.

The sections below give an overview of the purpose, functions and use of the tools and the type of procurement data stored. The chapter also provides an assessment of their current or potential performance concerning the anti-corruption measures. If the information registered in the system or the reports that can be generated using the tool can support the required anti-corruption measure, the IT tool is scored with a "+". If the IT tool has relevant data that can help one of the anti-corruption phases but needs to be restructured or reorganised, then it receives the "+/-" score. If the data or reporting systems are irrelevant to the assessed anti-corruption measure, then the IT tool is scored with a "-" .

4.3.1.1. Central IT tools for all EU Institutions

CED – Central Exclusion Database [42]

CED is a central IT tool for the prevention of fraud and corruption in EU projects. It is currently used by all EU institutions and relevant authorities of the Member States managing EU Funds. As it is a database directly involved with the anti-corruption and anti-fraud measures of the EU, below an in-depth analysis of this tool as regards the collection of administrative data on procurement at the EU level is presented.

Table 11: Central Exclusion Database		
Objective		The Central Exclusion Database was created to protect the EU's financial interests by developing a list of all the entities which have been excluded from EU funding. The entities registered in the database are either insolvent or have been convicted of a serious professional misconduct or criminal offense that is contrary to EUI financial interests.
How does it work?		Entries in the CED can be based on bankruptcy, unpaid tax or unpaid social charges, final court judgements for fraud, corruption, money laundering and involvement in criminal organisations detrimental to EU's financial interests, judgements for offences concerning professional conduct or decisions of a contracting authority for serious professional misconduct, and/or conflicts of interest. The data in CED is available to all public authorities implementing EU Funds, i.e. European institutions, national agencies or authorities in Member States, and, subject to conditions for personal data protection, to third countries and international organisations. Besides the Accounting Officer and his team managing the CED, only authorised users such as grant & procurement agents within European Union' institutions and Member States national authorities have access to CED[43]. Authorised users from third country national authorities and International Organisations delegated by the Commission for the implementation of Union funds may also have access to CED.
What is the quality of this data?		Data is entered by the primary sources directly. The content, level of detail and relevancy is linked to the main objective of the CED. CED is a mandatory Commission database into which all EU institutions and Member States are required to enter data on economic operators who cannot meet the exclusion criteria in a tender for an EU funded project. Personal data protection concerning the information in the database has to be respected by all officials giving access to CED[44].
Interoperability of the system or database		All relevant authorities at the EU and Member State levels have access to the system and can operate to enter and search for data. It is used EU-wide. The database is not linked to other systems and interoperability is not foreseen.
Added value of the CED in the fight against corruption in public procurement		
Prevention of corruption	+	Checking on entities registered in the database that are either insolvent or have been convicted of a serious professional misconduct or criminal offense disadvantageous to EUI financial interests can help to prevent corruption
Detection of corruption	+/-	The list covers companies, organisations and natural persons. Personal data collected includes name and legal name of the bidding entity, business address and the entity's business registration numbers[45]. CED could be used to check whether recently registered entities are involved in other running projects as well – this check is not performed automatically or procedurally yet
Investigation of corruption	-	The database can contribute to investigations through additional checks, but most of the data is filed by investigative agencies themselves.
Analysis of (costs) of corruption	-	This database does not provide any useful information on detected corrupt cases or on the costs of corruption

[42] European, Council (2002), *Article 95 of the Financial Regulation, COUNCIL REGULATION (EC, Euratom) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities (OJ L 248, 16.9.2002, p. 1)* [WWW], Available from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:2002R1605:20071227:EN:PDF [Accessed 11/03/2013].

[43] Ibid.

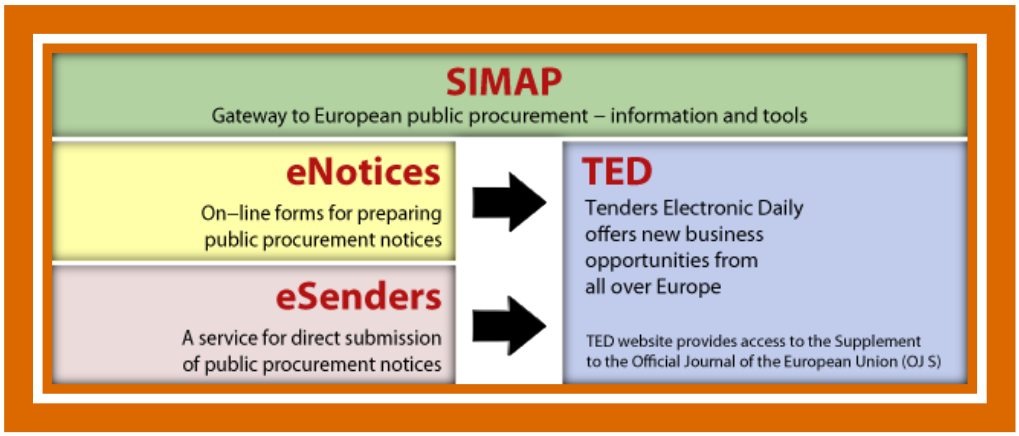
[44] Ibid.

[45] European Commission (2011), *Privacy Statement for the Central Exclusion Database, European Commission DG Budget* [WWW], Available from: http://ec.europa.eu/budget/library/sound_fin_mgt/privacy_statement_ced_en.pdf [Accessed 11/03/2013].

SIMAP

SIMAP is the central procurement portal for EU tenders. It has different components for the announcement of the tenders and the storage of the procurement data online. The figure below gives an overview of the different modules and functions of SIMAP.

Figure 5: SIMAP portal[46]



eNotices

It provides EU authorities with access to all document templates and standard forms used in European public procurement. eNotices also helps to check for possible errors in notices and for compliance with the EU directives regulating public procurement procedures. Electronic forms accessible through eNotices are compliant with the standard forms published in the Commission Regulations[47]. The European Commission maintains this online tool to enhance public access to information about its initiatives and European Union policies in general.[48]

TED (Tenders Electronic Daily)

All tenders launched by the EU institutions have to be published via the Tenders Electronic Daily database (TED). The TED database contains information on the procurement process such as the procurement types, technical details, dates and deadlines, contract values, exclusion criteria, etc.

TED is the web version of the Supplement to the Official Journal of the European Union (OJ). This web tool is the official source for timely information on public procurement opportunities in the European Union, the European Economic Area and beyond. Central governments, local or regional authorities, bodies governed by public law, or associations consisting of authorities or bodies governed by public law can all be seen as contracting authorities.

The OJ contains publications concerning notices for public works, services and supply contracts above certain thresholds. These publications have to be in compliance with EU directives and international agreements.[49]

eSenders

Another tool is eSenders. The submission of notices directly as XML files[50] by qualified organisations is possible via this tool.

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[46] SIMAP (2013), Information system for European public procurement [WWW], Available from: http://simap.europa.eu/index_en.htm [Accessed 11/03/2013].

[47] Commission Regulation 1564/2005 and 842/2011 (OJ L 222, 27.08.2011). According to directives 2004/17/EEC, 2004/18/EEC and 2009/81/EC, member states are required to use standard forms when publishing public procurement notices.

[48] Anghelakis, M. Et al. (2006), *Electronic Transmission of Procurement Notices for Publication Volume I (Main Report)* [WWW], European Commission, Available from: http://ec.europa.eu/internal_market/publicprocurement/docs/eprocurement/feasibility/enot-vol-1_en.pdf [Accessed 11/03/2013].

[49] Publications Office (2010), *Tenders Electronic Daily (TED), European Public Procurement* [WWW], Available from: http://bookshop.europa.eu/en/ted-european-public-procurement-pbOA3210447/ [Accessed 11/03/2013].

[50] Extensible Markup Language (XML) is a markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable.

Table 12: SIMAP		
Objective		SIMAP is a data portal that enables access to information about public procurement in Europe.
How does it work?		SIMAP consists of three parts: TED, eNotices and eSender. Tender notices are published on the TED website, the single official source of public contracts in Europe. Most public procurement notices are sent for publication through an electronic channel. eNotices is a web-based tool that simplifies and expidites preparation and publication of tender notices. The eSenders service allows qualified organisations to submit notices directly as XML files. [51]
What is the quality of this data?		All EU tenders and contracts must be published via this system. There are mandatory fields for publishing the data in the database and in the electronic forms, which must be filled in order for the announcement can be accepted by the system. However the research shows that the data is incomplete (e.g. not all tenders that should be recorded are entered, not factual and at times unreliable, limited data fields, etc).
Interoperability of the system or database		The system is not linked to external databases or systems.
Added value of SIMAP in the fight against corruption in public procurement		
Prevention of corruption	+/-	Data stored in the system could be used for preventive scans via relevant S.MA.R.T.[52] tools but relevant structural adaptations msut be done within the database.
Detection of corruption	+	SIMAP lists all reference documents containing the relevant background information for publications on Tenders Electronic Daily (TED) for the benefit of contracting authorities needing to publish a tender[53]. The data stored can be used for corruption detection.
Investigation of corruption	+	Information on the tenders and contracts could be used for corruption investigations.
Analysis of (costs) of corruption	+	The procurement data also contains financial information. Therefore, the system and its different components, such as TED, can be used to calculate of costs of corruption as shown in chapters 7-10.

4.3.1.1.1. Analysis on the Central IT tools for all EU Institutions

Based on the data collected on central IT tools accessible to all EU Institutions, an analysis can be conducted of their potential useto detect and prevent corruption in public procurement. The tools provide a number of advantages in terms of data collection related to EU public procurement. However, the systems are not structured to respond to the specific needs of anti-corruption measures. The data is stored centrally and is transparent as all EU institutions have access to the tools. Central systems require standardisation of data storage. This enables the possibility of computerised corruption detection and prevention. The procedures for collection and management of procurement data is also standardised with the development and use of these tools. The multi-functionality of the systems is underdeveloped. The structure, type and content of data is identified for the main purpose of the tools. This makes it very difficult to use the collected data for additional purposes such as the detection and prevention of corruption.

The table below provides an overview of the current or potential performance of these tools to fight corruption in public procurement. As presented below, the systems have different scores in different phases of anti-corruption measures. Even if the IT tools don't score positive for all stages, there is potential for better use of these systems to prevent, detect, investigate and analyse corruption.

[51] European Commission (2010), Commission staff working document evaluation of the 2004 action plan for electronic public procurement [WWW], Available from: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52010SC1214:EN:NOT [Accessed 11/03/2013].

[52] In computer language, S.M.A.R.T. means Self-Monitoring, Analysis, and Reporting Technology.

[53] SIMAP (2013), Information system for European public procurement [WWW], Available from: http://simap.europa.eu/index_en.htm [Accessed 11/03/2013].

Table 13: Overview on the analysis of the central IT tools for all EU Institutions concerning the fight against corruption		
ANTI-CORRUPTION MEASURE	*CED*	*SIMAP*
Prevention of corruption	+	+
Detection of corruption	+/-	+/-
Investigation of corruption	-	+
Analysis of (costs) of corruption	-	+

Taking a closer look at each IT tool presented above the following advantages and disadvantages are identified:

The data stored in the Central Exclusion Database (CED) is quite specific as it contains information about entities excluded from EU procurement. Data is centrally stored in the CED and made accessible to all EU institutions and Member States to enter and consult data. Other public authorities implementing EU Funds such as national agencies and authorities in the Member States are able to store and consult the data. The search process in the CED is straightforward, based on keywords related to economic crime and corruption. Furthermore, the CED is safe and secure as only authorised people have access.

SIMAP is the data portal of eNotices, eSenders and TED. The data stored in the eNotices tool is quite specific as it is used to prepare public procurement notices. It is a centralised tool accessible for all EU authorities. The data stored in eNotices is compliant with general standards for notice procedures as published in the Commission Regulations. The TED is also a rather specific tool as it contains all published tenders. There are standards for data collection and management as it is required to collect the tender information via an eNotice. Furthermore, the TED database has an advantage in that it delivers information on a timely basis in relation to public procurement opportunities in the European Economic Area and expedites the preparation and publication of tender notices.

4.3.1.2. Central IT tools for the European Commission

ABAC Contracts Module

ABAC (Accrual Based Accounting) is part of the Commission's global effort to modernise the management of the EU finances. The ABAC Contracts module is a tool for contract management and payment execution. It is a database with information on contracts signed between the Commission and the contractors or the beneficiaries. The system allows different reporting options by contractor's name, DG, contract date or value. It has functions such as registration of contracts, reporting, data search and, extraction of lists.

The survey conducted as part of this study pointed out a number of shortcomings of the system. The input provided by the Commission officials from the finance and IT units show that the main issues concern the limited access to the database and the lack of or insufficient interfaces with other ABAC modules. The users also complain about the fact that ABAC assets, contract and workflow on Business Objects are not linked. As a result, certain desirable reports cannot be produced. The Commission officials also find it difficult to extract information from ABAC. Another module which requires improvement is the follow-up function; survey results indicate that it is not user friendly and is too complicated to use.

EWS - Early Warning System

EWS is a function of ABAC. It identifies bodies and individuals representing financial and other risks to the EU, so that the Commission can take precautionary measures.[54]

[54] European Commission (2012), Financial Programming and Budget, Protecting EU interests [WWW], Available from: http://ec.europa.eu/budget/explained/management/protecting/protect_en.cfm [Accessed 11/03/2013].

If a DG or unit is suspicious of a contractor, discovers some issues that would require an investigation or delay of the payment, the DG flags the company in the system to warn other DGs and units in case the same company wins a tender with them. Before signing the contract or issuing the payment through ABAC, the EWS flag indicates that there is has been a problem with this contractor. There are 5 levels of flagging in the system. If a company is flagged at the 5th level, it means that there is a court decision on fraud against this company. In this situation the company cannot participate in any Commission tender and will thus be excluded. At all lower levels it is up to the DG and the authorising officer to let the company bid or sign a contract with the Commission.

Most of the EWS flags (W1 to W4) aim to encourage operational and financial managers to reinforce monitoring of the contract or grant in question or the procurement or grant award procedure. These flags inform other EU officials on the identified risks such as recuperation of certain amounts significantly overdue by a recipient, judicial proceedings pending for serious administrative errors/fraud, or findings of serious administrative errors/fraud. The flags also cover situations like setting off mutual debts, suspension of temporarily payments for the purpose of advance verifications, or executing them to a third party following attachment orders binding for the Commission. W5 flags refer to the exclusion from EU funding. These are identified by legal criteria listed in the FR. A W5 flag cannot be the reason of the exclusion, however, the legal situation of the beneficiary is. A prior conviction for fraud, serious breach of a contract already established after a contradictory procedure, or proven terrorist activity[55] are all legitimate reasons for exclusion from the bid.

Our survey of officials from the Commission's finance and IT units shows that EWS provides the advantage of better control but also presents a disadvantage because of the complexity of the system and given the limited access to the database.

Table 14: ABAC Contracts		
Objective		ABAC Contracts is a tool for contract management and payment execution.
How does it work?		It is a database with information on the contracts signed between the Commission and the contractors or the beneficiaries.
What is the quality of this data?		As the payments to the contractors can only be done via the accounting system ABAC, the data in ABAC Contracts contains detailed information on the contract and the contractor and is regularly updated. The data is centrally stored and also structured for certain types of reporting.
Interoperability of the system or database		There is limited access to the database and a lack of or insufficient interfaces with other ABAC modules. Users complain about the fact that ABAC assets, contract and workflow on Business Objects are not linked and, as a results, certain desirable reports cannot be produced. The Commission officials also find it difficult to extract information from ABAC.
Added value of ABAC Contracts in the fight against corruption in public procurement		
Prevention of corruption	+	Early Warning System (EWS) is a function of ABAC. It identifies bodies and individuals representing financial and other risks to the EU, so the Commission can take precautionary measures.[56]
Detection of corruption	+	The database contains information on contract management and budget execution. For suspicious cases, payment information can be extracted from the system and analysed.
Investigation of corruption	+	The data on contractors, contracts and payments stored in the system contains valuable information for corruption investigations.
Analysis of (costs) of corruption	+	All information on payments is registered in ABAC. When corrupt cases are identified, the cost can be calculated by extracting the budget execution information from the system.

[55] Council Common Position of 27 December 2011 on the application of specific measures to combat terrorism (Official Journal of the EU – L 344/3 of 28/12/2001)

[56] European Commission (2012), Financial Programming and Budget, Protecting EU interests [WWW], Available from: http://ec.europa.eu/budget/explained/management/protecting/protect_en.cfm [Accessed 11/03/2013].

CDS - Central Database for Studies

Double financing of studies (especially with respect to grants) and similar studies being commissioned by different DGs at the same or different times has been an important issue for the Commission. Even though the DGs publish a list of the studies they finance at the end of the calendar year, it was not preventive against the double financing or commissioning. Therefore the European Commission initiated a database for studies, which must be fed by every DG and EU agency that finances a study via EU grants or procurement. The studies procured by Member States with EU funding are not covered in this database; it is only for the studies financed by the European Commission.

An in-depth analysis of this tool is is provided below, summarizing the collection of administrative data on procurement at the EU level.

Table 15: Central Database for Studies		
Objective		CDS is a central database containing information on studies financed by the European Commission aimed at avoiding double financing.
How does it work?		All DGs have access to the database to conduct checks on the type of study that they would like to conduct or finance to see if a similar study has already been done for another DG.
What is the quality of this data?		The database must be fed by every DG and EU agency that finances a study via EU grants or procurement. This stimulates regular updates and new entry of data. The studies procured by Member States with EU funding are not in this database.
Interoperability of the system or database		The database is not linked to external systems.
Added value of the CDS in the fight against corruption in public procurement		
Prevention of corruption	+	As a preventive measure the database helps to prevent double financing of studies, which might be linked to corruption.
Detection of corruption	-	The system cannot be used for detection of corruption.
Investigation of corruption	-	The database cannot support corruption investigations.
Analysis of (costs) of corruption	-	The tool does not contain information contributing to the calculation of the costs of corruption.

HERMES

HERMES was developed to complement the Commission's various digital applications for document and file management in a common structure. It has modules for registration, filing and file management, preservation, security, search, workflow and e-signatory. Official Commission documents and files are stored in this single electronic repository. [57] Gaps and duplications are avoided and DGs and other services are assisted by sharing information and access Commission documents and files on a right-to-know basis.[58]

HERMES has as objective to bear the European Commission’s electronic document management policy for all internal services and executive agencies. It is estimated that the system is used by more than 40 000 people. Use of the system is mandatory and increasing significantly; at the end of 2010 it was estimated that more than 3 million attachments have been sorted in HERMES.[59]

[57]The generic requirements for an electronic records management system are defined by MoReq (Model Requirements for the Management of Electronic Records). It was first published in 2001. European Commission (2008) Model Requirements for the Management of Electronic Records Available from: http://ec.europa.eu/archival-policy/moreq/doc/moreq2_spec.pdf.

[58]European Commission (2009), IT Tools [WWW], Available from: http://ec.europa.eu/transparency/edoc_management/it_tools_en.htm [Accessed 11/03/2013].

[59]ISA (Interoperability Solutions for European Public Administrations) (2007), Document repository services for EU policy support, ISA Programme, European Commission DG DIGIT [WWW], Available from: http://ec.europa.eu/isa/actions/documents/isa_2.9_document_depository_workprogramme.pdf [Accessed 11/03/2013].

ARES

ARES is one of the central web applications that handle Commission documents under the eDomec rules applicable for registration, filing, preservation, appraisal and transfer of files to the Commission's historical archives, legal value of electronic and digitised documents.[60] It is a document management tool and a repository for all Commission documents required for use by all DGs. It registers documents created, received and held by the Commission. The filing system for these documents is based on the Commission's activities. ARES also assists Commission officials with the management of assignments, workflow, storage, scanning, full-text search, e-signatory and access rights. ARES also has functions for the preservation of documents and files (common retention list), appraisal of documents and files and transfer of selected files to the Commission's historical archives, where they will be open to the public. [61]

Some DGs use the functionalities of ARES to the maximum and manage the workflow of the procurement procedure and the approval of the tender documents before the launch of the tender. Some DGs enter the minimum required data into the system but do not use is as a daily tool in the procurement process. ARES is not a database, thus reports cannot be extracted. The search function can only be used if the EU official is looking for a specific document in the system.

NOMCOM

NOMCOM is a central web application to manage Commission documents like those stored on ARES. The filing plan and the file list for the whole Commission are managed by this application. A unique identifier is given to all official files. The European personal data protection supervisor has approved both ARES and NOMCOM.[62]

Table 16: HERMES		
Objective		Document and file management in a common structure.
How does it work?		The system has modules for registration, filing and file management, preservation, security, search, workflow and e-signatory. Official Commission documents and files are stored in a single electronic repository.
What is the quality of this data?		The data is entered directly by the EU officials. The system is used by all internal services and executive agencies. It is a central tool for document management. As a document repository, it is not designed as a database so the structure and format of stored data are not designed for advanced reporting.
Interoperability of the system or database		The system is not linked to an external system or database.
Added value of HERMES in the fight against corruption in public procurement		
Prevention of corruption	-	It is a document repository and is not designed for corruption preventive measures.
Detection of corruption	-	The system is not structured as a database available for advanced scans via filtering and data matching for detection of corruption.
Investigation of corruption	+	During the corruption investigation phase, the documents stored in the system can provide information and evidence on the case.
Analysis of (costs) of corruption	+	The documents stored in the system also contain financial information, which might be useful for calculating the costs of corruption.

[60] European Commission (2009), IT Tools [WWW], Available from: http://ec.europa.eu/transparency/edoc_management/it_tools_en.htm [Accessed 11/03/2013].

[61] Ibid.

[62] European Commission (2009), IT Tools [WWW], Available from: http://ec.europa.eu/transparency/edoc_management/it_tools_en.htm [Accessed 11/03/2013].

IMS - Irregularities Management System

IMS is a central system accessible to the European Commission and the Member States to report irregularities in the EU programmes to the European Commission. The system is developed and maintained by OLAF.

The table below presents an in-depth analysis of this tool with respect to to collection of administrative data on procurement at the EU level.

Table 17: Irregularities Management System		
Objective		IMS is a central system to report irregularities in the EU programmes to the European Commission.
How does it work?		IMS is a database with reporting capabilities. It is used for EU-funded grants and tenders managed by the Member States.
What is the quality of this data?		Data is collected centrally and entered by the managing authorities and the EC directly. The system is maintained by OLAF, which performs the necessary checks to ensure data quality.
Interoperability of the system or database		The system is not linked to external databases.
Added value of IMS in the fight against corruption in public procurement		
Prevention of corruption	+	IMS is the central reporting tool for irregularities. As such, it is an important corruption prevention tool that can identify problem areas so that action can be taken to detect and investigate.
Detection of corruption	+	The reported irregularities provide information necessary to trigger the detection process.
Investigation of corruption	+	The data provided by the system provides reliable information that can be used in the corruption investigations.
Analysis of (costs) of corruption	+	Financial information reported in the system can help to calculate the costs of corruption.

e-PRIOR

e-PRIOR is the European Commission's e-Procurement solution. The Commission has developed the tool and funding is obtained by the former Interoperable Delivery of European e-Government Services to Public Administrations, Businesses and Citizens (IDABC) and the current Interoperability Solutions for European Public Administrations (ISA) programme. [63]

e-PRIOR is a platform. It allows the European Commission, the European Union Agencies and their suppliers to exchange post-award documents by using web services or over the PEPPOL[64] network. Large suppliers can use XML-based communication over the internet, while Small and Medium sized Enterprises (SMEs) can use the Supplier Portal.[65]

e-PRIOR respects the CEN/BII e-Procurement standards (e-Catalogues, e-Ordering and e-Invoicing) and is also available as open-source "Open e-PRIOR". It is composed of various modules and has been developed to speed up the implementation of e-Procurement by the Member States. Public procurement procedures are managed by e-PRIOR. e-PRIOR originally covered the post-award phase but is being extended (development is on-going) to cover also the pre-award and award phases (initially e-Submisssion and then e-Award). It is a tool that can be rolled out to the various DGs. in case of adoption by multiple DGs, the same database instance is shared with adequate security measures in place to guarantee that each DG can manage only its own data. e-PRIOR post-award modules are integrated with the financial back offices of the connected DGs. e-Prior pre-award will be linked to the TED e-Tendering system of the Publication Office, with possible integration with ARES.

[63] European Commission (2008), e-PRIOR: eProcurement project at the European Commission [WWW], Available from: http://www.epractice.eu/cases/ePRIOR [Accessed 11/03/2013].

[64] Pan-European Public Procurement OnLine.

[65] European Commission (2013), Welcome to the Information Pages of the e-PRIOR Supplier Portal [WWW], Available from: http://ec.europa.eu/dgs/informatics/supplier_portal/index_en.htm [Accessed 11/03/2013].

The module to store data related to public procurement is called e-Submission. It stores information and data on calls for tenders (received and managed by TED, eTendering). This includes the timeframe of the calls for tenders, exclusion, selection, evaluation criteria and lot repartition.

The tenders and qualification data submitted by the economic operators with their annexes are also stored in the system. Additionally, the names and the authorities of the users (typically the actors on the back office side) are available in the system. The e-PRIOR Supplier Portal currently provides access to the following modules: e-Request and e-Invoicing. Further modules such as eOrdering, eFulfilment, ePayment are currently in the development phase.

e-REQUEST

e-Request is a central EC Tool rolled out in all DGs and available through the customer portal for DGs and the Supplier Portal for contractors. Through e-Request, both parties can exchange electronic documents and workflow actions until the signature phase of the specific requests, offers, acceptances or refusals of contracts. It has been developed for the exchange of electronic documents and workflow actions up to, but not including, the signatures of the specific requests, offers, acceptances or refusals of contracts.

eRequest stores on the one hand electronic data documents (requests, offers) and on the other hand workflow validations (acceptance, refusal, suspension, etc.). Any supporting document can be uploaded in e-Request (e.g. CVs of service providers). Some of the documents are compulsory at given stages of the procedure (e.g. Technical Appendix) and some are not. eRequest is currently used only for framework contracts.

e-INVOICING

e-Invoicing is a central EC Tool rolled out in all DGs that allows contractors to send electronic invoices to the Commission. Suppliers can only connect via the Supplier Portal to enter data using online forms accessible via their web browser.[66] It is a tool for contractors either through machine-to-machine connections or through the Supplier Portal. eInvoicing stores electronic invoices and allows supporting documents (e.g. Time-Sheets) to be uploaded into the system.The table below presents an in-depth analysis of this tool with respect to collection of administrative data on procurement at the EU level.

Table 18: e-PRIOR		
Objective	e-PRIOR is a platform allowing the European Commission, EU Institutions and Agencies and their suppliers to exchange post-award documents by using web services or via the PEPPOL network. It is currently extending to the pre-award phases of the procurement.	
How does it work?	Public procurement procedures are managed by e-PRIOR, which is composed of various modules and can store data.	
What is the quality of this data?	ePRIOR covers pre- and post-award phases. Therefore, there are data entry, updates and checks at several stages of the procurement cycle concerning the data in the system.	
Interoperability of the system or database	ePRIOR's post-award modules are integrated with the financial back offices of the connected DGs. The ePrior pre-award module will be linked to the Publication Office's TED eTendering system, with possible integration with ARES. By using this tool, the implementation and re-use of interoperable systems will be encouraged.	
Added value of ePRIOR in the fight against corruption in public procurement		
Prevention of corruption	+	The system provides transparency and improved access to data for both EU officials and contractors, which promotes prevention of corruption.
Detection of corruption	+/-	The information stored in the system can be used for the detection of corruption; however the data has to be structured in such a way that the relevant searches, scans, matching and filtering actions can be executed.
Investigation of corruption	+	The data registered in ePRIOR can be used in corruption investigations.
Analysis of (costs) of corruption	+	Financial information stored in the system can help to calculate the costs of corruption.

[66] European Commission (2013), *Welcome to the Information Pages of the e-PRIOR Supplier Portal* [WWW], Available from: http://ec.europa.eu/dgs/informatics/supplier_portal/index_en.htm [Accessed 11/03/2013].

4.3.1.3. Central IT tools for the European Parliament

WebContracts

WebContracts is the central database for contracts and contractors of the European Parliament. Central supervision exists at the level of DG FINS (Central Financial Unit) and access for the purpose of registration and processing is given to authorized staff in each DG There are different levels of access for different officials commensurate with their tasks. Its main function is to record existing contracts, and to create new ones. It also has reporting and search functions and is a tool for DG FINS in the preparation of the analysis of the Annual Activity Report and the reporting on contracts awarded. In addition to data on the contracts, contractors and payments, limited information on the procurement process can also be found in the database. Different alerts concerning procurement or payment deadlines can be introduced to the system for contract or budget management purposes. The database was put in place gradually from 2011, and as from 2012 and 2013 obligations to register and create contracts have been extended. From January 1st, 2014 it will be mandatory for all DGs of the European Parliament to use this tool for the creation of all contracts. WebContracts is also intended to serve as a tool for contract related issues, such as the ex-ante publication of low value contracts under article 124 Rules of Application.

Processing of commitments and payment orders is done through a separate tool (FINORD) whilst the invoices circuit is managed through the FINICS system at the level of the Accounting Officer.

In 2011 Parliament took the decision to replace the current general tools by an SAP based new system (as from March 2013, named "Financial Management System - FMS"), which is now being developed. In a first stage of the new system being operational (2014-2015) WebContracts will be made compatible but will continue to exist as a separate interface for contract management.

The table below presents an in-depth analysis of this tool with respect to collection of administrative data on procurement at the EU level.

Table 19: WebContracts		
Objective		WebContracts is the central database for contracts and contractors of the European Parliament.
How does it work?		Its main function is to record existing contracts, and to create new contracts. It has also reporting and search functions and is a tool for DG FINS in the preparation of the analysis of the AAR and the reporting on contracts awarded.
What is the quality of this data?		Central supervision exists at the level of DG FINS (Central Financial Unit) and access for the purpose of registration and processing is given to authorized staff in each DG There are different levels of access for different officials commensurate with their tasks.
Interoperability of the system or database		Processing of commitments and payment orders is still done through a different tool (FINORD) whilst the invoices circuit is managed through the FINICS system at the level of the Accounting Officer. In 2011 Parliament took the decision to replace the current general tools by a new SAP based system (as from March 2013, named "Financial management System - FMS"). It is now being developed. In a first stage of the new system being operational (2014-15) WebContracts will be made compatible but will continue to exist as a separate interface for contract management.
Added value of WebContracts in the fight against corruption in public procurement		
Prevention of corruption	+	The system provides transparency, central storage and accessibility to the contracts, which supports corruption prevention.
Detection of corruption	+	The database has a number of reporting functions, which can be used for corruption detection.
Investigation of corruption	+	The data stored in the tool can support corruption investigations.
Analysis of (costs) of corruption	+	The financial data registered in the system can help to calculate the costs of corruption.

GEDA - Gestion des Documents Electroniques Administratifs

GEDA is the document management system of the European Parliament. The table below presents an in-depth analysis of this tool is presented in regard to collection of administrative data on procurement at the EU level.

Table 20: Gestion des Documents Electroniques Administratifs		
Objective	GEDA is a central document management system.	
How does it work?	Electronic documents in different formats (including the tender documents) can be uploaded and attributed to a selected number of people.	
What is the quality of this data?	The data is entered by parliamentary officials. The EU official to whom the document is attributed, receives an e-mail with a message and a link to the document. The checks, updates and workflow on approvals can be tracked and applied with this feature.	
Interoperability of the system or database	It is not linked to external databases.	
Added value of GEDA in the fight against corruption in public procurement		
Prevention of corruption	+	The system is not designed for corruption prevention but the workflow management for approvals facilitates checks and controls on tender documents.
Detection of corruption	-	The tool is not structured for corruption detection measures.
Investigation of corruption	+/-	For corruption investigations the relevant documents can be retrieved from the system to be analysed manually.
Analysis of (costs) of corruption	+	The documents saved in the system also contain financial information, which can be used for calculating the costs of corruption.

Analysis on the Central IT tools for the Commission and the Parliament

The data collected on the current central IT tools at the European Commission and the Parliament provide an overview on the strengths and shortcomings of the systems concerning the potential use of these tools to detect and prevent corruption in public procurement. As shown in the tables above, the tools have a number of functionalities in terms of data collection on EU public procurement. They also provide an overview on the procurement process and increase the transparency. However, the systems are neither developed, nor structured to serve the needs of anti-corruption measures. Central collection of data with all DGs having access to the tools is already an important advantage in order to create a basis for the use of innovative technologies for prevention and detection of corruption. Central systems require standardisation of data storage, which enables the possibility of computerised corruption detection and prevention, such as data mining. However, the current structure, type and content of data is established for the main purpose of the individual tool, which limits the multi-functionality of these systems.

The table below provides an overview on the current or potential performance of these tools to fight corruption in public procurement. The systems have different scores in different phases of anti-corruption measures. Even if the IT tools do not receive a positive score for all stages, a clear potential can be observed to make better use of these systems to prevent, detect, investigate and analyse corruption.

Table 21: Overview on the analysis of the central IT tools concerning the fight against corruption

ANTI-CORRUPTION MEASURE	*ABAC Contracts*	*CDS*	*HERMES*	*IMS*	*e-PRIOR*	*Web Contracts*	*GEDA*
Prevention of corruption	+	+	-	+	+	+	+
Detection of corruption	+	-	-	+	+/-	+	-
Investigation of corruption	+	-	+	+	+	+	+/-
Analysis of (costs) of corruption	+	-	+	+	+	+	+

A closer look at each IT tool elaborated above provides an overview on the following advantages and disadvantages:

One of the central tools of the European Commission is the ABAC Contracts. An advantage of this tool is that it allows different reporting options by contractor name, DG, contract date or value. The tool has some disadvantages, such as limited access to the database and insufficient interfaces with other ABAC modules. For instance, different contract management or budget execution tools are not linked to ABAC. It is also difficult to extract the information and to analyse the data.

The Early Warning System (EWS), a module of ABAC, can be used for anti-corruption information as it identifies bodies and individuals that present financial and other risks to the EU. The data stored in this system can also be used for corruption prevention measures at a more advanced level, such as data mining and looking for links and patterns related to the information stored about the companies.

This tool responds to the EU needs as it covers grants and contracts managed directly by both the Commission and non-EU countries. Data in this tool is transparent; it informs other EU officials on identified risks by way of a flagging system.

The Central Database for Studies is a tool in which data is stored centrally. The disadvantage of this tool is that the data is not fully complete as studies procured by Member States with EU funding are not included in the database. The objective of this data storage is quite specific, intending only to avoid double financing of European Commission supported studies.

e-PRIOR has a lot of potential to manage, monitor and provide data storage and reporting for the full procurement cycle. Therefore it is very important to take the anti-corruption elements into account in developing new modules in subsequent phases.

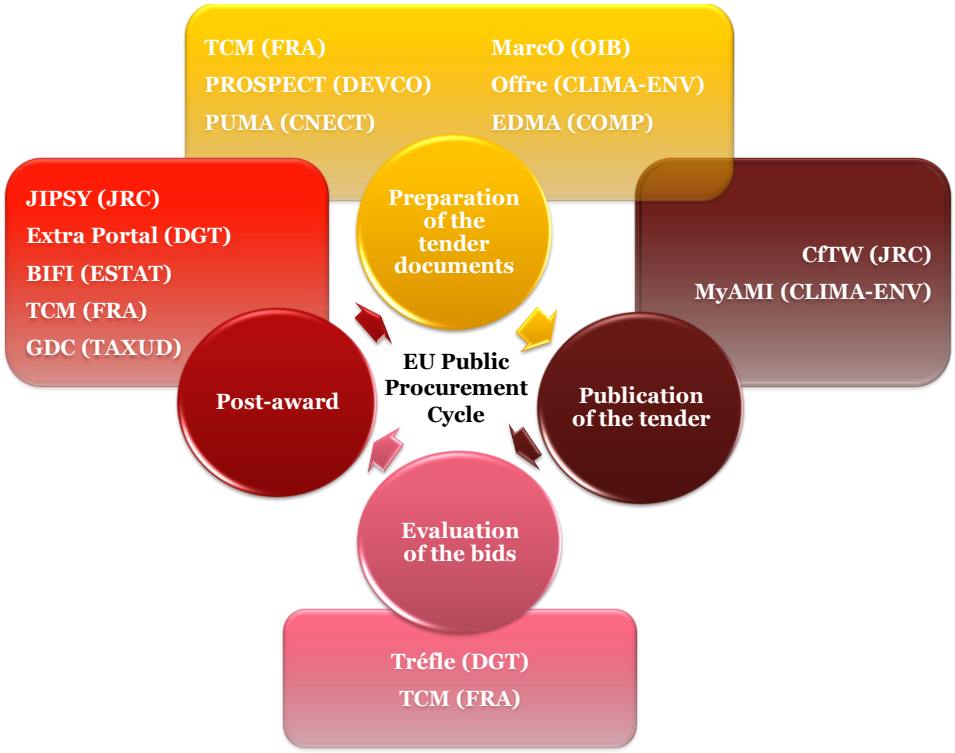
WebContracts is an important initiative by the European Parliament, which aims to have a more advanced central system with data collection and reporting functionalities concerning the post-award procurement phases. Even though the system is not designed with anti-corruption measures in mind, it has potential to provide input and support for prevention, detection, investigation and analysis of corruption in public procurement.

4.4. Identified Local IT tools and databases for Data Collection on Public Procurement

This part of the chapter provides an overview of IT tools used in different DGs of the European Commission and the EU agencies. These tools are locally developed and implemented based on the procurement processes and the needs of the DG or agency concerned.

4.4.1.1. Local tools to manage and execute procurement processes

Figure 6: Local tools per phase of the procurement process[67]



TCM - Tender Contract Manager (FRA)

TCM is an application developed internally by the Fundamental Rights Agency (FRA) for procurement teams to allow creation and management of tender dossiers and contracts, link tendering and contracting activities with AWP and AAA, offer monitoring and reporting capabilities for tenders and contracts. TCM offers centralised entry of information using predefined forms. TCM also has workflow functions for approval and authorisation. It contains automatic creation of opening and evaluation phase artefacts including opening and evaluation appointing notes, evaluation results calculation, declarations, reports and routing slips. TCM can create contracting phase artefacts as well. This includes contract type (single or framework contract, negotiated, open, services or supplies), specific contracts, order forms and contract amendments and purchase orders (for low value contracts). Management of reference data can be stored in the system, including information about authorising officers, contractor data, contact points and bank accounts.

Monitoring of tenders and contracts is another function of the tool. The list of tenders filtered by phase, department, work packages, name of person in charge, contractors, execution reports on duration, and consumption can all be found in the system. The automatic notifications when reaching a threshold can also be set up. It also includes a list of all tenders and successful contractors. The table below presents an in-depth analysis of this tool is presented in regard to collection of administrative data on procurement at the EU level.

[67]Internal figure created by PwC Belgium.

Table 22: Tender Contract Manager		
Objective	TCM is a tool for management of tendering and contracting phases. It covers preparation, publication, opening, evaluation, award, implementation, contracting, closure and archival of the procurement documents.	
How does it work?	TCM assists EU officials with the creation of tender dossiers including the invitation to tender, tender specifications, and the standard submission form.	
What is the quality of this data?	As indicated in the interview with the Agency's IT unit, TCM is a full-fledged procurement system that answers to a vast set of needs of the FRA procurement officers. It is an integrated tool being used in across the different procurement phases, therefore the data is regularly entered, updated and checked.	
Interoperability of the system or database	TCM is integrated with the Document Management System of the Agency, which allows storage of all contracting documents. DMS also links tenders, contracts (FWC, Direct, specific, order forms) and financial commitments (ABAC integration). Through the ABAC Workflow integration, TCM allows the follow up of contracts' consumption.	
Added value of TCM in the fight against corruption in public procurement		
Prevention of corruption	+	As it is a full-fledged procurement system that stores data on pre- and post-contracting phases of the tenders, the information provided by the tool could be used for corruption preventive measures.
Detection of corruption	+	The data stored in the system can help to detect corruption.
Investigation of corruption	+	The information provided by the system can support corruption investigations.
Analysis of (costs) of corruption	+	The procurement data collected in the system contains also financial information, evaluation results and budget execution. This information can help to calculate the costs of corruption.

PROSPECT (DG DEVCO)

Prospect is an online application submission system for the Directorate General for Development and Cooperation for call for Proposals (CfP). The table below presents an in-depth analysis of this tool with respect to the collection of administrative data on procurement at the EU level.

Table 23: PROSPECT		
Objective	Prospect aims to integrate and fully automate the business process, including sub-processes such as call preparation, call publication, management, submission and assessment.	
How does it work?	With regard to evaluation, automatic administrative checks will be performed and the online assessment of proposals by all assessors involved in the evaluation will be made possible	
What is the quality of this data?	The system is still in the development phase and is intended for use for grants and tenders.	
Interoperability of the system or database	It will be linked to ABAC so that the data needed for contract management and payments can be easily imported.	
Added value of PROSPECT in the fight against corruption in public procurement		
Prevention of corruption	+	Automatic administrative checks and online assessment of proposals by all assessors involved in the evaluation will help in preventing corruption.
Detection of corruption	+	Analyses of the data stored in the system may be performed to contribute to the detection of corruption.
Investigation of corruption	+	Data stored in the database will provide information for the investigation of corruption.
Analysis of (costs) of corruption	+	The system will also contain financial data on tenders and contracts, which will help to calculate the costs of corruption.

CfTW – Calls for Tender Website (JRC)

CfTW is a system of the Joint Research Centre (JRC) for publication of the call for tenders' specifications. Due to rationalisation and the e-procurement initiative of DIGIT, it has been suggested that the tool be replaced by an e-Tendering tool called "e-Access". However, the Joint Research Center (JRC) appreciates the user friendliness of the current site which does not want to lose this feature.

The table below presents an in-depth analysis of this tool in regard to the collection of administrative data on procurement at the EU level.

Table 24: Calls for Tender Website		
Objective	CfTW is a tool for publishing the specifications for the call for tenders.	
How does it work?	JRC published the tenders via this tool and the site.	
What is the quality of this data?	The data is entered directly by EU officials but it is only a tool for procurement announcements. As such, neither updates nor checks are done after the information is published.	
Interoperability of the system or database	CfTW is not linked to other systems.	
Added value of CfTW in the fight against corruption in public procurement		
Prevention of corruption	+	The tool provides transparency and helps to ensure equality for potential bidders as the tender is published through the system.
Detection of corruption	-	The tool does not contain any data or functionality for the detection of corruption.
Investigation of corruption	+/-	During an investigation phase the tool can provide details from the time of tender publication.
Analysis of (costs) of corruption	+/-	The only financial data that the system can provide is the budget foreseen by the JRC when the tender is published.

JIPSY – JRC Integrated Processing System (JRC)

Jipsy is a system for managing the tender processes and documents of the Joint Research Centre (JRC). DIGIT recommends that it be replaced and partially migrated to the e-procurement system currently being developed by DIGIT. The table below presents an in-depth analysis of this tool in regard to the collection of administrative data on procurement at the EU level.

Table 25: JIPSY		
Objective	Jipsy is a system for managing competitive dialogue, low value markets, orders, goods receipts and invoices of the Joint Research Centre (JRC).	
How does it work?	It is a tool storing information and documents on the tender and contracting processes in pre-award and post-award phases.	
What is the quality of this data?	The data and documents stored in the system cover the full procurement cycle. In order to ensure the accuracy of the payments regular checks on the registered data need be conducted.	
Interoperability of the system or database	The system is not linked to external databases.	
Added value of JIPSY in the fight against corruption in public procurement		
Prevention of corruption	+	The system, which covers the full procurement cycle, provides transparency and the ability to track the procurement processes. This can be seen to add preventive value in the fight against corruption.
Detection of corruption	+/-	The information stored in the system can be used for detection of corruption; however, the data must be structured accordingly to make filtering, matching and other scans possible.
Investigation of corruption	+	The documents collected in the system can provide useful information for corruption investigations.
Analysis of (costs) of corruption	+	The financial information in the documents stored in the system can provide input for calculating the costs of corruption.

MarCo - Marchés et Contrats (OIB)

MarCo is an IT tool to manage the procurement programming. The system is developed and managed by the Office for Infrastructure and Logistics, Brussels (OIB). The table below presents an in-depth analysis of this tool in regard to the collection of administrative data on procurement at the EU level.

Table 26: MarCo		
Objective	MarCo is used for planning of procedures, monitoring of actions and management reporting.	
How does it work?	The type of data that can be stored includes procurement types, bidder lists, contractor lists, timeframes, deliverables, budget estimations, contact persons in the operational units, and dates of major steps in the tenders. No documents can be uploaded into the system.	
What is the quality of this data?	Every manager of the tender procedures encodes the steps of each procedure he/she manages and the system enables the follow-up of each procedure and reporting.	
Interoperability of the system or database	MarCo is an OIB system and is not linked to other IT tools.	
Added value of MarCo in the fight against corruption in public procurement		
Prevention of corruption	+	The system provides transparency and availability to track the procurement processes. This can be considered as a preventive measure against corruption.
Detection of corruption	+/-	Data registered in the system can be used for corruption detection, but the way the data is structured should give access and availability to certain types of scans, matching and filtering activities.
Investigation of corruption	+	The information stored in the system can be useful for the corruption investigation.
Analysis of (costs) of corruption	+	The collected data on procurement also contains financial information, which can be used to calculate the costs of corruption.

Trèfle – Traduction FreeLance (DGT)

Trèfle is an IT tool used to manage free-lance translations. It has been developed in-house by DG Translation (DGT). Different types of data are stored in the system, including the procurement types, procurement procedures and the lot the contractor has won. The system can also store contracts (framework contracts and orders issued), the proposal documents, agreed unit prices, initial quality ratings and updated quality ratings (dynamic ranking system). It has the functionality to list the contractors and register the timeframe, and how long the contracts are valid. The officials of DG Translation can also upload deliverables temporarily in the system. Jobs can be proposed via the portal and the deliverables can be uploaded by the supplier via the portal once translation complete. Evaluation of the work done is also uploaded in the system, together with an updated quality rating, once a month.

The tool also assists EU officials to manage the budget execution and monitor payments and other data related to signed contracts. It can register data from amendments, annual price indexations, contract activation, suspension and termination. DGT officials can also issue the purchase order via the Trèfle system. Trèfle does not include any procedural documents like the tender specifications. It is linked to ABAC.

Trèfle is currently being migrated to e-Trèfle. The new e-Trèfle system is meant to be available by end 2014. In the exercise of developing the architecture for the new e-Trèfle, DGT works in close cooperation with DIGIT in order to base the new system on existing IT systems, such as e-Prior and Customer Portal. DGT intends to build e-Trèfle to reflect specific DGT core business functionality. Various documents that can be uploaded in Trèfle, including:

- Contract, the order form is produced by the system;
- Jobs to be performed (proposed jobs to translate);
- Jobs performed (result of the translation);
- Invoices;
- Payments;
- Administrative documents submitted by the contractor;
- Certificate of intellectual property rights; and
- Evaluation of the work done.

Tréfle and eTréfle can also manage public procurement procedures, generate public procurement documents automatically and use e-procurement. The table below presents an in-depth analysis of this tool in regard to the collection of administrative data on procurement at the EU level.

Table 27: Tréfle		
Objective	Trèfle is an IT tool used to manage free-lance translations	
How does it work?	The system stores electronic data on procurement type, procurement procedures and the lot the contractor has won, budget execution, payments and signed contracts.	
What is the quality of this data?	Our research revealed no information on data quality.	
Interoperability of the system or database	Trèfle is linked to ABAC.	
Added value of Tréfle in the fight against corruption in public procurement		
Prevention of corruption	+	The type of data stored in the system and functionalities such as initial quality rating and updated quality rating (dynamic ranking system) can help for prevention of corruption.
Detection of corruption	+/-	The electronic data stored in the tool can be used for the detection of corruption, but the data needs to be structured accordingly for the necessary searches, scans, matching and filtering applications.
Investigation of corruption	+	The data stored in the system can be used for corruption investigations.
Analysis of (costs) of corruption	+	The financial information concerning the contracts can be used in calculating the costs of corruption.

Extra Portal (DGT)

Extra Portal is another IT tool developed by DG Translation. It enables the EC officials to propose jobs to the free-lance contractors on the portal. The table below presents an in-depth analysis of this tool in regard to the collection of administrative data on procurement at the EU level.

Table 28: Extra Portal		
Objective	Extra Portal announces the translation jobs to the free-lance contractors on the portal.	
How does it work?	The contractor can consult, accept and download the proposed jobs via the system. The portal can automatically select the best price quality supplier available for every job proposed under a specific contract or negotiated procedure. At the delivery level, the contractor can upload the work completed.	
What is the quality of this data?	There is detailed data on the contractor, the scope of the work and the delivered result. As the communication and the exchange of information between the EC and the contractor are done via the portal, the data is regularly updated and checked by both sides.	
Interoperability of the system or database	The system is not linked to external databases.	
Added value of Extra Portal in the fight against corruption in public procurement		
Prevention of corruption	+	It increases transparency on the procurement process and helps to ensure equal treatment of the bidders. This characteristic stands to contribute to the prevention of corruption.
Detection of corruption	+/-	The electronic data stored in the system can be used for the detection of corruption, but the data must be structured accordingly for the necessary searches, scans, matching and filtering applications.
Investigation of corruption	+	The data stored in the system can be used for corruption investigations.
Analysis of (costs) of corruption	+	The financial information concerning the contracts can be used for calculating the costs of corruption.

BIFI (ESTAT)

BIFI has been mainly built in order to provide programme execution reports for Eurostat (ESTAT). Here below an in-depth analysis of this tool is presented in regard to the collection of administrative data on procurement at the EU level.

Table 29: BIFI		
Objective	BIFI is in place to provide programme execution reports.	
How does it work?	The system produces reports based on the programme execution data entered by the Commission officials.	
What is the quality of this data?	ESTAT would like discontinue use because the tool does no longer meets ESTAT needs and requires the use of parallel tools and excel sheets to manage the activities.	
Interoperability of the system or database	The system is not linked to other tools or databases.	
Added value of BIFI in the fight against corruption in public procurement		
Prevention of corruption	-	The system has notbeen designed with a view to serve any corruption prevention purposes.
Detection of corruption	+/-	The programme execution reports might contain data to be used for detection of corruption. However, the way the data is structured plays an important role in order to run corruption detection applications.
Investigation of corruption	+	The data stored in the tool can provide useful information for the corruption investigators.
Analysis of (costs) of corruption	+	The financial data stored in the system can provide useful information for the calculating the costs of corruption.

MyAMI – Appels a Manifestation d'Interet (CLIMA-ENV)

MyAMI is a portal of DG Environment (DG ENV) and DG Climate Action (DG CLIMA), through which economic operators can apply for the expression of interest published by DG CLIMA-ENV every 3 years. Qualification data is then available to CLIMA-ENV in a structured format. The system is very easy to use and performs its duties in an efficient manner, however it is limited to the expression of interest procedure and for the moment does not allow for managing qualifications for several procedures.

The table below presents an in-depth analysis of this tool in regard to collection of administrative data on procurement at the EU level.

Table 30: MyAMI		
Objective	MyAMI facilitates communication with potential bidders	
How does it work?	Economic operators can apply for the expression of interest published by DG CLIMA-ENV every 3 years.	
What is the quality of this data?	The data is updated every 3 years.	
Interoperability of the system or database	MyAMI is not linked to other systems.	
Added value of MyAMI in the fight against corruption in public procurement		
Prevention of corruption	+/-	The system provides transparency and improved communication with the potential bidders. This can be considered as an initiative towards corruption prevention even though it is not an explicit objective of the tool.
Detection of corruption	-	The tool is only used for the pre-tendering phase of the procurement cycle and , therefore, does not contribute to corruption detection.
Investigation of corruption	-	The data stored in the system is not useful for corruption investigations.
Analysis of (costs) of corruption	-	There is no financial information registered in the system. Therefore it cannot provide any input calculating costs of corruption.

Offre (CLIMA-ENV)

Offre is a tool of DG Environment (DG ENV) and DG Climate Action (DG CLIMA) for the creation and management of calls for tender. The table below presents an in-depth analysis of this tool in regard to collection of administrative data on procurement at the EU level.

Table 31: Offre		
Objective	Creation and management of calls for tender	
How does it work?	It creates the required documents that the candidates should receive and is also a database of tenderers' contact details. For restricted calls, it is used for the selection of potential contractors from the MyAMI list.	
What is the quality of this data?	Our research didn't reveal any information on the data quality in this tool.	
Interoperability of the system or database	It's not linked to any external database.	
Added value of Offre in the fight against corruption in public procurement		
Prevention of corruption	+	It provides a structured and transparent way for the preparation of tender documents. This can be seen to contribute to corruption prevention.
Detection of corruption	+/-	The data stored in the system can be used for corruption detection but it has to be structured accordingly so as to ensure useful results from the scanning, matching and filtering applications.
Investigation of corruption	+	Information such as tenderers' contact details stored in the database can be used in corruption investigations.
Analysis of (costs) of corruption	+	The tender documents produced by the tool also contain information on the project budgets, which can be used for calculating the costs of corruption.

PUMA – Procurement Unified Management Application (CNECT)

PUMA is an IT tool of DG Communications Networks, Content and Technology (DG CNECT) for document repository. As indicated during the interview conducted at the Commission, DG RTD is considering use of this tool for procurement procedures as well. The table below presents an in-depth analysis of this tool in regard to collection of administrative data on procurement at the EU level.

Table 32: PUMA		
Objective	PUMA is used as a repository for procurement procedures, document generation, and staff assignments.	
How does it work?	The system provides document generation for tenders and their management, and generates certain additional documents.	
What is the quality of this data?	Our research has not revealed any information on data quality.	
Interoperability of the system or database	It is not linked to any external databases.	
Added value of PUMA in the fight against corruption in public procurement		
Prevention of corruption	+	Automated and standardised generation of tender documents improves the transparency and helps to ensure equal treatment of the potential bidders. This can be seen as a preventive measure against corruption.
Detection of corruption	+/-	The data registered in the system can be used for corruption detection but the structure of the collected data has to be suitable for relevant searches, filtering and matching applications.
Investigation of corruption	+	The information on the tender documents generated and stored via this system can provide useful information for corruption investigations.
Analysis of (costs) of corruption	+	The financial information on the tender documents generated and stored via this system can provide useful information for calculating costs of corruption.

EDMA (COMP)

EDMA is a DG specific database used at DG Competition (DG COMP). The table below presents an in-depth analysis of this tool in regard to collection of administrative data on procurement at the EU level.

Table 33: EDMA		
Objective		It stores procurement documents electronically.
How does it work?		It is a document repository system.
What is the quality of this data?		Our research did not reveal any information on data quality.
Interoperability of the system or database		The system is not linked to any external databases.
Added value of EDMA in the fight against corruption in public procurement		
Prevention of corruption	-	The system is not designed with a view toward corruption preventive measures.
Detection of corruption	+	The information on the documents stored in the system can be useful for the detection of corruption. The documents can be searched and listed in the system but the relevant information on the documents must be searched and analysed manually.
Investigation of corruption	+	Information on documents stored in the system can be useful for corruption investigations. The documents can be searched and listed in the system but the relevant information on the documents needs to be searched and analysed manually.
Analysis of (costs) of corruption	+	Financial information on the documents stored in the system can be useful for calculating the costs of corruption. The documents can be searched and listed in the system but the relevant information on the documents must be searched and analysed manually.

GDC - Gestion des Contrats (TAXUD)

GDC is an Access and Oracle database developed by DG Taxation and Customs Union (DG TAXUD). It is a complementary tool to ABAC-WORKFLOW, and ABAC-CONTRACTS. ABAC-SAM was expected to replace this tool but its functionalities did not meet the needs of DG TAXUD to move forward.

The table below presents an in-depth analysis of this tool in regard to collection of administrative data on procurement at the EU level.

Table 34: Gestion des Contracts		
Objective		GDC is a contract management tool to follow up and manage the financial life of the contract invoices, payments, and budget execution.
How does it work?		With GDC, the unit can extract reports to see how much of a framework contract was used. Budgetary reports are presented to the Board of DG TAXUD (composed of the Director-General and the five directors of the Directorate-General) monthly.
What is the quality of this data?		The data is entered by the Financial Unit of the DG and is used for regular reporting. Therefore, regular updates and checks are done to ensure the data quality.
Interoperability of the system or database		GDC is not linked to ABAC. Thus, data must be entered separately into each system.
Added value of GDC in the fight against corruption in public procurement		
Prevention of corruption	-	The data entered into this tool and the reporting of the system focus on budget execution. Therefore, GDC cannot provide data for prevention of corruption.
Detection of corruption	+	The data stored on budget execution can be used for detection of corruption in case of suspicion concerning a specific contract.
Investigation of corruption	+	The tool can provide information for corruption investigation processes.
Analysis of (costs) of corruption	+	As the data stored contains financial information, the tool can help to calculate the costs of corruption.

Analysis on the local tools to manage and execute procurement processes

Our analysis based on the data collected regarding the local IT tools show that there is a possibility for the potential use of these tools for detection and prevention of corruption in public procurement. Even thought the systems are not structured in an efficient way to respond to the needs of specific anti-corruption measures, the tools provide a number of advantages in terms of electronic data collection on EU public procurement. The major disadvantage is the lack of interconnection among the systems used by different DGs for the same procurement phase. Standardisation of data storage and links between the local databases would increase the possibility of computerised prevention and detection of corruption. Interoperability between the local and the central tools would also increase the efficiency and the potential multi-functionality of the systems and the stored data. In the current situation the collected data is isolated from the rest of the central and local systems within the same institution. The structure, type and content of data are identified for the main purpose of the individual tools, which makes it very difficult to use the collected data for additional purposes such as corruption detection and prevention.

The table below provides an overview on the current or potential performance of these tools in the fight against corruption in public procurement. As shown below, the systems have different scores in different phases of anti-corruption measures. Even if the IT tools do not receive a positive score for all stages, there is a potential for better use of these systems to prevent, detect, investigate and analyse corruption.

Table 35: Overview on the analysis of the local IT tools concerning the fight against corruption

ANTI-CORRUPTION MEASURE	**TCM**	**PROSPECT**	**CfTW**	**JIPSY**	**MarCo**	**Tréfle**	**Extra Portal**	**BIFI**	**MyAMI**	**Offre**	**PUMA**	**EDMA**	**GDC**
Prevention of corruption	+	+	+	+	+	+	+	-	+/-	+	+	-	-
Detection of corruption	+	+	-	+/-	+/-	+/-	+/-	+/-	-	+/-	+/-	+	+
Investigation of corruption	+	+	+/-	+	+	+	+	+	-	+	+	+	+
Analysis of (costs) of corruption	+	+	+/-	+	+	+	+	+	-	+	+	+	+

4.5. Recommendations on data collection and storage at the EU level

In order to make a good assessment on the current IT tools and systems used at EU level, some criteria to perform the analysis had to be selected. The table below provides an overview of the data collection methods and systems in each phase of the procurement cycle, the diversity of functions that the procurement tools offer and the type of data collected during the procurement processes.

There is no central tool answering to all needs of all EU institutions (see below). This leads to a certain divergence in terms of the type of information collected, the structure used to store the administrative data and documents, and the level of use of the gathered information in the different procurement systems.

Table 36: Analysis of the central IT tools and systems used at EU level collecting procurement data

IT Tool	Procurement phase				Functions										Data collected								
	Preparation of the tender	Publication of the tender	Evaluation of the bids	Post-award	Preparation of tender documents	Data storage	Reporting	Filtering and listing	S.M.A.R.T	Workflow management	Processes management	Management of budget execution	Procurement portal	eProcurement	Document repository	Procurement type	Procurement processes	List of bidders	Evaluation reports	Project information	Contractor information	Budget information	Information on bidders	Tender documents
Central tools																								
CED			✓																					
SIMAP		✓				✓		✓					✓	✓	✓	✓				✓		✓		✓
European Commission																								
ABAC				✓		✓	✓	✓				✓				✓					✓	✓		
EWS			✓			✓		✓													✓			
CDS	✓					✓	✓	✓													✓	✓		
HERMES	✓		✓	✓		✓									✓									✓
ARES	✓			✓	✓	✓		✓		✓	✓				✓	✓				✓	✓	✓		✓
NOMCOM	✓			✓	✓	✓		✓		✓	✓				✓	✓				✓	✓	✓		✓
IMS				✓		✓	✓					✓								✓	✓	✓		
ePRIOR	✓	✓		✓		✓				✓	✓		✓	✓	✓	✓	✓			✓	✓	✓		✓
European Parliament																								
WebContracts				✓		✓	✓	✓				✓			✓	✓				✓	✓	✓		
GEDA	✓	✓		✓	✓	✓				✓					✓	✓	✓				✓	✓		✓

Table 37: Analysis of the local IT tools and systems used at EU level collecting procurement data

IT Tool	Procurement phase				Functions											Data collected								
	Preparation of the tender	Publication of the tender	Evaluation of the bids	Post-award	Preparation of tender documents	Data storage	Reporitng	Filtering and listing	S.M.A.R.T[68]	Workflow management	Processes management	Management of budget execution	Procurement portal	eProcurement	Document repository	Procurement type	Procurement processes	List of bidders	Evaluation reports	Project information	Contractor information	Budget information	Information on bidders	Tender documents
Local tools																								
TCM	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	✓
Prospect	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓			✓	✓	✓		✓
CfTW		✓												✓		✓				✓		✓		
Jipsy	✓	✓		✓	✓	✓							✓			✓				✓	✓	✓		
MarcO	✓				✓	✓				✓	✓					✓	✓			✓	✓	✓		
Trèfle	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extra Portal	✓	✓	✓	✓	✓	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BIFI				✓			✓			✓		✓				✓				✓	✓			
MyAMI	✓	✓				✓							✓			✓	✓	✓				✓	✓	
Offre	✓	✓			✓	✓							✓			✓	✓	✓					✓	✓
PUMA	✓				✓					✓	✓					✓	✓			✓		✓		✓
EDMA	✓			✓	✓	✓									✓	✓	✓		✓	✓	✓	✓		✓
GDC				✓								✓									✓	✓		

[68] In computer language, S.M.A.R.T. means Self-Monitoring, Analysis, and Reporting Technology.

In addition to this analysis the input from the interviews conducted among EU officials and the results of the survey among IT and finance officers in EU institutions show that procurement data at EU level are mainly stored:

- As hardcopy;
- Electronically;
- In shared directory with limited access;
- In ARES.

As mentioned earlier, this chapter also focuses on IT tools and methods for procurement data collection and storage. These tools enable the authorities to develop systems to facilitate the prevention and detection of corruption in public procurement. In order to implement this kind of advanced level of anti-corruption measures the type of data electronically saved is of high importance.

The type of data mostly collected at EU level and stored electronically is rated in the figure below. The most stored type of electronic data is indicated with the largest number of "✓".

Table 38: type of data collected at the EU level and stored electronically

Type of procurement data stored in the European Commission	*Most stored electronic data among DGs*			
Date of the launch of the procurement	✓	✓	✓	
Deadline for proposal submission	✓	✓	✓	✓
Date of the tender opening session	✓	✓	✓	✓
Date of the evaluation report	✓	✓		
Date of the evaluation submission	✓	✓		
Date of the contract awarding	✓	✓	✓	
Contract value	✓	✓	✓	
Names and contact details of the bidders	✓	✓	✓	
Scope of work/ description of the project	✓	✓	✓	
Technical criteria	✓	✓	✓	
Exclusion criteria	✓	✓	✓	
Selection criteria	✓	✓	✓	
Evaluation criteria	✓	✓	✓	
Proposals	✓			
Evaluation results	✓	✓		
Contract	✓	✓	✓	
Name of the contractor	✓	✓	✓	✓
Budget execution	✓	✓	✓	
Work orders	✓	✓		
Deliverables	✓	✓		
Approval of the deliverables	✓	✓		
Payments	✓	✓		

As illustrated in the table above, a vast diversity of data on public procurement is collected and stored electronically by the EU institutions. The result of the research shows that fundamental information concerning EU procurement procedures such as deadlines for proposal submissions, dates of the tender opening session and contractor names are the most commonly collected data types. The outcome of the study helps to easily distinguish the most and the least frequent electronically stored data.

Information on the procurement process is not stored electronically at every level of detail. Proposals are a good example for this practice being stored as hard copy only.

As indicated above there is a large number of IT tools and systems to generate, structure, process and store data and documentation on public procurement used within the EU institutions.

The study shows that the main objective of the units using an IT tool for procurement is to follow the management of the procedural steps and workflow rather than for data storage and processing. Procurement is a complex process within the EU institutions. Whereas the financial regulations set out the main rules, DGs and units have the liberty to develop processes that are most suitable to their own structure and working methods. The high number of units and individuals involved in the procurement cycle makes managing the process difficult. Therefore, an automated system for process management comes as one of the priorities when DGs decide to develop an IT tool for procurement.

The interview results indicate that the level of use of corporate systems related to public procurement differs immensely from DG to DG and even from unit to unit within the same DG. Whereas some DGs benefit from the functionalities of certain centralised tools to the greatest extent possible, others do not go beyond the minimum data requirements that must be entered to the system.

Different phases of the procurement cycle require different tools. The needs and the requirements of the units for the procurement process before the signature of the contract are divers. There is a streamline of processes and tools after the signature of the contract as all payments must be done through the central accounting system of the Commission ABAC. Processes like budget execution, payments, data storage on the contractors are managed via centralised tools.

Most of the systems are not linked to each other. Due to the diversity of needs and their limited budgets, different units even within the same directorate might have different tools which are not linked to centrally used systems, where the data from all units could be stored (e.g. different contract management or budget execution tools not linked to ABAC, which also offers an Early Warning System including fraud prevention).

The IT rationalisation initiative of DIGIT has put several individual IT initiatives of the DGs on hold. Local IT tools for different aspects of procurement of the DGs are some of these initiatives that got put on hold. DIGIT is aiming for a full-fledged IT system covering all phases of the e-procurement. Due to the development and implementation of this new system DIGIT recommends the replacement of some of the individually developed IT tools of the DGs.

Not only does the eProcurement project of DIGIT target procurement at the EU level, it also envisages a cross-border linked system operational in all Member States enabling data exchange among administrations and data storage.

These conclusions are key for understanding the current situation in the EU institutions, especially the European Commission. They also help to identify the possible modalities of improving or making better use of the current systems for collecting administrative data at the EU level (public procurement related) in order to better prevent and detect corruption.

4.5.1.1. DIGIT's proposed IT landscape: IT Rationalisation Initiative for EC Tools

Unit B41 of DIGIT in charge of "Systems for Policy Support, Grant Management, e-Procurement" initiated a recent report to be presented to the High Level Committee on the IT tools used in the Commission for procurement as part of the IT rationalisation initiative of DIGIT within the Commission. DIGIT is conducting investigations for systems and is also developing eProcurement tools for the procurement cycle of the European Commission at the same time. It will also set up a working group composed of owners and suppliers of the leading systems. This working group should analyse and plan the integration of the procurement tools in order to build a homogenous service-oriented suite to make available to the customer DGs. The DGs owning a system that is a candidate for replacement should limit the maintenance and perform a functional gap analysis with the leading systems in order to identify opportunities for a complete or partial replacement of the system.

4.5.1.2. Procurement and EU Grants

This part of the study sheds light on the connection between the EU grants and EU procurement. It also highlights opportunities to improve the EU procurement systems based on experience and technological capacity already in place for EU grants.

The desk research and interviews show that management of the EU grants is worth including in this study. Large budgets are allocated to beneficiaries and their contractors with a major impact on the financial interests of the EU. There is also a number of advanced IT systems developed for different levels of management of these projects. There are two aspects of EU grant management activities that provide valuable input for this study:

1. Public Procurement as a part of the EU grants;
2. IT systems used for grant allocation and management.

4.5.1.3. Public procurement as a part of the EU grants

Different EU policy programmes are linked to various funding schemes. Whereas in some EU grant programmes the beneficiaries are the direct users of the funds and the executers of the projects, in others beneficiaries (Member States or private companies) need to assign contractors to do the work. Fraud prevention or detection is very difficult for the Commission in these procurement processes because the procurement is not directly managed by the Commission. The Commission also has very limited information on the type and quality of data on these specific procurement procedures. A centralised system where all procurement data would be stored and processed would be ideal to enhance the prevention and detection of corruption. Chapter 7 of the study covers the ARACHNE initiative of DG EMPL and DG REGIO in order to develop a more centralised database for all projects under the Structural Funds with sophisticated risk analysis functions and links to external databases.

4.5.1.4. IT systems used for grant allocation and management

The interviews conducted for this study suggest that the DG RTD and DG CNECT have well integrated and extensively developed IT systems to store, process, structure and analyse data on grants and beneficiaries, as compared to all other Commission IT tools for procurement identified. Whereas e-submission, e-evaluation and e-management of the projects are possible for the grants, there big initiatives remain to be taken in order to reach the same level for procurement.

Differences between the grant management rules and the financial regulations for procurement procedures prevent the possibility for these systems to be used for procurement. The sophistication of the system for grant management is also proven with the centralised or linked data storage, on which fraud-preventive or detective analysis is possible based on data mining. Pluto and Daisy are the innovative tools developed by the European Commission, which are good examples for anti-corruption and anti-fraud initiatives for EU grants. They show how Self-Monitoring, Analysis, and Reporting Technology (S.M.A.R.T.) tools are applicable if the relevant data is electronically stored and processed.

4.6. Concluding remarks

Data collection at the EU level has many aspects and a significant impact on the development and implementation of S.M.A.R.T. anti-corruption tools. The divergence in needs and process management implementations of each procurement authority must be taken into consideration when developing such tools based on administrative data collection and analysis of this information. There are many different initiatives underway in this area at the EU and global level. The next chapter will further elaborate on these initiatives and make recommendations on corruption prevention and detection tools and techniques concerning the procurement of EU Funds.

5. Collection of procurement data with innovative tools and methodologies

This section provides an overview of S.M.A.R.T.[69] and innovative tools and methodologies which are able to structure, process and analyse available data on public procurement. As the definition of the word "innovative" suggests[70], IT systems that feature new methods and IT tools that are advanced and original in their development and implementation are presented in this chapter.

Firstly, the chapter focuses on structures and initiatives at the EU level, defining and explaining existing tools and their potential to improve for data processing and analysis for the detection and prevention of (fraud and) corruption. This section also provides an overview of innovative methods and tools in EU and non-EU countries such as India, South Africa, Russia and the USA.

5.1. Initiatives at EU level

5.1.1. PLUTO

DG CNECT provides EU grants to information technology research projects by co-funding the costs incurred. It manages 5,000 projects and its 15,000 beneficiaries invest more than EUR 1 billion per year. DG CNECT carries out 200 annual financial audits on these projects and the audit results contribute to the annual assurance process.[71]

PLUTO is an intelligence database storing all information about the 15 000 beneficiaries and 5 000 research projects funded by DG CNECT. PLUTO allows the relationships between the various entities contained in the systems (beneficiaries, projects, persons, telephones and addresses) to be analysed in a visual way. This analysis identifies risky areas in the contractual environment, facilitating auditing and investigative work. While auditors and investigators still need to demonstrate irregularities like fraud or corruption, PLUTO makes their task easier by locating the possible areas to look for these kinds of issues. It is based on the commercially available software iBase from i2 Inc.

PLUTO is currently used by the European Commission for EU grants. One of the highest risks of fraud with the allocation of EU grants is beneficiaries applying for the same grant under different legal entities. PLUTO helps the European Commission to identify the links among all applicants, projects and existing beneficiaries such as similarities in addresses, phone numbers, contact names, registration numbers and addresses of legal entities, the project teams or the names of the managers/directors in the legal entities. With these crosschecks PLUTO provides further evidence on the suspicious cases for the EC to start or continue investigations.

The core competence of PLUTO is its capability to look for links and similarities among the project data entered into the central system. Currently it is only used for EU grants but it could also be used for other procurement cases if all data could be centrally stored and structured so that the type of analysis and search that PLUTO conducts can be possible. The shortcoming of the system is the lack of automated checks among the data entered into the database. PLUTO can only be used if there is already a suspicion about a certain project, beneficiary or applicant. The data concerning this specific case is analysed and compared to other data in the system. PLUTO searches for links between the data of the suspicious case and any other data in the database and reports the results that have been identified.

[69] In computer language, S.M.A.R.T. means Self-Monitoring, Analysis, and Reporting Technology.

[70] Merriam Webster (2013), *Definition of Innovation* [WWW], Available from: http://www.merriam-webster.com/dictionary/innovation [Accessed 11/03/2013].

[71] Dezeure, F. Et al.(2010), *Alleged Fraud Involving Millions of Euros: Why Didn't We Notice?,* International Journal of Government Auditing.

5.1.2. *DAISY*

Daisy is a data mining tool developed by DG RTD currently used to identify links among the stored data of beneficiaries receiving EU funding under the research programmes. It is not an automated tool to run regular checks on beneficiaries or the projects. It is only operational when a unit has a suspicion about a beneficiary and would like to run a search in the database to see if there is any information that can confirm the suspicion. (e.g. different legal entities with the same address receiving different EU grants, double financing of the same project, etc.) Daisy is comparable to PLUTO so the strengths and shortcomings of the systems are quite similar.

5.1.3. *ARACHNE*

DG EMPL is developing the anti-fraud ARACHNE prevention tool for ESF and ERDF (with DG REGIO) funds spending data. The tool is based on the establishment of a public procurement database. The data is collected from Member States' funds execution data merged with public investigative databases (ORBIS, World compliance) and thus combines a mix of internal and external data in a single tool which is quite unique. The resulting public procurement database will also contain benchmarking anti-fraud ratios and links to the beneficiaries, companies and individuals for anti-fraud investigative analysis.

The ARACHNE database is accessible for viewing fraud indicators related to projects, beneficiaries and companies along with drill-down functionality. It can trace companies and individuals within the public investigative databases (ORBIS, World compliance). It can also set up cases on the chosen set of projects in order to trace their execution for anti-fraud purposes.

ARACHNE automatically calculates the anti-fraud related alerts based on both the Member States data and merged public investigative data. The calculated alerts (checks) fall into the following categories:

- Procurement;
- Contract management;
- Eligibility;
- Performance;
- Concentration;
- ESF projects – cost components;
- Reputational & Fraud alerts.

They are calculated at beneficiary, contractor, project, contract and operational programme level.

Roll-out of the tool was foreseen by November 2012. The end of the project, including training for all users, is estimated around the end of March 2013.[72]

The Managing Authorities have to extract data from their system into a predefined XML format and transfer it to the European Commission through the SFC2007 interface. The type of information includes data on projects, beneficiaries, contracts, contractors, expenditure line details and performance data.

[72] This is the date announced at the time of the research for this report.

Subsequently the data is transferred to the system where it is enriched with information from the data sources such as The Orbis database of Bureau van Dijk which covers 212 countries/regions with 110 million companies, more than 3 million groups, 100 million individuals and 35 million legal links. ARACHNE is also linked to the database of World Compliance encompassing global PEP lists, global sanctions lists, global enforcement lists and global adverse media lists. Press and media coverage in more than 100 countries and more than 75 languages are also included in the system.

After the data is enriched, more than 140 risk alerts are calculated with the objective to calculate an overall risk score for each project, beneficiary, contract and contractor. The risk alerts are organised in terms of procurement risks, contract management risks, eligibility risks, performance risks, concentration risks, other risks related to ESF projects as well as reputational and fraud alerts.

The results of the risk scoring are published on the server of the European Commission where they are accessible for the Managing Authorities through client-server application.

Advanced functionalities allow the users to make an interactive use of the ARACHNE dashboards through amongst others sorting the risk up to the level of individual alerts, organizing results through pivot tables and filter on a broad set of parameters e.g. individual alert values, project amounts, case status.

The strength of ARACHNE is its application of advanced forensics technologies for risk calculation of the EU procurement cases and analysis for suspicion of corruption or fraud. The links with external databases increases the data input and includes more information in the analysis together with the data received from outside sources.

The shortcoming of the system is the contribution and commitment from the Member States to provide data. The participation is on voluntary basis, therefore the Member States are free to decide if they would like to share their data or not. The demo version has been developed based on data from one single Member State and negotiations are on-going for 3 additional Member States to participate. The use and implementation of the tool EU-wide is a long-term and challenging goal.

Data structure and quality in Member States is another important issue for the success of the ARACHNE project and the accuracy of the results generated using the tool. IT and data management is centralised in some Member States and decentralised in some others. Some managing authorities can send the data to ARACHNE directly from their database and some have to collect it from other ministries. It is observed that small Member States have a better overview on their data and its quality compared to the bigger Member States.

If the data quality and a high participation rate of the Member States cannot be reached, ARACHNE will have major shortcomings as a centralised tool for the detection of corruption and fraud in EU public procurement. However, this analysis can only be made at later stages of the project.

5.2. IT systems for public procurement across Europe

One of the focal points of this section is the Europe wide initiatives aimed at improveing and encouraging the use of innovative IT tools for public procurement. There are a number of pilot projects funded by the EU Commission (hereafter “EC”)to initiate and increase the use of eProcurement and cross border procurement enabled via electronic data and documentation exchange. [73] The amount of funding and the high number of activities of the EC indicate that the EU sees eProcurement as the key solution for public procurement systems.

eProcurement plays an important role for the prevention and detection of corruption and fraud because it increases transparency, enables centralised and structured data storage and helps to detect and investigate corruption under certain conditions.

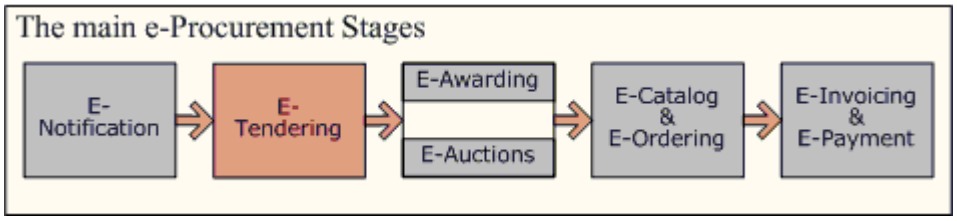
PwC has also identified IT systems for public procurement that prove to be good practices. These will be further elaborated in Chapter 12 on procurement best practices in the EU Member States.

Electronic Procurement is based on electronic methods in every stage of the purchasing process. Every stage from notification through to payment is covered and with the relevant set of the following modules, associated with the public procurement functionality support: e-notification, e-tendering, e-awarding, e-auctions, e-

[73]European Commission, ISA – Interoperability Solutions for European Public Administration (2013), *Official website* [WWW], Available from: http://ec.europa.eu/isa/ [Accessed 11/03/2013].

catalog & e-ordering and e-invoicing & e-payment. Not all systems in Member States cover all stages yet, but the EC is encouraging their development by funding programmes, workshops for collaboration and knowledge transfer among other initiatives.

Figure 7: The main e-Procurement stages



eProcurement can only be operational via an e-procurement platform. This platform offers a dynamic, real-time purchasing environment that allows procurement officers to exchange information with potential contractors for goods and services. Its objectives are to streamline and automate the purchasing process, distribute purchasing power to authorized users, standardise buying methods, control overall public spending and leverage corporate purchasing in order to negotiate better deals. The aim is to increase productivity and efficiency, decrease maverick buying, and lower transaction costs.[74]

The research on the Europe-wide IT tools and practices for public procurement show that the use of electronic communications and the automation of procurement procedures are also becoming more commonplace. Although the enabling technology is now widely available, the use of e-Procurement is quite low. The Commission Services estimate that, on average, less than 5% of procurement is conducted electronically today. According to Eurostat, the percentage of enterprises using the Internet for submitting a proposal in a public electronic tender system to public authorities has risen from 11% to 13% between 2009 and 2010.[75]

There are differences amongst Member States concerning the utilisation of e-procurement compared to traditional procurement processes. Lithuania, Cyprus and Portugal are leading the way with usage rates as high as 60-90%. Portugal has made e-procurement mandatory across all procurement procedures; however it has not reached the 100% target rate. Many of the bigger Member States, such as Italy and France, are lagging behind, despite their strong efforts in this area. [76]

The use of e-procurement is enabled through national legislation in place all Member States.[77]Furthermore, infrastructure is largely in place and it is possible to publish the tender on-line, make procurement documents publicly accessible and receive proposals in 24 Member States. In 2010 nearly 93% of forms for procurement notices sent to Tenders Electronic Daily (TED)[78] were received electronically. In short, the use of e-procurement has been enabled legally and technically, and the actual use, although low in ratio compared to the overall number of projects procured in Member States, is starting to increase.

The 2010 e-Government benchmark survey identified over 230 active e-procurement platforms and portals.[79] This survey identified an average of 3.500 registered contracting authorities. The average number of registered suppliers amounted to 11.000 from which 5% were non-domestic suppliers.[80]

eProcurement supported by the ISA Programme of DIGIT[81] is a big initiative of the European Commission in the area of public procurement across Europe. The policy is highly supported by innovative IT tools and aims at

[74]Clarity Consulting (2011), *e-PROCUREMENT: THE PLATFORM FOR CORPORATE PURCHASING: A PurchasePro Inc. White Paper* [WWW], Available from: http://www.clarity-consulting.com/e-procurement_the_platform_for_corporate_purchasing.htm [Accessed 11/03/2013].

[75]European Commission Internal Market and Services (2012*), EU Public Procurement Legislation: Delivering Results Summary of Evaluation Report*, Available from: http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/executive-summary_en.pdf [Accessed 11/03/2013].

[76]Ibid.

[77]Ibid.

[78]TED only contains a small part of all public tenders in the EU.

[79]European Commission Internal Market and Services (2012*), EU Public Procurement Legislation: Delivering Results Summary of Evaluation Report*, Available from: http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/executive-summary_en.pdf [Accessed 11/03/2013].

[80]Ibid.

improvement and standardisation of the systems and collection of procurement data, which would be a big step to set up mechanisms for the prevention and detection of corruption. Therefore challenges of the establishment and implementation of this eProcurement system are included in the analysis here as well.[82]

These challenges include:

- Multilingual issues in the electronic catalogues used for eCommerce[83] and eBusiness[84] in Europe;
- Standardisation of exchanging electronic data among potential bidders and procurement agencies as well as among administrations in Member States, which aims to define the guidelines for the implementation of electronic business;
- Creation of business processes, models and business class diagrammes for documenting business scenarios and business transactions for eGovernment;
- Development of harmonised procedures and agreements between trading parties and, as far as possible, tax authorities at European level to permit harmonised cross-border invoicing;
- Standardisation of electronic signatures and infrastructures;
- Removal of barriers as regards to the cross-border interoperability of electronic signatures based on qualified certificates;
- Supervision and accreditation systems of certification service providers issuing qualified signature certificates;
- Establishment of a "Trusted List of supervised/accredited certification service providers" and profiles of qualified certificates and the interoperability of Secure Signature Creation Devices (SSCDs);
- Provision of guidelines and guidance for cross-border and interoperable implementation of electronic signatures.

5.3. *Innovative tools for public procurement and detection and prevention of fraud and corruption outside of the EU*

In addition to initiatives at EU level and in Member States, this section also provides examples from non-EU countries concerning S.M.A.R.T. and innovative tools and methods to structure, process and analyse available data on public procurement and help the public and private sector, as well as individuals to fight corruption. The information further presented in this chapter is mainly based on desk research. Examples are taken from innovative IT tools and initiatives such as software, mobile applications and websites.

5.3.1. *Procurement software from South Africa - Tendersure*

Tendersure is a web based tendering tool designed to improve efficiency and is also used as a decision support tool. The tool is a highly traceable and auditable system, which helps to combat corruption. It is only possible for authorized parties to see bids. The tool reduces tender periods and therefore, the automation of the tendering process on current working practices will be improved.

Tendersure provides reactive and proactive follow-up. When decisions are made outside of normal parameters initially defined by the tender ranking criteria, warnings can be sent to related authorities as soon as the decision is published. If irregularities are identified before they happen, then investigations and prosecutions can be avoided. The tender information and the results of the evaluations are registered in Tendersure. The tool enables easy access to information for auditing purposes which allows subsequent investigations to provide

[81] European Commission, ISA – Interoperability Solutions for European Public Administration (2012), *Discover the ISA programme 2010-2015* [WWW], Available from: http://ec.europa.eu/isa/index_en.htm [Accessed 11/03/2013].

[82] EUROPEAN DYNAMICS S.A for the ISA Programme and for ePractice.eu in the context of SMART 0109/2008/ (2012), *The eProcurement Map: A map of activities having an impact on the development of European interoperable eProcurement solutions*, European Commission DG Informatics.

[83] eCommerce includes online business to business transactions, online business to consumer transactions, digital delivery of products and services, online merchandising, automated telephone transactions e.g. phone banking, Corker J., *Doing business in the information age* [WWW], Available from: www.cyberlawcentre.org/genl0231/e-commerce.ppt [Accessed 11/03/2013].

[84] eBusiness (electronic business) is using technology to improve your business processes. This includes managing internal processes such as human resources, financial and administration systems, as well as external processes such as sales and marketing, supply of goods and services, and customer relationships, Departement of Business (2012), *What is eBusiness* [WWW], Available from: http://www.dob.nt.gov.au/business/starting-business/ebusiness/pages/ebusiness.aspx [Accessed 11/03/2013].

answers around how a tender was awarded, even when warning signals have not been identified in an earlier stage.

The system also provides monitoring, which allows assessing how well individual departments or authorities are adhering to policy. In Tendersure a new policy can be identified and the implementation can be introduced to the system. This way, comparable projects can be tracked against their budget and projects that seem to consume the budget too quickly will be highlighted. This will allow for investigation and/or intervention at an early stage.

Data integrity is one of the qualities of Tendersure. Data is captured and stored at a central location. Due to the fact that this information is digital, this data will be easily accessible for the relevant authorities and cannot be 'lost'.

Potential suppliers receive direct communication by e-mail. The communications sent can be fine-tuned by industry or exclusion lists can be introduced. Tendersure can also send automated feedback to bidders, which increases transparency in the procurement process. There is a report generated for each bidder. In this report a comparison of their bid is given with the winning bid. This allows them to see why they did not win the tender together with recommendations for improvement. The bidder also acts as a final policing of the system. In case that one of the bidders can proof that their bid was clearly superior to the winning bid, it is possible to challenge the decision before any money is spent. This is an effective functionality of the tool to prevent and detect corruption.

Alternatively, bidders are given the opportunity themselves to nominate respected representatives from within their own communities to contribute in regular audit processes of the system and to draft a report regarding their findings for the communities they come from. The system and past tenders can be investigated randomly to guarantee that the process worked as planned by making use of the auditing body. The objective of the auditing body's report is to build reliance in the system and transparency as to its workings. This is again an effective way to prevent and detect corruption in public procurement.

Reporting is very important for procurement tools. Tendersure is considered as a S.MA.R.T. tool as data analysis can be compiled automatically in a custom made report. Red flags and other elements of decision making or corruption detection can be introduced to the system for a more detailed analysis.

5.3.2. *Procurement management tool from USA – eRequester*

eRequester is a procurement management, purchase requisition, authorization routing, and purchase order system. Organisations are able to define and implement standardized purchasing practices by using this system. Their supply chains would be managed and streamlined and custom-tailored solutions would be provided. These solutions concern key modules including: Budget, Receiving, Inventory, Request for Quote, Mobile, Project Accounting, Multi-Currency, Payment Request, Punchout.[85] eRequester facilitates the build of requisitions that help expedite the approval process that will transform the way an organization handles purchasing and expenses.

[85] E-Requester (2013), Official website [WWW], Available from: http://www.erequester.com/ [Accessed 11/03/2013].

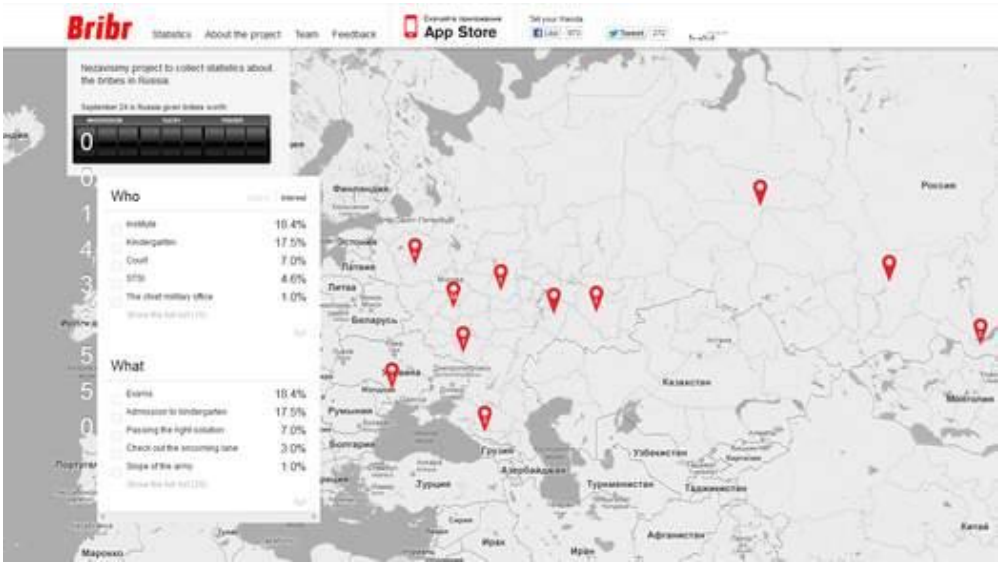
There are some features in eRequester that allow adaptation to the needs of the organization:

- Ability to make templates of recurrent orders;
- Built in calculations for totalling tax, shipping;
- Leverage business specific information such as locations, inventory and more;
- Ability to interact with other members of the approval chain.

5.3.3. *Anti-Corruption mobile application from Russia - Bribr*

In October 2012, Russia launched 'The Bribr', an application to combat corruption. This app encourages people to anonymously report the bribes they pay. This app is truely innovative as it is the first anti-corruption app in the country. The app is developed for iPhone devices and has been quite successful thus so far. It has already led to thousands of Euros worth of bribes being reported. Bribes reported through the app, are used to establish a national bribery map for the Bribr website. The map is presented in the figure below.[86]

Figure 8: Screenshot Bribr



The 'Bribr' is a free application that gives the opportunity to indicate how widespread corruption really is. The purpose of this app project is more than simply developing an IT tool; it aims to develop a movement. The app is inspired by 'I paid A Bribe' (see below), which is an Indian anti-corruption website. The app ensures that the users remain anonymous by not storing personal information and it uses moderation to guarantee that the reported bribes are true.

Apple is the only party that has criticized the app, saying that the app looks too nice and some people are encouraged to report (fake) bribes because it looks like a game. Apple recommends that the app be given a more bureaucratic look.

5.3.4. *C4C Compliance Officer*

C4C Compliance Officer is a free mobile application that provides practical anti-corruption compliance tips to a company's workforce and partners. The application works based on compliance information it gives 'on-the-go' employees. Employees receive reminders to their phones about giving and receiving gifts, red flags are identified and employees are given information about who to contact in a risky business scenario.[87]

5.3.5. *Anti-Corruption website from India – I Paid a Bribe*

The website ipaidabribe.com is a unique initiative to tackle corruption by harnessing the collective energy of citizens. It allows individuals to report the nature, number, pattern, types, location, frequency and values of

[86]Collerton, S. (2012), *Anti-corruption app launched in Russia* [WWW], SkyNews HD, Available from: http://news.sky.com/story/995786/anti-corruption-app-launched-in-russia [Accessed 11/03/2013].
[87]Click 4 Compliance (2013), Official Website [WWW], Available from: www.click4compliance.com [Accessed 11/03/2013].

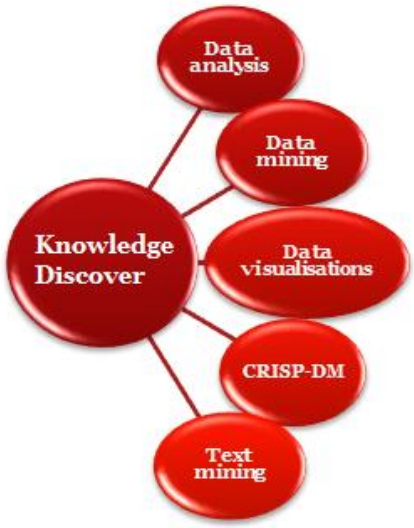
actual corrupt acts through its website. A snapshot of bribes occurring will be given by the site's summary reports. These are used to fight for improved governance systems and procedures, tighter law enforcement and regulation and thereby decrease the scope for corruption in obtaining services from the government. All citizens are invited to register any recent or old bribes they have paid. The website creators are also interested in cases when individuals resisted a demand for a bribe, or did not have to pay a bribe, because of a new procedure or an honest official who helped. There is no request for registration of names or phone details of people reporting a bribe, so all data and reports are anonymous following the formats provided.[88]

5.4. Prevention and detection of fraud and corruption techniques based on forensic technology

This section provides information on forensic techniques applied for the prevention and detection of procurement fraud and corruption. Different best practice scenarios are described based on methods and innovative IT tools following approaches with proven success.

5.4.1. Knowledge discovery

Figure 9: Knowledge discovery



Data collected on public procurement can only help to prevent and detect corruption if it can be used to extract knowledge and patterns that provide hints and red flags to investigate further or develop preventive structures. Huge collections of data create new needs to help to make better managerial choices. These are automatic summarization of data, extraction of the "essence" of information stored, and the discovery of patterns in raw data.[89]

Knowledge Discovery[90] (KD) is a concept in the field of computer science that describes the process of automatic search of large volumes of data for patterns that can be considered as knowledge. Multiple techniques are available to support knowledge discovery. The rapid and on-going growth of online data and the widespread use of databases have created an immense need for KD methodologies.

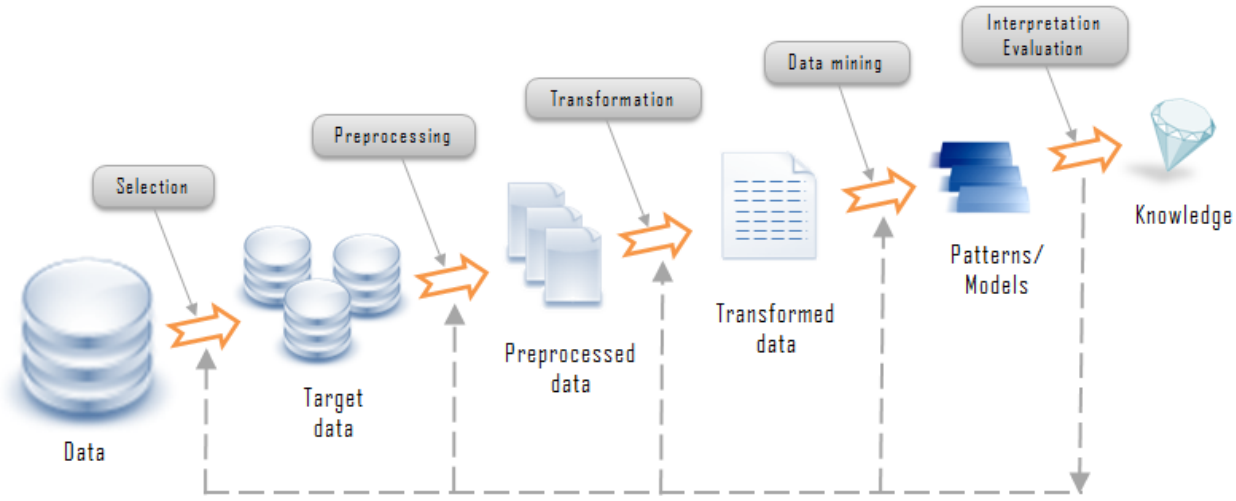
[88]Ipaidabribe (2013), Official website [WWW], Available from: http://www.ipaidabribe.com/About-us [Accessed 11/03/2013].

[89]ZAIANE, O.R. (1999), *CMPUT690: Principles of Knowledge Discovery in Database: Chapter I: Introduction to Data Mining* [WWW], Available from: http://webdocs.cs.ualberta.ca/~zaiane/courses/cmput690/notes/Chapter1/ [Accessed 11/03/2013].

[90]20 Rithme Business Intelligence Solutions (2013), Stored Data Volumes, Storage Cost and Need for Knowledge [WWW], Available from: http://www.rithme.eu/?m%3Dresources%26p%3Dkdprocess%26lang%3Den&h=349&w=814&sz=66&tbnid=ebbEOv70HxFdaM:&tbnh=54&tbnw=126&prev=/search%3Fq%3Dknowledge%2Bdiscovery%26tbm%3Disch%26tbo%3Du&zoom=1&q=knowledge+discovery&usg=__U7-GXv_tFhoH4AFjFzwPMkv_kZ8=&docid=sVJqjt-QZL1h8M&hl=en&sa=X&ei=SWvOUJC9MMa3hQfbjIH4BA&ved=0CGwQ9QEwCQ&dur=47 [Accessed 11/03/2013].

The challenge of extracting knowledge from data draws upon research in statistics, databases, pattern recognition, machine learning, data visualisation, optimisation, and high-performance computing, in order to deliver advanced business intelligence and web discovery solutions.[91]

Figure 10: Data analysis



Data analysis is a process of inspecting, cleaning, transforming and modelling data with the goal of highlighting useful information, suggesting conclusions and supporting decisions.

Data mining is an analytical process that uses computer algorithms to explore data in search of (hidden) consistent patterns and systematic relationships amongst elements in large data sets and subsequently applying the detected patterns to new subsets of data to make predictions.

Data visualisation relates to the techniques to represent data in a structural graphical format to obtain conceptual information.

Text mining applies statistical, linguistic and structural techniques to extract and classify information from textual sources or other unstructured data.

Knowledge discovery refers to the process of analysing data to discover patterns, trends, correlations and other (ir)regularities to create new or improved knowledge.

5.4.1.1. Data analysis

Procurement authorities collect and store vast amounts of data in relation to information on contractors, projects, tenders, bidders, budgets, etc. However, this data is not always used effectively to provide all necessary and relevant information to support and improve business decisions, and to prevent and detect corruption. Data analysis provides the answer to understand the underlying data and use it accordingly. Data analytics can support fraud detection in a variety of ways, including:

- Controls and testing of policies and regulations;
- Detection of anomalies in the data based on industry knowledge or best practice (e.g. fraud red flags);
- Cost saving through discovery of spend;
- Providing a single point of view into divers data;
- Tracking and measuring Key Performance Indicators (KPIs).

5.4.1.2. Data mining

Traditional data-driven reviews are transaction based and compare policies or expectations against execution. Historically this has been achieved by applying a series of rules, commonly known as “red flags”, in order to

[91]RESEARCHER WATSON (2013), *Knowledge discovery and data mining* [WWW], Available from: http://researcher.watson.ibm.com/researcher/view_pic.php?id=144 [Accessed 11/03/2013].

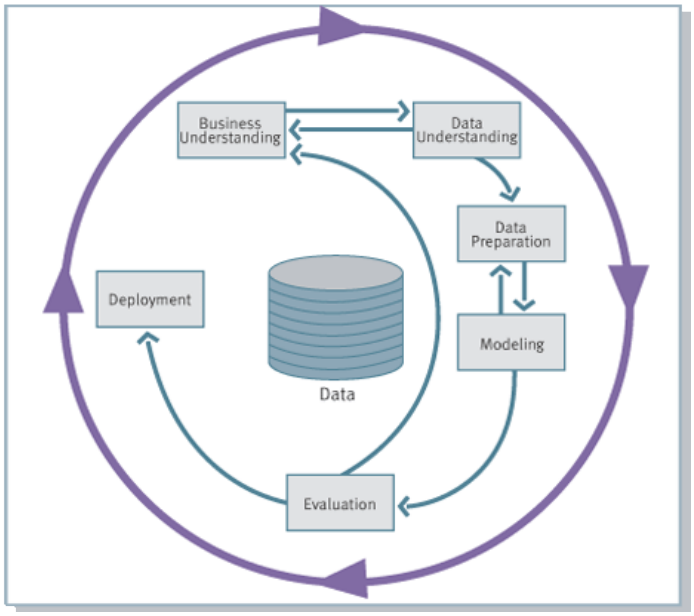
discover exceptions within data. This approach will fail to detect general anomalies or patterns that are within policy and the exceptions are considered in isolation from each other.

Data mining may provide additional benefits to other data analysis reviews, including:

- Improved fraud detection through discovery of known fraud patterns and profiling of clients;
- Increased revenue through identification of target markets / audience;
- Cost savings or optimisation through trend analysis;
- Improved business decision-making processes given the availability of enriched organisational information;
- Improved incident response through predictive data mining.

5.4.1.3. Cross-industry standard process for data mining

Figure 11: CRISP-DM Approach



CRISP-DM Approach provides a basic overview of the steps to implement or execute a general data mining functionality:

1. Develop of a good understanding of the business requirements and objectives, as well as the availability and quality of data: This will be the basis for all data mining processing;
2. Prepare the data: the appropriate techniques need to be selected and the statistical models need to be designed.

Based on the results of the analysis performed in the previous step, it may be recommended to recapture some of the steps in order to improve the overall quality going forward, for example through enriching the data or adjusting the models for a more perfect fit.

Once the desired solution has been obtained, the results can be reported and/or the set-up can be deployed.

5.4.1.4. Other knowledge discovery techniques

Each organisation is different and the data requirements for these organisations will vary accordingly. Some organisations may have an obvious need for quantitative analysis (numbers and figures), while others may require more qualitative reviews (interpretation of words and text). Therefore, other techniques such as **data visualisation** and **text mining** can be used for fraud prevention and detection.

These techniques can provide an organisation with the following benefits:

- Improved interpretation of the analysis results through visual representation (e.g. VAT fraud carrousels);
- Inserting structured hard copy documents into a database in an automated fashion;
- Searching and analysing unstructured data (e.g. random text).

Table 39: Phases and possible fraud prevention and detection actions with Knowledge Discovery[92]

Identification of data sources *	*Support to incorporate Business Intelligence initiatives in IT Transformation Programmes*	*Spend Cube analysis* *	*Visualisation of complex relations between data entities and its attributes*
Data quality improvement and data enrichment	Computer Assisted Audit Techniques (CAAT) *	Data Migration Validation *	Policy and regulation testing
Data cleansing	Red Flag Fraud analysis	Predictive Analysis	Reconciliation between different systems or processes *
Data modelling *	Forensic and security analysis	Profiling	
Data warehousing	Reporting from various sources of data	Drill-down analysis	

5.4.2. *Real life examples on prevention and detection of procurement fraud and corruption with innovative tools*

This chapter focuses on real life examples from the private sector presenting prevention and detection of procurement fraud and corruption with the help of S.M.A.R.T. IT tools and technologies. The cases are selected as best practices for the implementation of different innovative tools and techniques explained above. The data was collected by interviews conducted with PwC forensics experts.[93]

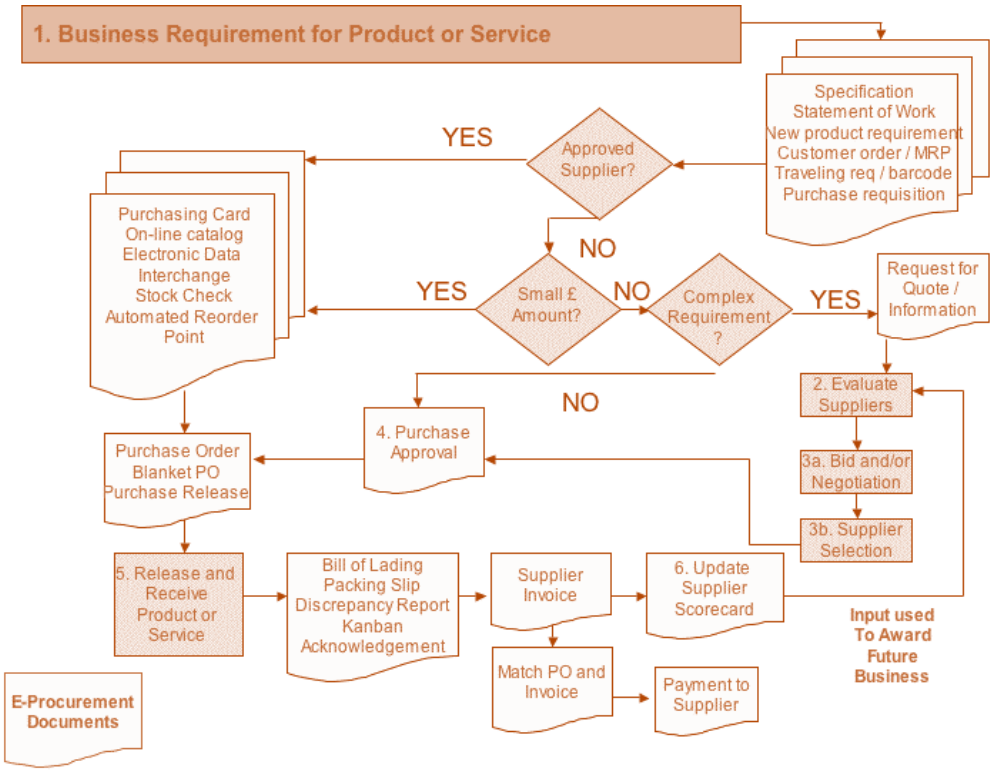
Tools and methodology

Fraud, corruption and/or other types of irregularities are detected by analysing the procurement process, where certain controls have been omitted (or are simply not in place). Ideally every organisation obtains a very good idea of their procurement processes.

[92]The actions marked with * are not necessarily designed for fraud prevention and detection. Some, like CAATs may be used to support this, however some – like data modelling are more supporting capabilities in order to perform data analysis and data mining properly.

[93]All names and addresses in the cases are changed in order to keep the confidentiality of the case.

Figure 12: Example of procurement process flow of a manufacturing company located in the UK [94]



The IT and administrative functions that support this procurement process, including a detailed description of the controls, are depicted. This may give an indication of control weaknesses, such as manual interventions, segregation of duties issues, un-enforced controls in receipts of goods and payment of invoices, etc.

Automated processes are often supported by technologies such as e-invoicing, data warehousing and supply chain management systems. Advantages of electronic systems are that the processes are generally being documented and controls are built in.

The most common types of procurement fraud and corruption are:

- Bid rigging;
- Collusion between vendors and employees;
- Collusion between vendors.

[94]This process flow can be completely different for every organisation. Kanban is a scheduling system for lean and just-in-time (JIT) production. Kanban is a new technique for managing a software development process in a highly efficient way. Kanban underpins Toyota's "just-in-time" (JIT) production system. Available from: http://www.kanbanblog.com/explained/ [Accessed: 25/3/2013]

How to tackle these types of procurement fraud

1. Approximately 40% of fraudulent activities are detected by a whistle-blower alert. There are many whistle blowing systems and platforms that enable employees and other stakeholders to make an (anonymous) alert. This is often done through call centres, websites, apps or ombudsman services.
2. Complaints from users or other parties involved are often a good indicator of misconduct.
3. Physical controls such as quality inspections, qualification procedures or checks of independent parties on the quality & processes. E.g. annual certification of processes, 6 sigma QC reports, audited inventories, etc.
4. Using e-discovery techniques or document management systems to support analysis and monitoring of unstructured data such as e-mails, contracts:

    a. Use of conceptual searching to identify collusion, nepotism, bid rigging, etc in e-mail communication between parties;
    b. Use of "big data" technology to quickly find related documents;
    c. Enables tracing of transactions to physical documents (e.g. to verify all necessary documents are present or to identify missing of false documents).

5. Using data analysis and data mining techniques to explore (structured) data. Types of reports that are run as a standard for procurement fraud detection are:

    a. Verification of vendor master table

        i. Connection analysis: Similar vendor names/addresses/ contact details or other connections between bidders/employees/agents/influencers;
        ii. Matching against employees or other related parties (e.g. bank account details);
        iii. Access control changes;
        iv. Modifications in vendor master table;
        v. Fictitious vendors.

    b. Payment transactions

        i. Split payments;
        ii. Duplicate payments;
        iii. Trend analysis (e.g. increased payments to specific vendors);
        iv. Threshold analysis (all payments below certain thresholds);
        v. Payments made to other parties than contract parties
        vi. Manual payments;
        vii. Round number bids/payments;
        viii. Transfers of cost charges from one contract to another;
        ix. Transfer of charges to suspense accounts;
        x. Total payments exceed contractual amount or purchase order.

    c. Multiple (structured) source analysis

        i. Verification against blacklists, sanction lists, corruption files, etc (Integrity due diligence);
        ii. Verification of financial interests or other links between parties concerned;
        iii. Verification of production data against transactional or payment data (e.g. to identify mismatch between prices paid and quality delivered);
        iv. Comparison of bids against industry averages, published price lists, similar jobs, etc;
        v. Verifications of involvement of agents, middlemen or brokers;
        vi. Verification of inappropriate gifts or entertainment;
        vii. Verification of expenses;
        viii. Verification of employee listing (compare against vendors, contractors, agent listings, etc);
        ix. Change order analysis;

x. Comparison of pre-qualification procedures (to identify unusually short times allowed for bidding, narrow contract specifications, etc);
xi. Invoices without corresponding order;
xii. Multiple invoices for same/similar goods;
xiii. Multiple invoices on same date;
xiv. Analysis of multiple suspicious events (e.g. circumvention of access log followed by manual transaction that initiates payment).

d. Data Mining techniques

i. Clustering (identify common features between groups of transactions, vendors, etc to identify outliers. Ex2: to identify unusual bid patterns – too high, too low);
ii. Regression analysis to predict more sensitive features of a procurement (to identify the variables that increase the likelihood of procurement fraud to better predict whether a transaction is fraudulent);
iii. Process Mining techniques to identify which control procedures or standard process flows have been by-passed;
iv. Identify patterns such as rotation of bidders by job, type of work or geographical area;
v. Pattern of low bid award followed by change orders that increase price or scope of a contract or extend contract period;
Verification of contract outlines against project completion actual;
vi. Verification of contract outlines against project completion actual;
vii. Sequence analysis (illogical flow of process – awards before approvals, etc);
viii. Benford's law (uniform distribution of invoice amount beginning figures);
ix. Unusual discount patterns;
x. Analysis of vendor behaviour.

5.4.2.1. Case study

Prevention of procurement fraud with the use of S.M.A.R.T. tools

In procurement frauds the traditional data-driven fraud and corruption reviews are transaction based and compare Purchase-to-Pay (P2P) policy against its execution. This is achieved by applying a series of rules, commonly known as "red flags", to discover exceptions within the data. However, this approach has some limitations, such as the exceptions to be only considered in isolation from each other and the shortcoming to detect suspicious vendor activity that is within policy. Data mining can help organisations to detect the fraudulent and corrupt cases that don't appear to be suspicious following other methodologies.

By searching for hidden patterns, the holistic impact of a fraud and the trace this will leave within the Purchase-to-Pay (P2P) data can also be looked at. This technique is based on grouping fraud based metrics ("events") into categories that broadly align to known fraud schemes, including false invoicing, rather than applying a series of red flag tests.

Statistical techniques can measure the similarity between contractors over a range of fraud-based metrics. Factor analysis is applied to reduce the number of events by excluding any events with poor discriminatory power and combining those that are statistically similar across the vendor population.

Combinations of events are selected to form an "event pool" which is used to plot each vendor's position within geo-spatial multi-dimensional space (where each event represents a separate dimension). Clustering is then applied to group together vendors with similar purchase activity. Contractors who are consistently within clusters containing numerous others demonstrate similar behaviour. Similar behaviour to be "normal" and reflective of typical contractor interactions over a period of time are deemed. A number of "event pool" iterations are typically performed as results from one iteration that allow to refine the event population for the next. A diagram of this process is provided below:

Figure 13. Example of an "event pool" iterations process



This analytical technique also identifies contractors with characteristics that appear to be different from the rest of the contractor population. These contractors are outliers because their behaviour is different compared to the population at large. It is this concept of difference as opposed to a binary measurement of compliance against a rule. By focusing on the identification of difference unusual or anomalous patterns of behaviour can be identified which may warrant further manual investigation.

Implementation of this technique with a representative example [95]

Step 1: Generation of events to support analytics

In this case a UK company in the manufacturing industry faces some issues in procurement fraud. The investigation team works closely with the P2P department to understand the processes and controls in place. They review the P2P policy documentation and establish an understanding of the specific risk profile. Then the team overlays its investigations experience of false invoicing schemes and how they operate.

This is an important step as it guides to defining tailored fraud-based metrics ("events"). From this process events are generated that are classified into the different categories. Some examples from these categories are listed in the table below:

Table 40: Example classification of fraud events

Category	*Description*
False invoicing	Events specific to detecting false invoicing schemes
General fraud activity	Universal events that do not relate specifically to false invoicing but are good at detecting a wider range of fraudulent activity
Other fraud schemes	Events related to detecting other fraud schemes (such as bribery, conflicts of interest, overpayments, etc)

The applied categorisation dictates which events are applied to the transactional data. The "False Invoicing" category of events is applied first in the search for discriminative variables. Further general fraud activity events are added on an iterative basis to generate a sharper picture.

Events generate continuous values (which can be clustered), compared to rules that generate discrete values (typically true/false). For example, in a false invoicing fraud, the value of the amounts misappropriated usually increases over time as the fraudster gains confidence. Using an event that counts (+1) if the amount is greater than the previous PO, and decrements (-1) if the amount is less, this behaviour can be detected through a high count (compared to a lower value that you would expect from 'normal' behaviour). This is an example of activity that cannot be detected through simple "red flag" rules.

[95] All names, numbers, addresses and other information in this case study are fictive and created for demonstration.

Step 2: Application of the events to the procurement data

The events are applied to the data of the procurement unit. A number of transactions and a population are decided together with the organisation that is undergoing the investigation. In this example any transaction below £250 in value and any vendor interactions where the end-to-end P2P process was not fully contained within the two-year review period were excluded. The events were applied to 187,902 transactions and a population of 9,535 vendors. Applying the events to every transaction created a total of 11,086,218 possible combinations. The generation of events provides some interesting results and insights into the control environment of the organisation that is being investigated. Some of the results are indicated in the table below:

Table 41: Example classification of fraud events

Event	*Results from generated events*
Segregation of duty between vendor creation and ability to create/authorise a PO[96]	There are no instances where an employee has raised a PO against a vendor and has been the last person to create or update that vendor's record.
Vendor / employee bank account match	There are no instances where an employee has raised a PO against a vendor containing the same bank account details as the employee.
Chained POs	569 vendors have at least one instance of a chained PO (multiple POs raised on the same day by the same user where each PO is <5k, but total sum is > £5k).
POs raised out of hours or at weekends.	0.7% of POs (by number) were raised on a weekend and 6.9% of POs (by number) were raised outside normal work hours (09:00-18:00).
Self approval of POs	24.1% of POs (by number) were self approved .
Number of PO requisition raisers	2,007 employees submitted requisitions over the two year period.

The easiest way to create a false invoicing scheme is to set up a false vendor within the system. Segregation of duty between the vendor creation process and the subsequent raising of POs and processing of invoices is commonly observed. Other common practices include the fraudster changing vendor bank account details to their own and processing payments at unusual times. In both cases the particular mechanics of how an organisation conducts business mean that these are not discriminative events.

Step 3: Detection of false invoicing fraud – Event Pool V1

A preliminary cluster analysis of the vendor population is performed using events that judged to be most pertinent to detecting false invoicing fraud. Using the categorisation detailed above, 15 events are selected belonging to the "False Invoicing" and "General Fraud" categories. Cluster analysis grouped your vendor population into 12 distinct clusters as shown below:

[96] Procurement officer.

Table 42: Fraud Metrics

Cluster	Vendors	Avg PO Amount (£)	Avg POs created & approved by same user (%)	% POs under £5k	% Chained POs (within day)	% Sequential Invoice Numbers	Avg Users Per PO	Avg Num of Employees with Bank Match	Avg Num of Employees with Address Match (Exact)	Avg Num of Employees with Address Match (Tight)	Avg Num of Employees with Address Match (Relaxed)	% POs within 1% of Approval Limit	% POs within 10% of Approval Limit	% POs within 50% of Approval Limit	% Payments Made Early	% Payments Made On Time	% of Credit Notes
A	166	8 367	80.6	36.1	0.02	6	5.2	0.01	0	0	0.03	14.1	69.6	79.7	10.7	52.4	0
B	523	21 875	79.8	67.5	0.2	2.3	4.4.9	0	0	0	0	0	0.6	20.6	88.3	3.8	0
C	101	11 537	74.2	4	0	2.2	4.68	0.01	0	0	0.02	99.2	99.2	99.5	10.8	38.1	0.3
D	237	16 387	88.5	41.5	0.4	8.9	7.41	0	0	0	0	0.3	2	10.1	4.2	36.2	26.2
E	1	690	96.2	0	0	3.2	6.38	0	6	6	6	0	0	0.5	1.3	86	1
F	2 836	21 345	70.7	75.4	0	2.8	4.24	0	0	0	0.01	0	0.1	16.7	1.3	57.5	0.1
G	162	2 651	91.4	61.3	2.8	32.4	5.96	0.14	0.34	0.86	1.09	0.6	1.8	12.5	1.8	69.1	0.1
H	23	28 108	92.3	43.5	4.2	19.4	6.23	0.43	0.7	1.39	3.74	0.3	1.1	12.2	0.6	55.9	0.3
I	3	2 919	100	66.7	0	0	6	0	0	7	7	0	0	33.3	50	16.7	0
J	1 138	25 561	91.5	24.4	11	46.4	6.45	0.01	0	0	0.02	0.2	1.3	14.5	2.7	55.3	0.5
K	4 321	14 757	97.3	73.8	0.2	5.2	6.67	0	0	0	0.01	0.1	0.4	8.6	1.9	56.8	0.5
L	24	18 644	87.5	58.4	0	5.2	10.61	0	0	0	0	0	4.2	29/2	4.2	21.7	97.2

The table above contains the average value for each cluster (**A** to **L)** across each event. To highlight risk, shading has been applied to each value where risk is characterised by extremes in the value returned for that event. Lack of shading denotes a low fraud risk, with darker shading representing a higher risk e.g. Cluster **J** has a high value of chained POs within a day.

Events which return values defined as low risk across all clusters, or which have little variance in the values between clusters, have been assessed as having low discriminatory power.

The cluster results can be interpreted both individually and through comparison with others. However, the primary purpose of preliminary clustering is to identify the discriminatory events.

Step 4: Refining the clustering

The clustering approach is based on identifying potentially anomalous or outlying behaviour. Metaphorically, this is achieved by both removing hay (removing unlikely candidates from the data population) and by searching for needles. The preliminary clustering allows to identify and remove non-discriminant events (to extend the metaphor, these redundant events represent hay). Their removal reduces noise within the clustering space and supports the development of more distinct clusters.

In this phase 7 of the more discriminative events applied in **Event Pool V1** are taken forward and, in addition, introduced a generic event that can detect chained purchase orders as this is a common way of maintaining self-approval. Similarly, a metric is derived to highlight vendors who only interact with a small number of users, as a vendor used for false invoicing fraud is unlikely to have interactions with a large number of people.

Then three further event pools are generated using different combinations of 9 discriminant events as illustrated in the table below:

Event pool	% Early payments	% POs under £5k	%POs within 10% approval limit	% raised by single user	% Raised within working hours	% Sequential invoices	% Chained POs	Avg number of approvers of vendors	Self approval rate
V2	X		X		X	X	X		X
V3	X				X	X	X	X	
V4		X		X			X		X

Step5: Detection of additional fraud and corruption risks: Contractor/employee flipping

One risk in terms of the opportunity it presents for fraud is the transient nature in which employees move between contractor and employee status. Contractor status requires the creation of a vendor record, which can then be used to raise a PO against it should the contractor become an employee at a later date.

Fuzzy matching is employed to search across all employee/vendor pairs to look for similar addresses. This technique is commonly used when an exact match is unlikely due to noisy, incomplete or obfuscated data.

In the example below there are three instances presented where the employee had raised a PO against the linked vendor[97]:

[97]All names and addresses presented in table are fictive.

Vendor name	POs raised	Total value (£)	Vendor address	Employee address
BDC Maintenance Services	6	2787	Matrim Cottage, 81 Beringdom Hill, PLYMOUTH, PL7 4DL	Matrim Cottage, 81 Boringdom Hill, Plymouth, PL7 4DL
SJF Ltd	1	579.23	105 Brengensbed Cl, Paysolton, Chester-le-Street, DH2 1XL	105 Brengenbed Clos, Peelton, Co, Durham, DH2 1XL
Squill Ltd	1	5000	29 Edingham Park Road, London, N3 2ED	29 Edingham Park Road, Finchley, London, N3 2ED

The "PO Raised" and "Total Value" columns refer to the number/value raised by the linked employee, and not the total vendor spend (which is always higher). Although the vendor/employee address records appear subtly different, it would appear that there is a match between the two addresses in each case.

Squill is particularly interesting as the amount (£5 000) is one of the self-approval thresholds. It is recommended that these three vendors are subject to a further manual investigation.

Step 6: Detection of additional fraud and corruption risks: Potential vendor overbilling and spend outside of policy

The potential overbilling of services by a suspect vendor is another risk factor in the area of procurement, in particular, inflated claims for "days worked", which exceeded the total number of days. The analysis looks for instances where a vendor had potentially billed more days during a period than it was possible to have worked.

The approach is to look for date information (often used to denote the period of work billed) within individual purchase order lines using sophisticated pattern matching. The issues here are the granularity of line item detail, and the extent to which a meaningful/valid description has been entered into the P2P system. For example, the table below highlights three distinct examples of date information for the same vendor within the Item Description:

Vendor name	Creation date	Item description	Unit price	Quantity
CBX Solutions Limited	04/12/2008	Contract extension for J Barnard - Jan-Mar2009	526	77
CBX Solutions Limited	17/03/2009	Extension for April09 as agreed with Ian W / Dan F	526	24
CBX Solutions Limited	09/09/2010	AP Automation Business Case Week 1 (14/09 - 20/09)	526	6

A 365-day sliding window was run over the extracted date values to look for instances where the quantity exceeded 250 days. Where vendors shared the same address, quantities were combined.

Data mining technology enables to look at the holistic impact of fraud and corruption by searching for hidden patterns rather than only applying a series of Red Flag tests. The fraud-based metrics ("events") are grouped into categories that broadly align to known fraud and corruption schemes. Subsequently, statistical techniques are used to measure similarity between contractors over a range of fraud-based metrics. A range of analytical methods, such as factor analysis, can be applied to identify and exclude metrics that are non-deterministic.

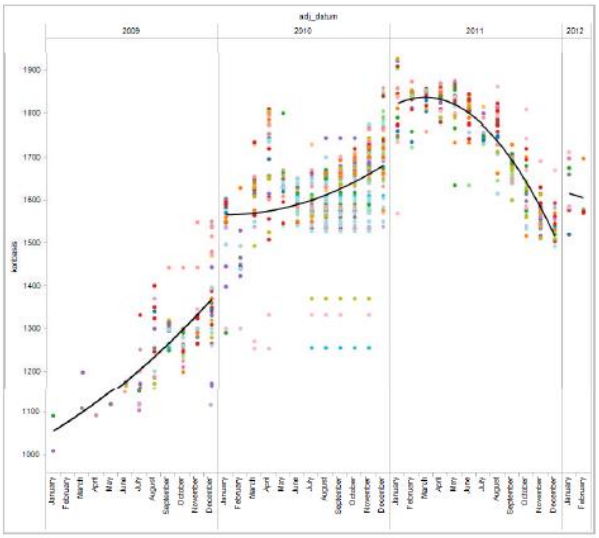
Detection of procurement fraud with the use of S.M.A.R.T. tools

A Belgian food company contacts fraud investigators concerning a potential procurement fraud reported by a whistle-blower. The systematic approach in such an investigation is to use as much automated tools and techniques as possible to obtain process information efficiently and effectively and exclude human error. This process requires data to be collected and processed and subsequently interpreted together with the physical information to report on a conclusion and evidence collected. In this case study, the investigation team first interviewed the whistle-blower and the CEO, to gain a deeper understanding of the facts in relation to the potential fraud. Based on this information, a background investigation was conducted to build a profile of the suspects and their relations with other companies and persons. As a result of the interviews and the corporate intelligence, it was found that the CFO was refurbishing his house, and the contractor performing these works was one of the firm's suppliers.

The e-mails, hard drives and the file shares belonging to the suspects were forensically preserved, and then analysed utilising advanced e-discovery tools. Through the application of specific keyword searches and filtering techniques, e-mail communications between the CFO, his personal assistant and the suspected supplier that confirmed the provision of refurbishing works at the CFO's house was discovered. Additionally, template invoices that were back-dated or manipulated have been identified on the PC of the CFO. In order to identify and quantify all activity involving the suspected supplier, data analytics was applied to the construction company's financial data. This data analytic process involves writing customised testing scripts to identify transactions linked with the suspected supplier. Through the application of fuzzy matching, it is discovered that the address of the supplier of the company matched the address of the contractor renovating the CFO's house. Given the actual work at the CFO's house was performed by a number of different contracting companies, further background searches revealed that these contracting companies were all registered at the same address. With this knowledge of other companies registered at the same address, the financial data was further analysed through data analysis and all payments to these companies were identified. Comparative analysis of the identified invoices showed significant difference between amounts paid to the suspect supplier and other suppliers to the company. These results confirmed that the invoices were inflated.

The figure below is the data analysis report, providing an overview of the amounts of the invoices paid between January 2009 and February 2012 together with the suppliers contracted. The general trend for pricing is represented with a curve and the suppliers with dots in different colours. It can clearly be seen that the invoices of some suppliers score significantly high above the cloud around the average price for the similar type of product or service provided selected for the analysis. These are the inflated invoices detected together with the suppliers in charge.

Figure 14: Comparative analysis



In this case innovative tools to perform corporate intelligence, e-discovery and data mining were used to collect evidence and quantify the procurement fraud. Note that these tools acted complementary in this investigation.

5.4.2.2. Implementation in EU institutions

The implementation of advanced forensic technologies can be observed in the EC tools PLUTO, DAISY and ARACHNE as presented in this chapter. Whereas PLUTO and DAISY focus on EU grants, ARACHNE is the tool being developed for EU procurement to make risk analyses and detect fraud and corruption. As the case study above demonstrates, centrally stored and structured data and data quality are the two major elements essential for S.M.A.R.T. detection tools to work and give accurate results. This can only be achieved by close cooperation of the Member States and with the European Commission. To achieve this in an efficient and fast way the on-going initiatives in the area of EU procurement need to join forces. Therefore, the EU-wide eProcurement initiative plays an important role. Whereas it is trying to encourage structured centralisation and transparency of public procurement in Member States and the Commission, it also sets standards to data exchange and interoperability of systems so that data can be stored and structured centrally and exchanged when needed. Once the centrally structured procurement data is available at the EU level covering all Member States, the S.M.A.R.T. tools described earlier in this chapter will be eligible for use for the Commission and Member States as well.

5.5. Concluding remarks

As elaborated above there are a number of initiatives at EU and global level to use innovative technologies to fight corruption in public procurement. ARACHNE is the most advanced tool developed for EU institutions that brings different aspects of risk assessment together to manage EU funds better and to prevent corruption.

This chapter also presents alternative solutions in Europe and beyond. The data mining technologies have a wide area of implementation in terms of prevention and detection of corruption in procurement. There are a variety of IT tools using the Knowledge Discovery method in order to help organisations from both the private and public sector in the world. As it is a sensitive matter for institutions, authorities have hesitations to provide the information on their specific tool.

Development and implementation of more and better Self-Monitoring, Analysis, and Reporting Technology (S.M.A.R.T.) anti-fraud and anti-corruption tools could help to orient auditors towards cases which higher risks including those of corruption. Initiatives like PLUTO, DAISY and ARACHNE demonstrate that the EU institutions already go forward with implementing and using advanced IT technologies to reduce the risk of corruption in EU funded projects to protect the financial interest of the EU. Centrally stored and structured data and data quality are the two major elements essential for S.M.A.R.T. detection tools to work and give accurate results. This can only be achieved by close cooperation of the Member States and with the European Commission. In ARACHNE the data is collected from Member States' funds execution data merged with public investigative databases (ORBIS, World compliance) and thus combines a mix of internal and external data in a single tool which is quite unique. The resulting public procurement database will also contain benchmarking anti-fraud ratios and links to the beneficiaries, companies and individuals for anti-fraud investigative analysis. Further support from the Commission and participation of more Member States is a must for the success of the tool.

6. *Existing methods, measures and systems of measuring risks and costs of corruption*

The literature on measuring corruption is diverse and fragmented. At the most fundamental level, this is due to the fact that those involved in corruption seek to hide their behaviour. Hence, all efforts to estimate corruption are based on a specific premise, namely that some aspects of corruption can be detected even though all authors would recognise that the full picture of corruption is unknown. Furthermore, corruption is in itself a vast subject, as it can occur at different levels of government, involve a variety of actors and take many forms.

Notwithstanding, several broad statements on the size of corruption have emerged lately. One estimate[98] is that worldwide corruption crime would amount to $ 600 billion to $ 1.5 trillion annually. Another estimate[99] is that bribery occurs in the OECD in 10% of all public procurement contracts. The EC[100] states that corruption implies a cost for the EU economy of about EUR 120 billion, or 1% of the EU's GDP. For Italy, the Italian Court of Auditors (2011) estimates corruption in Italy to amount to EUR 60 billion – which would be already half of all EU corruption. In the UK, earlier estimates of the broader phenomenon of fraud[101] pointed to a cost of fraud amounting to EUR 7.9 to EUR 16.2 billion per year.

Comparison of the above numbers is difficult, due to two main factors. First, as highlighted earlier in this report, there are differences in the definition and scope of corruption (e.g. public procurement), and in the aspects being estimated (bribes, direct costs, indirect costs). Within this respect, 'harm' is difficult to define, as it not only involves bribes, but much broader economic, environmental and social costs, including health, psychological and reputational aspects. A second factor that hampers comparison is of a methodological nature. Levi and Burrow recognise this and pointed to the fact that data can be collected with different purposes, but almost never with the purpose of estimating the costs of corruption.[102] Some data is only partially collected and much is not collected at all. Furthermore, there could be a considerable time lapse between committing the offence and the reporting and recording.

The body of corruption literature focuses traditionally on developing countries, where the phenomenon is more pervasive than in developed countries. With the EU as the territory in scope, however, the focus is on the literature addressing more developed countries. Moreover, the focus is on corruption in public procurement and in sectors of the economy where EU Funds are spent. The focus is on studies from international organisations, which have practical implications for the research at hand. Studies previously carried out or commissioned by the EU institutions have been taken note of by the consortium.

So where to start if so much about corruption is unknown? First of all, several *aims* can be distinguished: certain methods (e.g. surveys) attempt to estimate the phenomenon of corruption in more general terms. Others are more precise in their aims and focus on the identification of indicators of corruption, the probability of corruption and/or on the costs of corruption.

[98] KAUFMANN, D. (2005) Myths and Realities of Governance and Corruption. The World Bank. Available from: http://siteresources.worldbank.org/INTWBIGOVANTCOR/Resources/2-1_Governance_and_Corruption_Kaufmann.pdf.

[99] OECD (2007) Bribery in Public Procurement – Methods, actors and counter measures. Available from: http://www.oecd.org/investment/anti-bribery/anti-briberyconvention/44956834.pdf.

[100] EUROPEAN COMMISSION (2011) Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee on Fighting Corruption in the EU. COM (2011) 308 final. Available from: http://ec.europa.eu/home-affairs/news/intro/docs/110606/308/1_EN_ACT_part1_v12[1].pdf.

[101] NERA(2000), quoted by LEVI, M. and BURROWS, J. (2008) Measuring the impact of fraud in the UK: A conceptual and Empirical Journey. British Journal of Criminology, Vol. 48, p. 297.

[102] LEVI, M. and BURROWS, J. (2008), Measuring the impact of fraud in the UK: A conceptual and Empirical Journey. British Journal of Criminology, Vol. 48, pp. 293-318.

Corruption can be studied at various *levels of aggregation*: micro-level methods focus on corruption cases on the ground, while macro-level approaches take a more systemic view and attempt to identify patterns and intensity at the level of countries, regions or sectors including the perception of citizens and stakeholders. This chapter provides an overview of literature on existing methods, estimates and systems of measuring the risk of corruption and of the costs of corruption.

In this study, the aim was to investigate various aspects of corruption in procurement, notably indicators, probability and costs.

- Indicators of corruption or red flags; these indicators provide insight in the underlying patterns and are also important for the subsequent elements;
- Probability of corruption in specific sectors and countries;
- Costs of corruption – with a focus on the direct costs.

The literature has been grouped according to *research strands* - specific pathways to make estimates and calculate the size of corruption. These research strands can be considered broad 'families', and within these there are still several methods to be distinguished. Building on existing categorisation of corruption[103], the focus is on the results of these methods, and their ability to advance the researchers' insights on indicators, probability and costs of corruption in the area of public procurement.

- *Strand I: Surveys and interviews;* focusing on patterns and intensity of corruption at the level of countries;
- *Strand II: Indicator-based methods:* focusing on the identification of corruption both at micro- and at macro-levels;
- *Strand III: Audits, investigations and judiciary*. Investigations contribute to the development of indicators of corruption, audits focus more on the probability and the judiciary takes views on costs. This strand is based on case-specific data;
- *Strand IV: Performance analysis;* including budget reviews (particularly Public Expenditure Tracking Surveys), reviewing costing of projects, procurement markets and evaluation methods.

Table 43 presents an overview of these methods, including their aims and their level of aggregation. Methods in bold have been retained for the comprehensive methodology, and will be presented in the subsequent chapter.

Table 43: Overview of methods to measure indicators, probability and costs of corruption

Research Strand	*Description*	*Level of analysis*	*Tools / Sources*	*Indicators*	*Probability*	*Costs*
STRAND I. SURVEYS AND INTERVIEWS						
I.1 Corruption Perception Surveys	Surveys of perceptions about corruption, citizens in general or particular classes of individuals		• Corruption Perceptions Index • Global Corruption Barometer • Bribe payers Index		x	x
I.2 Expert Judgment	Qualitative data collection through in-depth interviews and focus groups, to determine areas of concern	Macro	• Interviews (phone, face-to-face) • Round tables • Hand delivered questionnaire • Electronic data reporting		x	x

[103]E.g. KAUFMANN, D., KRAAY, A. and MASTRUZZI, M. (2006) Measuring Corruption: Myths and Realities. The World Bank. Available from: http://www1.worldbank.org/publicsector/anticorrupt/corecourse2007/Myths.pdf .

Overview of methods to measure indicators, probability and costs of corruption						
Research Strand	*Description*	*Level of analysis*	*Tools / Sources*	*Indicators*	*Probability*	*Costs*
STRAND II. INDICATOR-BASED LITERATURE						
II General	Studies, researches and reports identifying the distinctive features of corruption	Micro / Macro	• Case-level studies • Research carried out at the sectoral, regional or country level	x		
II.1 Micro-level	Inventory of red flags	Micro	• Corruption studies and analysis • Investigation reports	x	x	x
II.2 Macro-level	Inventory of socio-economic indicators linked to corruption	Macro	• Corruption surveys and statistics • Socio-economic data	x	x	x
STRAND III: AUDITS, INVESTIGATIONS AND JUDICIARY						
III.1 Audits	Analysis of the correctness of use of funds against conformity standards and agreed procedures	Micro	• Verification of existing safeguards against corruption • Development of compliance systems	x	x	x
III.2 Investigations	Investigation of past corruption offences or current corruption offences	Micro	• Verification of bank accounts, tracing of financial assets • Interceptions of telephone and internet communications • Interviews to suspects and witnesses • Seizure of evidence such as files and computers	x	x	x
III.3 Methods used by the judiciary	Case-level identification and estimation of direct and indirect costs of corruption for recovery	Micro	• Case law			x
STRAND IV: PERFORMANCE ANALYSIS						
V.1 Public Expenditure Surveys and Budget Reviews	Identify leakages and flows of public funds between levels of government	Macro	• Public Expenditure Tracking Surveys • Perpetual Inventory Method		x	x

Overview of methods to measure indicators, probability and costs of corruption						
Research Strand	*Description*	*Level of analysis*	*Tools / Sources*	*Indicators*	*Probability*	*Costs*
STRAND IV: PERFORMANCE ANALYSIS						
V.2. Cost Analysis	**Identify gaps in primary or secondary data that suggests corrupt practices**	**Micro**	• Compare to standard unit price • Cost overrun analysis			x
V.3 Analysis of procurement data and competition	**Collection of case-level procurement information (type of procedure, contract value, number of bids received, type of awarding authority, etc.)**	**Micro**	• Procurement portals • Government websites • National newspapers		x	x
V.4 Evaluation literature	**Judgement of interventions according to their results, impacts and needs they aim to satisfy**	**Micro**	• Performance monitoring • Ex-ante, ex-post, interim evaluations • Impact assessments	x	x	x
Note: Methods in bold correspond to those that have been used for this study						

6.1. Strand I: Surveys and interviews

6.1.1. Corruption perception surveys

This strand of literature was developed in the 1990s and takes as a starting point that actual corruption is associated with the perception across societies. Therefore, corruption perceptions do not estimate actual corruption, but can shed light on the pervasiveness of corruption in the perception of citizens, businesses or other actors. Despite not offering quantitatively measurable data, perception surveys provide useful contextual elements that, according to their characteristics, reflect the functioning of national institutions.

Transparency International has developed several tools based on perceptions surveys, such as the Corruption Perceptions Index (CPI), the Global Corruption Barometer (GCB) and the Bribe Payers Index. The World Bank has also been active in the development of such tools and, using information on governance at the aggregate level, it regularly releases its Worldwide Governance Indicators and the Business Environment and Enterprise Performance Survey.

The *Corruption Perception Index* is widely quoted in most of the literature as one of the most common and extensively used indexes, measuring the degree to which corruption is perceived by citizens and businesses to exist within the public sector - among public officials and politicians. The 2012 CPI[104] draws on data sources from independent institutions specialising in governance and business climate analysis. The sources of information used for the 2012 CPI are based on data gathered in the past 24 months. The CPI includes only sources that provide a score for a set of countries/territories and that measure perceptions of corruption in the public sector. The 2012 CPI ranks a total of 176 countries, from those in which corruption is least perceived to those where the perception of corrupted behaviour in the public sector is much stronger.

[104]TRANSPARENCY INTERNATIONAL (2012) Corruption Perception Index 2012. Available from:http://www.transparency.org/cpi2012/results.

The *Global Corruption Barometer* is based solely on public opinion poll data and can therefore report on ordinary people's views on the state of corruption as how it affects them[105]. By doing so, it allows for a detailed analysis at the institutional and different demographic levels. Since 2003, citizens from around the world are asked to answer questions such as 'Have you paid a bribe?', 'Has corruption increased in your country?' and 'Is your government effectively tackling corruption?' As a consequence, the overall ranking of countries can vary considerably across the different questions. In the 2010/2011 Barometer, citizens were asked to indicate whether the level of corruption in their respective countries had changed in the past three years.

The 2011 *Bribe Payers Index* ranks 28 of the world's largest economies according to the perceived likelihood of companies to pay bribes abroad[106]. It is based on the results of the Bribe Payers Survey, for which senior business executives around the world are asked for their perceptions of the likelihood that companies in the countries in which they do business will engage in bribery when doing business in the executive's country.

The *Worldwide Governance Indicators* combine data, expert views and general perception to produce a large data-set with high reliability.[107] The data are organised in terms of six core indicators: voice and accountability, political stability and absence of violence/terrorism, government effectiveness, and regulatory quality, rule of law and control of corruption. Indeed, corruption can be positioned within a wider set of governance indicators.

Compared to the above mentioned perception surveys, Governance Indicators are based on more solid and reliable data that go beyond 'perception'. Attempts have been made to extrapolate survey results on the amount of bribery paid as a percentage of sales (for enterprises) or incomes (households) to overall populations[108]. This has led to an estimated amount of $ 600 billion - $ 1.5 trillion as the annual costs of corruption globally. With regard to country rankings for the control of corruption indicator, France and the Netherlands attain 91 and 97 respectively, with 100 indicating the best possible evaluation of the control of corruption. Spain follows with 81, Poland with 71, Hungary and Lithuania with 67 and 65, Italy with 57 and Romania with 55.

The World Bank *Business Environment and Enterprise Performance Survey* (BEEPS)[109] covers a broad range of issues about the business environment with a focus on the countries of Central and Eastern Europe, the former Soviet Union as well as Turkey. It was launched in 1999 after a growing consensus that corruption and institutional weakness halted business and investment flows; it and provides a private sector view on corruption.

Comparable to the above World Bank initiatives is the World Economic Forum's *Global Competitiveness Report*[110]. The survey is based on an annual survey of 15,000 respondents from 142 economies focuses is on institutions and questions business leaders about aspects such as diversion of public funds, public trust in politicians, irregular payments and bribes, judicial independence, favouritism in decisions of government officials and wastefulness of government spending. It also provides estimates of the frequency of bribery in corruption, which was estimated at 10% by business leaders within the OECD as a whole.[111]

Despite their impact on media and political circles, perception indices and surveys have their limits. In fact, perception-based surveys are believed to face methodological challenges; especially concerning reporting bias that might influence the nature and quality of the results they deliver[112]. Moreover, they rely on perceived behaviour, which may in turn differ from the actual behaviour of agents, and they are not based on actual corruption experience or hard data. This applies both to individuals active in corruption (who are likely to downplay its importance) as well as to citizens who are strongly influenced by media coverage.

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[105]TRANSPARENCY INTERNATIONAL (2011) *Global Corruption Barometer*. Available from: http://www.transparency.org/research/gcb/overview.

[106]HARDON H. (2011) *Bribe Payers Index 2011*, Transparency International. Available from: http://www.cism.my/upload/article/201111041120400.Bribe%20Payers%20Index%202011_Full%20Report.pdf.

[107]KAUFMANN, D., KRAAY, A. and MASTRUZZI, M. (2009) *World Bank Governance Indicators. The World Bank*. Available from: http://info.worldbank.org/governance/wgi/index.asp.

[108]KAUFMANN (2005).

[109]WORLD BANK (2008) *Business Environment and Enterprise Performance Survey (BEEPS)*. Available from: http://beeps.prognoz.com/beeps_tables/Regular.aspx?rid= SHORTCUT_TO_DINAMICREPORT1_FOR_WEB&T=1.

[110]WORLD ECONOMIC FORUM (2012) *Global Competitiveness Report 2012-2013*. Available from: http://reports.weforum.org/global-competitiveness-report-2012-2013/#=.

[111]OECD (2007), *Bribery in Public Procurement*.

[112]SEQUEIRA, S. (2012) *Advances in Measuring Corruption in the Field*. London School of Economics. Available from : http://personal.lse.ac.uk/sequeira/Chapter_Corruption_Sequeira_February.pdf.

Thus, corruption perception can be self-reinforcing. For example, corruption perception can be considered high now even in countries where corruption is not considered a factual problem, such as Finland. Indeed, they suffer from error problems – although those surveys with multiple indicators (e.g. WGI) do less so than others. The current debate on the utility of these perception surveys also points to the variety and the lack of precision of the scores.[113] For example, surveys often do not ask what type of corruption is referred to. Furthermore, their very macro-nature limits their usefulness for anti-corruption policies[114], as well as sector-specific analysis. Another critique, specific to the Good Governance Indicators, is a supposed lack in consistency and lack of an underlying theoretical framework. Furthermore, the Good Governance agenda suggests a 'one size fits all' model for all governments, which does not take into account the different institutional characteristics and cultures between countries.[115]

Therefore, corruption perception surveys will not be used for the development of the comprehensive methodology.

6.1.2. *Expert Judgment*

Some authors believe that, in the near future, the empirical work on corruption will rely more on the use of questionnaires[116]. Indeed, qualitative data can be a useful tool to further investigate the indirect costs of corruption which are even harder to estimate than the direct costs. Besides typical qualitative tools such as questionnaires and interviews, round tables allow experts and analysts to discuss and debate on topics of major concern. Examples of such tools are the so-called *Diagnostic Surveys* developed by the World Bank on the basis of surveys undertaken in single countries. For example a study in Romania, carried out more than a decade ago, stated that 41% of public officials, 40% of households and 60% of entrepreneurs declared that their government was at the time not committed at all to the fight against corruption.[117] Expert judgment can inform about changes in perceptions, attitudes, norms and beliefs over time. They can help to bridge the gap between empirical data (including surveys) and conclusions, by explaining findings and pointing to gaps in assumptions.

Given the possibility of overreliance on expert judgment and the dependency on the attitudes of the interviewees and the difficulty to obtain cross-cultural meanings, expert judgment also carries the risk of subjectivity.

6.2. Strand II: Indicator-based literature

A substantial part of the literature on corruption and procurement focuses on the indicators or red flags that point to corruption. A range of studies have been carried out in this domain, and a convergence of these indicators can be noticed.

Not all red flags or indicators are proof of corruption. They rather point to an increased probability, within a specific context and within a certain stage of procurement. Some authors[118] distinguish between red indicators (strong indicators regarding the probability of corruption, often derived from investigations) and yellow indicators (weaker indicators regarding the probability of corruption, often derived from broader studies including socio-economic and statistical analysis. This analysis starts with macro-indicators ('yellow flags') and then pursues indicators at micro-level ('red flags').

[113]THOMSON, T. and SHAH, A. (2005) *Transparency International's Corruption Perceptions Index: Whose Perceptions are they Anyway?* World Bank Institute and University of Maryland.

[114]URRA, F. (2007) *Assessing Corruption: An analytical review of Corruption estimation and its problems: Perception, Error and Utility*. Edmund A. Walsh School of Foreign Service, Georgetown University.

[115]ANDREWS, M. (2008) *The Good Governance Agenda: Beyond Indicators without Theory*. Oxford Development Studies, Vol. 36, no.4.

[116]So far, the World Bank has developed such questionnaires and the European Bank for Reconstruction and Development has also become involved.

[117]WORLD BANK (2000) *Diagnostic Surveys of Corruption in Romania.*.

[118]E.g.: WARE, G.T. ET. AL (2007), 'Corruption in Public Procurement. A Perennial Challenge', in : CAMPOS, J. E. and S. PRADHAN (ed.) (2007), *The Many Faces of Corruption. Tracking Vulnerabilities at the Sector Level* (The International Bank for Reconstruction and Development / The World Bank).

6.2.1. *Macro- level indicators*

There is growing recognition that corruption is embedded within a wider socio-economic, cultural and political setting, and authors have pointed to the importance of macro- or context indicators – sometimes referred to as 'yellow flags' . The premise of this literature is that patterns of corruption are not only specific to cases or projects, but that they are to a large degree systemic and detected at the level of sectors, countries or regions. Most of this literature points to the importance of factors related to governance, rule of law and socio-economic development.

In a study using cross-country data for about 100 nations, the same authors, Goel and Nelson[119] point to the importance of government in explaining corruption – both in terms of size and scope of government. Furthermore, they point to historical inertia of institutions that induce corruption to persist.

The same authors also carried out a systematic analysis of the patterns of corruption in the US, both by looking at convictions and by including perception-based surveys[120]. They found that greater educational attainment lowers corruption. Greater income prosperity might decrease incentives to engage in corrupt activities. Other factors include demographics, government size, enforcement, location and media coverage.

A recent report[121] points to the fact public and private interests are often mingled. As a matter of fact, a state independent from private interests can only be seen in some of the most developed countries. Modern states are based on universal citizenship, with fair treatment of every citizen. However many societies have not reached this level of citizenship, and settle for a sub-optimal equilibrium of poor governance with an insufficient domestic push for change. In such societies, group interests tend to dominate over state interests (particularism).

As corruption is so deeply entrenched in societies, it also correlates with a much wider range of socio-economic phenomena. High corruption (or more precisely a low control of corruption) coincides with lower levels of tax collection, a significant increase in brain drain, low levels of voluntary work, and limited freedom of press and newspaper readership. A low control of corruption also coincides with a high increase in red tape and (non-tariff) trade barriers.[122] The question remains however what the precise (direction of the) causal links between these correlations are.

6.2.2. *Micro-level indicators*

Whilst the probability of corruption is influenced by context indicators, it requires more case-specific information to come to more informed estimates and predictions. The OECD[123] and Ware et al[124] present some of the most observed forms of corruption (e.g. kickbacks, bid rigging and use of shell companies). They lay a good foundation by suggesting a pallet of 'red flags' that can be used to identify corruption at different stages of the economic relationship. The proposed operationalization of these corruption probability indicators has been an inspiration for this study, and will be presented in subsequent chapters.

The World Bank has issued in 2010 a guide on the top 10 most common red flags of fraud and corruption in procurement for bank financed projects.[125] Their classification is based on cases of fraud and corruption in the public and the private sector and again is not particular to the EU setting. The study uses quantitative methods to select the most frequent set of indicators out of a sample constructed on a predetermined questionnaire.

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[119]GOEL, R.K. and NELSON, M.A. (2010) *Causes of corruption: History, geography and government*, Journal of Policy Modelling, Vol. 32, pp.433-447.

[120]GOEL, R.K. and NELSON, M.A. (2011) *Estimates of corruption and determinants of US corruption*, Economics of Governance, Vol. 12, pp. 155-176.

[121]MUNGIU-PIPPIDI, A. et al. (2011) *Contextual choices in fighting corruption: Lessons learned*. Norad Evaluation Studies no. 4. Available from: http://www.norad.no/en/tools-and-publications/publications/publication?key=383808.

[122]MUNGIU-PIPPIDI, A. (2013) *The Good, the Bad and the Ugly: Controlling Corruption in the European Union*. Hertie School of Governance. Available from: http://www.againstcorruption.eu/wp-content/uploads/2013/03/ANTICORRP-Policy-Paper-on-Lessons-Learnt-1_protected1.pdf.

[123]OECD (2007), *Bribery in Public Procurement*.

[124]WARE, G.T. ET. AL (2007), 'Corruption in Public Procurement'.

[125]KENNY, CH., and M. MUSATOVA (2010),'Red flags of corruption' in World Bank projects. An analysis of infrastructure contracts, The World Bank Policy Research working paper no. WPS 5243.

The OECD roundtable discussion on corruption (including collusion) in public procurement[126] lays a solid foundation for an economic operationalization of the red flag literature. It points to the need to separately address two forms of corruption: 1) market participants attempt to distort the fair allocation of resources through collusion and 2) corruption based on the relationship between the official in charge of the public procurement and one or more client market suppliers (e.g. kickbacks, bid rigging). The study does not perform a quantitative analysis, as it is presented in the form of a series of country snapshots – legal framework, main actors, main problems and best practices.

Furthermore, the Transparency International study on corruption in the sphere of public procurement in Indonesia, Malaysia and Pakistan[127] was an inspiration. It attempts to identify and cluster the indicators of corruption along the public procurement cycle. Within the context of World Bank research, the same approach is followed by Ware et al[128], who distinguish the following procurement stages:

1. Project identification and design;
3. Advertising, prequalification, bid preparation and submission;
4. Bid evaluation, post qualification and award of contract;
5. Contract performance, administration and supervision.

These valuable pieces of literature have influenced the development of the comprehensive methodology. Therefore the red flags used in this study are broadly organised along the lines of the above public procurement process in order to avoid double counting of indicators and to more accurately capture the risks of corruption in each stage of the procurement process.

The studies referenced above reflect efforts of the international community to raise awareness of the detrimental effects of corruption and to better understand the corruption phenomenon, from cause, to mechanisms of functioning, to consequences. Having said this, these studies share many similarities and give almost identical recommendations. Examples of such recommendations are the introduction of E-procurement, broader use of forensic audits, strengthening investigation and enforcement capacity, voluntary disclosure programmes, external monitoring, reporting and access to information and information sharing.[129]

A global shift can be seen towards an evidence-based approach to anti-corruption policy. New studies have emerged with the aim to help practitioners, investigators and policy makers to estimate the probability and costs of corruption. A broad overview of the red flag literature is presented in a note on the fraud indicators for ERDF, ESF and CF.[130] The study lists some of the most common indicators of fraud that have been observed in EU Cohesion Policy. Despite this wide collection of red flags for fraud, no argument is made that these are corruption relevant as well.

Based on its investigative experience, accumulated by OLAF over many years, the office has been able to conduct qualitative analyses of selected cases and identify several indicators of fraud and corruption. OLAF shared some of this knowledge with the researchers in the course of this study.

The above-mentioned sources and micro-level indicators were used for the construction of the comprehensive methodology, which aims to use a set of red flags which could be used to estimate the probability and costs of corruption in a comparative way across countries.

6.3. Strand III: Audits, investigations and the judiciary

Audits, investigations and the judiciary share a common unit of analysis: irregular, fraudulent or corrupt cases themselves. Each of these angles can provide a useful entry-point into the estimation of the costs of corruption. Audits provide information on the probability of fraud and corruption, while investigations make use of indicators and red flags. The judiciary provides judgments with regard to what is considered a corrupt case (and what not) as well as the costs that can be attributed to corrupt procurement practices.

[126]OECD (2010) *Collusion and corruption in Public Procurement*, Policy Roundtables. Available from: http://www.oecd.org/competition/cartels/46235884.pdf.

[127]TRANSPARENCY INTERNATIONAL (2006) *Handbook for Curbing Corruption in Public Procurement*. Available from: http://www.transparency.org/publications/publications/other/procurement_handbook.

[128]WARE ET. AL (2007), 'Corruption in Public Procurement'.

[129]Ibidem, p. 318 onwards.

[130]EUROPEAN COMMISSION (2009) *Information Note on Fraud Indicators for ERDF, ESF and CF. EC DG REGIO*, COCOF 09/0003/00-EN. Available from: www.eufunds.bg/document/271.

6.3.1. *Audits and statistics on irregularities*

Audit reports are important sources of information on the existence of malpractice in specific situations, particularly so in EU Structural and Cohesion Policy. Managing Cohesion Policy is complex and carries inherent risks due to the large numbers of projects and the involvement of various organisations.[131] Since 2007, the European Court of Auditors reports on the estimated error rate for Cohesion Policy. Having the benefit of their own audit capacity as well as the cooperation of National audit authorities, the Court has been able to construct a database with 'erroneous' transactions that took place within EU Cohesion Policy. The Court tests annually a sample of projects in the area of ERDF, Cohesion Fund, Energy and Transport – focusing on the regularity of interim and final payments. The audit points to large proportions of projects being affected by one or more errors: 59% in 2011, 57% in 2010, 36% in 2009 and 51% in 2008. The budget affected by these errors (most likely error rate or MLE) is estimated by the ECA to be 6% in 2011. This error rate is an estimation of the overall financial impact on the entire population of payments, based on the quantifiable error rate in the sample. Thus, the error rate includes both an assessment of the probability and of the related costs due to irregularities.

The findings themselves need to be seen in the light of the extensive system of audit authorities that has been set up to manage Cohesion Policy: 112 of these authorities are active in 27 Member States and responsible for auditing 434 Operational Programmes covered by the ERDF, the CF and the ESF. The Court comes to the view that 62% of the regional policy transactions affected by error could have been detected and corrected by Member State authorities prior to certification.[132]

The data confirm that weak management and weak control systems in the Member States are important factors. Furthermore, they also argue that not all sectors and Operational Programmes register the same amount of errors and that some errors show a strong persistence, leading them to argue for a corrective/ repressive approach.

According to the ECA, an important part of the irregularities identified are due to poor compliance with public procurement rules. In 2011, the ECA therefore audited 298 public procurement procedures for works and services underlying the above 180 projects with a combined estimated contract value of EUR 6.8 billion.[133] It found that EU or national procurement rules were not complied with in 25% of the 180 projects analysed. These errors were found to be related to internal market rules and not specific to Cohesion Policy. Examples of serious failures to respect public procurement rules include:

- Use of direct award without justifications;
- Direct award of additional works in the absence of unforeseeable circumstances;
- Contract awarded to single bidders without obtaining intended price reduction;
- Artificial split of tenders;
- Significant changes in the scope of the contracted works.

The methodology used by the European Court of Auditors focuses on irregularity and much less so on fraud or corruption. As irregularity is a common phenomenon (59% of the cases inspected by the ECA in 2011), it is possible to draw representative samples of a reasonable size (180 cases) and to detect such irregularities through standard audit practice. Known fraud or corruption rates within the Structural Funds are considerably lower.

The ECA found that 0.26% of the payment appropriation for the 2000-2006 period was affected by established fraud –intentional infringement of rules which can only be established through the outcome of judicial proceedings. The detection of fraud and especially corruption goes beyond standard audit practice and clearly requires performance audits as well as specialised investigations – such as those carried out by OLAF.

[131] EUROPEAN COMMISSION (2011) *Analysis of Errors in Cohesion Policy for the years 2006-2009. Actions taken by the Commission and the Way Forward*. SEC (2011) 1179. Available from: http://ec.europa.eu/regional_policy/sources/docgener/presenta/errors2011/sec_errors2011_en.pdf.

[132] EUROPEAN COURT OF AUDITORS (2012), *Cost-effectiveness of Cohesion Policy Investments in Energy Efficiency*. Special Report No 21/2012. Available from: http://eca.europa.eu/portal/pls/portal/docs/1/20590745.PDF.

[133] Ibidem.

Findings of the European Court of Auditors are resonated in recent reports from national Courts of Auditors. In its latest report on management in the Spanish regions, the *Tribunal de Cuentas* (Spanish Court of Auditors) denounced a serious lack of control in public procurement, where multiple illegalities led to serious cases of corruption, especially at a regional level.[134] The audit analysed around 2 500 public contracts of all kinds (public works, supplies, consultancies and others) awarded by almost EUR 10 billion between 2006 and 2007. Amongst the main typologies of bad practices in public procurement, which are often linked to corruption cases, the report highlights the following ones:

- Unjustified offers. Unjustified or insufficient justifications of the need for a certain contract and/or insufficient justification of the amounts of public contracts;
- Contract fractionation to avoid competition. Improper fractionation of the contract amount in order to use negotiated procedures and to avoid publicity and competition;
- False urgency. Abuse of accelerated public procurement procedures without an adequate justification. The halving of the time limits sometimes implies a restriction of competition;
- Abuse of tenders instead of auctions. Auctions were scarcely used, despite of the highly regulated nature of their procedure. Their use would assure a lower risk of violation of the principles of transparency and objectivity;
- Unjustified procurement typologies. Lacking or inadequate justification of the choice of a certain contract award procedure and method and, in particular, of the legal standards that allow the joint procurement of projects and works;
- Lack of criteria. Deficient establishment of the award criteria due to the lack of/imprecise methodology for their implementation and for the score assignment. In some cases, use of eligibility criteria as quality criteria. In other cases, higher scores were assigned to bidders who proved their experience in the region, which is contrary to the principles of equality and non-discrimination;
- Lack of technical data. Poor foundation of the contract awards from a technical point of view.
- Strange price reductions. Insufficient assessment of the price reductions, and especially with respect to the possible cases of abnormally low tenders;
- Lack of publicity. Lack of justification of the legal cases that allow the use of negotiated procedures without advertising;
- Contract modifications. Modifications of contracts in progress, and particularly of public works, which do not derive from new needs arisen during implementation, but are due to unforeseen factors and deficiencies related to the preparatory proceedings. In many cases, lack of the related compensation for damages caused to the public administration;
- Medical bills. Deficient compliance of the Public Administration with the invoices for supplies of consumables or medical equipment to hospitals and public health services;
- Unjustified need. With respect to consulting services, lack of a concrete justification by the public administration of the impossibility to carry out those services internally (by using its own staff/materials).[135]

6.3.2. *Fraud statistics*

Fraud statistics have received increasing attention in recent years; however there remain many hurdles in this domain. Levi and Burrows point to the fact that one should not only look at the information that is collected, but also at what is not collected as an indication of concern about social 'problems' as felt by those managing the state.[136] And much information is not collected in a harmonised way due to weaknesses and inconsistencies in defining fraud, the different purposes of data collection, the neglect of some forms of fraud, imprecision about the unit of analysis, time elapsed between the commission of the offence and the reporting, etcetera.

In recent years, considerable progress has been booked in the estimation of suspected fraud, both in terms of probability and amounts concerned. Although these statistics are not specific to corruption, they remain important for this study as corruption is considered to be a part of fraud. The EC investigation of fraud and corruption in expenditure programmes including Cohesion Policy is nowadays recorded through the Irregularity Management System (IMS) managed by OLAF, which captures a very high number of the irregularities reported. The web-based database allows for data-input of irregularities by users across the system.

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[134] TRIBUNAL DE CUENTAS (2012) *Informe de Fiscalización del Sector Público Autonómico, Ejercicios 2006 y 2007* (Spanish Court of Auditors, Audit Report on the Regional Public Sector, 2006 and 2007). http://www.tcu.es/uploads/I935.pdf.

[135] Within the context of this study, no cooperation from the Spanish Court of Auditors could be obtained.

[136] LEVI and BURROWS (2008) *Measuring the impact of fraud in the UK*.

The report system distinguishes Fraud Frequency Level and Fraud Amount Level. Over the years, the percentage of reported irregular cases where fraud is suspected (Fraud Frequency Level) varies from 3.2% in 2002 to 14.5% in 2007; in most recent years this rate was 10.4% (2009) and 6.6% (2010). The Fraud Amount Level has been considerably higher: 4.1% of irregularities in 2002 and 32.2% in 2006. Suspected fraud amounted to 9.6% of overall irregular amounts reported in 2010 and 23.5% in 2011. Such variations are due to the high impact of large, incidental the available information from the Irregularity Management System, the overall fraud rate (total amount of suspected and established fraud divided by the total of all Funds) was found to be 0.74% of the annual budget for Cohesion policy in 2010.[137] The frequency of fraud is found to be relatively high in the ESF (12.1% of detected cases in 2010), but the impact on the EU budget is lower as projects tend to be smaller (Fraud rate of 1.1%). For ERDF, the frequency of fraud was found to be somewhat lower (7.2% of cases detected in 2010); however the overall amount involved is higher due to the larger size of such projects and therefore the impact on the EU budget is greater as well (fraud rate of 2.5%).

For the previous programming period (2000-2006), strong differences in the Fraud rate were found within the 8 countries studied in this report: 0.1% in the Netherlands, 0.9% in France, 1.3% in Spain, 4.0% in Hungary, 15.2% in Lithuania, and up to 35% in Poland and 39.5% in Italy (no data available for Romania).

The above findings on suspected and established fraud are important references for this study; however there are several important operational limitations to be mentioned:

- The findings relate to fraud in general and not to corruption, which is considered only a subset of fraud;
- The above amounts are not necessarily to be seen as 'public loss', as they are commonly recovered by the EU; for instance the amounts still to be recovered linked to cases of suspected fraud amounted to 0.31% of the EU budget for 2010[138];
- The above amounts refer only to instances where fraud is suspected or established; the method is not able to estimate uncovered fraud and its size is expected to vary strongly between Member States and sectors;
- As with all crime statistics, the above amounts are not only an indication of the size of fraud, but also of the ability of the systems to detect fraud (as can be seen in the fraud rate in Italy).

In addition to these operational limitations, there is also a range of more fundamental limitations related to the statistics presented above. A recent study evaluating the need for a European Criminal Justice system commissioned by the European Parliament (the "EuroNeeds" study 2011) found a large number of structural barriers towards the conviction of criminal cases involving EU interests, including:

- Difficulties in requesting legal assistance;
- Limited recourse to the EU instruments and bodies for assistance;
- Difficulties when dealing with offences having an EU dimension;
- Low procedural standards (in order to ensure evidence admissibility);
- (Slight) biases against Member States prosecutions of offences involving EU interests.

Thus, there are ample reasons to assume that the current set-up has a bias against the detection, investigation, prosecution and conviction of cases where EU financial interests are at stake. [139]

[137] EUROPEAN COMMISSION (2011), *Statistical Evaluation of Irregularities - Own Resources, Agriculture, Cohesion Policy, Pre-Accession Funds and Direct Expenditure – Year 2010*, SEC (2011) 1108 final. Available from: http://ec.europa.eu/anti_fraud/documents/reports-commission/2010_ann2_en.pdf, p. 88.

[138] EUROPEAN COMMISSION (2011) *Report from the Commission on the protection of the European Union's financial interests and thefight against fraud*, COM (2011) 595 final. Available from: http://ec.europa.eu/anti_fraud/documents/reports - commission/2010_en.pdf.

[139] See also a forthcoming study on the impact of the different policy options to protect the financial interests of the Union by means ofcriminal law, including the possibility of establishing a European Public Prosecutor's Office (EPPO).

6.3.3. *Prevention and recovery statistics*

The EC has a system for monitoring recovery of funds through its Accrual Based Accounting system (ABAC).[140]

The recovery of funds is monitored through the Irregularity Reporting System, which also indicates which irregular amounts have not been paid out (prevention rates). Data available for the programming period 2000-2006 point to an EU-wide prevention rate of 16.4%, or about EUR 600 million out of an overall sum of irregular amounts of EUR 4 billion. These rates were much higher in Italy (26%), Poland (43%), Lithuania (49%), Hungary (72%) and the Netherlands (82%), while prevention rates were low in Spain (0.7%). This implies that the ability of Member States to detect irregularities prior to payment varies substantially.

Differences in recovery statistics are smaller: the overall recovery rate amounted in the period 2000-2006 to 67% for the EU as a whole, with higher percentages of recovery in those countries with lower score on prevention rates and vice versa.[141]

With regard to established fraud, an overall 162 cases were reported across the EU in the period 2000-2006. By far the largest number of established fraud concerns ESF (113 cases), followed by ERDF (28 cases) and EGFF (21 cases). Germany was by far the most successful in establishing fraud cases (100), followed by Poland (35) and Italy (14). The average amount affected by this fraud amounted to EUR 250 000 for ERDF, EUR 50 000 for ESF and EUR 25 000 for the EAGGF – Guidance Section.[142] With regard to the Cohesion Fund, irregularities and fraud appear to be more frequent in the environment (fraud rate of 1.3%) than in the transport segment (0.9%).[143]

Although not specific to corruption, the above findings are crucial as part of anti-fraud policies and initiatives.[144] Caution in the interpretation of these figures is however to be taken as these rates not only differentiate between crime rates but also between audit and investigative skills and capacities.

6.3.4. *Investigations*[145]

The recovery of funds by the EC can take place on the basis of audit reports and initiated by the responsible DGs. However the more serious cases of irregularities, in which fraud or corruption are suspected, are taken up by the EC's Anti-Fraud Office, OLAF. OLAF can decide whether it investigates such cases or not, and conclude its investigations with recommendations including those of a judicial, disciplinary, financial or administrative nature. It can also monitor the implementation of recommendations, notably those referring to criminal investigations, prosecutions and convictions, financial recoveries and disciplinary estimates.[146]

OLAF annual reports cover all the cases that have been investigated or concluded in the course of any given reference year and present concrete case studies through which OLAF's work is detailed[147]. Cases are classified according to their phase of analysis, divided between the selection phase and the investigation/coordination phase. Cases are also classified according to the source, the sector, the duration of the investigation and the type of recommendation that has been addressed to the competent authorities. In 2011, for instance, OLAF opened 144 new investigations and 34 new coordination cases, according to the new classification introduced as of 2011. Structural funds represented 55 investigative cases and 9 coordination cases. Among the 208 investigations completed by the end of 2011, 108 were accompanied by recommendations which could be of judicial, financial disciplinary or administrative nature.

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[140]EUROPEAN COMMISSION (2011) *Statistical Evaluation of Irregularities - Own Resources, Agriculture, Cohesion Policy, Pre-Accession Funds and Direct Expenditure – Year 2010*, SEC (2011) 1108 final. Available from: http://ec.europa.eu/anti_fraud/documents/reports commission/2010_ann2_en.pdf.

[141]COM (2011) 595 final. For example, e.g. Spain has a 0.7% of prevention rate and a 76% recovery rate.

[142] EUROPEAN COMMISSION (2011), *Statistical Evaluation of Irregularities - Own Resources, Agriculture, Cohesion Policy, Pre-Accession Funds and Direct Expenditure – Year 2010*, p. 96.

[143]EUROPEAN COMMISSION (2011) *Statistical Evaluation of Irregularities*, SEC (2011) 1108 final, 97.

[144]For analytical clarity, it should be noted that these rates may be considered to be an artefact consequent to differential audit and investigative skill rates, rather than solely of differential crime rates. Unfortunately assessing the quality of such secondary data is an aspect which cannot be fully addressed in the context of this study.

[145]This section will focus on EU-level investigations. National level investigations and their results have been reported in the Country reports that accompany this report.

[146]OLAF (2012) *The OLAF Report 2011*. Available from: http://ec.europa.eu/anti_fraud/documents/reports-olaf/2011/olaf_report_2011_en.pdf.

[147]See, for instance, the OLAF Annual Report 2011.

Over the period 2006-2011, OLAF transferred a total of 1030 cases to Member States, of which 54.3% were pending judicial decisions. Of the 471 cases with a judicial action, 51% resulted in dismissal, 6.6% in acquittal, and 42.3% led to convictions. In absolute terms, the highest number of convictions following OLAF investigations was recorded in Germany (65), Romania (35), Italy (14) and France (9).

Despite the overall importance of these fraud data, their usefulness for this study is limited as they are not specific to corruption. Furthermore, they focus on suspected or established fraud and can therefore be considered a subset of the overall amount of fraud.

6.3.5. *Methods used by the judiciary*

A final consideration within this strand of research relates to the methods used by the judiciary in the case of corruption regarding procurement related to EU Funds. The number of court cases referring to EU Funds and public procurement is very limited across the countries investigated. To date, most systematic evidence has been found from Italian case law – which is advanced when it comes to articulating its methods to assess the costs of corruption. The Italian practice is particularly useful as historically high levels of corruption are accompanied by an equally strong policy including judiciary actions against corruption.

Throughout the last decade, a rich jurisprudence has supported the Italian Court of Auditor's corruption-related assessments, in particular in the areas of awarding and management of public works and supplies. Its importance is derived from the recognition that corruption brings about both direct and indirect costs. [148]

- ***Direct costs***. Since corruption is believed to distort public resources from the community, the Italian judge generally understands the direct costs of corruption as damage to the Treasury. This is because the sums that have been illegally perceived expose the public administration to higher costs than those that could have been obtained. For quantifying the direct costs of corruption (and when specific conditions are met) a wide judgment tradition suggests to apply the so-called 'transfer of the bribe' principle. The principle considers that the entrepreneur, because of the costs deriving from the payment of illegal sums and the risks that such activity entails, cannot but try to obtain advantages that are at least equal to the amount of the bribes he has paid. Common experience suggests that the price rising of the tender is a consequence of the bribe payment, especially since the entrepreneur cannot operate within a loss account. For these reasons, the judge quantifies the direct loss to the Treasury as the amount of the bribe.[149]
- ***Indirect costs***. Italian case law is also quite advanced in the estimation of the indirect costs of corruption, which is expressed as 'image damages' to the Public Administration. The case law on the matter is wide and stems from the idea that the public goods and/or values are so relevant that their damage itself calls for compensation. Therefore, the judge considers that the original damaging fact (i.e. the payment of a bribe) is enough to call for a reimbursement, even when no restoring intervention is necessary. As for the quantification of the damage, the characteristics and dimensions of the illegal act have to be considered and weighted with objective, subjective and social criteria that have been elaborated by the accounting judiciary[150]. Finally, the amount of the bribe is another element that is weighted to determine the total image loss.

Clearly, the estimation of indirect costs taken by the (Italian) judiciary is just one possible approach. A wider body of literature exists on this topic, often recognising the overall impact on society, citizens, economic operators as well as the environment (e.g. Bankwatch or *Bundesverband Materialwirtschaft*).[151] Across these studies, definitions of direct and indirect costs can differ.

[148]Distinction between direct and indirect costs slightly differ from the one applied in this methodology.

[149]Although this amount could be only a part of the economic benefit for the entrepreneur.

[150]For example, an objective criterion is the modality through which the illegal act has been committed; one subjective criteria is the positioning of the civil servant within the Public Administration. As for the social criteria, they generally correspond to the territorial dimensions of the public entity, the relevance of the functions executed by the civil servant, as well as the diffusion and coverage of the facts.

[151]ARNOLD, U. and N. TRUCK (2004), *Gesamtwirtschaftliche Schäden von Korruption. In: e-Vergabe – Korruptionsprävention bei der elektronischen Vergabe* (Beschaffungsamt des Bundesministeriums des Innern und Bundesverband Materialwirtschaft, Einkauf und Logistik e.V.).

6.4. Strand IV: Performance analysis

Performance analysis assumes that corruption leads to compromises regarding the effectiveness and efficiency of projects and investments. A popular statement – often inspired by journalistic investigations - is that corrupt projects are often 'poor' projects, with substantial socio-economic, financial and/or environmental losses as a consequence. Here, it is assumed that – due to sub-optimal decision making and implementation, corrupt projects are indeed less performing than other projects, and that such performance concerns can be measured in several ways.

6.4.1. Budget review analysis

Several strategies might be followed under this approach: identify a mismatch between two sources of official administrative data, detect discrepancies between administrative data and results from an independent firm-survey; or generate two primary sources of data and finding gaps that suggest hidden or illicit behaviour.[152]

An illustration of such an approach is provided by an Italian study by Golden and Picci comparing the physical quantities of public infrastructure with a cumulative price government pays for public capital stocks.[153] The study develops a so-called 'Perpetual Inventory Method' and uses two sets of data referring to public capital stock in Italian regions and provinces: one on (financial) inputs and one on (physical) outputs. When correcting for a number of standardisation and aggregation problems (e.g. construction wages and basic construction materials, while controlling for altitude, population density and seismicity), the study develops two corruption indices. The index on general infrastructure points to a poor performance in southern regions. For example Calabria has slightly more than half the stock of (normalised) infrastructure than the national average, whereas Emilia-Romagna in the north has over 40% more than the average.[154] A second index on population-serving infrastructure (e.g. schools and hospitals) brings about similar results. This Italian budget review analysis points to very large differences in efficiency across one country. It recognises that such inefficiencies can be due to a large number of reasons, but that corruption often lies at the heart of it. It therefore points to the costs of corruption in a broad sense that can be much higher than previously found through other methods.

Despite its useful insights, there are clear limitations for the use of this Perpetual Inventory Method. Authors see possibilities for application in other EU Member States, including France, Germany, the UK and Spain where data on public capital stocks exist even though data on physical infrastructure are much harder to collect. The Authors admit however that such research would be 'painstaking' and that it could only be carried out by an international team with multinational funding.[155] Another limitation of the Golden and Picci study – not mentioned by the authors – is that it relies on strong intra-regional differences in efficiency and corruption, which are most probably highly specific to Italy. This method will therefore not be applied in this study, even though important notions on public loss will be incorporated into the work.

6.4.1. Public Expenditure Tracking Surveys

A specific elaboration of the above budget review analysis has been developed under the name Public Expenditure Review Surveys. This approach attempts to estimate corruption and consists of quantifying the flow of public resources across various administrative levels of government. It aims to identify, on a sample basis, how much of the original allocations (financial, salaries, in-kind items) reach the next level of government and, ultimately, the final delivery units such as schools and hospitals.[156]

Public Expenditure Surveys provide information on opportunities and/or incentives for corruption, such as procurement practices, budget transparency, etc. They do not estimate actual corruption, but can provide useful indications of the probability of corruption.[157]

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[152]SEQUEIRA, S. (2012) *Advances in Measuring Corruption in the Field*.

[153]GOLDEN, M.A. and L. PICCI (2005), *Proposal For A New Measure Of Corruption, Illustrated With Italian Data*, Economics & Politics Volume 17 March 2005, pp. 37-75.

[154]GOLDEN and PICCI (2005), *Proposal For A New Measure Of Corruption*, p. 62.

[155]A condition for such research is that the overall cost of such research is lower than what can be recovered from the emerging costs of fraud and corruption.

[156]GURKAN, A., KAISER, K. and VOORBRAAK, D. (2009) *Implementing Public Expenditure Tracking Surveys for Results: Lessons from a Decade of Global Experience*, The World Bank Prem Notes, Vol. 145. Available from: http://pets.prognoz.com/prod/Guidelines.aspx

[157]KAUFMANN, D., KRAAY, A. and MASTRUZZI, M. (2006) *Measuring Corruption: Myths and Realities. The World Bank*. Available from: http://www1.worldbank.org/publicsector/anticorrupt/corecourse2007/Myths.pdf.

The World Bank has adopted a particular indicator called the *Public Expenditure Tracking Surveys* (PETS), which is mostly used to trace the flow of resources from origin to destination and determine the location and scale of the anomaly[158]. By collecting information on aspects such as financial flows and outputs, the PETS enables the collection of information on actual public spending at the provider or facility level or by activity.[159] Also known as the 'follow the money initiative', the PETS methodology was first developed in Uganda in 1996, where the findings suggested that only 20% of the budgets allocated for high school education were actually reaching their final destination. However, some critics of the PETS methodology underline how it has proven difficult to apply where overly complex systems of financial transfer exist.[160] Moreover, the fact that an allocated budget does not reach its destinations can have numerous reasons other than corruption: theft, fraud, use of discretionary powers, etc. Furthermore, conducing PETS can be a difficult challenge, especially when it comes to gathering budget data on the basis of accounting books and reports.[161] Therefore, the Public Expenditure Tracking Surveys have been mostly applied to developing countries, where the capacities and the awareness of the targeted actors and communities are believed to be low.[162]

Hence, although a potentially promising strand, PETS are not relevant for this study since they are not implemented in the EU27, and because the underlying budget structures and schemes can be considered too complex for application in the context of EU Member States. This approach is also considered less appropriate as the focus here is on EU Funds rather than national funding streams.

6.4.2. *Cost overrun analysis*

The literature on cost overruns is important for this study, as higher costs can be considered one symptom of poor performance related to corruption. However, the EU literature on such cost overruns does not tend to make strong links with corruption.

A study commissioned by EC DG REGIO[163] compares the costs of 155 projects: 115 infrastructure projects and 40 productive investments. The study builds on the insights from the literature on the reasons for cost overruns. The assessment of output efficiency of major projects involves the current context and a comparison between the costs of these projects to produce benchmarks for various sectors.

Cost analyses are divided for three types of projects. For rail projects, unit costs (EUR 10 million per kilometre) were on average 27% higher than the ex-ante estimate. Rail projects had a higher degree of variation in unit cost due to the different design features. A key factor in cost overruns of tunnels is whether the tunnel is urban or rural: urban tunnels cost significantly more than rural ones. For road projects, unit costs were, on average 21% higher than estimated.

[158]The World Bank, Public Expenditure Tracking Survey, available http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALDEVELOPMENT/EXTPCENG/0,,contentMDK:20507700~pagePK:148956~piPK:216618~theSitePK:410306,00.html.

[159]REINIKKA, R. and SVENSSON, J. (2003) *Survey Techniques to Estimate and Explain Corruption*. World Bank. Available from: http://www1.worldbank.org/publicsector/pe/PETS2.pdf.

[160]SUNDET, G. (2008) *Following the Money: Do Public Expenditure Tracking Surveys matter?* Anti-Corruption Resource Centre. Available from: http://www.u4.no/publications/following-the-money-do-public-expenditure-tracking-surveys-matter/.

[161]GURKAN, KAISER and VOORBRAAK (2009) *Implementing Public Expenditure Tracking Surveys for Results*.

[162]SUNDET (2008) *Following the Money*.

[163]EUROPEAN COMMISSION, DG REGIO (2009) *Work Package 10, Efficiency: cost unit major projects, Final Report*. Available from: http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/expost2006/wp10_final_report.pdf.

Table 44: Cost overrun summary by country and sector

average percentage differences between estimated and actual cost

% / (number of projects)	*Rail*	*Road*	*Urban transport*	*Water*	*Energy*	*Weighted Average*
France			32.9% (1)			*32.9%*
Germany	-4.3% (6)	-10.0% (3)				*-6.2%*
Greece	74.3% (2)	19.7% (8)	20.1% (2)		0.0% (1)	*26.6%*
Ireland		2.1% (5)	74.1% (1)			*14.1%*
Italy	62.4% (5)	-5.0% (2)		-0.9% (1)		*37.6%*
Poland		19.7% (2)	80.9% (2)			*50.3%*
Portugal			9.0% (1)		3.3% (4)	*4.4%*
Spain	12.8% (6)	30.7% (1)		17.4% (2)		*15.8%*
United Kingdom					110.7% (1)	*110.7%*
Weighted average	*26.9%*	*9.4%*	*45.4%*	*11.3%*	*20.7%*	*21.2%*

Source: EC DG REGIO (2009) – Work package 10. Note: Positive values correspond to actual overruns, whereas negative values indicate that the actual average completion costs were below expected.

In the above studies, corruption as such has not been identified explicitly as a reason for cost overruns, nor have reasons such as clientelism, favouritism, collusion and conflicts of interest. Hence, relating cost overruns to corruption requires in-depth analysis especially of institutional factors.

Indeed, the literature on effectiveness and corruption is still rather scarce, although interest in this relation is clearly growing amongst researchers. A recent contribution to this literature is a study on effectiveness and efficiency in the Italian solid waste industry.[164] Although the study focuses on micro-data on waste collection activities in 529 Italian municipalities, it also includes macro-data (collected by Golden and Picci). It finds that addressing corruption could amount to a cost reduction of 8.8% and 14% respectively.[165]

6.4.3. *Standard Unit Prices*

A particular topic of cost analysis focuses on the benchmarking of standard unit prices. The standard unit price approach as has been explored by World Bank and EC DG REGIO allows for cross-country comparisons. However, it has proven to be methodologically challenging to develop standardised unit prices, because of the difficulties in gathering reliable unit costs benchmarks and in isolating a variety of cost elements. A useful application of standard unit prices therefore requires a generally accepted cost and price definition and assumptions about technical, organisational, micro and macro realities that influence such prices substantially.

The detailed analysis related to the standard unit price is provided in Chapter 11 of this report.

6.4.4. *Evaluation literature*

Good performance implies more than obtaining products and services at reasonable prices. It also involves broader performance issues, taking into account environmental and social considerations, but also the extent to which innovation and technological progress is encouraged.

[164] ABRATE, G., F. ERBETTA, G. FRAQUELLI and D. VANNONI (2011), *The costs of disposal and recycling an application to Italian municipal solid waste services*. Available from: http://www.carloalberto.org/assets/working-papers/no.232.pdf.

[165] WARE ET. AL (2007), 'Corruption in Public Procurement'.

Evaluation theory and practice offers a body of literature that addresses these broader performance issues. Standard evaluation guidelines (e.g. EC DG Budget 2004) suggest the following performance issues for EU funded projects:

- Effectiveness: the project does not reach its objectives; procurement of works, goods or services with a low (or even negative) public value ("waste");
- Efficiency: the outputs of the project are not in line with the inputs; sources of public loss include procurement at higher prices and similar quality as offered by competing bids ("excessive price"), procurement at similar prices but with lower quality than competing bids ("inferior quality");
- Utility (or need, rationale): the project does or does not address the problem;
- Impacts: the project generates unintended (negative) side effects; these include consequences for other public budgets, socio-economic and environmental consequences;
- Sustainability: the benefits of the project do not last over time, including the acceptability of stakeholders to embrace the intervention.

Effectiveness relates the input and the output to the final outcome[166], which is in turn influenced by several factors including contextual (environmental) factors. Efficiency demonstrates the success of the resources used in achieving the objectives set in advance. Thus, it is not always easy to distinguish between efficiency and effectiveness.

Even more difficult to establish are broader links between sustainability and impacts, which are even more rarely made in the corruption literature. However, the above-mentioned example on the Italian waste industry is revealing and exemplary in this respect. It not only found a link between corruption and costs, but also to levels of innovation and sustainability. A group of less corrupt municipalities distinguished itself from the group of more corrupt municipalities through more innovative waste collection schemes, resulting notably in higher recycling rates. Authors therefore suggest that pushing municipalities towards more result-oriented waste collection schemes (including recycling programmes) would help to curb corruption.[167]

Despite the importance of sustainability and innovation, the analysis in this study is limited to direct costs, and apply the effectiveness and efficiency concepts to the assessment at hand.

6.4.5. *Analysis of procurement data and competition*

The recognition that public procurement is among the most vulnerable government activities has been growing in recent years. Using World Economic Forum survey data, the OECD confirms that bribery is more pervasive in public procurement than in utilities, taxation, the judiciary or state capture.[168] The World Economic Forum survey, which reflects international business leaders' views, estimates that bribery occurs in over 10% of international procurement in OECD countries. This vulnerability is partly due to the complexity of public procurement and partly due to the fact that it concerns a relatively low number of high-value transactions.[169] As public procurement is such a large activity, the overall scope for improving effectiveness is large.

Various literature sources on procurement[170] point to the importance of competition. In order to obtain goods, civil works and services at low cost and with appropriate levels of quality, most public procurement systems attempt to construct market mechanisms, primarily by requiring competitive tendering procedures.[171] A World Bank analysis of procurement data from multi-and bilateral official development projects in three infrastructure sectors (roads, electricity, and water and sanitation) confirmed the existence of such a competition effect. To take full advantage of competition, at least seven bidders are needed in the road and water sectors, while three may be enough in the power sector. The paper also shows that not only competition, but also auction design, especially lot division, is crucial for reducing unit costs of infrastructure. Based on the estimated efficient unit costs, the annual financial needs are estimated at approximately $ 360 billion. By promoting competition, the

[166]E.g. MANDL, U., DIERX, A. and ILZKOVITZ, F. (2008) *The effectiveness and efficiency of public spending*. Economic Papers. DG ECFIN. Vol. 301. Available from: http://ec.europa.eu/economy_finance/publications/publication11902_en.pdf.

[167]WARE ET. AL (2007), 'Corruption in Public Procurement'.

[168]OECD (2007) *Bribery in Public Procurement – Methods, actors and counter measures*. Available from: http://www.oecd.org/investment/anti-bribery/anti-briberyconvention/44956834.pdf.

[169]WARE ET. AL (2007), 'Corruption in Public Procurement'.

[170]E.g. ESTACHE, A. and IMI, A. (2008) *Procurement efficiency for Infrastructure Development and Financial Needs Reassessed*, World Bank Policy Research Working Paper, Vol. 4662; AURIOL, E. (2006) *Corruption in Procurement and public Purchase*. International Journal of Industrial Organization, Vol. 24, pp. 867-885; WARE ET. AL (2007), 'Corruption in Public Procurement'.

[171]WARE ET. AL (2007), 'Corruption in Public Procurement', p. 297.

developing world might be able to save at most 8.2% of total infrastructure development costs.[172] Again, corruption can be seen to be part of a broader set of inefficiencies; however its role has not been made explicit in the above research.

More recent research of PwC, London Economics and Ecorys regarding the cost-efficiency of procurement within the EU[173] has been facilitated by the emergence of electronic procurement tender databases, such as the EU-wide TED database. The study points to the fact that the degree of competition in public procurement varies dramatically between the top and the lower performing group of countries. While the top group receives an average of 7 or more bids per procurement, the bottom group receives 3 or fewer. However, such differences only show partial results in terms of cost-efficiency. Most noticeable is the difference in procurement length between top performers and the bottom group.

Similar findings emerge from pioneering work on public procurement, corruption and state capacity.[174] An analysis of micro-level public procurement data with company-level and institutional-level data in Hungary points to a negative association between corruption and public sector efficiency. Administrative capacity appears to contribute to public sector efficiency, notably in terms of price gained and level of competition.

The above information on the efficiency of procurement markets can also be linked to surveys, notably the already above-mentioned *Global Competitiveness Survey* of the World Economic Forum, which estimates aspects such as intensity of local competition, extent of market dominance and effectiveness of anti-monopoly policy.[175]

6.5. Conclusions

6.5.1. Consistency of findings

The above overview points to a wide number of research strands available to identify and estimate corruption. When applying these methods to the 8 countries analysed in this report, it becomes clear that several of the research strands (II, III and IV) are able to produce tangible data on corruption or corruption-related matters, at the level of Member States at least.

[172] ESTACHE and IMI (2008) *Procurement efficiency for Infrastructure*.

[173] PwC, LONDON ECONOMICS, ECORYS (2011), *Public Procurement in Europe: Costs and Effectiveness*. Study commissioned by the European Commission - DG MARKT. Available from: http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/cost-effectiveness_en.pdf.

[174] FAZEKAS, M. and TOTH, I. J. (2012) *Public procurement, corruption, and state capacity in Hungary – objective estimates and new insights*. Corruption Research Centre - Corvinus University of Budapest.

[175] WORLD ECONOMIC FORUM (2012) *Global Competitiveness Report 2012-2013*. Available from: http://reports.weforum.org/global-competitiveness-report-2012-2013/#=.

Table 45: Overview of strands of corruption research and their findings on 8 Member States studied	Year	Scale	FR	HU	IT	LI	NL	PO	RO	SP
STRAND I: SURVEYS AND INTERVIEWS										
a. TI Corruption Perception Survey	2012	0-100	**71**	**55**	**42**	**54**	**84**	**58**	**26**	**65**
b. World Good Governance Indicators	2012	-2.5 - 2.5	**1.2**	**0.7**	**0.5**	**0.8**	**1.7**	**0.8**	**0.1**	**0.9**
- Voice and accountability	2012	-2.5 - 2.5	1.2	0.85	0.94	1.57	1.52	1.04	0.41	1.1
- Political stability/violence	2012	-2.5 - 2.5	0.61	0.75	0.59	0.63	1.12	1.09	0.12	0.13
- Government effectiveness	2012	-2.5 - 2.5	1.36	0.71	0.45	0.68	1.79	0.68	-0.22	1.02
- Control of corruption	2012	-2.5 - 2.5	1.51	0.34	-0.01	0.29	2.17	0.51	-0.2	1.06
- Rule of law	2012	-2.5 - 2.5	1.5	0.77	0.41	0.77	1.82	0.73	0.04	1.2
- Regulatory quality	2012	-2.5 - 2.5	1.11	1.05	0.75	0.94	1.84	0.96	0.72	1.09
c. World Economic Forum	2012	1-7	**4.2**	**3.4**	**2.9**	**3.2**	**5.6**	**3.6**	**2.6**	**3.5**
- Diversion of public funds	2012	1-7	4.8	3.8	2.9	3	5.9	4	2.5	3.7
- Public trust in politicians	2012	1-7	3.4	4	1.8	2.1	5.4	2.4	1.8	2.6
- Irregular payments and bribes	2012	1-7	5.4	2.6	3.9	4.5	6.2	4.9	3.7	4.8
- Judicial independence	2012	1-7	4.9	1.8	3.8	3.5	6.4	4.2	2.7	4
- Favoritism in decisions of govt. officials	2012	1-7	3.7	4.3	2.5	3.1	5.2	3.3	2.4	3.3
- Wastefulness of government spending	2012	1-7	3.1	3.7	2.3	3	4.7	2.9	2.5	2.7
STRAND III: AUDITS AND INVESTIGATIONS										
- Number of irregularities in SF	2012	Abs.	NA	32	12	26	10	270	20	2
- Fraud Frequency (FFL) in SF	2000-06		1.5%	7.6%	29.2%	13.1%	0.5%	22.1%	NA	4.3%
- Fraud Amounts (FAL(in SF	2000-06		0.9%	4.0%	15.2%	15.2%	0.1%	35.0%	NA	1.3%
- Fraud rate (FR) in SF	2000-06		0.3%	2.5%	3.1%	0.9%	4.1%	2.2%	NA	1.6%
- Prevention rate	2000-06		11.1%	72.0%	26.8%	49.1%	82.3%	43.4%	NA	0.7%
- Recovery rate	2000-06		48.0%	17.0%	54.3%	46.2%	57.1%	81.9%	NA	76.2%
- Established fraud cases	2000-06	Abs.	1	1	14	0	0	35	0	1
STRAND IV: PERFORMANCE DATA										
a. Cost overruns (rail, road, water, energy)	2000-06	% of costs	32.9%		37.6%			50.3%		15.8%
b. World Good Governance indicators	2012	1-7	**4.7**	**4.2**	**4.5**	**4.1**	**5.7**	**4.7**	**3.7**	**4.8**
- Intensity of local competition	2012	1-7	4	5.3	4.9	5.1	6.1	5.4	4.3	5.5
- Extent of market dominance	2012	1-7	4.6	3.4	4.9	3.4	5.4	4.7	3.4	4.5
- Effectiveness of anti-monopoly policy	2012	1-7	5.5	3.8	3.6	3.7	5.7	4.1	3.4	4.3
c. Analysis of TED procurement data	2006-10									
- Number of offers (mean)	2006-10	Abs.	5.0	3.5	5.3	3.5	5.5	3.1	3.8	8.8
- Incidence of cross-border wins	2006-10		1.9%	3.2%	2.3%	4.8%	3.6%	2.7%	5.6%	1.6%

Overall findings point to *comparable country rankings across methods:* the Netherlands has the best corruption scores, followed by France and Spain, with Lithuania, Poland and Hungary coming next. Italy performs considerably worse than these new Member States, while Romania has by far the poorest scores in the perception surveys reviewed. The corruption survey results are strongly correlated with other governance-related indicators, such as government effectiveness, rule of law, political stability etc. This confirms the systemic nature of corruption. Furthermore, countries with higher corruption scores tend to see reduced market performance – notably through reduced competition. For example the mean number of bidders for procurement projects in Italy and Romania is clearly lower than in other countries, despite the fact that larger countries have on average more bidders.

However, findings across the research strands disclose *substantial differences in the size of corruption*. Strong differences appear between survey-based approaches (strand I – pointing to high corruption in a range of Member States) and findings from audits and investigations (strand III – pointing to more incidental problems, at least with regard to fraud).[176] Furthermore, some findings from audits and investigations do not point to only to the levels of fraud, but above all to the strength of anti-fraud measures. This explains for example a Fraud rate of 4.1% in the Netherlands, higher than that of other countries. Findings from performance data point to less extreme values which fall between those from perception surveys and those from audits and investigations.

6.5.2. *Implications for the methodology*

In the subsequent presentation, the comprehensive methodology is built on the most useful and advanced insights with regard to 1) indicator development, 2) cost estimates and 3) estimation of probability.

The literature on ***indicators*** is rather well-developed. To develop the indicators for this study, indicator-based literature has been used as well as literature from audit and investigation findings.

When it comes to ***cost estimates***, performance analysis literature has been widely used.

The literature on ***probability*** appears to be much less developed. Here there has been drawn on audit statistics as well as findings from the analysis of procurement data and competition. However, the available literature appears to be largely insufficient to build on.

The corruption literature reviewed includes both micro- and macro-level sources. Both levels appear clearly important for the understanding and estimation of corruption. However: none or few of the analysed methods appear to connect micro- to macro-findings.

The comprehensive methodology that will now be presented provides value added in various respects to the literature identified:

- It combines the force of both micro- and macro-level approaches, by including both bottom-up and top-down analysis;
- It combines the dimensions of indicators, costs of corruption and probability;
- It allows for differentiation of findings between Member States and sectors.

[176]This may be the result of the possible investigative effort and therefore depending on available time and resources.

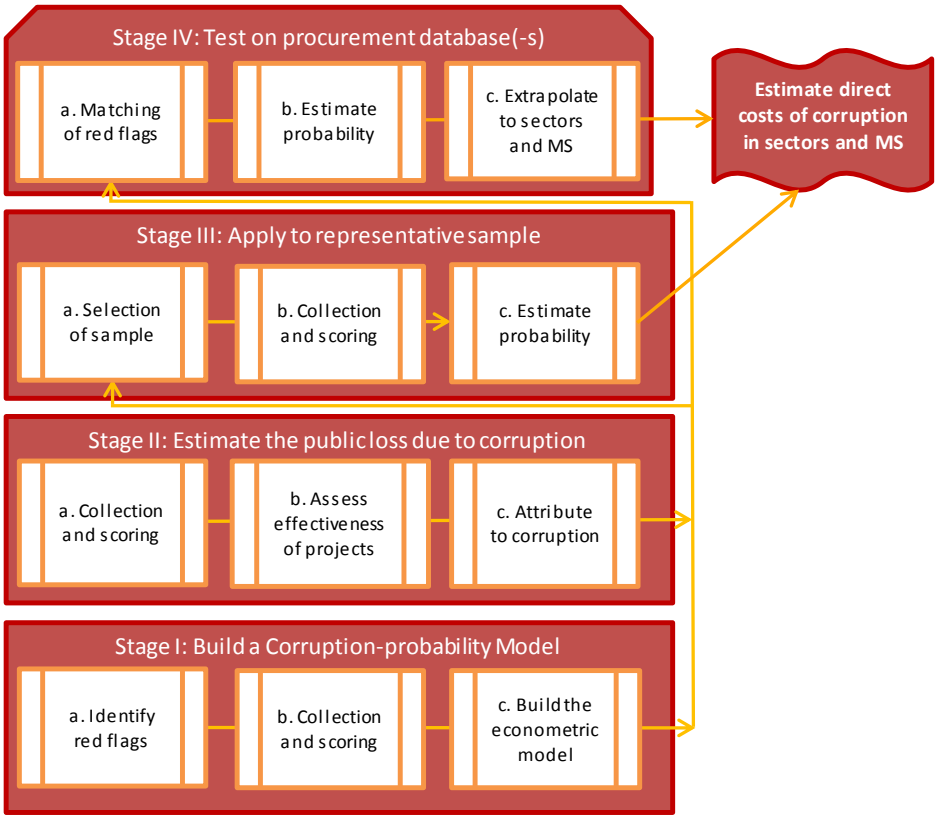
7. Stage I: Build a Corruption-Probability Model

7.1. Overview of the methodology

Our comprehensive methodology to measure the costs of corruption in public procurement will be presented in this and subsequent chapters. This methodology is above all an *econometric* methodology. Although it does contain elements of an investigative approach, it should not be treated as a forensic method geared towards the detection of individual cases of corruption.

The main stages of this method (including data, activities and outputs) are schematically presented in the 'Measurement House' below.

Figure 15: The Measurement House: Overview of the comprehensive methodology to estimate the costs of corruption in public procurement



The comprehensive method is based on several stages that build on each other and that ultimately provide an estimate of the direct costs of corruption in sectors and Member States studied. The method is based on the notion that costs of corruption depend both on direct public loss in individual corrupt cases due to performance issues and the probability that such cases are expected to be corrupt at some stage of the procurement process. Building on the insights available in the literature (see Chapter 6), the method starts with the identification of significant red flags derived from the scoring of a set of corrupt or grey as well as clean cases. On this basis, an econometric model is built to provide a basis for the first estimate of the probability of corruption. The same dataset also serves as a basis for the estimation of the direct public loss of corruption due to performance issues. Findings are then applied to a representative sample of procurement cases in 6 product groups, and tested on an EU-wide procurement database. This leads to an extrapolation and estimation of direct costs of corruption in public procurement of specific product groups/sectors in selected Member States. A Technical Annex (Annex G) provides details with respect to the econometrics used. The stages have been constructed as follows:

Stage I: Build a Corruption-Probability Model: A long list of (27) red flags have been identified and subsequently scored by applying them to a set of 96 corrupt or grey and 96 clean cases in 5 sectors and 8 Member States (see paragraph 2.2.5).The clean cases are used as a control group, allowing for a comparison with a set of corrupt/grey cases. The collection and scoring of data allows for an assessment of the power of individual red flags. A so-called Probit model[177] enables an assessment of the explanatory power of the red flags, not only individually but also in their relationship. A model has been built that aims to arrive at the best probability estimate.

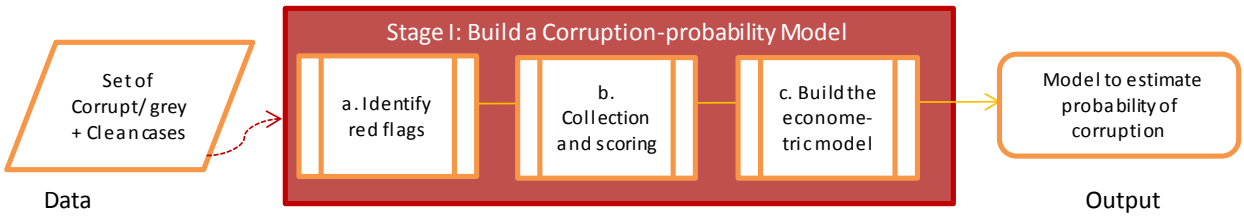
Stage II: Estimate the public loss due to corruption: For both categories of cases, an estimate is made of the performance of the cases in terms of (in-)effectiveness and (in-)efficiency loss – which are together considered the direct cost or direct public loss. This direct public loss takes into account cost overruns, delays and quality considerations. The difference between the direct public loss of corrupt/grey and clean cases is attributed to corruption.

Stage III: Apply to representative sample: This stage provides a first estimate of the probability of corruption within public procurement. A different, representative sample has thereto been drawn from public procurements in 6 specific product groups (defined within the above 5 sectors) and within the 8 Member States studied. Data on these procurement cases has been collected, and scored on the same long list of (27) red flags. The findings feed into the above-constructed Probit model and provide an estimate of the probability of corruption within the product groups selected.

Stage IV: Testing on procurement database: As the representative sample provides only information about a limited number of product groups, a further testing has taken place at the level of sectors through the TED procurement database. This testing is based on the operationalisation of a limited number of red flags only – namely those for which data are available in the TED procurement database. The findings are informative due to the large number of procurement cases covered.

The above stages allow for the extrapolation of direct costs of corruption within the sectors, product groups and Member States selected. This extrapolation takes into account the overall volumes of procured through EU tendering procedures, direct cost estimates from Stage II, and the probability estimates from both Stage III and IV.

The four stages are described in more detail below. In this chapter, the focus will be on the Stage I Corruption-Probability Model. A separate chapter is then serves to elaborate on each subsequent stage.



7.2. The Datasets

A total of 206 cases have been studied, of which 108 corrupt/grey and 98 clean cases. A quality check showed that 14 of these cases (of which 12 corrupt/grey and 2 clean) contained insufficient information on the red flags to be of use for the Stage I analysis. Therefore, detailed information on 192 procurement cases was collected, of which 96 relate to corrupt or grey procurements and 96 to clean cases. This is considered a sufficiently large number, and no comparable dataset of corrupt/grey cases within the EU context was encountered to date. The cases were collected in the 8 countries studied (France, Hungary, Italy, Lithuania, Netherlands, Poland, Romania and Spain) in the following sectors: Road & Rail Construction, Water & Waste, Urban/utility construction, Training, R&D/High-tech/Medical.

[177] A Probit model is a type of regression where a variable (corrupt or clean case) is to be explained by a set of other variables. The name comes from probability and unit.

Building on the overview of degrees of solidity in corruption cases, as classified in Chapter 4.2, the focus is on the following two categories of cases in public procurement: corrupt/grey and clean cases.

1. **Corrupt/grey cases**:

1.a *Corrupt cases*: cases where, in a final ruling that is no longer open to appeal, a procurement case was defined as corrupt and cases where a validated confession of one of the parties involved (preferably with underlying evidence) could be presented;

1.b *Cases with strong indications of being a "corrupt case"*: cases where, based on many reliable and verified sources (but where no verdict from the highest court nor confession is available) could be concluded that these are highly suspected to be corrupt cases – e.g. certain settlements, and verdicts from lower courts.

1.c *Grey cases*: Strong circumstantial indication or a mix of circumstantial indications, preferably pointing in the same direction, can point towards a case that is potentially corrupt. However, in order to prove that these indications are right, additional analysis of each identified case has been conducted. These cases have, if no explicit evidence is presented from the opposite, been considered as possibly corrupt cases, since a sufficient number of cases of the categories 1.a "corrupt cases" and 1.b "cases with strong indications of being a 'corrupt case'" were not always available. These grey cases are explicitly separated from non-corrupt cases to rule out any possible bias.

2. **Clean cases**: cases where there is no reason to assume that corruption has taken place.

The number of cases which is formally considered corrupt or where there is a strong indication (24 cases) is only part of the group of corrupt/grey cases. This situation is a direct consequence of the small number of convicted cases related to public procurement, and within the sectors and Member States selected compared to the overall numbers of these cases.

Nevertheless, the use of grey cases allows for the possibility of inclusion of a number of cases being effectively clean (so-called 'false positives'). However, such classification errors can be countered by another possible classification error: the inclusion of corrupt cases in the group of 'clean' cases (so-called 'false negatives'). Therefore, from a statistical point of view, the issue of incorrect classification of cases is not considered a major obstacle for the use of the comprehensive methodology.

Our hypothesis is therefore that the corrupt and grey cases are rather similar in characteristics. This hypothesis will be tested in the course of this Stage I.

Table 46: Overview of cases studied (for Stage I and II)

Status	Corrupt/grey	Clean	Total
Number of cases studied	108	98	206
Number of cases retained for Stage I analysis	96	96	192
Number of cases retained for Stage II analysis	86	31	117

In the end, the cases collected in this project can be considered a unique and powerful dataset to test the relevance of red flags for identification of corruption in public procurements. OLAF has checked the cases against their information and was able, for a number of cases, to confirm the findings.

Cases have been identified within five selected sectors. However due to differences in frequency and availability, the number of cases varies between sectors. The table below shows the number of cases collected from each sector.

Table 47: Spreading of cases over sectors	
Sector	*Number of cases*
Road & Rail Construction	44
Water & Waste	28
Urban/utility construction	65
Training	20
Research & Development / High Tech/Medical Products and Services	33
Other sectors	2
TOTAL	**192**

Source: calculations based on collected dataset.

The above sector breakdown has been adjusted in light of the number of real cases that could be identified in the sectors and Member States studied. [178] A detailed overview of the sectors and the CPV (Common Procurement Vocabulary) codes is provided in Annex F. The following remarks on the sector grouping can be made:

- *Road & Rail construction*: this group includes both local and national roads including motorways, as well as bridges and tunnels. Rail construction includes urban rail and metros. These projects can be procured by national, regional and local authorities and can benefit from ERDF and Cohesion Fund support (main corresponding Structural Funds product groups: 311, 312, 313);
- *Urban/utility construction* consists of a wide set of projects involving the building of schools, hospitals, sports complexes, stadiums, opera houses and other public buildings including airports. These projects tend to be procured by local governments and can benefit from ERDF support (main corresponding Structural Funds product groups: 35, 314);
- *Water & Waste sector* includes the procurement, running and maintenance of sewage installations, as well as water supply and water management projects, which tend to have similar characteristics. These projects are often procured by local governments and can benefit from ERDF and Cohesion Fund support (main corresponding Structural Funds product groups: 343, 344, 345);
- *Training* includes projects which are within the scope of ESF support (main corresponding Structural Funds product group: 23);
- *R&D/High-tech/Medical* includes IT investments as well as health/hospital equipment, which fall within the scope of ERDF and FP7 support. The small number of cases in this group has prevented a breakdown between ERDF- and FP7-relevant cases (main corresponding Structural Funds product group 18).

In Poland it turned out to be impossible to find more than 13 corrupt/grey cases in the selected sectors and two corrupt/grey cases from other sectors were added.[179] These were fully included in the identification of red flags, the probability of corruption at Member State level and the costs of corruption at Member State level.

The aim has been to include as many cases as possible involving EU Funds. Currently, 26 cases without EU Funds were identified. However, these cases were retrieved from the very same sectors where EU Funds are spent. The assumption is that the source of the budget does not play any relevant role for potential corruptors. This made it possible to take into account these cases without EU Funds as well.

The cases differ in budgets from several thousand to several hundred million Euros. The overall public budget involved in these cases amounts to more than EUR 5.5 billion. The table below reports some more descriptive statistics on the project size.

[178] Sector grouping has taken place on the basis of the characteristics of the suppliers, in line with CPV codes as used in the TED database.
[179] Our robustness analysis showed that the inclusion or exclusion of these two cases does not alter the results in any way.

Table 48: Descriptive statistics on procurement size	
Statistic	*Value*
Average project size	€ 29 358 872
Median	€ 2 900 000
Standard deviation	€ 89 362 331
Minimum	€ 9 800
Maximum	€ 875 000 000 [180]
Sum	€ 5 519 467 972
Number	188 [181]

Source: calculations based on collected dataset. The project value used in this table is the overall project value, which includes EU Funds as well as non-EU Funds.

Cases also vary in terms of market structure, both in terms of demand side (procurement authorities) and supply side (contracted companies). With regard to the demand side, as will be presented later in this report (Chapter 10.5), each of the sectors has different patterns in terms of the level of government involved. Road and especially rail projects are more frequently tendered by central, national procurement authorities. For urban & utility construction as well as water & waste, decentralised authorities (e.g. local governments) are more often in the lead. The picture is rather mixed for training projects (both central and decentralised authorities), as well as R&D/High-tech/Medical. With regard to the supply side, contracted companies tend to be large across the sectors studied, especially so in the road & rail sector, urban & utility construction, as well as water & waste.

Furthermore, each corrupt/grey case has particularities with regard to the corrupt practices applied. These practices are grouped as described in the box below.

Box 1: Typology of corrupt practices – building on empirical evidence

On the basis of the case study analysis, and using the established types of corruption identified in the literature, the following corrupt practices in the 96 corrupt/grey cases were encountered:

Bid rigging

The contract is 'promised' to one contractor, with or without consent of the public official issuing the tender. Bid rigging is a form of collusion which takes into account considerations other than merit, caused by passive bribery or by cooperation amongst bidders. Forms of bid rigging are bid suppression, complementary offers, bid rotation and subcontracting.

Kickbacks

The public official demands or is open to a bribe which will be accounted for in the tendering process, including administrative processes.

For example, the public official falsifies documents in order to attest to completion of work, that in reality has not taken place.

The public official deliberately overlooks fraud or falsification detected, most likely because he/she receives financial or other compensations from the contractor to do so.

[180] This largest case can be considered an outlier, and has been omitted from certain statistical calculations.

[181] It should be noted that this does not include 4 cases of which the consortium was unable to retrieve the project size.

Conflict of interest

The public official holds a post with or owns shares in the wining company.

The public official has family members working with or owning shares in the winning company.

The public official has very close friendly relationships with the management/owners of the winning company.

The public official has close ties to a political party that itself has a business or a political agenda vis-à-vis any tenderer.

Other – including deliberate mismanagement/ignorance

The public official has not properly carried out checks or followed procedures where this is required.

The public official tolerates/ignores overt deliberate mismanagement by a contractor.

Source: Country reports for 8 selected Member States, drafted for the purpose of this study.

The types of corrupt practices encountered are recorded in the table below.

Table 49: Types of corruption by sector (based on sample results)

	Bid rigging		*Kickbacks*		*Conflict of interest*		*Deliberate mismanagement*	
Sector	#	%	#	%	#	%	#	%
Road & Rail	10	44%	8	35%	4	17%	1	4%
Water & Waste	15	62%	6	25%	3	13%	0	0%
Urban/utility construction	19	40%	14	30%	11	23%	3	7%
Training	1	14%	3	43%	2	29%	1	14%
Research & Development	12	67%	4	22%	2	11%	0	0%
Total	**57**	**48%**	**35**	**29%**	**22**	**19%**	**5**	**4%**

Note: Certain cases displayed multiple types of corruption, which explains why the number of observations (119) exceeds the total number of cases.

Table 50: Types of corruption by Member States (based on sample results)								
	Bid rigging		*Kickbacks*		*Conflict of interest*		*Deliberate mismanagement*	
Member State	#	%	#	%	#	%	#	%
France	6	40%	3	20%	5	33%	1	7%
Hungary	9	60%	2	13%	4	27%	0	0%
Italy	12	63%	3	16%	4	21%	0	0%
Lithuania	11	73%	2	13%	1	7%	1	7%
Netherlands	0	0%	0	0%	1	100%	0	0%
Poland	10	52%	6	32%	2	11%	1	5%
Romania	4	24%	8	46%	4	24%	1	6%
Spain	5	28%	11	60%	1	6%	1	6%
Total	**57**	**48%**	**35**	**29%**	**22**	**19%**	**5**	**4%**

Note: Certain cases displayed multiple types of corruption, which explains why the number of observations (119) exceeds the total number of cases.

Bid rigging is observed in almost half (48%) of the practices and most present in Water & Waste and R&D projects. Bid rigging is encountered more frequently in Hungary, Poland, Lithuania and Italy. Kickbacks are encountered in about 1 out of 3 cases. This practice appears to be rather equally spread across all sectors. Kickbacks are the most frequent form of corruption encountered in Spain and Romania. Conflict of interest practices were encountered in around 1/5th of cases and across all sectors, though slightly more frequent in the Training and Urban/utility construction sector. Deliberate mismanagement was encountered on average in 4% of all practices.

7.3. A) Identify red flags

The first activity of this Stage consists of the identification of indicators of corruption, also referred to as 'red flags'.

The term 'indicator' is not applied in a uniform way in the literature, and its meaning differs slightly depending on whether the findings are based on audits or investigations, or from econometric or socio-economic analysis. In the econometric method at hand, red flags suggest a possible increased probability of corruption. In the context of this study, a red flag provides information on the chance of corruption being present. More red flags indicate a higher chance of corruption. Two caveats are in place. First of all, the red flags indicate a *chance* of corruption in a procurement which says nothing on actual presence of corruption in an individual case. Procurements with lots of red flags – and thus a high chance of corruption – may be non-corrupt, while procurement with no red flags – and thus a low chance of corruption – may still turn out to be corrupt. While in individual cases, chances of corruption and actual presence of corruption may be misaligned, the chance of corruption does allow estimating the total number of corrupt cases in a large group of cases. The second caveat, related to the first caveat, is that red flags reflect the status with respect to chance of corruption, but they do not cause the status. In other words, while red flags may indicate an increased chance of corruption, procurement becomes corrupt due to presence of red flags. The terms 'red flag' and 'indicator' are basically interchangeable in this terminology.

The indicators (i.e. the red flags) that were tested were collected in a two-step process. First an extensive literature survey was conducted and, to the extent possible, all the indicators of corruption mentioned in the literature were incorporated. After having collected a gross list, this list was revised– i.e. possible duplicate indicators, indicators that were likely to be relevant only outside the EU and indicators that were mentioned very seldom were removed. Finally, the indicators were tested during a pilot that was conducted in Romania.

Building on the literature presented in the previous chapter, the red flags that have been tested in the methodology are listed. They are presented according to the phases of the public procurement process. These indicators broadly fit the micro-economic literature as outlined in Chapter 7.

It is important to note that these indicators relate not only to the procurement process itself, but also to the decision to contract and the contract monitoring and implementation stages that tend to receive less attention but which can be prone to corruption as well. A distinction is made between:

1. The decision to contract;
2. Definition of contract characteristics;
3. Contracting process;
4. Contract award;
5. Contract implementation and monitoring.

1) The decision to contract

Public authorities decide to purchase goods, works and services. It is possible at this point that the decision does not follow a policy rationale or an existing need but rather the desire to channel benefits to an individual or/ and organisation.[182]

Investigated red flags:

Is there any evidence for conflict of interest for members of the evaluation committee (for instance because the public official holds shares in any of the bidding companies?)
Is there strong inertia in the composition of the evaluation team of the tender supplier?

When a tender provider assesses the need for a product/ service it goes without saying that he/she has collected information about the impact this product would have on the relevant stakeholders. Therefore, lack of consultation of the tender beneficiaries is likely to point to a non-rational policy decision.

If funds are instead corruptly channelled to individuals or organisations, this is likely to be seen as an unexplained rise in the wealth of officials involved in the tendering procedure just before the tender and shortly after the award.[183] They are also very likely to explain why officials are unlikely to seek a promotion or another job as the present one offers extra benefits that are not legally accounted for. Furthermore, the fact that teams in charge of tender evaluations remain more stable relative to their environment could point to the fact that there is unwillingness from the team members to relocate, even to better positions.

The need to disguise this increase in wealth is clear and therefore a network analysis is needed to really detect it. That is why it is important to look at the wealth of immediate family and at the financial position of other companies owned by the corrupt officials. Furthermore, political parties to which corrupt officials belong can be used just as any other financial entity to channel illegal funds to certain party members. Another red flag is the possible impartiality of the tender provider to certain suppliers because of past or present affiliation.[184] This affiliation, be it direct or mediated via family members reduces the uncertainty that exists between the tender providers and the specific supplier and could therefore create the proper environment for illegal funds channelling.

2) Definition of contract characteristics

Public authorities determine what they need and how they will go about it. The risk here is that the tender is designed in such way that it favours a special bidder instead of addressing a specific need.

Investigated red flags:

Are there multiple contact offices/ persons?
Is the contact office directly subordinated to the tender provider?
Is the contact person employed by the tender provider? Are there any elements in the terms of reference that point at a preferred supplier?

[182]OECD (2007) Bribery in Public Procurement, pp. 19-20.
[183]OECD (2007) Bribery in Public Procurement, p. 57.
[184]Information from OLAF.

Middlemen are often used by tender suppliers to intermediate the flows of money (TI 2006). The existence of multiple contact offices that are not directly subordinated to or employed by the tender provider and that provide consultation to the bidding companies could point out to their position in the tender process as middlemen.

Furthermore, the tender can be constructed in such a way that it discourages the participation of non-corrupt competitive bidders.[185] It is therefore important to look at the evaluation criteria and assess whether they are conspicuous. This conspicuousness is assessed by looking at the attention that the tender provider pays to concealing corrupt intentions. This ranges from low attention of the tender provider when it practically nominates the favoured supplier in the text of the call, to high attention when the tender provider uses multiple evaluation criteria and small weights to stump out criteria that favour a certain supplier.

3) Contracting process

A contracting process opens. It should take place according to what method the law determines be used to receive proposals (e.g. open bidding system) or evaluate contractors (e.g. single source). The risk is that the tender process does not follow the legal design in order to restrict the entrance of competitive bidders.

Investigated red flags:
Was there a shortened time span for the bidding process?
Has the procedure for an accelerated tender been applied?
Is the size of the tender exceptionally/ unusually large (e.g. packaged)?
Is the time-to-bid allowed to the bidders in conformity with the legal provisions?
Are bids submitted after the admission deadline still accepted?
How many offers have been received?
Are there any artificial bids (e.g. bids from non-existing firms)?
Are there any (formal or informal) complaints from non-winning bidders?
Are there any connections between bidders that would undermine effective competition?
Are all bids higher than the projected overall costs?

Once a tender process is open, the tender provider can still dissuade competitive bidders by keeping the contracting process non-transparent and by circulating private information to favour a particular clientele. One way to do so is unjustified procurement typologies. Negotiated or restricted procedures can be used in situations where these are not justified. However, when compiling the list of red flags, we did not find any indication in the (international) literature that such procurement typologies (often specific to EU Directives) would lead to higher corruption. Hence, we have not taken this indicator into account. However, another way to do so is to shorten the time span for the bidding process or to apply an accelerated procedure, also in situations where such procedures are not justifiable. This indicator, which has for example been detected by the Spanish Court of Auditors in relation to corruption (see section 6.3.1), has been retained.

Furthermore, it is important to look for signs of opaque contracting and to see whether the tender provider keeps accurate minutes of the discussion it has with its potential suppliers, and whether these minutes are made available to all bidders. Similarly, it will be inquired as to the extent to which the tender provider speeds up the tender process to discourage competitive suppliers from submitting a bid. A competition effect makes procurement more efficient and effective. The number of bids is thereto important, even though the optimal number of bids differs between sectors, subject of procurement (works, services, goods) and the Member State concerned.

[185]Information from OLAF.

From the bidder's side, the chance of bidder collusion increases when tender procedures are transparent and predictable.[186] Therefore the unusual composition and distribution of bids put forward in a call will be analysed and matched with known patterns of collusive behaviour. In this sense, high prices and similar bids are expected to strongly signal collusion; bidders would be expected to also adopt more sophisticated strategies, for example in subcontracting one another so as to avoid competition. Finally, as collusion is a risky trust game, collusion is expected less likely to occur when bidders have different nationalities and more likely to occur when bidders are closer to or have more things in common (i.e. management teams, assets, property etc.).

4) Contract award

The contract process ends and a decision is made to select the winning bidder. The risk is that evaluation criteria are not clearly stated in tender documents, leaving no grounds to justify the decision of awarding the tender to a corrupt supplier.

Investigated red flags:

Are the contract award and the selection justification documents publicly available?
Are all bidders informed of the contract award and on the reasons for this choice?

At this point the tender provider has already made a decision over the winning supplier, and this decision has to be justified and made public.[187] One would look at whether the tender formulates strict requirements for justification of the award and at whether these reasons are presented in due time to all other bidders. One would also investigate whether the contract award and the justification documents are publicly available.

5) Contract implementation and monitoring

The contract is signed with the selected bidder or contractor. The risks are that contract changes and renegotiations after the award are of a nature that changes the substance of the contract itself. Another risk is that monitoring agencies are unduly influenced to alter the contents of their reports so changes in quality, performance, equipment and characteristics go unnoticed. Moreover, contractor's claims can be false or inaccurate and can be protected by those in charge of revising them. Finally, fictitious companies can be used to relieve the procurement authorities from any accountability or to unlawfully channel funds.

Investigated red flags:

Is there any indication of overrun of costs in the execution compared to the original budget?
Are there substantial changes in the scope of the project or the project costs after award?
Awarded contract includes items not previously contained in the bid specifications?
Are there inconsistencies in reported turnover or number of staff?
Are audit certificates issued by unknown/local auditor with no credentials?
Is there any negative media coverage about the project (e.g. failing implementation)?
Is there any substantial delay in the project?
Is there any inferior quality in the deliverable(s)
Have objectives been reached as expected?
Are objectives still expected to be reached in the future?
Is the winning company listed in the local Chamber of Commerce?

At the contract implementation stage, the risks of corruption are threefold. First, the procuring entity can fail to keep track records of their procurement process thereby allowing changes to the awarded contract to be made and even to go unnoticed. This would provide public authorities the freedom to ask for additional services to be

[186]OECD (2007) *Bribery in Public Procurement*.
[187]OECD (2007) *Bribery in Public Procurement*.

provided on top of what was requested in the tender. But it would also allow the winning bidder to reduce the proposed workload, the scope of the project etc. It is therefore important to investigate any changes in the scope of the project compared to the original design, as well as changes in quoted prices as compared to the original quotations.

Second, the monitoring entity can be corrupt or negligent such that the poor performance of the contractor is not recorded or is diluted. It is therefore important to look at audit assessments and compare these with relevant media coverage of the tender.

Third, the case in which audit companies reveal irregularities due to poor performance of the supplier will be investigated. At this point, the risks of corruption are assigned to the supplier who has to fake some of the costs it has incurred such that it can recuperate the bribe and make a profit. To check for this, unusual costs and charges and unusual time delays in the execution of the project will be looked at.[188]

Finally, phantom companies can provide the best coverage for fake invoices, and therefore the real existence of the subcontracting firms and of the other team members will be checked, and their persistence in the market. The first question to ask is whether the winning bidder has been registered at the Chamber of Commerce.

The overall list of red flags assembled can now be presented below.

Table 51: Overview of red flags assembled - including assumptions about patterns of corruption

	Assumption	*Shorter name*
1	Strong inertia in the composition of the evaluation team of the tender supplier	Strong inertia in composition of evaluation team
2	Any evidence for conflict of interest for members of the evaluation committee (for instance because the public official holds shares in any of the bidding companies)	Conflict of interest members of evaluation team
3	Multiple contact offices/ persons	Multiple contact points
4	Contact office is not directly subordinated to the tender provider	Contact office not subordinated to tender provider
5	Contact person not employed by the tender provider	Contact person not employed by tender provider
6	Any elements in the terms of reference that point at a preferred supplier (e.g. unusual evaluation criteria or explicit mentioning of the brand name of the good instead of general product characteristics)?	Preferred supplier indications
7	Shortened time span for bidding process (e.g. request on a Friday for a bid to be sent the following Monday)	Shortened time span for bidding process
8	Procedure for an accelerated tender has been applied	Accelerated tender
9	Size of the tender exceptionally large (average value plus two times the standard deviation)	Tender exceptionally large
10	Time-to-bid allowed to the bidders not in conformity with the legal provisions	Time-to-bid not conform the law
11	Bids submitted after the admission deadline still accepted	Bids after the deadline accepted
12	Few offers received	Number of offers
13	Any artificial bids (e.g. bids from non-existing firms)	Artificial bids
14	Any (formal or informal) complaints from non-winning bidders	Complaints from non-winning bidders
15	Awarded contract includes items not previously contained in the bid specifications	Award contract has new bid specifications

[188]Information from OLAF.

16	Substantial changes in the scope of the project or the project costs after award	Substantial changes in project scope/costs after award
17	Any connections between bidders that would undermine effective competition	Connections between bidders undermines competition
18	All bids higher than the projected overall costs	All bids higher than projected overall costs
19	Not all (or: no) bidders informed of the contract award and on the reasons for this choice	Not all (or: no) bidders informed of the award and its reasons
20	Contract award and the selection justification documents not publicly available	Award contract and selection documents not public
21	Inconsistencies in reported turnover or number of staff	Inconsistencies in reported turnover/number of staff
22	Winning company not listed in the local Chamber of Commerce	Winning company not listed in Chamber of Commerce
23	No EU funding involved (as % of total contract value) *No hypothesis*.	% of EU funding
24	Share of public funding from the MS is involved (as % of total contract value) *No Hypothesis*	% of public funding from MS
25	Awarding authority not filled in all fields in TED/CAN	Awarding authority filled in all fields in TED/CAN
26	Audit certificates issued by unknown/local auditor with no credentials (cross-check reveals external auditor is not registered, not active or registered in a different field of activity)	Audit certificates by auditor without credentials
27	Any negative media coverage about the project (e.g. failing implementation)	Negative media coverage

The red flag questions are constructed in such a way that, according to the literature, they are expected to be answered positively more often for corrupt/grey cases. Hence, a positive relationship is expected between the number of red flags and the status of cases being corrupt/grey. Exceptions are by definition those questions that are not answered with yes or no (red flag 12, 23 and 24), but with a number. For those red flags the expected relationship is either negative (red flag 12: less bids indicates corruption) or unclear (red flag 23 and 24: % of funding from EU / the MS). In absence of consistent findings from the literature, note is therefore to be taken of the fact that no *a priori* assumptions have been made with regard to the relation between the corrupt/grey status and cases which have benefitted from EU funding.

7.4. B) Collection and scoring

The collection and analysis of 96 corrupt/grey cases has followed an agreed protocol which consisted of the following activities:

- *Activity 1: Preparation of the field work (desk-research);* Focus has been on the national and sector levels, where cases have been identified. Use has been made of the national country reports provided by the ECLAN network and the data obtained from the PwC Network;
- *Activity 2: Scoping stage (national level);* A set of high level interviews with experts in the field of corruption took place to identify cases and sources for further research. These contacts have been used as gate-keepers to more specific interviewees in the subsequent stages.
- *Activity 3 In-depth research of cases (case level);* Collection and assessment of case-specific data of corruption in public procurement in the sectors of the economy selected; identification and testing of red flags of corruption (the list of 27 red flags identified above). Data on cases that are corrupt (or grey) should preferably be derived from actual files or databases containing the original data, information and/or documents with regard to these files. When access to such files or databases was granted, information was either copied to be taken to the country research team office, or assessed on the spot. For this assessment, the list of initial identified red flags was used and main findings reported in templates. If direct access to files and databases was refused, an interview was scheduled to derive as much detailed information as possible on the cases that are corrupt (or grey) and cases that were clean from the respondent. In practice, some indicators (e.g. all bids higher than the projected overall cost) could be detected more easily from official public sources, while others (e.g. conflicts of interest) had to be gathered on the basis of interviews (including those with experts, see also activity 2 above). As this collection exercise is not to be seen as an investigative procedure, the research team has refrained from judgments and relied on the evidence obtained from this process (including triangulation of sources).
- *Activity 4: Collection of other data (national level);* National-level interviews and research have been taken place in order to collect overall statistical and market data and other information in order to supplement the findings.
- *Activity 5: Reporting;* The reporting has been performed according to the templates provided.

The collection and scoring of the information on red flags has been a major undertaking. At the beginning of this work, the assumption was that such cases would be much more widely available, however this turned out to be a wrong assumption. The following barriers to collection of information on corrupt cases were encountered by the study teams in one or several Member states:

Our interest focused on procurement within a restricted number of sectors, within 8 selected Member States and during the period 2000-2010. This focus has led to a more restricted population of cases.

It proved difficult, and sometimes impossible, to obtain access to files of formal investigative institutions. Frequently, it was not possible to conduct a case analysis as – in line with national legislation – no access to the relevant files was granted. The complex and decentralised governance structure of EU Funds leads to a high level of decentralised public procurement, and fragmented procurement data. In some countries, researchers found it difficult to obtain objective information on the topic, as cases can be part of bipartisan disputes, involving political parties, government institutions and the press. Some of the organisations concerned (e.g. procurement agencies) have formally declared that their role is not to detect corruption, and have therefore insisted that there is no basis for cooperation in the context of this project. The researchers engaged did not have the authority to demand such cooperation. In some countries, the study team could get insight in anonymised databases in order to analyse cases of allegations/investigations involving procurement. The information available was however of a high-level character, preventing answering the detailed questions required for this method. As a consequence, the number of red flags that could be actually ticked can be considered a conservative estimate.

Some information – including apparently obvious red flags such as the number of bids – was missing. Due to a lack of a good central database, the local study teams were often dependent on the information provided by the responsible authorities. Some of the cases included in the analysis are rather old and the persons giving us the information were often not employed at the specific authority at the time of the procurement. With no explicit requirement to keep track of the number of bids submitted, this information was easily forgotten. Moreover, newer employees were rather unable to retrieve this information from memory if not from the registries.

Furthermore, in many cases the procurement was part of a broader corrupt practice, which could include limited or incorrect provision of information regarding the procurement process (e.g. number of bids).

As a consequence of the above barriers, not all questions could be easily answered for all analysed cases. The table below shows the answers collected for the 192 cases. For 4 of the red flag questions, it proved impossible to find a definite yes/no answer in more than 50% of the cases.

Table 52: Answers to red-flag questions

#	*Short name of the red flag*	*Yes*	*No*	*% unanswered*
1	Strong inertia in composition of evaluation team	21	69	53%
2	Conflict of interest members of evaluation team	27	88	40%
3	Multiple contact points	27	73	48%
4	Contact office subordinated to tender provider	38	56	51%
5	Contact person employed by tender provider	40	60	48%
6	Preferred supplier indications	40	122	16%
7	Shortened time span for bidding process	14	154	13%
8	Accelerated tender	12	147	17%
9	Tender exceptionally large	38	133	11%
10	Time-to-bid not conform the law	6	158	15%
11	Bids after the deadline accepted	1	151	21%
12	Number of offers			26%
13	Artificial bids	9	122	32%
14	Complaints from non-winning bidders	41	95	29%
15	Award contract has new bid specifications	17	124	27%
16	Substantial changes in project scope/costs after award	35	110	24%
17	Connections between bidders undermines competition	18	102	38%
18	All bids higher than projected overall costs	14	99	41%
19	Not all (or: no) bidders informed of the award and its reasons	6	115	37%
20	Award contract and selection documents public	113	45	18%
21	Inconsistencies in reported turnover/number of staff	7	83	53%
22	Winning company listed in Chamber of Commerce	106	8	41%
23	Absence of EU funding			11%
24	% of public funding from MS			15%
25	Awarding authority filled in all fields in TED/CAN	83	26	43%
26	Audit certificates by auditor without credentials	4	59	67%
27	Negative media coverage	71	100	11%

Source: calculations based on collected dataset. Unanswered is a rest category, which includes mainly “don’t know”, “N/A” and not answered. Questions 12, 23 and 24 are not answered with yes/no but with a number.

One final remark regarding this red flag methodology must be made. All of the above indicators are to be considered factors that add to the probability of corruption, but can never provide definite answers about the status of a specific case. Furthermore, as corruption takes increasingly sophisticated forms, corrupt actors can pursue practices not (yet) covered by these red flags. Besides, corrupt officials may have the tendency to prevent disclosure of information, which in the methodology at hand could lead to a large share of missing information. The next section will therefore explore whether there is a relation between missing information and the status of a case.

7.5. C) Build the econometric model

7.5.1. Assessment of individual red flags

A key question in this activity is whether the corrupt/grey cases differ from the reference group, the clean cases or not. The power of individual red flags can be determined by relating the status of a case (corrupt/grey or clean) to the occurrence of red flags. The following table presents correlation statistics: a maximum correlation of one implies that the red flag is ticked in all corrupt/grey cases and in none of the clean cases. Such a high correlation goes together with a low P-value[189]. A P-value below 0.05 points to a pattern whereby a red flag scores statistically differently between corrupt/grey and clean cases.

The statistically significant correlations (which indicate relevant red flags) are marked with an asterix (*) and are presented in bold. Note that one extra indicator has been added: the amount of missing information. This is simply the number of red flag questions that could not be answered for each case. This red flag has been added on the basis of the above assumption, that more missing information may point to a higher chance that a case is corrupt[190]. Please note the distinction between Red Flag 25 and the amount of missing information. The first refers to the information available in the TED database. The latter refers to the amount of missing information in our dataset, and is not specifically a red flag.

Table 53: Correlations between corruption and red-flags

#	*Short name of the red flag*	*Correlation*	*P-value*
1	Strong inertia in composition of evaluation team	0.0167	0.8183
2	Conflict of interest amongst members of the evaluation team (4)	*0.3653	0.0000
3	Multiple contact points	-0.0449	0.5359
4	Contact office subordinated to tender provider	-0.0917	0.2060
5	Contact person employed by tender provider	-0.0225	0.7570
6	Preferred supplier indications (2)	*0.4873	0.0000
7	Shortened time span for bidding process	*0.2003	0.0053
8	Accelerated tender	*0.1721	0.0170
9	Tender exceptionally large	*0.3301	0.0000
10	Time-to-bid not conform the law	*0.1796	0.0127
11	Bids after the deadline accepted	0.0724	0.3186
12	Number of offers	*-0.1781	0.0346
13	Artificial bids	*0.2218	0.0020
14	Complaints from non-winning bidders	0.1144	0.1142
15	Award contract has new bid specifications	*0.2383	0.0009
16	Substantial changes in project scope/costs after award (5)	*0.3373	0.0000
17	Connections between bidders undermines competition	*0.1787	0.0131
18	All bids higher than projected overall costs	*0.1603	0.0264
19	Not all/no bidders informed of the award and its reasons	0.1197	0.0981
20	Award contract and selection documents public	*0.2582	0.0003
21	Inconsistencies in reported turnover/number of staff	*0.1945	0.0069
22	Winning company listed in Chamber of Commerce	-0.1043	0.1501
23	Absence of EU funding	*-0.2157	0.0046

[189]The P-value can be seen as the chance the correlation is found accidently (hence all amounts are considered lower than 0.05 significant and above 0.05 insignificant).

[190]The underlying reason could be that corrupt officials may try to keep information confidential and not share it with the research team; it could also imply that the administrative capacity in the procuring organisation is insufficient; or the case is part of an on-going formal investigation which prevents disclosure of information.

24	% of public funding from MS	0.1598	0.416
25	Awarding authority filled in all fields in TED/CAN	*0.1522	0.0351
26	Audit certificates by auditor without credentials	0.0729	0.3147
27	Negative media coverage (1)	*0.5287	0.0000
-	Amount of missing information (3)	*0.4317	0.0000

Source: calculations based on collected dataset

Overall, 18 red flags point to significant correlations with a corrupt/grey status. This can be considered a very high score, and points to a confirmation of the power of the red flags selected from the literature. All the significant red flags have the expected sign, confirming the hypotheses that were formulated in section 7.3.[191]

The strongest correlations appear as follows:

1. Negative media coverage;
2. Amount of missing information;
3. Preferred supplier indications;
4. Conflict of interest amongst members of the evaluation team;
5. Substantial changes in project scope/costs after award.

Overall, involvement of EU Funds appears to be associated with less corruption, and this correlation is statistically significant. However, it was not possible to find a relation between the probability of corruption and the precise share of EU Funds involved.

Following the identification of red flags, the extent to which corrupt cases show a higher presence of red flags has been assessed. The results are presented in the table below.

Table 54: Scoring of corrupt/grey and clean cases on red flags

		Number of cases	Average number of red flags[192]	Level of transparency[193]
1a+1b	Corrupt	24	4.6	54%
1c	Grey	72	4.5	64%
2	Clean cases	96	1.8	80%

A crucial finding from the above table is that the average number of red flags scored is 4.6 for corrupt cases, 4.5 for grey cases and 1.8 for clean cases. The above differences between corrupt/grey and clean findings are statistically significant and point to at least four important conclusions:

- Corrupt cases are indeed characterised by a higher number of red flags than clean cases;
- Corrupt and grey cases score virtually the same number of red flags (4.6 and 4.5), supporting the hypothesis that grey cases resemble corrupt cases much more so than clean cases. Their difference in status may be due more to their judicial status than to the underlying variation in the nature of the case.
- The amount of information that could be collected (the level of transparency) is for clean case much higher (80% coverage) than for corrupt cases (54%), with grey cases being in the middle (64%). This finding supports the above hypothesis that officials may try to keep information on corrupt/grey cases confidential;
- The difference between corrupt /grey cases and clean cases is even stronger if the more limited amount of information available on corrupt/grey cases is taken into account.

The number of red flags also differs between sectors and Member States. The overall number of red flags (corrupt and clean cases combined) is highest in waste water treatment (3.8 red flags), followed by urban & utility construction (3.5) and road & rail construction (3.1). The number of red flags (again, corrupt/grey and clean cases combined) appears to be relatively high in Romania, followed by France, Lithuania, Italy and Hungary. The numbers of red flags scored are lowest in Poland and the Netherlands.

[191]Note that the strong relation with negative media coverage, and to a lesser extent conflict of interest and preferred supplier, might be due to the classification procedure used.

[192]The three red flags that consist of a number instead of a yes/no answer are not taken into account; all red flags are formulated positively.

[193]The level of transparency is calculated as follows: The country teams tried to answer 27 questions about each case. The more questions they were able to answer (no matter what the answer was) the higher the transparency. The percentage reported is the simple division of the number of questions answered by the total number of questions (27). Hence, if 20 questions could be answered for a certain case, the case scored a level of transparency of (20/27=) 74%.

Table 55: Descriptive statistics on procurement size and numbers of red flags				
	Average size [1)]	*Number of cases [2)]*	*Average number of red flags*	*Average % of information missing*
Corrupt	€ 83 mln	24	4.6	45%
Grey	€ 42 mln	72	4.5	36%
Clean	€ 8 mln	96	1.8	20%
Road & Rail Construction	€ 39 mln	44	3.1	27%
Water and Waste	€ 80 mln	28	3.8	26%
Urban & Utility Construction	€ 19 mln	65	3.5	34%
Training	€ 2 mln	20	2.0	28%
Research & Development	€ 10 mln	33	2.8	24%
France[3)]	€ 138 mln	17	4.4	41%
Hungary	€ 33 mln	30	3.2	31%
Italy	€ 9 mln	26	3.5	27%
Lithuania	€ 7 mln	30	3.8	10%
Netherlands	€ 5 mln	6	2.5	7%
Poland	€ 25 mln	29	1.4	44%
Romania	€ 6 mln	26	5.2	46%
Spain	€ 33 mln	28	3.0	45%

Notes:
1) The four cases for which the size is unknown are not taken into account
2) The three red flags that consist of a number instead of a yes/no answer are not taken into account; all red flags are formulated positively.
3) One very large case (EUR 800 million) is considered and outlier and has not been taken into account here.

Relations with types of corruption

Each of the red flags identified hints at particular types of corruption; therefore it has been assessed whether there is any relation between these red flags and the types of corruption included in the dataset.

As mentioned above, although a clear split of the cases in types of corruption is not possible, an indicative overview points to almost half (47%) of the corrupt/grey cases being related to bid rigging, followed by kickbacks (31%), conflict of interest (19%), and deliberate mismanagement (6%) (multiple answers are possible).

To identify whether different types of corruption are related to different red flags, a correlation has been made between the red flags in all corrupt/grey cases followed by a similar analysis for those belonging to one type of corruption (thereby ignoring all corrupt/grey cases of the other types). Due to the limited number of cases on mismanagement, no calculations were made for this type. The table below presents the main findings.

Table 56: Correlations between corrupt/grey cases and red flags					
#	*Short name of the red flag*	*All corrupt/ grey cases*	*Bid rigging*	*Conflict of interest*	*Kickbacks*
1	Strong inertia in composition of evaluation team	0.0167	-0.0301	0.0013	0.1137
2	Conflict of interest members of evaluation team	0.3653*	0.3091*	0.6906*	0.5089*
3	Multiple contact points	-0.0449	-0.0379	0.0017	-0.0802
4	Contact office subordinated to tender provider	-0.0917	0.0489	-0.186*	-0.1905*
5	Contact person employed by tender provider	-0.0225	0.0801	-0.0907	-0.1845
6	Preferred supplier indications	0.4873*	0.5681*	0.6106*	0.5709*
7	Shortened time span for bidding process	0.2003*	0.3008*	0.0741	0.1035
8	Accelerated tender	0.1721*	0.2478*	0.1711	0.1035
9	Tender exceptionally large	0.3301*	0.2963*	0.3588*	0.1846
10	Time-to-bid not conform the law	0.1796*	0.2720*	0.2105*	.
11	Bids after the deadline accepted	0.0724	0.1199	.	.
12	Number of offers	-0.1781*	-0.2112*	-0.1463	0.0364
13	Artificial bids	0.2218*	0.2720*	0.2990*	0.3563*
14	Complaints from non-winning bidders	0.1144	0.1514	0.1873*	-0.0878
15	Award contract has new bid specifications	0.2383*	0.3008*	0.2496*	0.2173*
16	Substantial changes in project scope/costs after award	0.3373*	0.3617*	0.4327*	0.2841*
17	Connections between bidders undermines competition	0.1787*	0.2178*	0.3063*	0.0476
18	All bids higher than projected overall costs	0.1603*	0.2966*	0.0433	-0.0639
19	Not all/no bidders informed of the award and its reasons	0.1197	0.1053	0.2210*	0.1522
20	Award contract and selection documents public	0.2582*	0.2550*	0.2901*	0.0867
21	Inconsistencies in reported turnover/number of staff	0.1945*	0.2092*	0.3679*	.
22	Winning company listed in Chamber of Commerce	-0.1043	-0.1464	0.0624	-0.0917
23	Absence of EU funding	-0.2157*	-0.1035	-.1918*	-0.2139*
24	% of public funding from MS	0.1598	0.1373	0.0983	0.2139*
25	Awarding authority filled in all fields in TED/CAN	0.1522*	0.1570	0.0941	0.0690
26	Audit certificates by auditor without credentials	0.0729	0.0434	-0.0417	-0.0366
27	Negative media coverage	0.5287*	0.4890*	0.4800*	0.5085*
-	Amount of missing information	0.4317*	0.3940*	0.2591*	0.5008*

Source: calculations are based on collected dataset. Note: to increase readability, all red flags are positively formulated (meaning that the expected sign on the basis of the hypothesis is positive). Question 12 is not a yes/no question, but the number of offers. Questions 23 and 24 are formulated as a percentage.

The results show that the relation between types of corruption and red flag patterns is rather complex, and interpretation requires some nuances. Notwithstanding, the following patterns can be observed with regard to individual red flags:

- Complaints from non-winning bidders are related to conflict of interest only, which sounds plausible since (suspicions of) conflict of interest might be visible from the outside and therefore could lead to complaints;
- Bid rigging correlates relatively strong with the red flags identified, suggesting that these red flags appear quite capable at detecting this type of corruption. Typical and powerful indicators associated with bid rigging are a low number of bids and all bids being more expensive than the expected overall costs. Other indicators for bid rigging (with consent of the public official) are a shortened time span and accelerated tender.
- Kickbacks appear to correlate slightly less with the red flags identified. Typical and powerful indicators associated with kickbacks include conflicts of interest within the evaluation team and a large amount of information missing.

On the basis of these correlations, the indicators selected may have a stronger predictive power for bid rigging than for kickbacks. This is the more important as types of corruption vary between sectors and Member States.

7.5.2. *Assess indicator sets*

The above assessment of individual indicators provides essential information on the characteristics of corrupt/grey cases compared to clean cases. The question now needs to be posed whether one really needs to know all information about all red flags in order to make statements about the probability of corruption? Or are there possibilities to make 'smart sets' of indicators that have together a comparable explanatory power? Clearly, if this were to be the case then there could be substantial advantages with regard to the amount of information to be collected and the efficiency when implementing this method. Thereto the relations were reviewed not only between corruption and the red flags, but also between the various red flags themselves. As could be expected, several indicators can be found, often in conjunction with each other. Examples include:

- A case with preferred supplier indications (red flag 6) also demonstrates a higher probability of the awarded contract having new bid specifications;
- A case with a small number of offers (red flag 12) also tends to have bids with higher than projected overall costs;
- Complaints from non-winning bidders (red flag 14) often coincide with a higher probability of the awarded contract having new bid specifications;
- When all bids are higher than projected costs (red flag 18), inconsistencies in reported turnover/number of staff are more frequent as well;
- Awarding authorities fill in all fields in the TED database (red flag 25) more often in cases for which EU-funding is involved.

A conclusion from the review of these relations is that these are often blurred, sometimes trivial and not necessarily informative. For this reason, this type of analysis is brought to an end here – and recourse is taken to a more advanced econometric analysis.

The more advanced econometric analysis, which aims to find out if the probability of a case being corrupt/grey can be predicted on the basis of its characteristics. A so-called multivariate Probit model has thereto been constructed.[194]

[194]The idea of a Probit model is not to try to explain/predict some standard variable which can be any number, but a variable which consists of only yes and no answers (or only zero and one values). In this Stage, we try to explain/predict whether a case is corrupt/grey or clean. A Probit-model takes into account that these are the only two options and therefore basically explains/predicts the probability that the case is corrupt/grey. This can be done more efficient by not assuming a linear relationship (which is the standard in econometrics), but by using a non-linear relation. This non-linear relation makes it somewhat harder to interpret the results; we therefore also calculate and show the marginal effect. The marginal effect of a red flag is the increase (or decrease) of the chance of corruption when the red flag is present in a case (as opposed to the situation where the red flag is not present). Multivariate means that we use multiple variables (red flags) to explain/predict corruption instead of one at a time, as is the case with correlations. This gives the advantage that we can correct the relation between one red flag and whether a case is corrupt/grey for the occurrence of all other red flags and context variables, such as country and sector. This means that the relations found with these econometric estimations should be interpret as: given all other characteristics (red flags, country and sector) the occurrence of this red flag is related with X% more chance of corruption. With X being the marginal effect obviously.

The model is self-constructed and includes a set of variables which explain best whether a case is corrupt/grey or clean. Building on the literature on indicators, differences are acknowledged between countries and sectors (through so-called sector-dummies and country-dummies[195]) to correct for these context variables.

Box 2: About the use of dummies

Variation in the frequency of red flags can arise due to various reasons. There is a need to recognise that there are differences between sectors as well as Member States, and these differences need to be taken into account.

Thus, the model makes use of so-called 'dummies'. A dummy variable basically means that the assigned value could be either zero or one; either a case is within a certain sector/country (value = 1), or it is not (value = 0). The set of dummy variables basically sets the context in which a certain case is situated. The calculation of the effect of a red flag is what economists call 'ceteris paribus', i.e. all else being constant.

Although the model contains country and sector dummies, the coefficients of these dummies cannot be used for the analysis of country or sector specific corruption. The reason lies in the applied method for data collection. For interpretation of the coefficients, a random selection of cases for Stage I is required. As we collected a set number of corrupt/grey and clean cases - with numbers we have set ourselves for efficiency purposes - and as the coefficients of country and sector dummies are determined by the number and share of corrupt/grey and clean cases, the coefficients cannot be interpreted. More specifically, the effects of these context variables suffer from the so-called 'selection bias'.

Before the running the model, an assessment was made of the *independence* of the indicators listed from the status ('corrupt/grey' or 'clean'). Red flags 2 (composition of the evaluation team), 6 (audits) and 27 (negative media coverage) have been dropped because they are too strongly related to the selection procedure and can therefore better be seen as dependent variables (part of corruption) than independent variables (indicators for corruption).

Overall, the explanatory power of the model – using a total of 15 red flags – is 0.55. This implies that the model is able to explain 55% of whether a case is corrupt/grey or not. This percentage can be considered high given the hidden nature of corruption and the variety in patterns of corruption between countries and sectors. In the literature there is only one study with a similar type of approach, namely to explain money laundering in the real estate sector. In this study, Unger and Ferwerda[196] eventually derive a model with an explanatory power around 10%. It can be therefore concluded that this model performs very well.

[195] A dummy variable basically means that the value could be either zero or one. Note that we consider the country and sector variables context variables for which we want to correct, but which we do not want to interpret, because these were parameters to acquire a widespread set of cases.

[196] UNGER, B. and J. FERWERDA (2011) *Money laundering in real state*. Utrecht University.

The table below shows the results of the complete estimation with the maximum number of red flags. (Red flags in light colour are not included in the model as they do not add to the explanatory power of the model).

Table 57: Econometric estimation using the maximum number of red flags – an effective model

#	*Short name of the red flag*	*Coefficient*	*Standard error*	*Marginal effect*
1	Strong inertia in composition of evaluation team	-0.254	(0.712)	-0.100
2	Conflict of interest members of evaluation team	Too related to the dependent variable		
3	Multiple contact points	0.904*	(0.517)	0.301
4	Contact office not subordinated to tender provider	0.082	(0.616)	0.032
5	Contact person not employed by tender provider	1.027*	(0.610)	0.361
6	Preferred supplier indications	Too related to the dependent variable		
7	Shortened time span for bidding process	0.756	(0.769)	0.254
8	Accelerated tender	0.516	(0.870)	0.184
9	Tender exceptionally large	1.175***	(0.425)	0.379
10	Time-to-bid not conform the law	Not enough variation in the answers		
11	Bids after the deadline accepted	Not enough variation in the answers		
12	Number of offers	Too many missing values		
13	Artificial bids	Not enough variation in the answers		
14	Complaints from non-winning bidders	0.992**	(0.425)	0.336
15	Award contract has new bid specifications	0.758	(0.691)	0.256
16	Substantial changes in project scope/costs after award	1.093**	(0.456)	0.356
17	Connections between bidders undermines competition	0.492	(0.585)	0.177
18	All bids higher than projected overall costs	1.136*	(0.628)	0.341
19	Not all/no bidders informed of the award and its reasons	Not enough variation in the answers		
20	Award contract and selection documents not public	0.746*	(0.428)	0.266
21	Inconsistencies in reported turnover/number of staff	Not enough variation in the answers		
22	Winning company listed in Chamber of Commerce	Not enough variation in the answers		
23	Absence of EU funding	Too many missing values		
24	% of public funding from MS	Too many missing values		
25	Awarding authority not filled in all fields in TED/CAN	1.125**	(0.446)	0.354
26	Audit certificates by auditor without credentials	Not enough variation in the answers		
27	Negative media coverage	Too related to the dependent variable		
	Amount of information missing	0.298***	(0.049)	0.116
	Observations	192		
	Explanatory power (Pseudo R^2)	0.55		

Source: calculations based on collected dataset. Stars indicate that a coefficient is significantly different from zero with the following p-values: *** p<0.01, ** p<0.05, * p<0.1. The results are interpreted in the main text with a 95% confidence interval. Note that probit-regressions are non-linear and that therefore the estimated coefficient cannot be interpreted directly. The last column shows the marginal effect of each red flag. To increase readability all red flags are now positively formulated (meaning that the expected sign is positive) and the context variables are not shown.

The table first addresses the question as to whether a red flag has a significant effect on the probability of a case being corrupt/grey. This information is indicated with stars in the third column 'Coefficient'. A number of 2 or 3 stars are considered significant, with a 95% and 99% confidence, respectively. For those red flags that are significant, the effect of this red flag on the probability of a case being corrupt/grey is presented in the fifth column 'marginal effect' – which can be considered as a weight of the red flag. For example, complaints from non-winners (red flag 14) is considered significant on a 95% confidence interval and therefore procurements with complaints from non-winning bidders have 33.6 % higher chance of being corrupt than cases without this red flag. By the same token, substantial changes in project scope/costs after award (red flag 16) increase the probability of corruption by 35.6%, while this probability further increases by 34% if all bids are higher than the projected overall costs (red flag 18).

As mentioned previously, the Probit model constructed above does not make use of all indicators and it is important to understand why this is the case. First, indicators were taken out when not considered sufficiently independent (indicators 2, 26 and 27). The subsequent decisions on inclusion or exclusion were made by the model itself. It dropped a number of red flags that present *overlap* – not providing substantial information to the already included indicators. This is the case for red flags 10, 11, 13, 19, 21, 22 and 26.

But there is a third reason why red flags are not necessarily included in the model, caused by the information provided by the underlying dataset. The main weakness lies in the fact that certain red flags suffer from *incomplete information* more than others. The Probit model then concludes that these red flags do not add sufficient value, hence they are dropped. This is the case for red flags 12, 23 and 24. The fact that red flag 12 (number of offers) is dropped can be considered particularly problematic, as this is an indicator with a significant value – as also identified by the literature.

Hence, it is important to recognise that the explanatory power of the red flags – when taken together – is influenced by the amount of information that can be collected. If insufficient data is available, it is difficult to make proper estimations on the probability of corruption. For this reason, it has also been difficult to adjust the model to the specificities of the sectors studied. The number of cases studied by sector has been too limited to produce tailor-made variations of the Probit model. However, with more case information available such adjustment would certainly be possible.

7.6. Conclusions

On the basis of the international literature, a long list of 27 red flags of corruption has been identified according to the phases of the procurement cycle. These indicators have been applied to a set of 96 corrupt/grey and 96 clean cases in 5 sectors and 8 Member States. The clean cases are used as a control group, allowing for a comparison with the set of corrupt/grey cases. Bid rigging and kickbacks are the most frequently studied types of corruption. All of the above indicators are to be considered factors that add to the probability of corruption, but they can never provide definite answers about the status of a case. Furthermore, as corruption takes increasingly sophisticated forms, corrupt actors can pursue practices not (yet) covered by these red flags.

An assessment of the collected case information points to significant correlations between the occurrence of red flags and the (corrupt/grey) status of a case: 18 out of the 27 red flags appear to be statistically significant. Corrupt and grey cases turn out to be very similar in terms of characteristics (scoring 4.6 and 4.5 red flags respectively), but both differ markedly from the clean cases (scoring 1.8 red flags only). The amount of information that could be collected appears to be a useful indicator of corruption as well: the coverage rate for clean cases amounts to 80% for clean cases, much higher than that for corrupt (54%) or grey cases (64% coverage). One must consider the possibility that the indicators selected may have a stronger predictive power for bid rigging than for kickbacks.

A more advanced econometric analysis aims to find out if corrupt/grey cases can be predicted on the basis of their characteristics or not. A so-called multivariate Probit model has been constructed, including a set of variables which explain best whether a case is corrupt/grey or clean. In constructing the model, indicators have been assessed on independence, overlap and incomplete information.

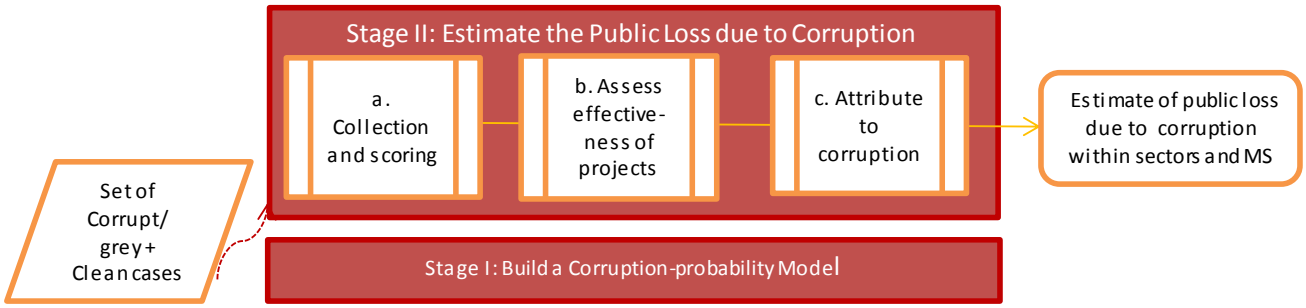
Overall, the explanatory power of the model – using a total of 15 red flags – is 0.55. This implies that the model is able to explain 55% of whether a case is corrupt/grey or not. This percentage can be considered high given the hidden nature of corruption and the variety in patterns of corruption between countries and sectors.

Meanwhile, this 55% also clearly indicates a limitation to the analysis, as 45% of the corruption is not explained by the model. This may partially be explained by the method to select candidate red flags by means of literature review. Because of this approach, which was the only feasible approach for this study given lack of investigative powers, we have not tested for new red flags that are not yet discussed in literature. In this sense, the study rather tests red flags that have been suggested in the part than searched for undiscovered red flags. Hidden practices are not easily uncovered by means of this model. However, for each of the red flags that were tested, a clear indication of applicability was obtained.

Another limitation of the approach is the choice to select the number of clean and corrupt cases instead of drawing a random sample of cases to analyse (which would not be feasible in the scope of this study due to the large size of the required sample). While the selection method does not detract from the identification of red flags and their relative importance, it does impact the analysis with respect to calculation of the total chance of corruption. This is discussed more in-depth in Chapters 9 and 10. In addition, the approach does not allow inclusion of country dummies and sector dummies in the results of the analysis, meaning no country or sector specific patterns in red flags can be identified.

The inclusion of grey cases does not seem to distort the results. While these cases are collected without any influence of the characteristics of the case, the grey cases turn out to closely resemble corrupt cases in terms of number of red flags. On this basis, the assumption that grey cases can be considered as likely corrupt cases seems to hold true. The close resemblance also means that it is highly unlikely that the calculation of red flags is distorted by the inclusion of grey cases.

8. Stage II: Estimate the public loss due to corruption



For both corrupt/grey and clean cases, an estimate will now be made of the public loss in terms of suboptimal performance due to lost effectiveness and efficiency. This loss takes into account cost overruns, delays and quality considerations. The difference between the public loss of corrupt /grey and clean cases is attributed to corruption.

8.1. A) Collection and scoring

The dataset consists of the same sample of cases of corrupt/grey and clean cases as used in Stage I: 206 cases of which 108 corrupt/grey cases and 98 clean cases. The table below presents the composition of cases, by sector and by country. As already indicated in table 46 in the previous chapter, *86 corrupt/grey cases* could be used for the analysis of public loss due to corruption. A total of *31 clean cases* could be used for the purpose of this analysis. The main reason for the limited information on clean cases lies in the fact that less information was known about them then about the corrupt/grey cases – most of the corrupt/grey were already under investigation or review what resulted in much more available data - and that (full) cooperation of procurement or management authorities was harder to obtain – as this (theoretical) activity did not rank high on their priority lists.

Apart from the Netherlands, for which only 1 corrupt/grey case could be identified, the distribution of corrupt/grey cases has been balanced amongst the countries analysed. A relatively large number of useable cases (29) were found in the sector Urban/utility construction, while the number of useable Training cases was limited to 9. With regard to the clean cases, satisfactory coverage could not be obtained for Water & waste projects.

Table 58: Overview of corrupt/grey and clean cases, by sector and country
(Based on sample data only)

A. Corrupt/grey cases

	Total nr.	With data on costs	% of cases with data
France	15	12	80%
Hungary	15	13	87%
Italy	18	17	94%
Lithuania	15	15	100%
Netherlands	1	0	0%
Poland	16	8	50%
Romania	13	9	69%
Spain	15	12	80%
Total	**108**	**86**	**80%**

	Total nr.	With data on costs	% of cases with data
Road / Rail construction	22	17	77%
Water / Waste	22	19	86%
Urban / utility construction	38	29	76%
Training	9	8	89%
R&D / High tech / Medical products	17	13	76%
Total	**108**	**86**	**80%**

B. Clean cases

	Total nr.	With data on costs	% of cases with data
France	5	0	0%
Hungary	15	5	0%
Italy	15	7	47%
Lithuania	15	2	13%
Netherlands	5	0	0%
Poland	15	7	47%
Romania	13	6	46%
Spain	15	4	27%
Total	**98**	**31**	**32%**

	Total nr.	With data on costs	% of cases with data
Road/Rail construction	22	9	41%
Water/Waste	9	0	0%
Urban / utility construction	35	12	34%
Training	11	4	36%
R&D / High tech / Medical products	21	6	29%
Total	**98**	**31**	**32%**

8.2. B) Assess overall effectiveness and efficiency

Building on the performance and evaluation literature as outlined in Chapter 6, the starting point has been the assumption from the literature[197] that corruption leads to suboptimal decision-making on procurement and, therefore, to poor or suboptimal performance of projects. Performance has been operationalised in three ways. The first two concern efficiency losses, while the third group focuses on effectiveness losses:

1. Cost overruns, either during the procurement stage or through additional costs in the implementation stage;
2. Delays of implementation, which leads mostly to delays of the benefits to society (the project becomes available at a later stage, hence leading to postponed benefits);
3. Effectiveness: The project does not reach or only partially reaches the objectives of the project, e.g. due to inferior quality[198].

8.2.1. Assessment of Cost overruns

Two types of cost overruns are distinguished in the literature:

a. ***Cost overruns at the time of procurement***: the difference is taken between the most advantageous (cheapest) offer and the winning bid; it is assumed that procurement takes place in a competitive environment and that the lowest bid tends to be the most economically advantageous bid – provided that all technical specifications are met. Hence, any bid which is substantially higher – while meeting the technical specifications - is considered a cost overrun. [199] The case studies – developed on the basis of real cases – illustrate how the assessments have been made.

Case study: A public administration opened a tender for the construction of two buildings. The winning company received € 600 000 to give technical advice and control. At the same time, other private companies had presented offers to do this work for € 400 000. The cost overrun is estimated at 50% above the norm price (€ 600 K /€ 400 K).

b. ***Extra costs that have been added after initial contract award***. Cost increases during implementation are quite common, in particular in construction projects. It is important to record any such cost increases as they are often a deviation of the original procurement request.

Case study: Procurement for the reconstruction of a historic city centre was given a budget ceiling of € 4.32 million. The only bidder submitted an offer for € 5.4 million. An external evaluator therefore declared the bid invalid and the procurement was restarted. Again the same bidder was the sole contender and this time with a winning offer of € 4.32 million. However, during the works the costs were increased by € 1.08 million, making the costs of the project € 5.4 million (the price of the original offer). The cost overrun is estimated at 25% above the norm price (€ 5.4 mln. / € 4.32 mln.)

[197] E.g. GOLDEN and PICCI (2005), *Proposal For A New Measure Of Corruption*.

[198] Also included under this heading are the aspects of relevance and sustainability, although, in practice, these are hard to assess unless extensive evaluations are carried out.

[199] This logic follows the reasoning of a recent (unpublished) study carried out by Deloitte on Procurement systems in Romania, commissioned by DG REGIO. The study states that transparency can be increased in procurement by focusing on standard specifications, allowing for a clear comparison of prices.

In the table below, information on cost overruns for the cases analysed is presented. In this table, as well as the following tables, different results are presented:

- % of volume lost: this is the overall % of the budget lost for the corrupt/grey cases concerned
- % lost of average case budget: this is a different value as both large and small corrupt/grey cases are assessed, and as they have a different weight;
- % of corrupt/grey cases concerned by this type of performance loss

Table 59: Overview of cost overruns

(n = 86 corrupt/grey cases)	*(000's €)*	*% of volume lost*	*% lost of avg. case budget*	*% of cases affected*
Total (of all budget)	€ 735 404	22%		53%
Total (of EU budget)	€ 162 070			
Loss per average budget	€ 15 008		28%	
Road/Rail construction	€ 27 409	24%	38%	35%
Water/Waste	€ 20 581	16%	20%	74%
Urban/utility construction	€ 16 988	25%	33%	55%
Training	€ 2 109	40%	77%	44%
R&D/High tech/Medical products	€ 428	15%	2%	35%
France				83%
Hungary				77%
Italy				29%
Lithuania				80%
Netherlands				0%
Poland				13%
Romania				11%
Spain				58%

Out of the 86 corrupt/grey cases considered, 53% encountered cost overruns. The total cost overrun for the cases involved amounted to EUR 735 million, of which EUR 162 million concerned EU Funds. The overruns amounted to 22% of the total average budget involved (EUR 3.3 billion for these cases together). The average overrun per project amounted to EUR 15 million, or 28% of the average budget.

A high occurrence of cost overruns can be observed in France (83% of all corrupt/grey cases), Lithuania (80%) and Hungary (77% of all available cases). Cost overruns are most frequent in the Training sector (40% of budgets lost, 77% of average case budget lost), but amounts involved are smaller than average due to the smaller size of training projects. Road and rail (38% of corrupt/grey cases) and Urban/utility construction (33% of corrupt/grey cases) were confronted with a smaller share of cases with cost overruns.

8.2.2. *Assessment of delays of implementation*

In the case study research as well as the literature, implementation delays have emerged as a frequent phenomenon. However, measuring the costs of delays is not so well documented in literature. The efficiency loss is related to the fact that delays lead to a deferral of the public benefits. Thus the total budget, delay (in years), internal rate of return (IRR), lifespan of the project and the discount rate (EC DG REGIO (not dated)) were taken into account:

- *Budget /investment costs*[200]– this is given per case;
- *Delay* – this is given per case;
- *Ex-ante IRR* (Internal rate of return) for the original project (without delay). A typical IRR per sector project is estimated by sector experts;
- *Lifespan* – this is given by DG REGIO in its "guide to cost benefit analysis of investment projects" for projects in specific sectors;

[200]In the calculations, the assumption is that the cost of the project is spread equally over the investment period of the project.

- *Discount rate* – a measure that makes an adjustment to the fact that people place higher value on money now as opposed to the future. This is because money today can be made productive, but money received tomorrow is a missed opportunity. For example: a road is completed in 2012 and people can start using it, cutting their journey time (personal benefit) and companies can make deliveries quicker (cutting costs). A road completed in 2013 will miss all the benefits of 2012. These missed opportunities are represented in the investment calculations through the discount rate.

Since the IRR and the lifespan of the project are known, the annual (net) benefit that that project[201] would bring over its lifetime can now be deducted.

For the delayed project the investment period is extended and the moment at which the benefits start to kick in is also delayed[202].

Now, for both cases net cash flows during the life time of the project are discounted (using the discount rate) and the Net Present Value (NPV) is calculated. In order to calculate the cost of delay, the NPV of the delayed case is distracted from the NPV of the optimal case without delay. As benefits only materialise at a later date this represents an efficiency loss to society.

It is assumed that the physical cost element due to delays is covered as part of contractual obligations (e.g. interests or fines on late implementation), and hence recouped from the contractor. In other words, if the delay would not only lead to deferred benefits but also to additional costs (e.g. for additional works supervision) that should be compensated.

Public loss is related to the fact that delays lead to a deferral of the public benefits as described earlier. Thus the total budget, the delay (in years), the internal rate of return (IRR), the lifespan of the project and the discount rate are taken into consideration.[203] A few qualifying comments apply however:

- *IRR* –The IRR as calculated in ex-ante Cost Benefit Analyses differs between sectors. Experience reveals that it is widely considered to be higher for road and health projects (10%) than for example for waste water treatment projects (5%);
- *Lifespan* – The lifespan of road projects is 25 years, for waste water treatment plans 30 years, and 15 years for R&D projects;
- *Discount rate* – the widely accepted rate is 5%; this rate may currently be considered high in Northern European countries and rather low in Southern European contexts.

Case study: Three companies bid for a research project of € 1.7 million. The winning bid came at only € 180 below the budget limit. Later, the public official modified the contract extending the original contract duration of 3 years with another 3 years, making the project investment period last twice as long. Consequent action by the public authority had to be also delayed.

Starting with an investment cost of € 1.7 million, we assume the project has a lifetime of 15 years (stipulated for R&D) and an internal rate of return (IRR) of 10%. Based on an equal distribution of benefits over time, we can calculate the annual benefits which would result in an IRR of 10%. If a project is delayed, the benefits will kick in at a later stage. As benefits that occur at a later stage are worth less than the current benefits (discounted at 5% to arrive at net present value), it will result in a lower net present value of the benefits. To a certain extent this will also be offset by the spreading of costs. All in all, the impact has a negative benefit of €208 000 (12% of the original budget).

[201]Again assuming an even spread of benefits over the years. Net benefits are benefits minus operation & maintenance costs.
[202]The end-date of the project is also postponed, assuming an unchanged lifetime of the project once operational.
[203]Ibid.

The table below shows the results of the analysis of delay costs for the selected cases. Overall, 30% of the cases for which data are available experienced delays in the delivery of the project.

Table 60: Overview of delays of implementation

(n = 86 corrupt/grey cases)	*(000's €)*	*% of volume lost*	*% lost of avg. case budget*	*% of cases affected*
Total (of all budget)	€ 132 584	6%		30%
Total (of EU budget)	€ 32 231			
Loss per average budget	€ 5 099		9%	
Road/Rail construction	€ 7 713	8%	11%	59%
Water/Waste	€ 2 172	6%	2%	16%
Urban/utility construction	€ 4 130	4%	8%	38%
Training				0%
R&D/High tech/Medical products	€ 1 754	2%	9%	15%
France				33%
Hungary				54%
Italy				6%
Lithuania				20%
Netherlands				0%
Poland				63%
Romania				33%
Spain				25%

The efficiency loss caused by delays totalled an estimated EUR 132 million, of which EUR 32 million involved EU Funds. This represents 6% of the total budget analysed.

The average cost of delay per project affected was EUR 5.1 million, representing 9% of the total budget of an average project concerned.

Delays are encountered frequently in the Member States studied, with the exception of the Netherlands, Italy and to some extent Lithuania. Delays are relatively frequent in Poland (63% of cases analysed) and Hungary (54% of cases analysed).

Delays are rather equally spread across the sectors, with Road/ rail encountering a higher share of cases (59%), followed by Urban/utility construction (38% of cases analysed). The average costs due to delays were also highest in Road/rail (EUR 7.7 million per case).

8.2.3. *Assessment of effectiveness*

Beyond efficiency considerations, a potentially even larger public loss is at stake when a project does not reach its original objectives, or when the objective of a project is no longer appropriate and, thus, ineffective. In such situations, a relatively large share of the full project costs can be written-off. One symptom of limited effectiveness is the inferior quality of a project.

In case of inferior quality, the difference between standard norm and costs of inferior materials are estimated (in % of the total cost savings of the cost of the project).[204]

All shares are part of the initial contracted budget and are based on available figures. This includes components of projects which have not been implemented.

In case bribes are reported and taken out of the project budget, these amounts are also reflected as a percentage of the contract budget.[205]

[204] In fact this is to a certain level similar to a cost overrun approach, as the use of standard/norm quality outputs would have result in a higher price.

[205] The amount of bribes as % of contract budget has been found to be 3% (Romania) and 3-5% (Spain).

Fictive example: The aim of a training programme is to gather 48 young orphans and 47 youngsters for a 3 month period to foster their social integration and communication skills. The contract is awarded without a tender being held. However, no activity ever took place and the children were given fruits and sweets in exchange for signatures indicating their participation. The effectiveness loss is estimated at 100% as none of the original objectives were met.

Table 60 shows the results of the analysis on effectiveness: 48% of the cases considered experienced issues of effectiveness. These issues appeared very often in France (92% of corrupt/grey cases analysed), Italy (82%) as well as Lithuania and Romania (both 67% of cases).

Table 61: Overview of effectiveness findings

(n = 86 corrupt/grey cases)	*(000's €)*	*% of volume lost*	*% lost of avg. case budget*	*% of cases affected*
Total (of all budget)	€ 36 295	3%		48%
Total (of EU budget)	€ 9 802			
Loss per average budget	€ 885		2%	
Road/Rail construction	€ 647	6%	1%	35%
Water/Waste	€ 1 310	1%	1%	58%
Urban/utility construction	€ 719	11%	1%	31%
Training	€ 195	22%	7%	75%
R&D/High tech/Medical products	€ 1 327	6%	7%	69%
France				92%
Hungary				8%
Italy				82%
Lithuania				67%
Netherlands				0%
Poland				50%
Romania				67%
Spain				42%

Overall, 48% of the corrupt/grey cases analysed encountered some form of effectiveness issue. The cost caused by reduced effectiveness totalled EUR 36 million, of which EUR 9.8 million EU Funds. This represents 3% of the total budget analysed.

The average cost caused by effectiveness loss per case was EUR 885 000, or 2% of the total budget of an average case.

Training and R&D/High tech/Medical projects appear to be most problematic from an effectiveness point of view, as 75% and 69% of these projects, respectively, encountered related performance issues. These percentages are only indicative due to the limited number of cases analysed in these sectors. In the training sector, the average cost caused by effectiveness issues was EUR 195 000 or 7% of the average training budget.

8.2.4. *Estimating the total direct public loss*

Now that the above elements of cost overruns, delays and effectiveness issues have been assessed, the overall direct costs encountered in the corrupt/grey cases can be aggregated. This amount is considered to represent the direct public loss.

At an aggregated level (Table 59), the direct public loss is estimated to be 37% of the average budget, taking into account only those cases for which data is available.

Table 62: Overview of overall direct public loss encountered in corrupt/grey cases analysed – by sector

(n = 86 corrupt/grey cases)	*(000's €)*	*% of volume lost*	*% of avg. budget*
Total (of all budget)	€ 904 283	18%	
Total (of EU budget)	€ 176 864		
Loss per average budget	€ 10 515		31%
Road & Rail	€ 14 128	20%	26%
Water & Waste	€ 16 266	16%	26%
Urban/utility construction	€ 11 162	29%	23%
Training	€ 1 200	44%	67%
R&D/High tech/Medical products	€ 1 265	5%	29%

Overall, the direct public loss encountered in corrupt/grey cases analysed amounts to EUR 904 million, or 18% of the total budgets of all 86 corrupt/grey cases combined (table 61). The direct public loss for the EU budget of these cases amounts to an estimated EUR 177 million. The average loss per case amounts to 31% of the average case budget. The overall share of budgets lost tends to be higher in smaller projects than in larger projects.

In relative terms, the highest public losses are encountered in training projects (44% of volume lost, 67% of average case budget lost), followed by all other sectors in which budgets lost within corrupt/grey projects are estimated to be roughly ¼th of the average case budgets involved.

A breakdown of direct public loss per country is presented in the table below.

Table 63: Overview of overall direct public loss encountered in corrupt/grey cases analysed – by country				
(n = 86 corrupt/grey cases)		*(000's €)*	*% of volume lost*	*% lost of avg. case budget*
France	Total (of all budget)	€ 466 245	21%	
	Total (of EU budget)	€ 4 000		
	Loss per average budget	€ 38 854		28%
Hungary	Total (of all budget)	€ 121 621	14%	
	Total (of EU budget)	€ 121 621		
	Loss per average budget	€ 9 355		21%
Italy	Total (of all budget)	€ 25 739	16%	
	Total (of EU budget)	€ 18 276		
	Loss per average budget	€ 1 980		34%
Lithuania	Total (of all budget)	€ 24 028	19%	
	Total (of EU budget)	€ 22 665		
	Loss per average budget	€ 1 602		21%
Poland	Total (of all budget)	€ 34 320	6%	
	Total (of EU budget)	€ 4 718		
	Loss per average budget	€ 5 665		19%
Romania	Total (of all budget)	€ 2 779	16%	
	Total (of EU budget)	€ 1 557		
	Loss per average budget	€ 309		56%
Spain	Total (of all budget)	€ 223 194	34%	
	Total (of EU budget)	€ 3 371		
	Loss per average budget	€ 13 219		40%

Some differences can be noted in the direct public loss between Member States. In absolute amounts, losses have been largest in France (EUR 466 million direct public loss in corrupt/grey cases analysed), followed by Spain (EUR 223 million lost in corrupt/grey cases analysed) and Hungary (EUR 121 million lost in cases analysed).

More telling is the average cost per case as a percentage of the average budget. In this respect, 56% of budgets are lost in Romanian cases, however these losses are concentrated in small projects as the overall % of budget lost is 16%. The direct public loss also appears to be high in Spain (also as % of budget volume lost) and Italy, where 40% and 34% of average case budgets involved in corrupt/grey cases appear to be lost.

8.3. C) Attribute public loss to corruption

It may be tempting to assign all of the above losses to corruption. However, it is important to realise that the direct public losses as assessed above can arise for a variety of reasons. For example, the literature on cost overruns suggests that technical, economic and institutional reasons as well as reasons related to project management all play a role. The fundamental question now is which part of the public losses encountered can be attributed to corruption? The literature[206] points to problems in isolating corruption from other reasons: after all, corruption is expected to be a root problem that influences overall decision-making and implementation. Therefore, corruption is pervasive in nature, and influences technical, economic, institutional and project management aspects.

[206]GOLDEN and PICCI (2005), *Proposal For A New Measure Of Corruption*.

Therefore, the approach here does not seek to isolate corruption from all possible causes. Rather, a comparison is proposed between corrupt/grey cases with a set of clean cases – which function as a control group. This approach is inspired by a method called 'counterfactual analysis'. Thereto, efforts have been made to find clean cases which are comparable to the corrupt/grey cases, in terms of the sectors, the time and where possible the regional setting as well. Subsequently, the direct public losses encountered in these clean cases have been assessed, and compared to the average direct public loss encountered in corrupt/grey cases.

The underlying assumption of this analysis is that the sample of clean cases will demonstrate a lower direct public loss than corrupt/grey cases. After all, they will suffer less from sub-optimal decision-making and implementation and hence can be expected to outperform the corrupt cases in terms of efficiency and effectiveness. The differences between the corrupt/grey and clean cases are statistically significant.

As stated above, the direct public loss encountered in corrupt/grey cases amounts to 18% of the budgets involved, while this figure is 6% in clean cases. Hence, the overall public loss due to corruption is estimated at 13% (rounding errors), thus explaining over 2/3 (69%) of the direct public losses of corrupt/grey projects.

The analysis points to substantial sectoral differences, even though results are to be treated with caution due to limits in the sample size. A comparison with clean water & waste projects could not be made for this reason. Therefore, it has been assumed that the performance of such clean cases has been similar to that of Urban/utility construction projects, which have similar procurement characteristics.

Table 64: Estimated direct public loss due to corruption (for cases analysed)

	Sample size	*000's €*	*% of volume lost*	*% lost of avg. case budget*
Total (of all budget)	86 (108)	€ 904 283	18%	
Loss per average budget	86 (108)	€ 10 515		*31%*
Road/Rail construction	17 (22)	€ 14 128	22%	*26%*
Water/Waste	19 (22)	€ 16 266	16%	*26%*
Urban/utility construction	29 (38)	€ 11 162	29%	*23%*
Training	8 (9)	€ 1 200	44%	*67%*
R&D/High tech/Medical products	13 (17)	€ 1 265	5%	*29%*
B. Direct public loss in clean cases				
Total (of all budget)	31 (98)	€ 62 386	6%	
Loss per average budget	31 (98)	€ 2 012		*10%*
Road/Rail construction	9 (22)	€ 5 932	5%	*5%*
Water/Waste	0 (9)	*n.a.*	9%	*16%*
Urban/utility construction	12 (35)	€ 599	9%	*16%*
Training	4 (11)	€ 9	1%	*0%*
R&D/High tech/Medical products	6 (21)	€ 296	5%	*11%*
C. Estimated public loss due to corruption				
Total (of all budget)		€ 625 440	13%	
Loss per average budget		€ 7 208		*21%*
Road/Rail construction		€ 8 197	17%	*22%*
Water/Waste		*n.a.*	7%	*10%*
Urban/utility construction		€ 3 517	20%	*7%*
Training		€ 1 192	43%	*66%*
R&D/High tech/Medical products		€ 969	0%	*17%*

It appears that not only corrupt/grey, but also clean Urban/utility construction cases encountered losses due to cost overruns, delays and/or ineffectiveness. This is most likely due to the complex nature of these cases, and/or the fact that these cases tend to be procured by local governments, which do not always have the necessary technical and project management skills to supervise them. Therefore, the direct public loss due to corruption is considered relatively modest in this sector (7% of all budgets concerned). Furthermore, Urban/utility construction projects tend to be large-scale so even smaller percentages bring about large absolute losses.

Corruption is seen to be more pervasive in Road/ rail and R&D/High tech/Medical products projects, where over 20% of the public budgets spent on corrupt/grey projects can be lost. Corruption is the overriding reason for the poor performance of corrupt/grey projects in these sectors. In training, virtually all public losses encountered are attributable to corruption.

These findings appear to confirm those from the literature, namely that once corruption is encountered it affects the performance of the underlying projects in a major way. Corruption therefore appears to have a direct and adverse impact on public (including EU) budgets.

8.4. Conclusions

Using the same set of corrupt/grey and clean cases, and building on the performance and evaluation literature, the starting point here has been that corruption leads to suboptimal decision-making on procurement, and therefore to poor or suboptimal performance of projects.

An analysis of the corrupt/grey cases leads indeed to an estimate that the direct public loss encountered in corrupt/grey cases analysed amounts to 18% of the overall budgets concerned. The overall share of budgets lost tends to be higher in smaller projects than in larger projects, however overall amounts lost are obviously higher in large projects. In relative terms, the highest direct public losses are encountered in training projects (67% of budget lost in projects affected), followed by all other sectors where the loss amounts to roughly ¼th of the budgets involved. An estimated 56% of budgets are lost in Romanian corrupt/grey cases concerned, while these shares are estimated to be 40% in Spain and 34% for the Italian cases studied.

Such direct public losses are due to limited performance of projects, and can be caused by 1) cost overruns; 2) delays of implementation and/or; 3) loss of effectiveness (including inferior quality and questionable usefulness).

Cost overruns (either at the time of contract award or through additions of the initial contract) occurred in 53% of corrupt/grey cases, amounting to 22% of the total average budget volume concerned. The average overrun per project amounted to 28% of the average budget. The relative size of overrun is highest in the case of small tenders, e.g. in the area of training.

Delays of implementation affected 30% of corrupt/grey cases, and the related loss is estimated to be 6% of the total budgets concerned. The average cost of delay per project affected represents 9% of the total budget of an average project concerned. Delays are rather equally spread across the sectors, with Road & rail encountering a higher share of cases (59%), followed by Urban/utility construction (38% of cases analysed).

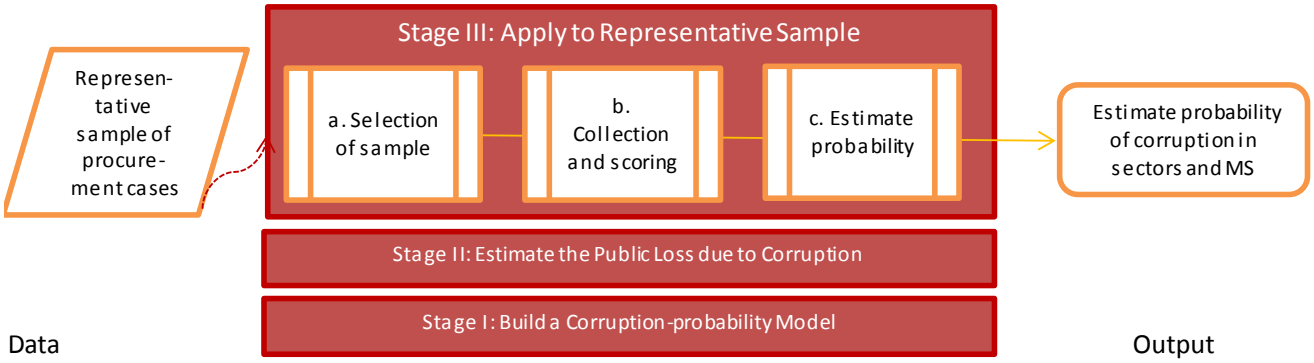
An overall 47% of the corrupt/grey cases analysed encountered some form of *effectiveness issue*, e.g. they did not meet their original objectives or are no longer considered useful. A total of 32% of the cases experienced issues of effectiveness and an estimated 3% of the total budget analysed is considered lost. Training and R&D/High-tech/Medical projects appear to be most problematic from an effectiveness point of view, as respectively 75% and 69% of these projects encountered such performance issues. In the training sector, the average cost caused by effectiveness issues was 7% of the average budget.

Not all of the above losses are necessarily due to corruption. However, it is highly problematic to isolate corruption from other reasons: corruption is a root problem which influences other problems, including those of a technical, economic, institutional as well as project management nature.

Therefore, the performance of the corrupt/grey projects has been compared to a set of comparable clean cases – a so-called control group. For this group, the direct public loss due to performance issues is estimated to be 5% of budgets involved. As the direct public loss encountered in corrupt/grey cases amounted to 18% of the budget volume, the overall direct public loss due to corruption is estimated to be 13% of budget volume. This finding points to the pervasive nature of corruption in public procurement: corruption is expected to explain over 2/3 (69%) of direct public losses.

The above estimates are considered conservative as it is expected that a more thorough evaluation of the cases would lead to a further identification of amounts lost. Furthermore, the overall public losses are only of a direct nature. They are expected to be higher once indirect losses (not studied here) are accounted for as well, including monetary and other damages to victims, to the environment, to civil society, to the reputation of institutions, and to the international investment climate.

9. Stage III: Applying to a representative sample of cases



This Stage provides a first estimate of the average probability of corruption (the private gain for public loss) within public procurement in the selected sectors and countries. A different, representative sample has thereto been drawn from public procurement cases in 6 specific product groups (defined within the above 5 sectors) and within the 8 Member States studied. Data on these procurement cases have been collected, and scored on the same long list of (27) red flags as used in Stage I of the method. The findings feed into the Corruption-probability Model constructed in Stage I and provide an estimate of the probability of corruption within the product groups selected.

9.1. The Dataset

The comprehensive methodology has been applied on a representative sample of procurement cases within 6 product groups, for which the cost and probability of corruption are not known. The focus has been on the following sectors and within each sector on one (two) clearly defined product groups:

Table 65: Overview of sectors, product groups and associated CPV codes

Sector	*Product group*	*CPV*
Road/rail construction	Railway track construction materials and supplies	34946100
	Construction work for highways	45233130
Water/waste	Construction waste water plants	45252127
Urban/utility construction	(Airport) Runway construction works	45235200
Training	Staff development services	79633000
R&D/High tech/Medical products	Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices	33150000

Note that the listed 5 sectors are the same as the sectors used in the earlier stages of the comprehensive methodology, to ensure coherence and comparability across the various stages. This similarity is required as the underlying calculations are 'fit for purpose'. Due to the variety of products and services assessed until now, the focus now is on 6 specific product groups with shared characteristics – which are part of the above 5 sectors.

In selecting these product groups, efforts have been made to select product groups which can be considered 'typical' for the broader sector, in terms of works/services delivered and demand/supply actors active on the procurement market. The product groups retained are expected to be indeed typical, with the exemption of (Airport) runway construction works, which are expected to deviate from other Urban construction works, due to the specific suppliers for such works (which are unlikely to provide other works such as the construction or renovation of stadiums, theatres and other public buildings). For each of the product groups, a representative sample of procurement cases has been drawn. This sample is based on a screening of the TED procurement database, necessary to know the entire population in order to be able to calculate a representative sample [207]. Product groups are categorised through a Common Procurement Vocabulary – so-called CPV codes.

Per defined product group, the total number of procurement cases has been included (the total population). The figures of the total populations per CPV from the TED, their distribution over the 8 selected MS[208] and the size of the representative sample is presented in the tables below:

Table 66: Distribution of cases over the 8 selected Member States

Country	*Total population*	*Cases received*	*Accuracy **	*Cases with contracts/ToR*
FR	44	11	26%	3
HU	26	27	0%	0
IT	23	16	14%	15
LI	8	4	37%	0
NL	12	10	13%	10
PO	35	17	17%	0
RO	16	16	0%	0
SP	19	12	11%	0
TOTAL	183	113	5.7%	28

* Presented is the accuracy of the estimated probability, the 95%-confidence interval is given by the estimate +/- this accuracy (assuming a probability of 50%).

In the table above, the number 183 refers to the total amount of cases identified in the TED database for the given period (2006-2010) for the product groups selected. This was again necessary to know the entire population in order to calculate a representative sample. The TED served only a starting point; additional data were collected in the Member States. In order to arrive at a fully representative sample for the 6 product groups in the 8 Member States over the period between 2006 and 2010, a sample of 124 cases was required.[209] The total number of cases collected is 113. Despite major efforts, the samples for Poland and especially France and Lithuania are limited. The representative samples are relatively robust for all other Member States studied (Hungary, Italy, Netherlands, Romania and Spain).

[207] This is necessary to know the entire population in order to calculate a representative sample. The TED served only a starting point, additional data was collected in the MS, even on other procurements not listed in the TED. In this way, an extra assessment of the value of a top down-analysis in the TED could be performed.

[208] Not all MS procured all products, so for all products only some MS will be assessed. However, the products in all 5 sectors were selected in a way that it was possible to collect data in all 8 selected MS.

[209] The understanding of the term representativeness is here is that the sample size is sufficiently large to make statements with a 5% significance – which can be regarded as conservative. A higher (e.g. 10%) significance level would lead to a smaller required sample size.

Table 67: Overview of population and sample by product group						
Sector	*Product group*	*CPV*	*Total population (TED)*	*Represen-tative sample**	*# Cases*	*Inaccuracy **
Road/rail construction	Railway track construction materials and supplies	34946100	47	32	31	10%
	Construction work for highways	45233130	55	35	39	9%
Water/waste	Construction waste water plants	45252127	31	24	18	15%
Urban/utility construction	Runway construction works	45235200	13	12	10	16%
Training	Staff development services	79633000	7	7	3	46%
R&D/High tech/Medical products	Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices	33150000	30	23	12	22%
TOTAL			**183**	**133**	**113**	

* As calculated beforehand, with confidence level 90% and confidence interval 10.
** Presented is the inaccuracy of the actual amount of cases, with the confidence interval of the sample size being 100% minus the inaccuracy figure (assuming a probability of 50%). For example, the confidence interval for the 12 R&D cases is 78% (= 100% -/- 22%).

With regard to coverage of product groups, a fully or almost fully representative sample (with an inaccuracy of 9%) could be obtained for construction work for highways and railway track construction materials (10%). The inaccuracy is higher (15-16%) for construction of waste water plants and runway construction works, followed by radiotherapy, mechanotherapy, electrotherapy and physical therapy devices (22%). The number of cases in staff development services can be considered too limited for drawing statistically significant conclusions – resulting in a very high (46%) inaccuracy.

9.2. Collection and scoring

As was expected by the consortium, the collection of information required has been very difficult and resource-intensive. The precise strategy for contacting the procurement authorities was adjusted to local circumstances, but always included a combination of E-mail and telephone. Referral letters from the EC (OLAF) were used, often translated into the local language. Commonly, several E-mails and telephone calls were needed in order to obtain the information required. The overall period available for collecting this information was extended repeatedly, to a total of 2 ½ months, allowing for the maximum amount of cooperation.

In practice, as with the Stage I collection, some indicators (e.g. all bids higher than the projected overall cost) could be detected more easily from official public sources, while others (e.g. conflicts of interest) had to be gathered on the basis of interviews. As this collection exercise is not to be seen as an investigative procedure, the research team has refrained from judgments and relied on the evidence obtained from this process (including triangulation of sources). As a consequence, the number of red flags that could be actually ticked can be considered a conservative estimate.

The main reason for the burdensome collection process lies not necessarily in a direct lack of cooperation, but rather in a range of operational hurdles that were identified and that had to be overcome throughout the process. Of great importance was the fact that the contractors had no coercive or investigative powers, as well as the fact that procurement authorities had no clear benefit in cooperation.

The main types of problems and hurdles in collecting and scoring are listed below:

- Many contact details inserted in the representative sample were obsolete, especially for procurements older than 2007; this has significantly augmented the average time necessary to retrieve relevant information for each procurement case;
- In using the CPV codes, some care needs to be taken as the codes are not always used accurately. In a recent study for EC DG MARKT, a test with a sample of 405 tender notices (Ramboll et al[210]) showed that the code was inaccurate in about 23% of the notices. In around 10% of cases the code applied did not describe the work/supply/service procured; in some 8%, the code applied was too general, and in about 4%, the code was too specific. The extent of incorrect use is highest for works, where around 28% of the works notices tested carried an incorrect code;
- It was not always possible to double-check the information of the representative sample with the one from the TED database, as many cases were not accessible online (those before 2007). This has also lengthened the time necessary to find the correct contact details;
- The representative sample does not report the titles of the single procurement cases, which has in turn lengthened the necessary time to report such information;
- Due to administrative reorganisations, e.g. in the case of Managing Authorities, there was sometimes miscommunication across departments, which led to delays in follow-up of the information requests;
- Archives are not always passed on to the newly responsible individuals. Accessing the archives could take long and was viewed by those responsible as overly burdening;
- Some authorities declared that a prior decision had to be taken on whether some information can be disclosed or not. This caused substantial delays, especially in larger and hierarchically organised institutions. In certain cases, a formal non-disclosure agreement had to be signed before any information was passed to the researchers;
- In some cases the request was viewed as not matching the interests of the procurement authority, and work overload for public servants was mentioned as a reason for non-cooperation.

Once again, it is important to state that the consortium had no coercive powers, and that cooperation was therefore considered voluntary.

9.2.1. *Frequency of red flags*

Although the methodology applied does not count on individual red flags but rather on their combined power, we considered it useful to start with a simple counting of the frequency of red flags across the representative sample. For the cases analysed, the average number of red flags accounted amounted to 1.4. [211]

Table 68: Average numbers of red flags: the representative sample findings compared to the corrupt/grey and clean cases

(N=109)	*Average number of Red flags in the representative sample*
All	1.4
Railway construction & supplies	1.4
Construction of highways	0.8
Construction of waste water plants	1.4
(Airport) Runway construction works	3.0
Staff development services	2.7
R&D/High tech/Medical products	1.2

However, substantial differences between product groups can be recorded. Construction of highways has seen the lowest number of red flags (0.8), followed by R&D/High tech products (1.2), Construction of waste water plants as well as Railway construction & supplies (1.4). A relatively high number of red flags have been recorded in Staff development services (2.7) and (Airport) Runway construction works (3.0).

[210]RAMBOLL and BUNDESVERBAND MATERIALWIRTSCHAFT, EINKAUF UND LOGISTIK E.V. (2012), *Review of the functioning of the CPV codes/system. Final report*. Study commissioned by the European Commission – DG MARKT (MARKT/2011/111/C).

[211]Only red flags have been counted which have been used in the Probit model – which explains the relatively low number of red flags compared to those found in the previous sample of clean cases 1.8 red flags) and corrupt/grey cases (4.6 and 4.5 respectively).

Furthermore, it is important to note that the **distribution of red flags** is particular: A relatively high share of cases has no red flags or a limited number of red flags. Only few cases have a high number of red flags, pointing to a higher probability of corruption. This distribution can be considered typical for such corruption-research.[212]

The distribution of a selection of red flag questions over the representative sample is as follows:

Table 69: Answers to red-flag questions as used in the Probit model (in percentages)

#	*Short name of the red flag*	*Yes*	*No*	*% unanswered*
1	Strong inertia in composition of evaluation team	3	81	15
3	Multiple contact points	8	83	9
4	Contact office subordinated to tender provider	22	67	11
5	Contact person employed by tender provider	24	69	7
7	Shortened time span for bidding process	1	99	0
8	Accelerated tender	0	100	0
9	Tender exceptionally large	15	84	1
14	Complaints from non-winning bidders	7	74	19
15	Award contract has new bid specifications	4	69	27
16	Substantial changes in project scope/costs after award	23	68	9
17	Connections between bidders undermines competition	7	76	17
18	All bids higher than projected overall costs	4	67	29
20	Award contract and selection documents public	22	73	5
25	Awarding authority filled in all fields in TED/CAN	8	79	14

Note: Only frequencies of red flags which have been used for the Probit model have been displayed. Total may not add up to 100% due to rounding errors.

As can be seen above, a relatively high share of positive answers could be recorded for the following red flags:

- Contact office subordinated to tender provider;
- Contact person employed by tender provider;
- Tender exceptionally large;
- Substantial changes in project scope/costs after award;
- Award contract and selection documents (not) public.

These findings will now be used for the estimation of probability, through a comparison with the red flag patterns as derived from the samples of clean and corrupt/grey cases (Stage I).

9.3. *Estimate probability*

9.3.1. *Sector specific findings*

Subsequently, the comprehensive methodology for estimating the probability of corruption was applied to the collected cases from the representative sample. Technically, this activity was carried out by running the Corruption-probability Model from Stage I on the representative sample. It resulted in an estimate of the probability of corruption for each case analysed.

The probability of corruption can be estimated per product group only. The table below presents descriptive information on the estimated probability of corruption for the cases assessed per product group. The average indicates the average estimated probability of corruption.

[212] A methodological consequence of this distribution is that care should be taken in the use of standard deviations, which assume normal distribution of frequencies.

The standard deviation indicates how large the spread of the individual observations are. A low standard deviation indicates little spread of the observed values (and thus similar figures for the estimated level of corruption in each case), while a high standard deviation indicates clear differences in the estimated level of corruption, with some cases scoring very low (being most likely clean), while other cases score very high (with a strong suspicion of corruption being present.

Table 70: Estimated probability of corruption by product group for the MemberStates analysed (based on the Probit model)

Sector (product group)	*Average probability of corruption*	*Inaccuracy**	*Bandwith*	*Standard deviation*
Road/rail construction *Construction works of highways*	16%	10%	11-21%	23%
Road/rail construction *Railway track construction materials and supplies*	13%	9%	9-18%	14%
Water/waste *(Construction of waste water plants)*	36%	15%	28-43%	28%
Urban/utility construction *(Runway construction works)*	45%	16%	37-53%	25%
Training *(Staff development services)*	15%	46%	0-46%	11%
R&D/High tech/Medical products *(radiotherapy, mechanotherapy, electrotherapy and physical therapy devices)*	21%	22%	10-32%	19%

Note: The Probit model has an overall explanatory power of 55%. * Inaccuracy arising from the sample size only – as reported in Table 66

A number of observations can be made about the above findings. Firstly, the estimated average probability for **Construction works of highways** (11-21%) and **Railway track construction materials and supplies** (9-18%) is comparable. In terms of spread, we found a moderate difference in expected corrupt cases and expected non-corrupt cases in the construction works of highways. This spread was lower in railway track construction materials and supplies scored low on spread.

The estimated probability of corruption in **Runway construction works** (37-53%) and **Construction of waste water plants** (28-43%) is considerably higher. But the spread is also the highest in these products groups, meaning there are clear differences between expected corrupt and non-corrupt cases. Put in other words, the model clearly points to which cases it expects to be corrupt and which one's not.

The estimates for **Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices** (10-32%) have a relatively large bandwidth, due to the limited number of cases that could be studied within this product group. An average spread is noticed here. The same limitations apply to **Staff development services** where the estimate on probability (0-46%) is not very informative, again due to the small number of cases that could be studied.

9.3.2. *Member State specific findings*

In addition to an analysis of probability of corruption in the various product groups, the probability of corruption has also been studied within the Member States. The breakdown of estimated probability of corruption on country level provides some useful insights, but extreme caution is required in its further use. These estimates should by no means be considered the average probability of corruption in procurement for these Member States as a whole – as the number of product groups studied is only limited.

A comparison of country averages is complicated by the fact that the balance between product groups differs between Member States. This is due primarily to the fact that certain product groups are less common in certain Member States than in others. For example, construction of motorways is more frequent in new Member States. A relatively low probability of corruption in these product groups would dampen the estimated probability in these countries. By the same token, a high estimated probability in a product group such as construction of waste water plants would inflate estimates of the probability of corruption in a country which has a large number of these cases in the representative sample (e.g. because it is a national investment priority).

Therefore, a restriction has been made to a breakdown of sector findings for two product groups, Railway track construction materials and supplies as well as Construction works for highways.

Table 71: Estimated probability of corruption for product group "Rail construction works and supplies" (selected Member States only) *

Member State	*Estimated probability*
Overall	13%
Member State 1	23%
Member State 2	11%
Member State 3	7%
Member State 4	15%
Member State 5	10%
Member State 6	36%

* Only Member States included for which 2 or more cases in this product group assessed

Table 72: Estimated probability of corruption for product group "Construction works for highways (selected Member States only) *

Member State	*Estimated probability*
Overall	16%
Member State 1	19%
Member State 2	16%
Member State 3	20%

* Only Member States included for which 2 or more cases in this product group assessed

When comparing the results by Member States, it is clear that levels of probability of corruption in these product groups are not only confined to one or two Member States, but that the phenomenon appears to be more structural across Member States.

9.3.3. *A broader review of the results*

As observed above, the results of the application of the method to estimate the probability of corruption to the representative sample yield results which are partially conclusive, but partially inconclusive. In itself, this cannot come as a surprise, as findings across the various research strands in the literature to date disclose substantial differences in the size of corruption (see Chapter 6). Even more important, information about probability of corruption within public procurement within the EU and within the sectors studied is scarce, and can be considered the 'weakest link' in the research.

As a starting point, the method used for data collection and estimation of probability of corruption in this Stage has been fully compliant with the method developed in Stage I, the collection of corrupt/grey and clean cases. The method has also been applied to similar sectors and product groups. Nevertheless, in reviewing the above results, it is important to take full account of the factors that play a role in the estimation of probability and that have been identified throughout the Stages I and III combined, and to identify all considerations, limitations and uncertainties.

- Firstly, it is important to take into account that the explanatory power of the Corruption-probability Model as constructed in Stage I is 0.55. Even though this ability of the model to explain 55% of the corruption/grey status can be considered high, 45% of that question remains unexplained. One can expect that this unexplained variation is specific to cases and unique circumstances – that can either lead to an upward or downward move of the estimates at the level of individual product groups or Member States.
- Secondly, another likely source for uncertainty of the results lies in the cooperation of interviewees. As described in the previous section, collecting information for the representative sample proved to be excessively difficult. As the research team did not have legal powers supporting the analysis of cases, participation of interviewees took place on voluntary basis only. The possibility to decline participation was used by multiple persons/organisations. The earlier analysis of corrupt/grey and clean cases (Stage I) pointed already to a correlation between missing data and the status of a case being corrupt/grey: the coverage rate for corrupt cases (54%) was found to be much lower than for clean cases (80%). Hence, there is a possibility that the representativeness of the sample is somewhat compromised by the lack of cooperation from procuring authorities. In other words, the requirement to have a full set of information for each procurement case studied could lead to a slight overestimation of clean cases and a slight underestimation of 'corrupt/grey' cases. It is expected that results obtained could be somewhat different if the collection had been carried out by investigative authorities that have the legal powers to collect all relevant information for any randomly selected case.
- Thirdly, another possible source of uncertainty may lie in the local contexts that were encountered. Even though local research teams were extensively briefed and intensively guided in their work, each of them encountered particular problems and hurdles that required unique and untested strategies and tactics in order to obtain the information required. Although no proof of any bias could be identified to date, these can never be excluded.
- Fourthly, it is important to restate that cases relate to the period 2006-2010, and that today's figures might be different from these.

With regard to the *product-specific results,* the following points need to be made.

- First of all, it needs to be emphasised that the above results are based on representative samples of very precise product groups, each with their own dynamics. The results for road, rail and to some extent waste water procurements can be considered rather typical for the broader sectors, due to the specific of the works/services involved and the suppliers involved. The same cannot be said for (Airport) runway construction works, where further generalisations to the Urban construction sector are indicative at most.
- Secondly, it is important to recall that types of corruption differ between sectors. Earlier (Chapter 8), it was mentioned that the indicators selected in the comprehensive methodology (and inserted into the model) appear to be strongest in uncovering bid rigging, more so than in other forms of corruption – such as kickbacks. This could be one explanation for the relatively high estimated probability in urban development/construction as well as in waste/water, where a high share of cases studied encountered bid rigging.

With regard to *Member State specific* findings, the following reservations need to be raised.

- Firstly, a comparison of country averages is complicated by the fact that the balance between product groups differs between Member States. This is due primarily to the fact that certain product groups are less common in certain Member States than in others.
- Secondly, it is important to recognise that corruption can take many forms, which are increasingly complex and sophisticated. It is possible that the comprehensive methodology is better at detecting relatively straightforward forms of corruption, which could lead to an underestimation of probability of more complex and sophisticated forms, with consequences for Member State-specific findings.

9.4. Conclusions

The Corruption-probability Model has been applied to a (new) representative sample of procurement cases within 6 product groups. The focus has been on specific product groups within the broader sectors already studied, namely:

- Railway track construction materials and supplies (Road/rail);
- Construction work for highways (Road/rail);
- Runway construction works (Urban development);
- Construction waste water plants (Waste/water);
- Staff development services (Training);
- Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices (R&D/High tech).

In total, a population of 183 cases was studied, all procured in the period 2006-2010. The necessary information could be obtained for 113 cases, whilst a fully representative sample would have required 124 cases. This implies that for some sectors, the results of the calculation of probability of corruption are not-significant.

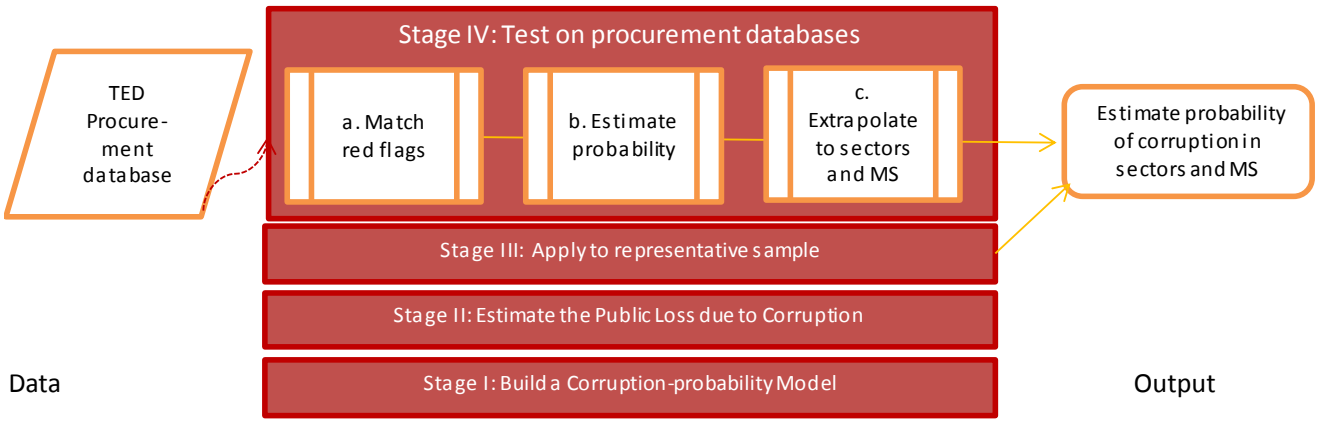
The collection of information required has been difficult and resource-intensive. The precise strategy for contacting the procurement authorities was adjusted to local circumstances, but always included a combination of E-mail and telephone. The overall period available for collecting this information was extended repeatedly, to a total of 2½ months, allowing for the maximum amount of cooperation. The main reason for the burdensome collection process lies in a range of operational hurdles that were identified and that had to be overcome throughout the process. Of great importance was the fact that the contractor had no coercive or investigative powers, whilst procurement authorities had no clear benefit in cooperation.

Based on the collected sample, it is possible to estimate the probability of corruption within different bandwidths of inaccuracy. The estimated probability in **road** (11-21%) and **rail** (9-18%) show a high level of accuracy due to the high number of cases studied. Furthermore, the two product groups selected appear to be typical for the broader sector. The estimated probability of corruption in **waste water treatment plants** is higher, with 26-41%. The estimates for **radiotherapy, mechanotherapy, electrotherapy and physical therapy devices** suffer from a limited number of cases in the sample (10-32%). The limited number of procurement cases for **staff development services** (training) in the sample is the reason that no meaningful probabilities could be determined.

Levels of probability of corruption in the product groups within rail and road have also been analysed at Member State level. The main finding here is that the probability of corruption is not only confined to one or two Member States, but that the phenomenon appears to be more structural across the Member States studied.

A broader review of the findings points to a range of possible considerations, issues and uncertainties which are partly generic to the collection of data, and partly specific to product groups and Member States. Taking these into account, it is considered appropriate to test these results with an alternative approach to estimate the probability of corruption, namely through the use of an EU-wide procurement database – the final Stage IV of the comprehensive methodology.

10. Stage IV: Testing on an EU procurement database



As the representative sample provides only information about a limited number of product groups and cases, a further testing has taken place at the level of product groups and sectors through the TED procurement database. This testing is based on the tailoring of the Corruption-probability model and the operationalisation of a limited number of red flags – namely those for which data are available in the TED procurement database. The findings allow for the extrapolation of direct costs of corruption within the selected sectors in the Member States studied. This extrapolation takes into account the overall volumes procured through EU-tendering procedures, direct cost estimates from Stage II, and the probability estimates from both Stage III and IV.

10.1. The Dataset

Starting point for this exercise are again the red flags as identified in Stage I.

Before turning to the EU-wide TED procurement database, identification was made of a number of national and EU databases regarding projects and procurements. An analysis was made of such databases, with a focus on Spain, Italy, France and Romania. A disadvantage of the national databases is that they prevent any comparison across the EU. Furthermore, these national databases provided rarely added value compared to the EU database.

At the EU-level, a database of Structural Funds projects was studied, as collected by the Financial Times and the Bureau of Investigative Journalism, however the information in this database turned out to be insufficient and largely unable to relate to the red flags identified, as the database does not focus on public procurement, and rather on actors rather than on procurement characteristics.

By far the most powerful and promising for the purpose of this analysis is therefore the European TED database – which records since 2006 all procurements that need to be implemented according to EU public procurement rules. The database at the consortium's disposal contains more than 500,000 tenders (from 2006 until mid-2010), and covers the 8 Member States studied here. Nevertheless, the TED database has also a number of limitations, including:

- Coverage of the years 2006-2010; hence it does not cover the full period 2000-2010 from which corruption cases have been derived;
- Only inclusion of larger procurements, higher than EUR 5 000 000 in the case of works and EUR 130 000 in case of supplies and services, is mandatory;

- It assumes that all procurements are inserted in the database; even though there are reasons to assume that corrupt/grey cases may be inserted less frequently than clean cases.

The assumption here is that cases in the procurement database that resemble the corrupt/grey cases from the bottom-up approach have a higher probability of being corrupt than other cases. Critiques of this approach would immediately point to the fact that the cases from the case study analysis here are not necessarily similar to the corrupt/grey cases analysed here. This critique is certainly valid. a range of measures to prevent that the cases from the case study analysis are biased vis-à-vis data from the procurement database has therefore been taken. This includes the following characteristics between case study cases, the cases from the representative sample and cases taken from the TED database:

- Sectors: case study cases are grouped by CPV codes allowing for matching with the TED database;
- Product groups: results from the representative sample are fully compatible, as these samples have been drawn directly from the TED procurement database, within the same CPV codes and years;
- Member States: the TED analysis has been limited to the same 8 Member States that have been studied throughout the research;
- Period of time: the corrupt/grey and clean cases identified cover the period 2000-2010, whilst the cases from the representative sample and the TED database cover the period 2006-2010.

10.2. Operationalisation of the red flags

Despite the compatibility of the TED database with the various samples of cases already studied, the main constraint of this particular analysis is imposed by the limited number of variables for which information is available in the TED database. In the table below, the red flags identified in Stage I are listed and confronted against the information available in the TED database.

Table 73: Confrontation of significant red flags from the econometric estimation with the information available in the TED database

#	*Short name of the red flag*	*Possible to proxy in TED?*	*Relevant information in the TED database?**
1	Strong inertia in composition of evaluation team	No	n.a.
3	Multiple contact points	No	n.a.
4	Contact office not subordinated to tender provider	No	n.a.
5	Contact person not employed by tender provider	No	n.a.
7	Shortened time span for bidding process	Yes	Date of publication of the tender and date of deadline
8	Accelerated tender	Yes	Type of procedure
9	Tender exceptionally large	Yes	Contract value
12	Amount of offers is one	Yes	Number of offers
14	Complaints from non-winning bidders	No	n.a.
15	Award contract has new bid specifications	No	n.a.
16	Substantial changes in project scope/costs after award	No	n.a.
17	Connections between bidders undermines competition	No	n.a.
18	All bids higher than projected overall costs	Yes	Estimated contract value and final contract value of the winning
20	Award contract and selection documents not public	Yes	Missing data fields
23	No EU-funding involved	Yes	Community funds involved
25	Awarding authority not filled in all fields in TED/CAN	Yes	Missing data fields

* n.a. stands for “not applicable”.

The table shows that for at most half of the red flags that were identified in Stage I, a proxy may be available. For the other red flags, no matching information can be identified in the TED database. Note that we are able to include the number of offers (red flag 12) here, while this was not possible in Stage I. In Stage I the number of cases was rather limited (192) and the amount of missing information for this red flag (the number of offers) was relatively high (50). We decided that the gain in explanatory power of including one extra red flag did not compensate for the substantial loss in efficiency due to the reduction in the number of cases (50). The advantage of the TED-database is that it includes so many cases that the number of cases is not a serious concern anymore and that therefore loss of cases is in general easily offset by the gain in explanatory power of including an extra red flag. Likewise, we were able to include involvement of EU Funds (red flag 23).

To determine whether the information in the TED can serve as proxy for identified red flags, the presence of the proxies has been explored in the 8 Member States of the case studies.

Presence of red flags in the database

In the tables below, the relative presence of a proxy in the selected Member States is selected. A proxy is considered a probable indicator of corruption if a clear pattern in the relative presence of the proxy across the countries is observed, and if the outcome does not contradict the results from Stage I.

As a statistical test of significance is not possible in the comparison, a fall-back option is to rely on a qualitative estimation on whether or not a proxy should be considered as a likely red flag. Thereto, similarities between the scoring on the proxies and the level of corruption according to the World Bank governance indicators on control of corruption and the Transparency International Corruption Perception Index (CPI) 2012 will be taken into account. The score on these listings are presented in the table below.

Table 74: Degree of corruption of selected Member States in corruption indices

Member State	*World Bank index*	*Transparency International CPI*
France	+1.51	71
Hungary	+0.34	55
Italy	-0.01	42
Lithuania	+0.29	54
Netherlands	+2.17	84
Poland	+0.51	58
Romania	-0.20	44
Spain	+1.06	65

* The higher the value, the lower the estimated level of corruption.

The Netherlands, France and Spain score well on the World Bank index, meaning a low level of corruption is expected. Poland, Hungary and Lithuania score mediocre, while Italy and Romania show a low score, equalling a high expected level of corruption. The CPI of Transparency International shows a similar pattern.

Red flag 7 – Shortened time span for bidding process

Red flag 7, presence of a shortened time span for the bidding process, is operationalised by estimating the time allowed to bid – being the time between publication of the contract notice and the deadline for submission of bids – and comparing this time frame with the minimum time to tender as required by the Directive.[213] The results are presented in the table below.

[213]Procurements with missing values that do not allow to estimate a granted time to submit a tender are assumed to have met the legal requirements of the Directive and are thus considered as procurements with a normal time span for the bidding process.

Table 75: Percentage of tenders where time span was shorter than minimum of Directive (based on number of procurements 2006-2010)			
Member State	*No*	*Yes*	*Total*
France	137 174	6 994	144 168
	(95.1%)	(4.9%)	-100%
Hungary	9 649	703	10 352
	(93.2%)	(6.8%)	-100%
Spain	42 188	2 466	44 654
	(94.5%)	(5.5%)	-100%
Italy	31 3	1 684	32 984
	(94.9%)	(5.1%)	-100%
Lithuania	7 502	454	7 956
	(94.3%)	(5.7%)	-100%
The Netherlands	14 604	958	15 562
	(93.8%)	(6.2%)	-100%
Poland	60 67	6 132	66 802
	(90.8%)	(9.2%)	-100%
Romania	11 66	1 013	12 673
	(92.0%)	(8.0%)	-100%
Total EU	510 441	35 994	546 435
	(93.4%)	(6.6%)	(100%)

The results do not show any relation between the scoring on the proxy and the level of corruption according to the indices. Poland and Romania, both classified as having higher levels of corruption, show a higher than average score on the proxy used. However, Italy and Lithuania score below the EU average despite relatively high corruption scores on the lists of the World Bank and Transparency International. Therefore, time between publication of the tender and deadline for submission is not considered to be a valid proxy for red flag 7.

Red flag 8 – Accelerated tenders

Information on red flag 8, the use of accelerated tenders, can be directly found in the TED database. The type of procedure used contains options to indicated use of an accelerated restricted procedure or an accelerated negotiated procedure. Building on the findings from the Spanish Court of Auditors, and as mentioned in Chapter 6 and 7, accelerated procedures can also be used in situations where such practice is not justifiable. In the analysis of the TED database, procurements where no procedure has been indicated were considered non-accelerated. The results of the analysis of this red flag are presented in the table below.

Table 76: Percentage of tenders where accelerated procedure were used (based on number of procurements 2006-2010)			
Member State	*No*	*Yes*	*Total*
France	144 065	103	144 168
	(99.9%)	(0.1%)	(100%)
Hungary	9 613	739	10 352
	(92.9%)	(7.1%)	(100%)
Italy	30 511	2 473	32 984
	(92.5%)	(7.5%)	(100%)
Lithuania	7 951	5	7 956
	(99.9%)	(0.1%)	(100%)
Netherlands	15 445	117	15 562
	(99.2%)	(0.8%)	(100%)
Poland	65 2	1 602	66 802
	(97.6%)	(2.4%)	(100%)
Romania	12 469	204	12 673
	(98.4%)	(1.6%)	(100%)
Spain	44 509	145	44 654
	(99.7%)	(0.3%)	(100%)
Total EU	537 268	9 167	546 435
	(98.3%)	(1.68%)	(100%)

The relation between the results in the table above and the corruption indices appear to exist, with Italy and Hungary scoring significantly above average, Poland somewhat above average and Romania at EU average. Meanwhile, the Member States with more positive scores on the indices (the Netherlands, France and Spain), all make much less use of accelerated procedures than the EU average. On top of that, the information in the TED database is identical to the red flag, meaning the results are not distorted by the operationalisation. Because of the results and the close match between information in the TED database and the red flag, the information used as an appropriate proxy for red flag 8 is used.

Red flag 9 – Tenders exceptionally large

In Stage I, an exceptionally large tender is defined as a tender which has an average size value plus two times the standard deviation. Here, the operationalization needs to be adjusted to the specifics of the TED database. After all, the TED database contains nearly exclusively above-threshold procurements. These are procurements with the largest contract values in the overall spectrum of procurement (above and below threshold). The presence of the threshold value means that the distribution of contract values in the TED is strongly distorted because of presence of a cut-off point (the threshold value). As a result, the distribution of contract values is strongly lob-sided which makes the concepts of average value and standard distribution of values highly unreliable. To correct for this, we choose an alternative approach to definition of the indicator 'tender size being exceptionally large' that is less sensitive to the lob-sided distribution of contract values in the form of the 10% largest tenders.[214] As product category, four-digit CPV-codes are used. Testing of the proxy happens by checking if procurements in the various countries belong to the highest 10% procurement in that sector across Europe. The results of the analysis are presented in the table below.

Table 77: Percentage of tenders where volumes are amongst the 10% largest in Europe (based on number of procurements 2006-2010)

Member State	*No*	*Yes*	*Total*
France	137 232	6 936	144 168
	(95.2%)	(4.8%)	(100%)
Hungary	9 593	759	10 352
	(92.7%)	(7.3%)	(100%)
Italy	27 968	5 016	32 984
	(84.8%)	(15.2%)	(100%)
Lithuania	7 69	266	7 956
	(96.7%)	(3.3%)	(100%)
Netherlands	14 788	774	15 562
	(95.0%)	(5.0%)	(100%)
Poland	62 891	3 911	66 802
	(94.1%)	(5.9%)	(100%)
Romania	11 721	952	12 673
	(92.5%)	(7.5%)	(100%)
Spain	39 367	5 287	44 654
	(88.2%)	(11.8%)	(100%)
Total TED	504 965	41 47	546 435
	(92.4%)	(7.6%)	(100%)

There is no clear pattern in the results of the analysis. While countries France and the Netherlands score below average on exceptionally large tenders, Spain scores significantly above average. Likewise, Italy scores high on this proxy, but Romania scores only average with Lithuania scoring significantly below average. No clear pattern can be detected, other than the size of market, and information is therefore not considered a useful proxy for red flag 9.

[214] Procurements where contract value was missing are treated as procurement with normal contract value. As a result, the percentage tenders meeting the criterion in the benchmark group is lower than 10%.

Red flag 12 – Number of bids

The literature (see Chapter 6.4.5) states that a competition effect makes procurement more efficient and effective. In the Stage I analysis, the number of bids has thereto been constructed as a Red flag 12, the number of bids has been applied in Stage I. The optimal number of bids differs however between sectors, subject of procurement (works, services, supplies) and the Member State. In order to operationalise this red flag, the number of procurements where the number of bids equals one has been used. In the table below, the results of the analysis are presented on number of procurements that receives exactly one bid.[215]

Table 78: Percentage of tenders where only one bid was received (based on number of procurements 2006-2010)

Member State	*No*	*Yes*	*Total*
France	133 972	10 196	144 168
	(92.9%)	(7.1%)	(100%)
Hungary	7 122	3 23	10 352
	(68.8%)	(31.2%)	(100%)
Italy	26 968	6 016	32 984
	(81.8%)	(18.2%)	(100%)
Lithuania	4 493	3 463	7 956
	(56.5%)	(43.5%)	(100%)
Netherlands	14 494	1 068	15 562
	(93.1%)	(6.9%)	(100%)
Poland	40 295	26 507	66 802
	(60.3%)	(39.7%)	(100%)
Romania	8 39	4 283	12 673
	(66.2%)	(33.8%)	(100%)
Spain	39 723	4 931	44 654
	(89.0%)	(11.0%)	(100%)
Total TED	461 996	84 439	546 435
	(84.6%)	(15.4%)	(100%)

In Lithuania, Poland, Romania, Hungary, values far above the EU-average are observed, while Italy scores above EU average as well. Meanwhile, the Netherlands and France score well below the EU average and so does Spain. Note is to be taken of findings from previous studies (e.g. PwC/London Economics/Ecorys 2011[216]) that procurement in large Member States attracts more bids than procurement in smaller Member States. As the information in the TED database directly matches the information of the red flag, the information on number of bids is considered a good proxy for red flag 12.

Red flag 18 – All bids higher than projected overall costs

The TED database does not contain information on non-winning bids other than the registration of the number of bids received. In particular, no information on names of other bidders than the winner or the price of their submitted bids is registered. A direct operationalization of red flag 18 is therefore not possible. As next best possible proxy, the cost for the awarded bid in excess of the projected overall costs is taken. This may prove a valid alternative provided that the cost of the awarded bid is near the lower range of the costs of all bids submitted. This is per se the case in contracts awarded on the basis of lowest price, but may also turn out valid for contracts awarded on economically most advantageous tenders (EMAT). The results of the analysis are presented in the table below.[217]

[215] If no information on the number of bids is available, the number is assumed to be different from one.

[216] PwC, LONDON ECONOMICS, ECORYS (2011), *Public Procurement in Europe: Costs and Effectiveness*. Study commissioned by the European Commission - DG MARKT. Available from: http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/cost-effectiveness_en.pdf.

[217] Procurements where relevant information – here: either projected contract value or awarded contract value – is missing, are treated as not having an award value above projected contract costs.

Table 79: Percentage of tenders where cost of awarded bid was higher than projected costs (based on number of procurements 2006-2010)			
Member State	*No*	*Yes*	*Total*
France	135 343	8 825	144 168
	(93.9%)	(6.1%)	(100%)
Hungary	8 116	2 236	10 352
	(78.4%)	(21.6%)	(100%)
Italy	31 059	1 925	32 984
	(94.2%)	(5.8%)	(100%)
Lithuania	7 381	575	7 956
	(92.8%)	(7.2%)	(100%)
Netherlands	14 734	828	15 562
	(94.7%)	(5.3%)	(100%)
Poland	56 739	10 063	66 802
	(84.9%)	(15.1%)	(100%)
Romania	11 85	823	12 673
	(93.5%)	(6.5%)	(100%)
Spain	41 528	3 126	44 654
	(93.0%)	(7.0%)	(100%)
Total TED	496 687	49 748	546 435
	(90.9%)	(9.1%)	(100%)

The observed pattern is mixed. Poland and Hungary, both Member States with an average score on the indices of the World Bank and TI, score significantly above average on this red flag proxy. Similarly, the Netherlands, France and Spain score significantly below average. Based on these five countries, one could identify a clear pattern. However, this pattern is disturbed by Italy, Romania and Lithuania - all scoring below average with Italy and Romania scoring below Spain. A case can be made for both inclusion and exclusion of the proxy. In order to improve the explanatory power of the model, the value of the awarded contract exceeding the projected project costs is accepted as likely proxy for red flag 18.[218]

Red flag 20 – Award contract and selection documents public

Red flag 20, the contract award and the selection justification documents not being publicly available, can only be tested partially. Absence of a contract award can, by definition, not be tested by a database containing contract award notices. Instead, absence of selection details is tested as a possible proxy for selection justification 'documents not being publicly available'. The selection details and criteria were:

- projected costs;
- contract value;
- selection criterion applied (lowest cost or EMAT).

The results of the analysis are presented in the table below.

[218] Exclusion of this red flag did not yield very different results.

Table 80: Percentage of tenders with missing selection details (based on number of procurements 2006-2010)					
Member State	*0*	*1*	*2*	*3*	*Average*
France	19 644	69 765	48 534	6 225	1.29
	(13.6%)	(48.4%)	(33.7%)	(4.3%)	
Hungary	6 452	3 334	563	3	0.43
	(62.3%)	(32.2%)	(5.4%)	(0.0%)	
Italy	18 188	9 933	4 089	774	0.62
	(55.1%)	(30.1%)	(12.4%)	(2.3%)	
Lithuania	1 356	5 123	1 476	1	1.02
	(17.0%)	(64.4%)	(18.6%)	(0.0%)	
Netherlands	2 231	4 372	8 746	213	1.45
	(14.3%)	(28.1%)	(56.2%)	(1.4%)	
Poland	39 801	23 564	3 26	177	0.46
	(59.6%)	(35.3%)	(4.9%)	(0.3%)	
Romania	7 772	4 725	176	0	0.40
	(61.3%)	(37.3%)	(1.4%)	(0.0%)	
Spain	19 662	17 595	6 926	471	0.74
	(44.0%)	(39.4%)	(15.5%)	(1.1%)	
Total	177 546	232 479	124 474	11 936	546 435
	(32.5%)	(42.5%)	(22.8%)	(2.2%)	(100%)

The table shows that France and the Netherlands have the highest number of missing information in procurements, while Member States with a poorer score on corruption perception indices score much lower in terms of missing information. The chosen operationalization as a proper proxy for red flag 20 is left aside in the further analysis.

Red flag 23 – Absence of EU Funding

Red flag 23, the absence of EU funding, is operationalised by the TED database field that indicated whether or not Community Funds are involved in the procurement. The findings from Stage I point to a negative correlation: inclusion of EU Funds correlates with lower levels of corruption.

The presence of EU Funds in the TED database procurements is presented in the table below.[219]

Table 81: Percentage of tenders where EU Funds are involved (based on number of procurements 2006-2010)			
Member State	*No*	*Yes*	*Total*
France	142 24	1 928	144 168
	(98.7%)	(1.3%)	(100%)
Hungary	8 534	1 818	10 352
	(82.4%)	(17.6%)	(100%)
Italy	31 929	1 055	32 984
	(96.8%)	(3.2%)	(100%)
Lithuania	6 873	1 083	7 956
	(86.4%)	(13.6%)	(100%)
Netherlands	15 042	520	15 562
	(96.7%)	(3.3%)	(100%)
Poland	60 269	6 533	66 802
	(90.2%)	(9.8%)	(100%)
Romania	11 713	960	12 673
	(92.4%)	(7.6%)	(100%)
Spain	41 565	3 089	44 654
	(93.1%)	(6.9%)	(100%)
Total TED	519 79	29 645	546 435
	(94.57%)	(5.43%)	(100%)

[219]Due to the structure of the information registered in the database, no distinction can be made between a missing value and the selection that Community funds are not involved. Missings are treated as Community funds not involved.

The overall share of EU Funds across all sectors of the economy is high in Poland, Hungary, Romania, and Lithuania. These are countries with high access to EU Funds, although Romania accessed these Funds later than other Member States – following its accession in 2007. Netherlands and France score significantly below average, but also have lower levels of access to EU Funds, due to the (almost) absence of Objective 1 status. Italy scores below average and Spain above average.

Note is to be taken of the fact that the above tables apply to the overall economy. The Corruption-probability Model is able to identify at the level of individual cases, and hence takes full consideration of the real situation. Therefore, this red flag has been included in this analysis without any prejudice to the above pattern.

Red flag 25 – Awarding authority filled in all fields in CAN

Operationalization of red flag 25, the contract authority not filling out all fields in the contract award notice, is done by checking presence of information in three fields:

- Procedure selected;
- Number of offers; and
- Time to offer.

The results of the analysis are presented in the table below.

Table 82: Percentage of tenders with missing fields in the contract award notice (based on number of procurements 2006-2010)

Member State	*0*	*1*	*2*	*3*	*Average*
France	35 188	10 371	63 835	34 774	1.68
	(24.4%)	(7.2%)	(44.3%)	(24.1%)	
Hungary	5 723	233	3 736	660	0.94
	(55.3%)	(2.3%)	(36.1%)	(6.4%)	
Italy	14 852	732	15 268	2 132	1.14
	(45.0%)	(2.2%)	(46.3%)	(6.5%)	
Lithuania	5 019	0	2 902	35	0.74
	(63.1%)	(0.0%)	(36.5%)	(0.4%)	
The Netherlands	6 417	680	6 841	1 624	1.24
	(41.2%)	(4.4%)	(44.0%)	(10.4%)	
Poland	32 15	254	31 679	2 719	1.07
	(48.1%)	(0.4%)	(47.4%)	(4.1%)	
Romania	4 473	0	8 193	7	1.29
	(35.3%)	(0.0%)	(64.6%)	(0.1%)	
Spain	20 875	2 669	15 837	5 273	1.12
	(46.7%)	(6.0%)	(35.5%)	(11.8%)	
Total	209 036	18 536	251 872	66 991	1.32
	(38.3%)	(3.4%)	(46.1%)	(12.3%)	

The pattern for this red flag proxy shows a similar counter-intuitive result as red flag 20, with France scoring well above EU average in the number of missing data fields. The lowest scores are achieved by Lithuania, Hungary and Poland. The chosen operationalization is rejected as a proper proxy for red flag 25.

Box 3: And what to do with the other red flags?

The assessment of the red flags in the TED database can be considered pioneering. Nevertheless, one needs to recognise that some valuable information is lost as not all red flags can be found in this database. In the absence of this information, it was assessed to which extent information on other red flags is (centrally) collected. Therefore these indicators were included in a questionnaire amongst procurement bodies (including management authorities and anti-corruption bodies) as part of a questionnaire regarding benchmarking on procurement projects (see chapter 13). Some highlights from this benchmark are as follows:

Are there any (formal or informal) complaints from non-winning bidders (red flag 14)?

- Some countries indeed have indicators such as 'frequency of complaint' in national databases.

- Use of eligibility criteria as quality criteria; thus reducing the competition on formal grounds.

- Some countries register this type of information, allowing for identification of bidders.

False urgency; abuse of accelerated public procurement procedures without adequate justification.

- Tends not to be registered centrally.

Unjustified need: lack of a concrete justification by the public administration of the impossibility to carry out those services internally.

- Tends not to be registered centrally.

Are there substantial changes in the scope of the project or the project costs after award (red flag 16)?

- Several countries reported that they do not have this information as part of the procedure, and that it is up to the discretion of the public officer to record so.

More information on the benchmark on procurement projects is reported in Chapter 12.

Tailoring the Corruption-probability Model

In the previous section, the following red flag proxies have been selected for application. These are:

- Red flag 8 – Accelerated tenders (leads to higher probability of corruption);
- Red flag 12 – Number of bids (more bids lead to lower probability of corruption);
- Red flag 18 – All bids higher than projected overall costs (leads to higher probability of corruption);
- Red flag 23 – Community funds involved (leads to lower probability of corruption).

When observing the red flag proxies, it is important to understand that these proxies are only descriptive in signalling where corruption may be present. The reverse does not hold true: a procurement does not become corrupt if any of the red flags occur. As long as the legal rules are followed, procurements including one or more red flags should be considered to be fully legitimate and theoretically justified. Use of accelerated procedures is fully justified as long as the criteria in the Directive are met. If only one bid is received on a tender, the contract may still be awarded without obtaining a per se suspicion of corrupt practices. In other words, the ref flags are not normative in prescribing how procurement should take place.

In order to estimate the probability of corruption, the Corruption-probability Model from Stage I has been taken as a starting point. It has been tailored to the red flags listed above and weights have been assigned to each of the variables (see Annex G). These weights are figures that indicate how much the presence of a red flag raises the probability of corruption. This assumes a perfect match between the red flags and the selected proxies. Although presence of this perfect relation should be considered to be unlikely, it does offer the best possible basis to explore the probability of corruption on Member State or sector level.

10.3. Estimate the probability

Following the approach described, it has now been possible to estimate the probability of corruption by applying the formula to each procurement found in the TED database, within the product groups researched.

Probability of corruption in selected product groups

Using the tailor-made model, an estimate has been made of the probability of corruption in the 6 product groups and the 8 Member States as studied in Stage III. Providing a breakdown of the probability of corruption per sector, the following results are obtained.

Table 83: Estimated probability of corruption in selected product groups (in %) – through testing on the TED procurement database

Sector (product group)	*Probability of corruption **
Road/rail construction *Construction works of highways*	11- 14%
Road/rail construction *Railway track construction materials and supplies*	15-19%
Water/waste *(Construction of waste water plants)*	22-27%
Urban/utility construction *(Runway construction works)*	11-13%
Training *(Staff development services)*	23-28%
R&D/High tech/Medical products *(radiotherapy, mechanotherapy, electrotherapy and physical therapy devices)*	11-14%

The product group with the highest probability of corruption are the **staff development services** (23-28%) and **construction of waste water plants** (22-27%). Probability of corruption is estimated to be lower for **railway track construction materials and supplies** (15-19%). Corruption probability is considered somewhat lower and comparable for the **construction works for highways** (11-14%), **radiotherapy, mechanotherapy, electrotherapy and physical therapy devices** (also 11-14%) and **(Airport) Runway construction works** (11-13%).

Probability of corruption in selected Member States

The results of the analysis are presented in the table below. Due to the high level of uncertainty of the figures, bandwidths of 90% to 110% of the estimated value are presented.

Table 84: Estimated probability of corruption in selected Member States (in %) – through testing on the TED procurement database

EU Member State	*Probability of corruption*
France	2-3%
Hungary	26-31%
Italy	8-10%
Lithuania	31-37%
The Netherlands	< 1%
Poland	19-23%
Romania	28-35%
Spain	34-41%

One observation is that the estimates provide a number of important deviations. Notable is the low probability of corruption in the Netherlands. This is caused by the extremely low number of red flags in the 12 cases falling in the selected product group (see also Table 66). Out of the possible 48 red flags (12 cases times 4 possible red flags per case in the procurement database), no red flags were actually present. Care is to be taken in the interpretation of other country-specific outcomes (e.g. France, Italy), as that would presume pre-existing knowledge on the level of corruption in these Member States within the product groups identified. Instead, we will limit ourselves to the observation that the level of corruption (whether high or low) will be influenced by the fact that the TED database limits itself to the tendering and contracting phase, thus ignoring the pre-procurement and post-procurement phase. It is possible that, as stated above, more sophisticated and complex forms of corruption lead to a downward bias on the probability of corruption.

Confrontation with results from representative sample

Now that the estimates of corruption are made both in Stage III and Stage IV, a confrontation of the two methods can be presented. It is not yet possible to express a preference for any of the approaches, as both the Stage III and the Stage IV approach have their advantages and disadvantages. The Stage III approach is embedded within the literature on audits and investigations. Although the information per case is relatively rich, the number of procurement cases studies is limited. The Stage IV approach is embedded in the literature on performance analysis. It can handle only limited information for each case, but the number of cases analysed is large.

Therefore, in using these estimates of the probability of corruption for subsequent purposes, an unweighted average of the two approaches will here be taken forward.

Table 85: Estimated probability of corruption by product group – a comparison of the two methods

Sector (product group)	*Through Representative sample (Stage III)*	*Testing through TED Procurement database (Stage IV)*	*Average**	*Comment*
Road/rail *Construction work for highways*	11-21%	11-14%	11-17%	Findings comparable and robust
Road/rail *Railway track construction materials and supplies*	9-18%	15-19%	12-18%	Findings comparable and robust
Water/waste *Construction of waste water plants*	28-43%	22-27%	25-35%	Findings reasonably comparable and robust
Urban/utility construction *(Airport) Runway construction works*	37-53%	11-13%	24-33%	Findings not reliable as substantial differences between the two methods
Training *Staff development services*	0-46%	23-28%	11-37%	Findings not reliable due to limited number of cases from the representative sample
R&D/High tech/Medical *Radiotherapy, etc.*	10-32%	11-14%	10-23%	Findings not reliable as substantial differences between the two methods

*) From a statistical point of view, the point estimates are to be taken as the basis for this average.

The two methods appear to come to similar results in the case of road and rail construction: the TED procurement database points to slighter higher probability in **railway track construction and supplies**, whilst the representative sample points towards a somewhat higher probability in the **construction works for highways**. The average range for both product groups is of 12-16%.

The estimates for **construction of waste water plants** are also pointing towards a high degree of convergence: both methods point to an estimated corruption level exceeding 20%. The bandwidth for the representative sample is larger due to the lower number of cases that could be studied. The average probability of corruption is estimated to be between 25-35%.

The largest discrepancy between the two methods is noticeable in the area of **(airport) runway construction works,** where the representative sample points to much higher values than the analysis with the TED procurement database. A possible explanation may lie in the fact that corrupt practices in this particular product group are not captured by the selected red flags from the TED database, e.g. due to the type of corruption. The average estimate of 24-33% can be considered similar to the construction of waste water plants.

The small sample for **staff development services** explains the large bandwidth as found within the Stage III method. The average estimated probability of corruption lies at 12-44%. The same notion applies to the **radiotherapy etc.** product group, where the average estimated probability of corruption is expected to be 6-23%.

10.4. Extrapolation to sectors

Now that all required components of the measurement are in place, an extrapolation of the direct costs of corruption in selected sectors and Member States can be made.

Before making the extrapolation, one more matching problem needs to be accounted for: estimates for direct costs have been derived from the sample of corrupt/grey and clean cases at the level of sectors (Stage II). However, the estimates on probability are based on that of product groups. An important additional assumption required for this extrapolation is therefore that the probability of corruption as estimated above for the product groups also applies to the broader sectors. This assumption appears to be justified for the sectors road/rail, waste water and training, but is more questionable for urban development (runway construction is not necessarily typical for the product group and R&D/High-tech/Medical.

The following variables have now been brought together in the table below:

- The overall procurement value is based on the information published in the Official Journal (OJ) and the TED database for the year 2010.[220] The overall amount procured in Member States is substantially higher, however such procurements are not covered by the public procurement Directives 2004/17/EC and 2004/18/EC. The areas not covered by this rule include health and education spending, supply of energy or of fuels for the production of energy, defence purchases, purchase of water for the supply of drinking water, as well as below-threshold procurements. Therefore, we will focus the extrapolation only on the information published in the OJ;
- The % of overall OJ procurement value is estimated on the basis of the delineation of sectors (according to CPV codes as detailed in Annex F), as share of the overall procurements (in volume);
- The % of EU Funds provides an overview of the relative importance of these sectors as part of Structural Funds spending, based on certified expenditure for the period 2000-2006 and for all Member States (Objective 1 and 2 only). Thereto, the sectors have been linked to Structural Funds product groups (see Chapter 7.2);
- The average probability of corruption is taken from the tables above, and acknowledges the un-weighted results from Stage III and IV;
- The direct public loss has been analysed on the basis of the original sample from Stage II. The extrapolations are based on these sample results and are indicative. The percentages refer to shares of volumes lost, except for R&D where estimates are based on the average case budget[221].

[220] See: Public Procurement Indicators 2010 (Brussels, 4 November 2011), Available at: http://ec.europa.eu/internal_market/publicprocurement/docs/indicators2010_en.pdf [Accessed 18 May 2013].

[221] Due to the inclusion in the sample of one large R&D project which can be considered an outlier.

Table 86: Direct costs of corruption in procurement for selected sectors and Member States I (2010)

Sector (product group)	% of overall OJ procurement value (*sectors*)	Total public procurement in OJ (bln.) (*sectors*)	% of EU Funds *) (*sectors*)	Probability of corrupt cases (*product groups*)		Direct public loss due to corruption as % of volume (*sectors*)
				low	***high***	
	%	*(Col. C)*	*(Col. D)*	*(Col. E)*	*(Col. F)*	*(Col. G)*
Road & Rail *(Construction work for motorways, railway track construction materials and supplies)*	12.4%	€ 26.1	12.4%	11%	17%	17%
Water& waste *(Construction waste water plants)*	0.7%	€ 1.6	4.8%	25%	35%	7%
Urban/Utility construction *((Airport) Runway construction works)*	8.2%	€ 17.3	6.7%	24%	33%	20%
Training *(Staff development services)*	0.1%	€ 0.5	6.5%	11%	37%	43%
R&D/High-tech/Medical *(Radiotheraphy, etc.)* **	2.8%	€ 5.8	5.6%	10%	23%	17%
All sectors studied	24.3%	€ 51.1	36.0%	n.a	n.a	13%
All other sectors	75.7%	€ 159.1	64.0%	n.a	n.a	n.a
Total (all sectors)	100%	€ 210.2	100%	n.a	n.a	n.a

* Certified expenditure in Obj. 1 and 2 in the period 2000-2006 as % for all MS.
** The direct public loss for this sector is estimated on basis of average case budgets.

Table 87: Direct costs of corruption in procurement for selected sectors and Member States II (2010)

	Low estimate		**High estimate**	
	% of total procured value in OJ *(Col. E*G)*	*Total per sector (mln.)* *(Col. C*E*G) (mln.)*	*% of total procured value in OJ* *(Col. F*G)*	*Total per sector ('000)* *(Col. C*F*G) (mln.)*
Road & Rail *(construction work for motorways, railway track construction materials and supplies)*	**1.9%**	€ 488	**2.9%**	€ 755
Water& waste *(Construction waste water plants)*	**1.8%**	€ 27	**2.5%**	€ 38
Urban/utility construction *(Airport) Runway construction works)*	**4.8%**	€ 830	**6.6%**	€ 1.141
Training* *(Staff development services)*	**4.7%**	€ 26	**15.9%**	€ 86
R&D/High-tech/Medical *(Radiotherapy, etc.)*	**1.7%**	€ 99	**3.9%**	€ 228
All sectors studied (excl. training)	***2.9%***	*€ 1 470*	***4.4%***	*€ 2 247*
All other sectors	n.a	n.a	n.a	n.a
Total (all sectors)	n.a	n.a	n.a	n.a

* These numbers are only indicative and the inaccuracy of these figures is large due to the small number of training cases that could be studied

The direct costs due to corruption in public procurement in the year 2010 for **road & rail** in the 8 Member States studied together is estimated at **1.9% to 2.9%** of the overall value of procurements in the sector published in the Official Journal, EUR 488 million to EUR 755 million.

The estimated direct costs due to corruption in public procurement in the year 2010 for **water & waste** in the 8 Member States studied together is estimated at **1.8% to 2.5%** of the overall value of procurements in the sector published in the Official Journal, EUR 27 million to EUR 38 million.

The estimated direct costs due to corruption in public procurement in the year 2010 for **urban/utility construction** in the 8 Member States studied together is estimated at **4.8% to 6.6%** of the overall value of procurements in the sector published in the Official Journal, EUR 830 million to EUR 1 141 million.

The direct costs due to corruption in public procurement in the year 2010 for **training** in the 8 Member States studied together is estimated at **4.7% to 15.9%** of the overall value of procurements in the sector published in the Official Journal, EUR 26 million to EUR 86 million. These numbers are only indicative and the inaccuracy of these figures is large due to the small number of training cases that could be studied.

The estimated direct costs due to corruption in public procurement in the year 2010 for **R&D** in the 8 Member States studied together is estimated at **1.7% to 3.9%** of the overall value of procurements in the sector published in the Official Journal, EUR 99 million to EUR 228 million.

Taken together, **the overall direct costs of corruption in public procurement in 2010 for the five sectors studied in the 8 Member States constituted between 2.9% to 4.4% of the overall value of procurements in the sector published in the Official Journal**, or between EUR 1 470 million and EUR 2 247 million.

It should be noted that the estimated value of tenders published in the TED in 2010, as percentage of the total value of public expenditure on works, goods and services in the 8 selected EU Member States, is 19.1%, but it is not known what this percentage is for the individual sectors of the economy studied.

Broader reflection on the estimates of corruption

The above findings indicate that public procurement is an activity in the economy and in the public administration which is at higher risk. After all, the costs related to procurement within the sectors and Member States studied point to levels (2.9–4.4%) which are substantially above the more general estimate of the overall costs of corruption within the EU, namely a 1% of GDP-level across all Member States, all sectors and all types of corruption according to the European Commission.

The following points need to borne in mind as well when further interpreting the above findings:

- The absolute estimates of the direct costs of corruption only take into account the volume of public procurement which is published in the Official Journal. However, the overall amounts of public procurement are substantially higher. For example, the broadest available estimate of the total expenditure of the government public sector and utility service providers on public works, goods and services is up to 5 times higher. However we cannot extrapolate these amounts as these procurements take place under different procurement legislation;
- The direct involvement of EU Funds differs between Member States and sectors. Overall, within the sectors and Member States studied, the probability of corruption in public procurement is lower when EU Funds are directly involved. Nevertheless, the sectors studied have been amongst the priority axes of EU Structural and Cohesion Policy, and together account for 29.5% of Structural Funds spent in the period 2000-2006 (36% including training expenditures);
- The estimates on direct costs of corruption only refer to the corruption that could be detected through the comprehensive methodology, and not to hidden corruption – a share which is expected to grow with increasingly complex and sophisticated forms of corruption being practiced. It is therefore expected that a more in-depth analysis of individual cases would most likely lead to larger direct public losses.

10.5. Assessment of sectors

This section presents a more detailed assessment of the sectors studied. First, the nature of the demand side is described (the procurement authorities) and the supply side (the contracted companies), before presenting the data from the analysis as well as the interpretation of the results.

10.5.1. *Road & Rail Construction*

Overview of procurement volume and size of sector

In 2010 there were a total of 1 845 public procurements throughout the EU27 in the Road & Rail sector, which is the least amongst all sectors analysed. The aggregate value of these procurements amounted to just under EUR 26 billion. With an average value of a project in the sector of just over EUR 15 million, this sector constitutes by far the biggest projects compared to other sectors.

Road & Rail infrastructure is one of the fundamental infrastructures on which the EU economy is reliant. The spending on the construction and maintenance of such key infrastructure across the EU is about 1% of the GDP. For instance in the UK the current plans are to spend around EUR 40 billion between 2009-2014 on rail alone[222]. Road & Rail is also an important category for EU spending. In the period 2000-2006, an overall 12.4% of certified expenditures (Objective 1 and 2) were allocated to this sector. This share is higher still when the Cohesion Fund expenditures are included.

Market structure

Road

The structure of the **demand side** (procurement authorities) depends on the ownership of the network, which can be either national or regional, but also municipal. The frequency of projects is key in determining the experience of the procurement authority. For example when Slovenia decided to completely rebuild and improve its motorway network, the procurement authority at first was rather inexperienced. It had to completely rely on consulting engineers that supervised the construction. As the wider strategy progressed and the national agency grew in experience it was in a better position to conduct its own assessment of the proposals and progress. This put the authorities at a more level playing field with the construction companies. On the other hand, when a procurement authority is inexperienced the information asymmetry places it into a weak position vis-à-vis the contractor.

On the **supply side** (contracted companies), large international companies bid for the major national roads and motorways projects, while regional companies tend to bid for the regional and municipal road projects. The large international companies will use local suppliers and local subcontractors to provide aspects of the work (especially the works requiring little technological capacity, such as provision of sand). In general, all these companies conduct road construction on a rather frequent basis and therefore have vast experience of the process, giving them an information advantage over the procurement authority. They can use this information to their advantage to win the project, or attain better prices at the cost of the public official. Corruption can be relatively easily hidden due to the complexity of these projects.

Providers of concrete play a very powerful role in the building process as their fundamental importance to the construction process allows them to influence the cost of construction. Since concrete is almost always sourced locally and most plants have dominance in a given area, they often have a monopolistic power, allowing them to determine prices. In some instances it is the cement plant owners that will determine the winner by giving a certain company preferential prices, which leaves a large window for corruption. On other occasions, a construction will own the concrete plant, or acquire it and thereby exclude competition.

An interesting situation occurred in the New Member States when Cohesion Funds started to flow in. The huge scale of construction projects at a very short notice put enormous supply-side pressure on the local companies and since they simply did not have the experience or capacity to conduct all projects, prices increased and as a result foreign and international players entered into the market - putting additional pressure on the local ones. Such market inflexibility, typical of a transition period, led to more expensive motorway construction in the Czech Republic – even in real terms when compared to Germany or Austria. When one combines these market pressures to an environment where corruption was not only very common, but also relatively risk-free, it is of little surprise why the prices were so high.

[222]http://www.aggregate.com/documents/brochures/rail-and-railway-platforms-brochure.pdf.

Rail

On the **demand side**, rail construction is exclusively conducted on a national level and usually by national rail companies. The responsibilities are usually split (at least in liberalised markets) between the manager of rail infrastructure and rail operators. This study focuses on procurement in rail infrastructure. In recent years, there has been limited rail construction and the emphasis has been more on maintenance and upgrading of existing structures. This may imply that procurement authorities have an information disadvantage compared with the tendering companies. It is a requisite therefore to have very good supervising engineers to oversee the project. Such an environment is rather susceptible to corruption and due to the relative un-interest from the public there is a danger of limited focus on control mechanisms. These projects can be co-financed by the ERDF or (in case of large projects) the Cohesion Fund.

In some Member States the infrastructure company has a division focused on building and maintaining its own network - in which case it only secures (not procures) materials.

The **supply side** is made of very few and very specialised companies and a lot of regional suppliers of materials or the technologically undemanding tasks (digging of foundations, clearing trees). Corruption in such environment is relatively easily disguised and the infrequency of building increases the incentive to corrupt to ensure a winning bid.

Findings from the analysis

Stage I: Indicators specific to this sector

The most common type of corruption in the Road & Rail sector is bid rigging (36% of the cases analysed), a figure which is below average for the sectors analysed (46%). Other more common types of corruption are kickbacks (27%) and conflict of interest (14%), both in line with the average value for these two types of corruption in other sectors analysed. Finally, Road & Rail projects show a low level of mismanagement (5%) on par with sector average (6%). Thus, the findings do not point to a typical corruption type in Road & Rail - all types are used depending on the opportunity at hand.

Stage II: Costs of corruption in cases

The Road & Rail projects analysed have budgets of EUR 72 million, which is quite large in comparison to the projects in the other industries. Average corrupt/grey projects appear to be 40% bigger than clean projects.

The value of the average budget volume lost due to corruption is 17% (13% for all sectors).

In the Road & Rail sector only 35% of the cases experienced losses (overpriced or extra costs) during the project's life time. This is, together with the R&D sector, the lowest of the sectors analysed. However, the value of the losses per project caused by cost overruns is significantly higher than the average: 38% of the concerned project's budget is lost, compared to 22% for all sectors.

Delays in the Road & Rail sector occurred in 59% of the cases compared to a 30% average, which is by far the highest frequency compared to the other sectors. This could be due to the complex building process and natural obstacles in road construction. By the same token, such complexity allows for a convincing explanation even in the case when such delays have been intentional. Finally, effectiveness losses (e.g. poor quality) occur in 35% of Road & Rail cases, which is the second lowest of all sectors studied.

If the total amount of public losses amongst the analysed projects is compared, the main reasons for such losses appear to be overpriced projects or additional costs during the project (EUR 164 million in total), as well as delays (EUR 77 million in total), rather than poor effectiveness issues (EUR 4 million in total).

Stage III/IV: Probability of corruption

The Road & Rail sector has an average estimated probability of corruption of **11% to 17%**, based on the product groups construction of motorways and railway track supplies & services. Compared to the other sectors studied, this is in the middle of the five sectors studied.

Extrapolation: Direct costs of corruption in the sector

Based on the calculation in the previous stages, it is estimated that in 2010 there has been between **EUR 488 million** and **EUR 755 million** of public money lost or badly spent in the Road & Rail sector due to corruption in the 8 Member States studied. This represents between **1.9%** and **2.9%** of the total procured amount. Comparing to other sectors studied this is the second largest share, while in nominal terms it by far the largest cost compared to the other sectors studied.

10.5.2. *Water supply/Waste Water/Water Management*

Overview of procurement volume and size of sector

In 2010 there were a total of 314 public procurements throughout the EU27 in the Water & Waste sector, which is the least out of all the sectors analysed. The aggregate value of these came in at just over EUR 1.6 billion. The average value of a case amounted to just under EUR 5 million.

Although the spending on Water & Waste projects constitutes less than 0.1% of EU's annual GDP they are a crucial infrastructures to the smooth functioning of modern society. Also these projects have usually very long lifespans (between 25-40 years)[223] and therefore they are built less frequently, which is represented in the size of the sector. The infrastructure importance is disproportionate to their costs.

Water & waste is also an important category for EU spending. In the period 2000-2006, an overall 4.8% of certified expenditures (Objective 1 and 2) were allocated to this sector. This share is higher still when the Cohesion Fund expenditures are included.

Market structure

On the **demand side** (procurement authorities), cases in the water sector are usually taken forward on a local government level with medium sized cities. Sometimes these projects can be part of a wider national initiative that can cover a whole river basin, covering multiple administrative regions. However, most procurements are left to a regional administration.

The fact that these projects are unique and rare also means that local or regional authorities do not necessarily have the experience and capacity to conduct such large public procurement cases and its oversight. Furthermore, they may also lack the sector expertise to accurately evaluate proposals and ensure effective budget and quality control. This creates an information and expert asymmetry between the contractor and the procurement authority, giving a strong advantage into the hands of an experienced and well-resourced contractor.

On the **supply side** (contracted companies), a limited number of international companies is active – and capable of completing the whole value chain, a pattern which resembles that of the Urban/utility construction sector. This concentrated and restricted market is particular for the technology-intensive parts of the project. However, the supply of basic water pipes is often outsourced or contracted to small and regional companies, for which the market is a lot more open and competitive.

The main players tend to be from the larger, old Member States and have a long track record in water & waste projects. This is due to the fact that they can operate across the EU and beyond and simply replicate their approach, gaining experience and perfecting their model. This is in stark comparison to the local authorities, who do not have such a chance to learn from experience. Significantly the contracted companies have a huge informational and experience advantage that they can use to their advantage. This can be done either through persuasion of the badly informed local authority, or through outright corruption.

Findings from the analysis

Stage I: Indicators specific to this sector

About half of the cases analysed experienced bid rigging types of corruption, 27% of projects analysed contained kickbacks and 14% conflict of interest type of corruption. These values are close to the average values across the sectors. Overall, a majority of cases studied experience corruption in the early stage of preparing, e.g. by preparing tender documents that can be biased towards one particular supplier.

Stage II: Costs of corruption in cases

The Water & Waste projects studied have the highest budgets (on average EUR 109 million) compared to the other sectors analysed. Still, the budget for those Water & Waste projects with high probability of corruption is on average bigger (ten times) than that of clean project, as well as three times as long (on average 340% longer). This could suggest that bigger projects are more susceptible to corrupt practices[224].

[223] DG Regio guide to Cohesion policy.

[224] Although such data could also suggest a lower chance to identify corruption for small-sized projects.

The major issue encountered with Water & Waste sector was that out of the nine clean cases no losses could be identified at all. This could be either because the clean projects do not experience any losses, but more likely reason is the lack of data for the right cases. In the light of the similarities with Urban/utility construction sector, the assumption at this stage is that the clean projects experience the same public loss of 7% of all volume.

Given this assumption when the standard calculation was performed on the Water & Waste projects, it was found that these are considered as high risk, experience 10% of the value of their budget lost due to corruption. This is close to the average (13%) and therefore in line with the earlier findings of the sector being close to the overall average.

In the Water & Waste a high number of projects (74% of the cases analysed) experienced losses during the projects life-time, which is the highest percentage amongst all the sectors analysed. However, amongst those projects the value of the loss attributable to corruption (in a project that experienced cost overruns) is 20% of the budget, a value close to the average of 22% for all analysed sectors.

Finally, delays in the Water & Waste sector occur in only 16% of the projects compared to a 30% on average, whilst losses in effectiveness (e.g. lower quality or failure to deliver) occur in 58% of the projects.

Therefore, public losses in Water & Waste occur mostly through "overpriced projects" or emergence of "additional costs" during the project implementation (EUR 288 million in total), rather than with effectiveness (e.g. bad quality) issues (EUR 14 million in total) or delays (EUR 7 million in total).

Stage III/IV: Probability of corruption

The Water & Waste sector has an estimated average probability of corruption in the range of **25%** to **35%**, based on the probability of corruption in the product group waste water treatment plants. Compared to the other sectors studied this is rather a high probability.

Extrapolation: Direct costs of corruption in the sector

Based on the above, the estimated direct costs of corruption in public procurement in the Water & Waste sector in the 8 Member States studied (2010) is expected to be between **EUR 27 million** and **EUR 38 million**. This represents between **1.8%** and **2.5%** of the total procured amount.

10.5.3. *Urban/utility construction*

Overview of procurement volume and size of sector

In 2010, a total of 7 808 public procurements were made throughout the EU27 in the Urban/utility construction sector. The aggregate value of these came at just over EUR 17.3 billion. The average value of procurement in the sector was just over EUR 2.2 million.

Urban/utility construction is part of the broader construction sector which represents more than 10% of EU GDP. It is the largest single economic activity and it is the biggest industrial employer in Europe. Direct employment in the sector is almost 20 million people and 40-45% of Europe's energy consumption stems from buildings with a further 5-10% being used in processing and transport of construction products and components. [225]

Urban/utility construction is also an important category for EU spending. In the period 2000-2006, an overall 6.7% of certified expenditures (Objective 1 and 2) were allocated to this sector. In exceptional cases, projects may be funded under the Cohesion Fund.

Market structure

On the **demand side** (procurement authorities), urban construction projects are usually taken forward on a local government level, including so by larger as well as medium-sized and smaller cities. In smaller and medium-sized cities, larger procurements tend to be of an incidental nature, and they include 'once in a lifetime' projects for the authorities and are amongst the biggest investments made by local government. Examples include the construction of a sports stadium, a theatre, a congress centre, a hospital or a regional airport.

[225] Ecorys (2009) *Sustainable Competitiveness of the Construction Sector,* study carried out for EC DG ENTR.

Because of their uniqueness these urban development projects are of major political importance and value. At stake are often the legacy and reputation of local political leaders and the reputation vis-a-vis the local electorate. This means that leading politicians take active participation throughout the decision-making process and actively influence it.

The fact that these projects are unique and rare also means that local authorities do not necessarily have the experience and capacity to conduct such large public procurement projects and their oversight. Furthermore, they may also lack the sector expertise to accurately evaluate proposals and ensure effective budget and quality control.

On the **supply side** (contracted companies), a limited number of international companies is active – and capable of offering the whole value chain related to complex and large urban construction projects. They are often able to perform concept and design, building of the project itself, finance of the project, and operate and manage the finished construction. The size and scope of expertise required creates major barriers to entry for newcomers, creating often an oligopolistic market structure. Such markets have a higher probability of collusion between the players and in Urban Construction there have been cases of such practices occurring.

The largest construction companies have a long track record and tend to be located in the larger, old Member States. They can operate across the EU and beyond and benefit from economies of scale and scope, constantly gaining additional experience and perfecting their model. This is in stark comparison to the local authorities, who do not have such a chance to learn from experience. Contracted companies can therefore have a large knowledge and expertise advantage that they can use to their advantage. This market structure can create an information and expert asymmetry between the contractor (company) and the procurement authority, giving a strong advantage into the hands of the experienced and well-resourced contractor.

Findings from the analysis

Stage I: Indicators specific to this sector

About half of the cases analysed experienced bid rigging. A total of 37% of cases analysed contained kickback and 29% conflict of interest, which are the highest shares of all sectors analysed. The high share of bid rigging is symptomatic for the market structure, at least for the top-end of the market: market providers tend to be concentrated, while the public sector is local, and not always well-equipped to manage the procurement process from beginning to end. Overall, corruption can be found in all stages of the procurement – spreading out from the initial acquisition phase to the implementation stage. Corruption is also encountered in the maintenance/operating stage, e.g. through long-lasting lease constructions which come at high cost for local governments and which can create excess profits for companies involved.

Stage II: Costs of corruption in cases

The Urban Construction cases analysed have budgets of EUR 45 million on average, considerably higher than the overall procurement size. These amounts are particularly large for the local government involved.

Cases with a high probability of corruption therefore tend to be much bigger: four times larger than clean cases analysed and they last twice as long (average 4.7 years). The fact that the average value of the clean projects is closer to the overall sector average can point to a bias of the sample, but can also indicate that bigger projects are more susceptible to corrupt practices.

The share of the average budget in Urban/utility construction lost in corrupt/grey cases amounts to 29%. However, losses in clean cases are estimated at 9% of costs. The overall direct loss attributable to corruption amounts therefore estimated at 20%, above the average of all the analysed cases (13%).

In the Urban and Construction half of the cases experienced losses during the projects life time, which is exactly the average value overall. However, the share of the loss in the sector is significantly higher than the average with, on average 33% of the project's budget being lost, compared with 22% over the entire average of the entire population.

Delays in the Urban and Construction sector occur in 38% of the cases, compared to a 30% on average. In terms of effectiveness, Urban and Construction cases are less problematic in terms of effectiveness losses - occurring in 31% of the cases, the lowest of all sectors. These results indicate that public loss in Urban/utility construction occurs mostly through overpricing or through charging additional costs during the implementation.

Stage III/IV: Probability of corruption

The Urban and Construction sector has an estimated average probability of corruption in the range of **24% to 33%** in the eight Member States. This estimate is based on the product group runway construction works, and considered only indicative for the sector as a whole. Compared to the average probability of corruption in all sectors analysed, this probability is amongst the highest.

Extrapolation: Direct costs of corruption in the sector

Assuming that the probability of corruption in the product group runway construction works is typical for the Urban and Construction sector as a whole, the direct public loss due to corruption in public procurement in the sector in 2010 would amount to **EUR 830 million** and **EUR 1 141 million.** This represents between **4.8%** and **6.6%** of the total amount procured.

10.5.4. *Training*

Overview of procurement volume and size of sector

In 2010, a total of 664 public procurement cases in the Training sector in the 8 Member States were recorded in the TED database. The aggregate value of these amounted to just over EUR 0.5 billion. The average value of a case in the sector amounted to just over EUR 0.8 million

The training sector is very difficult to define in its size and market structure. This is largely due to the fact that mandatory and voluntary education are often mixed in the statistics. For example, education institutions (secondary schools, vocational schools, universities also provide voluntary training services. The funding of training comes from a wide set of sources: from public, to private to NGO sector, to personal initiative etc.

The training sector is a significant sector for the economy, and therefore deferred efficiency and employment gains that can come out of it are expected to be substantial. These projects may be co-funded by ESF Funds, and overall 6.5% of EU Funds are allocated to this sector, based on certified expenditures in the period 2000-2006.

Market structure

On the **demand side** (procurement authorities), projects can be commissioned by agencies and government at every governance level – national, regional and local. They are usually implemented at regional and local level, and procured by organisations closer to final recipients, such as decentralised state bodies, local governments and NGOs.

As territorial and local administration might not have the full capacity and skill-sets needed to effectively monitor and evaluate the training activities, there is a possibility for corruption patterns to emerge. This is exacerbated by the fact that trainings are often difficult to evaluate, since the outcomes are mostly intangible (e.g. achievement of higher professional skills for those attending a course). These sector-specific elements put any procurement official in a very difficult and weak position compared to the contractor, as often limited evidence can emerge in case of final results being of lower quality than what was expected. This is particularly so in the case of illicit agreements amongst the contractor and the evaluator of the services.

On the **supply side** (contracted companies or organisations), although national and international providers can be involved, usually local organisations are contracted, or sub-contracted by larger entities. These local entities are able to establish close personal ties with the procurement authorities as they might have easy access to them. Therefore, although the sector presents an extensive fragmentation of the market, this element does not necessarily mean a fierce competition on price or quality. It can therefore be challenging for outsiders to acquire access to the procurement authority.

Although training projects are usually quite small in value and reach, they may be part of larger initiatives and can be broken up into small sub-projects (ultimately referring to individual classes and courses being held locally). This means that often these individual projects are below the budget-size required to be listed on the TED database and therefore they do not have to comply to the high requirements of public procurement that contracts in other sectors might often have to respect. On top of that, small projects tend to be in general less interesting to investigators or journalists due to their limited media impact and therefore can easily slip under the radar of public accountability.

The combination of difficulty of evaluation and the relatively ease of cover up, together with little public oversight, means that corruption in the training sector is likely to happen but difficult to identify. Although losses can be lower than in other sectors due to limited size of individual projects, the share per project is very high since there is a minimum nominal price for corruption that is demanded by the actors – needed to justify the transaction costs and risks inherent to corruption.

Findings from the analysis

Stage I: Indicators specific to this sector

In only 11% of the cases analysed did bid rigging was found to be the type of corruption, which is by far the lowest of all sectors analysed (average is 47%). On the other hand 33% of projects analysed contained kickbacks and 22% conflict of interest types of corruption, both of which are very close to the average (31% and 19% for all sectors together). Training contained a low level of mismanagement if compared with the average for all services analysed in this study. It is expected that corruption takes place primarily through kickbacks and conflicts of interest, with public officials playing an active role.

Stage II: Costs of corruption in cases

The Training projects studied have relatively small budgets, an average of EUR 2.4 million. Nevertheless, corrupt/grey cases are on average bigger (twice as big) than the clean cases; however they take the same amount of time to complete. The fact that the value of the clean cases are in size comparable with the sector average suggests that bigger projects are more susceptible to corrupt practices[226].

The share of the average budget in Training that is lost due to corruption is with 43% of budget volume high (13% across sectors). This is due to the effectiveness dimension, as many of the corrupt/grey trainings are not delivered at all. Following this logic, if a training project was identified as clean then it is likely that it was delivered in full and virtually no loss was identified.

In Training, almost half (44%) of the corrupt/grey cases experienced losses during the projects life time, which is a little bit below the average value for such practice in other analysed sectors (53%). But these losses (mostly overpriced projects from the beginning) mostly occur in tandem with issues of effectiveness (e.g. lower quality or failure to deliver). In fact 75% of corrupt/grey cases reviewed experienced such losses, which is a very high share compared to the average of all sectors (48%). No delays were encountered in the analysed Training procurements.

Stage III/IV: Probability of corruption

The average estimated probability of corruption in the Training sector varies between **11%** and **37%**. This estimate is derived from the product group staff training services, which is considered typical for the sector as a whole. This estimate is only indicative due to the limited number of training projects that could be studied as part of Stage III.

Extrapolation: Direct costs of corruption in sector

The direct cost due to corruption in public procurement in the year 2010 for training in the 8 Member States studied together is estimated at **EUR 26 million** to **EUR 86 million**, or **4.7 %** to **15.9%** of the overall procurement value in the sector (as published in the O/J). These numbers are only indicative and the inaccuracy of these figures is large due to the small number of training cases that could be studied.

10.5.5. *R&D/High tech/Medical products*

Overview of procurement volume and size of sector

In 2010, a total of 4 569 public procurements were recorded in the TED database, within the R&D/High tech/medical sector in the 8 Member States studied. The aggregate value of these procurements amounted to just under EUR 5.8 billion, with an average value of a procurement in the sector of just under EUR 1.3 million.

[226] An alternative explanation would be that corruption in smaller-sized budget projects is less easy to spot.

Companies have been increasing their R&D investment by 8.9% in 2011, up from 6.1% in 2010. The increase nearly matches investments made by US firms (9%), and beats the global average (7.6%). Recently released Eurostat data show that combined EU public and private research spending increased to 2.03% of GDP in 2011, from 2.01% in 2010. This was mainly due to increased private sector spending[227].

R&D/High tech/Medical products may be funded by ERDF or FP6/FP7. In the period 2000-2006, the share of certified expenditures in this sector amounted to 5.6%, and is expected to rise over time.

Market structure

The sector can be divided into different types of R&D procurement which can be aggregated in two groups reflecting different market structures.

Procurement of R&D intensive products

This can be procurement of for instance medical equipment, or software. The significant difference is that the procurer buys a product as a normal customer and does not acquire the Intellectual Property Rights (IPRs).

On the **demand side** (procurement authorities), this type of R&D procurement is taken forward by a range of actors, including medical institutions such as (groups of) hospitals, public research centres, etcetera.

On the **supply side** (contracted companies or organisations), a limited number of international companies that are capable to deliver such R&D intensive products (such as MRI machines or sophisticated IT software). This market is therefore rather closed and oligopolistic. The companies have vast experience in the procurement and sale of their products since they sell their products frequently at global scale. As a result these contracted companies tend to have an informational and experience advantage over procuring authorities. Smaller suppliers also provide this type of R&D procurement (e.g. suppliers of oxygen machines, or radar for military vehicles).

Service procurement of R&D

This procurement is not aimed at any specific product delivered but at acquiring the Intellectual Property Rights (IPRs) that allow for:

- Greater innovation without immediate product innovation – e.g. the aim is for secondary effects to filter through the economy, increasing aspects such as efficiency, job creation etc.;
- Future product innovations (usually done in the form of public private partnership) that do not exist as of yet.

On the **demand side** (procurement authorities), these projects are procured by large authorities at a national or even EU level. This means that the procurement authority is more specialised (such as national universities or consortia) and with more capacity, skills and time available to properly procure and monitor the projects. These procurements may be co-financed by FP7 funds.

On the **supply side** (contracted companies or organisations), entities involved usually organise themselves into consortia, made up of big companies, specialised companies, but also research institutes, universities and NGOs. This market is dominated by established lead partners, where around 20% of the partners get 70% of the funding. Competition is therefore present, but limited to a number of established players.

Findings from the analysis

Stage I: Indicators specific to this sector

The majority (71%) of the cases analysed experience bid rigging, which is the highest share compared to all the sectors studied. Whilst 24% show kickbacks and 12% conflict of interest, the lowest share compared to the other sectors. R&D contained exactly the average level of mismanagement of 6% of cases. These figures point to high active corruption from the side of the contractors, with collusion being frequent.

Stage II: Costs of corruption in evaluated cases

The R&D projects analysed have average budgets of EUR 18 million, small when comparing to other projects in the other sectors.

[227] DG Enterprise and Industry http://ec.europa.eu/enterprise/newsroom/cf/itemdetail.cfm?item_id=6312

The procurements deemed at high probability of corruption are on average much bigger in budget size (six times bigger) than clean cases and take on average a year longer (average 3.8 years for the high probability cases), therefore suggesting that bigger projects are more susceptible to corrupt practices.

The share of the average budget lost in R&D due to corruption is above average (13%) at 17%. This is largely because the corrupt/grey R&D cases analysed experience the second largest public loss at almost a third (29%) of the value of the project being lost, compared to 18% on average. The public loss in clean cases was an average 11%.

In R&D almost half (46%) of the cases experienced losses during the project's life time, which is very close to the average value for all sectors analysed (53%). However, the value of these losses in the sector is extremely small, with only 2% of the overall budget lost per project that experienced cost overruns, compared with the average of 22% for all sectors.

Delays in the R&D sector occur in only in 15% of the projects, half of the average for all sectors (30%). In terms of effectiveness, R&D projects are the second most problematic amongst all sectors analysed, with 69% of the projects experiencing low quality due to corruption practices, compared to an average of 48% for all sectors.

These results indicate that public loss R&D occurs mostly due to poor effectiveness (e.g. bad quality or questionable usefulness), which is in stark contradiction to other sectors where public loss occurs in different ways and stages of the process.

Stage III/IV: Probability of corruption

The R&D sector has an average estimated probability of corruption in the range of **10%** to **23%**. This estimate is based on the product group radiotherapy, electrotherapy, etc., which can be considered typical at least for the procurement of R&D products.

Extrapolation: Direct costs of corruption in the sector

The estimated direct public loss due to corruption in public procurement in the year 2010 for R&D in the 8 Member States studied together is estimated at **EUR 99 million** to **EUR 228 million** or **1.7%** to **3.9%** of the overall procurement value in the sector.

10.6. Conclusions

In the final Stage IV of the comprehensive methodology, a further testing of the probability of corruption has taken place at the level of product groups. This has been done by tailoring the Corruption-probability Model from Stage I to the EU-wide Tender Electronics Daily (TED) procurement database. This testing is based on the operationalization of a limited number of red flags only – namely those for which data are available in the procurement database.

According to the performed analysis, the product group with the highest probability of corruption are the staff development services (23-28%) and construction of waste water plants (22-27%). Probability of corruption is estimated to be lower for railway track construction materials and supplies (15-19%). Corruption probability is considered somewhat lower for the construction works for highways (11-14%), radiotherapy, mechanotherapy, electrotherapy and physical therapy devices (also 11-14%) and (airport) runway construction works (11-13%).

The testing of the methodology in Stage IV has a number of limitations. Most important, the testing is limited to the procurement phase, as the TED database (as well as many national databases) only contains information on this phase in the procurement process. With the expansion of available information to the pre-procurement phase and the post-procurement phase, more elaborate analysis may be possible in the future.

Another point of attention for the applied method is that the operationalization of the red flags had to take place by means of benchmarking against corruption indices. Only those red flags that demonstrate a similar pattern as the indices could be selected, leading to a self-confirming result in terms of estimated level of probability of corruption. As the indices used are more or less based on circumstantial evidence or subjective opinions, this fully reflects in the selection of red flags. This approach can be improved if corrupt cases could be identified in the TED-database, allowing for econometric analysis on the characteristics of corrupt cases. This would also open doors to identification of new red flags that are not yet identified in the literature.

Extrapolation of direct costs due to corruption in selected sectors and Member States

In summary, both the Stage III and the Stage IV approach have their advantages and disadvantages. The Stage III approach is embedded within the literature on audits and investigations. Although the information per case is relatively rich, the number of procurement cases studies is limited and the research efforts required are substantial. The Stage IV approach is embedded in the literature on performance analysis. It can handle only limited information for each case, but the number of cases analysed is large. This approach can be implemented in a resource-efficient manner.

The two approaches appear to come to comparable results in the case of road and rail construction. When taking into account the size of the representative sample, the robustness of these estimates can be considered relatively high. The estimates for waste water treatment are also pointing towards convergence: both approaches estimate an average probability of corruption around 25%. In R&D, and in particular in urban/utility construction, the representative sample approach arrives at a higher estimated probability of corruption than the TED-based approach. It is expected that corrupt practices in these particular product groups studied are not sufficiently captured by the selected red flags from the TED database.

The direct cost due to corruption in public procurement (2010) can now be extrapolated to sectors and Member States studied by multiplying the overall public procurement amounts published in the Official Journal (OJ) by the probability of corruption and the direct public loss due to corruption as % of the volumes procured.

Taken together, **the overall direct costs of corruption in public procurement in 2010 for the five sectors studied in the 8 Member States constituted between 2.9% to 4.4% of the overall value of procurements in the sector published in the Official Journal**, or between EUR 1 470 million and EUR 2 247 million.

Broader reflection on the estimates of corruption

The above findings indicate that public procurement is an activity in the economy and in the public administration which is at higher risk. After all, the costs within procurement in the sectors and Member States studied point to levels (2.9–4.4%) which are substantially above the more general estimate of the overall costs of corruption within the EU, namely a 1% of GDP-level across all Member States, all sectors and all types of corruption according to the European Commission.

The following points need to borne in mind as well when further interpreting the above findings:

- The absolute estimates of the direct costs of corruption only take into account the volume of public procurement which is published in the Official Journal. The estimated value of tenders published in the TED in 2010, as percentage of the total value of public expenditure on works, goods and services in the 8 selected EU Member States, is 19.1%. The overall amounts of public procurement are substantially higher. However we cannot extrapolate these amounts as these procurements take place under different procurement legislation;
- The direct involvement of EU Funds differs between Member States and sectors. Overall, within the sectors and Member States studied, the probability of corruption in public procurement is lower when EU Funds are directly involved. Nevertheless, the sectors studied have been amongst the priority axes of EU Structural and Cohesion Policy, and together account for 29.5% of Structural Funds spent in the period 2000-2006 (36% including training expenditures);
- Public procurement is carried out by a variety of actors, each with different types of competency. A crucial difference needs to be made between levels of government, and in particular between central expert bodies and decentralized local authorities. Within this respect, the assessment of sectors such as water & waste and Urban/utility construction points to market structures where contracted companies can have an advantage over (decentralized) procurement bodies in terms of information, experience and/or competence;
- The estimates on direct costs of corruption only refer to the corruption that could be detected through the comprehensive methodology, and not to undetected corruption – a share which is expected to grow with increasingly complex and sophisticated forms of corruption being practiced. It is therefore expected that a more in-depth analysis of individual cases would most likely lead to larger direct public losses.
- Furthermore, indirect costs of corruption are not accounted for. In particular, effects on public institutions, the environment, psychological costs, and costs to civil society have not been estimated. Neither have effects of corruption on the international investment climate and trade been estimated.

11. Procurement prices for standardised units

11.1. Introduction

The general objective of this study is to collect information and develop methodologies and tools for the Commission to implement and/or to assist Member State authorities with the implementation of EU anti-corruption policies. This general objective is divided into ten separate research objectives and this chapter focuses on research objective 7 which is to:

"Analyse **the procurement prices for standardised units** of 5 particular sets of products/services typically procured with the support of EU Funds across all Member States. Among the sets of products selected for these comparative case studies are the costs of road infrastructure, retraining courses, medical hospital equipment."

The price of standardised units can be defined as an estimation of the economic effort that a productive unit has to provide to carry out the production cycle.

The rationale for applying the concept of price of standardised units is to control the efficiency and the effectiveness of performance. For proposal evaluation, the analysis of the misalignment between the price of standardised units estimated and the price for which a product/service has been procured, provides in theory a base to evaluate the results of a production unit. In the field of public procurement, prices of standardised units can be used as an instrument to measure the efficiency of the public administration in managing public resources.

In light of the general objective of this study, this chapter will investigate the (theoretical) assumption that the prices of standardised units can help to prevent or to detect corruption in public procurement and therefore could be included as one of the indicators in the framework put forward in this report. In the following sections the opportunity of applying standardised unit prices as an indicator of corruption are explored. The conclusions on this particular question will presented in three sections:

- Presentation of the **literature and database review** on procurement prices of standardised units. This section aims to critically assess the relevant studies and databases which have been elaborated on for the subject under investigation;
- Analysis of **procurement prices of standardised units** describes the methodology and the data analysis related to the standardised units prices on the basis of sample data;
- Analysis of **market prices** sheds light on the link between the market price and the price of standardised units and presents the results of the market prices data collection exercise.

11.2. Literature and databases review

11.2.1. Literature review

The literature review of publicly available information was conducted with the objective of gathering relevant information on existing methodologies and/or data in relation to the topic of standardised unit pricing as a whole, with a specific focus on the selected sectors from publicly available sources and/or databases. The goal was also to understand possible challenges and limitations related to data availability and data quality related to the price of standardised units.

The literature review also identifies a number of limitations and challenges with respect to prices for standardised units. These have been summarised and consolidated across all sectors and are presented in the subsections "Data Limitations" and "Conclusions".

11.2.1.1. Infrastructure sector

The literature review carried out for the infrastructure sector encompasses the following sectors that are within the scope of this study: Road/Rail construction and Urban/Utility construction.

Although the focus of the publication of the Statistics Directorate of the OECD and EUROSTAT (1997)[228] does not centre on the price of standardised units, the publication provides good insights on limitations and/or difficulties that impact the comparability and reliability of data used for infrastructure projects. These limitations are summarised as follows:

- The products of construction activities (and especially civil engineering such as roads, bridges, dams, etc) are rarely comparable with one another due to variations in specifications, production location, size, equipment used, etc.;
- Rural and/or urban differences can have a major impact and should therefore be reflected in the price;
- Time impacts, due to the fact that the relevance of building practices and technology change over time (due to innovation in technologies and equipment);
- Obtaining the 'right' transaction price (i.e. contract value) is critical, thus price data needs to be adjusted for cash discounts, competitive discounts, seasonal discounts, trade discounts and quantity discounts;
- The prices compiled should also reflect current market conditions and include a realistic allowance for overheads and profit;
- In reference to price changes, it is difficult to separate changes in price strictly speaking from changes in quality;
- It should be clear which items are included and/or excluded in the price (for example profits, overheads, margins, price of land, site preparation, architects, supervisor fees, transport, legal fees, etc.).

One of the main conclusions of the OECD and Eurostat publication is that there is considerable variation in the concepts, price components and methodologies used by the member countries of the OECD and European Union. This lack of harmonisation is results from different administrative and legislative environments, and differing physical characteristics (i.e. site conditions) such as geographic size, population density and climate in which organisations undertaking construction activity operate in each country.

Flyvbjerg et al.[229] have applied a simple cost comparison methodology across projects with comparable data to compare implementation costs across a set of homogenous rail projects in Europe. In order to make the data for rail projects in Europe comparable (i.e. homogenous), a number of selections have been made: a particular focus on urban rail projects in densely populated areas in Europe; a focus on urban rail projects that were wholly or at least partially underground; European projects were considered as more relevant than American projects; and light rail and commuter rail projects were excluded from the data sample. In addition to these distinctions, the original data were normalised for currency (i.e. converted into EUR) and inflation (i.e. is deflated/inflated) to make it consistent and coherent. It should also be noted that only cost estimates accrued until the moment the project starts (i.e. the first year the project was completed and brought into use) are considered.

The conclusions that have been made in the OECD and EUROSTAT publication are supported by Flyvbjerg et al. which states that the capital costs per route-kilometre of urban rail varies highly between the sample projects (i.e. a big range[230]). The main reasons for this high variation in route-kilometre costs are due to the differences between the projects, such as the ratio of underground to above-ground construction, the ground conditions, the station spacing, the type of rolling stock, the environmental and safety constraints and the labour costs. Another possible explanation for this cost variation can be found in the changes (i.e. differences related to time periods and the country/region of construction) between the real costs in the construction industry and local market circumstances during the construction period.

[228] STATISTICS DIRECTORATE OF ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT (OECD), STATISTICAL OFFICE OF THE EUROPEAN UNION (EUROSTAT) (1997) *Sources and methods: construction prices indices*. OECD Publishing.

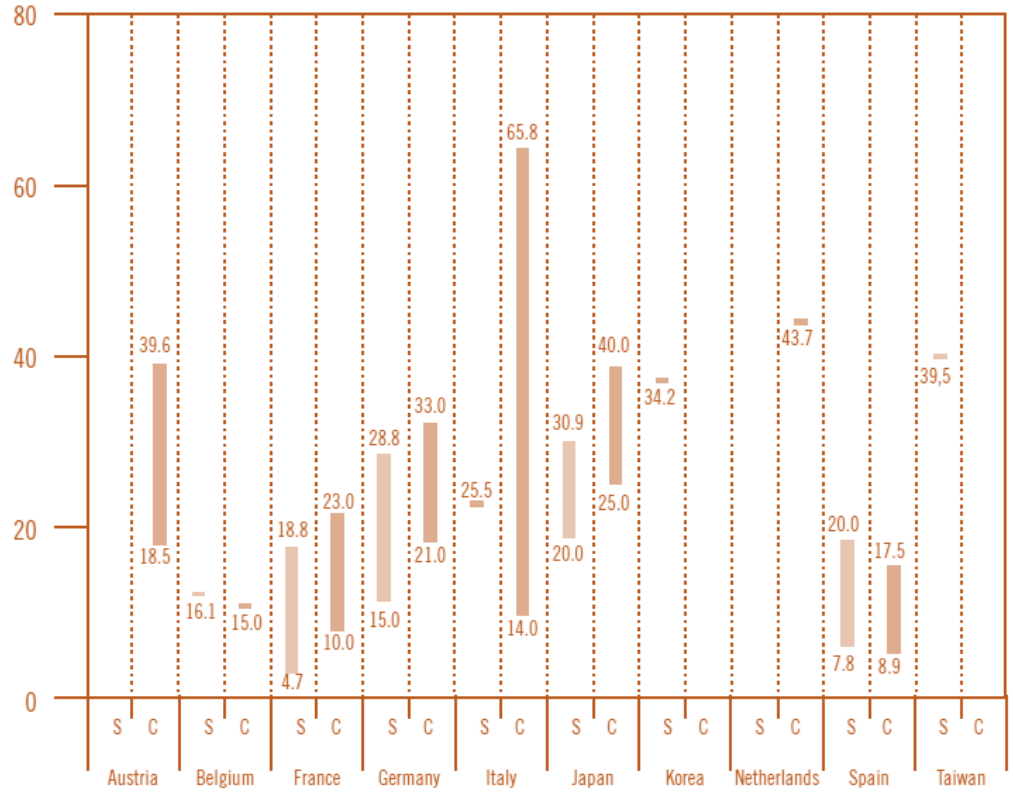
[229] FLYVBJERG B., BRUZELIUS N. and VAN WEE B. (2008), *Comparison of Capital Costs per Route-Kilometre in Urban Rail*. European Journal of Transport and Infrastructure Research, Volume 8, Number 1 (2008), p. 17 – 30.

[230] FLYVBJERG et al. (2008): 'Looking at European projects and excluding outliers, the total capital costs per route-kilometre (including stations and rolling stock) lie mainly in the interval US$50-100 million (2002 prices)'.

The study of Campos et al[231] regarding an 'Economic analysis of High Speed Rail in Europe' discusses in more detail the specific characteristics of a High Speed Rail (HSR) project. A HSR project differs from a conventional railway for a number of technical reasons such as different signalling systems and electrification systems (since most high speed lines require at least 25.000 volt to achieve enough power). HSR projects are influenced by project and/or site conditions. For example in densely populated areas the number of roadway level crossings will be higher than in rural areas and this will have an influence on the project cost.

The study of Campos et al. also reports on an average cost per kilometre of building HSR infrastructure based on a total sample size of 45 projects. The reported values include infrastructure costs, but exclude planning and land costs. Overall, the construction cost per kilometre for High Speed Rail projects varies between EUR 6 million and EUR 45 million, with an average of EUR 17.5 million.[232] The figure below shows the high variance between the average cost per kilometre of new HSR infrastructure in ten selected countries.

Figure 16: Average cost per kilometre of new HSR infrastructure



S = Lines in service; C = Lines under construction (2006). Data exclude planning and land costs. Source: CAMPOS J., DE RUS G. and BARRON I. (2007).

No relation to any forms of corruption has been explicitly mentioned by the authors in order to explain this high variance. The authors remind that comparisons of the figures should be interpreted with caution due to the intrinsic characteristics of each project.

Furthermore, the user's guide of the Directorate-General for Regional Policy and Cohesion (1998)[233] to strengthen the appraisal capabilities of officers supports the fact that differences exist between European countries in geographical terms resulting in a high variation in construction costs, material costs, land costs and design standards across the European Union. This can be explained by such factors as the distance from suppliers, climate and weather conditions and general market conditions.

[231]CAMPOS J., DE RUS G. and BARRON I. (2007), *Economic analysis of high speed rail in Europe – Chapter 1: A review of HSR experiences around the world*. Fundacion BBVA.

[232]The calculations are carried out on 2005 as a base year.

[233]EUROPEAN COMMISSION, DIRECTORATE-GENERAL FOR REGIONAL POLICY AND COHESION (1998) *Understanding and Monitoring the Cost-Determining Factors of Infrastructure Projects.*

Even within one country, it is possible to have significant variation between projects, depending on whether the project the project is implemented in a peripheral or central area, or in an urban or rural context. The text reads:

> "*No two infrastructure projects will cost the same amount of money no matter how similar they are. Apart from basic technical factors, the wide range of economic and institutional conditions in different Member States will itself always lead to variations. Nevertheless, the fundamental project costs are based on the actual cost of the land, materials, equipment and labour in the region where the project is being procured. These basic costs will vary depending upon a number of factors [...]:*
> - *The Project Specification;*
> - *Location;*
> - *Form of Procurement/Contract;*
> - *Site Characteristics;*
> - *New Build or Improvements;*
> - *Tax Liabilities;*
> - *Timescale;*
> - *Inflation"* [234]

In light of the construction of a set of prices of standardised units for different types of infrastructure projects, the Directorate-General for Regional Policy and Cohesion (1998) user's guide indicates:

> *"One method of assisting desk officers that was considered, but then rejected, would be to compile a set of standard or unit costs for different types of infrastructure. This approach would involve a comprehensive review of actual project out-turn costs for a range of project types. This would need to be done for each Member State or even region of the EU. The rationale behind a standard costs approach is that it would provide a benchmark against which desk officers could assess both new and revised project cost estimates. The main reason for rejecting this approach is that it does not allow for the extreme diversity of conditions under which projects are implemented in practice, including location, topography, institutional differences and many others".* [235]

Jorge and de Rus[236] describe a cost-benefit methodology for economic evaluations of airport infrastructure projects. One of the conclusions of their study is that conducting a thorough cost-benefit analysis of airport investment projects can be a very resource consuming exercise (e.g. carrying out surveys). Further, the exercise does not automatically result in an accurate appraisal. But even if a full appraisal exercise will be carried out the evaluation still renders to significant uncertainties. These uncertainties are due to the limited comparability across projects because of the widely differing data availability, therefore the authors conclude that the emphasis should be placed on making the projects comparable in order to ensure consistency in the evaluation, rather than on the accuracy of the results.

Finally and Wyman[237] has published a Guide to Airport Performance Measures to help airports around the world in their performance management efforts by providing a useful set of performance measures across a number of categories (i.e. internal and external benchmarking). Although benchmarking is a powerful analytical tool, it must be used carefully, especially given the complexity of airport operations (i.e. the different physical, financial and governance structures within which airports operate). Wyman concludes that in order to make useful airport comparisons, it is essential to compare similar sets of businesses operating in similar environments.

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[234] EUROPEAN COMMISSION, DIRECTORATE-GENERAL FOR REGIONAL POLICY AND COHESION (1998) *Understanding and Monitoring the Cost-Determining Factors of Infrastructure Projects, p. 9.*

[235] Ibidem.

[236] JORGE J.D. and DE RUS G. (2004) *Cost-benefit analysis of investment in airport infrastructure: a practical approach*. Journal of Air Transport Management 10 (2004), p. 311-326.

[237] WYMAN A. (2012), *Guide to Airport Performance Measures*. Airports Council International.

11.2.1.2. Waste water sector

The Barnstable County Wastewater Task Force (2010)[238] study on waste water management facilities in Cape Cod (located in the North-East of the United States) focuses on four types of waste water treatment plants that can be installed: individual on-lot systems, clusters systems, satellite systems and centralised systems. In this study, cost estimates include all costs of waste water management (i.e. collection costs, treatment costs, disposal costs, possible co-location costs) for 30 projects. Based on the sensitivity analysis performed, the following cost factors are identified by the authors as the most important: economies of scale, density of development, location of disposal facilities and land costs.

Another study, on the costs of 1 400 municipal wastewater collection and treatment plants in Poland, finds that costs are increasing with technology efficiency, and decreasing with high wastewater treatment plant capacity (Berbeka, Czajkowski and Markowska 2012)[239]. This study reveals that cost variance is large in the case of wastewater treatment plants. Comparing costs is complicated due to the fact that some studies focus on water throughput volumes, while others express costs as a function of population covered.

Finally, Ecorys[240] has performed an 'Ex post evaluation of a sample of projects co-financed by the Cohesion Fund (1993-2002)' for the Directorate-General of Regional Policy of the European Commission. The study was based on a sample of 200 projects in Greece, Ireland, Portugal and Spain and focused on two main sectors: environment. Each sector was further divided into a number of sub-themes, including wastewater treatment plants as a subs-theme in the environment sector. Unit costs identified in the Ecorys study show that Spain has a relatively small variance in unit cost per m³ treated (EUR 0.0 to EUR 0.77) and that Portugal has a relatively large variance in unit cost per inhabitant (EUR 93 to EUR 177) for a wastewater treatment plant. No information regarding unit cost for wastewater treatment plants in Greece or Ireland is reported.

11.2.1.3. Medical hospital equipment

As discussed in the 2006 Annual Global Corruption Report published by Transparency International[241], health systems are prone to corruption because of the large number of actors involved and the complexity of their multiple forms of interaction. These actors can be classified in five main categories (see Figure 17): government regulators (health ministries, parliaments, specialised commissions); payers (social security institutions, government office, private insurers); providers (hospitals, doctors, pharmacists); consumers (patients); and suppliers (medical equipment and pharmaceutical companies). The presence of so many actors exacerbates the difficulties of generating and analysing information, promoting transparency and identifying corruption when it occurs.

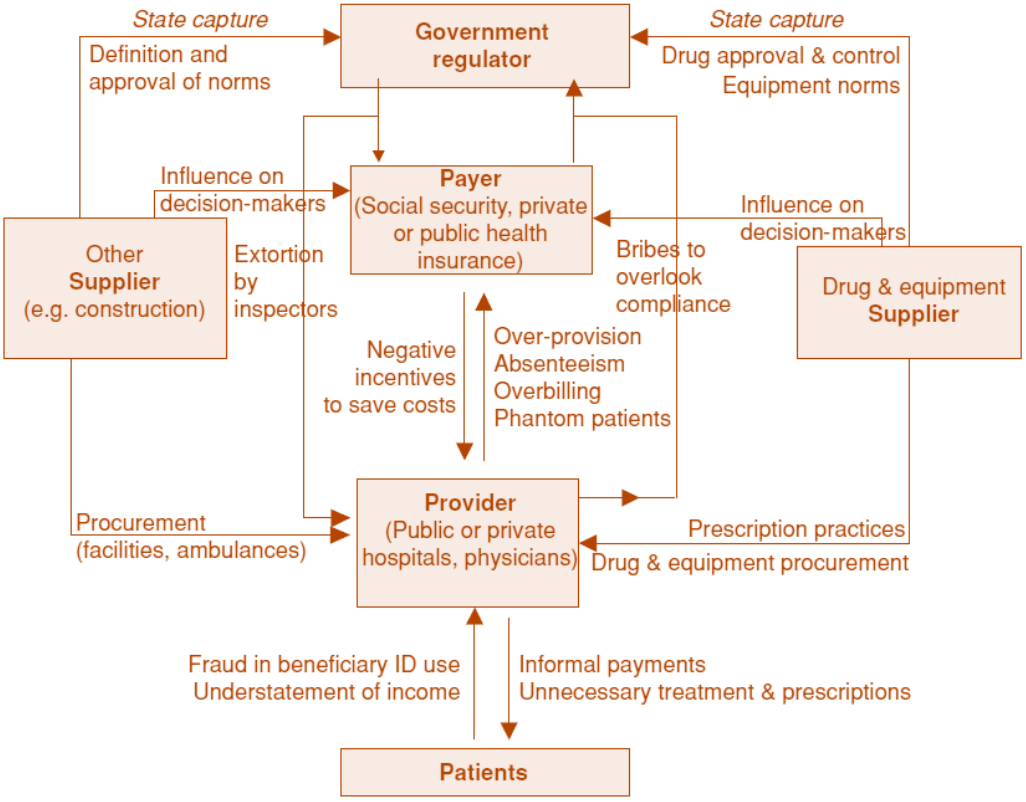
[238] BARNSTABLE COUNTY WASTEWATER COST TASK FORCE (2010) *Comparison of costs for wastewater management systems applicable to Cape Cod.*

[239] BERBEKA K., CZAJKOWSKI M. and MARKOWSKA A. (2012), *Municipal Wastewater Treatment in Poland – Efficiency, Costs and Returns to Scale*. University of Warsaw.

[240] ECORYS (2005) *Ex Post Evaluation of a sample of projects co-financed by the Cohesion Fund (1993-2002).*

[241] TRANSPARENCY INTERNATIONAL (2006) *Global Corruption Report*. Annual Global Corruption Report with a special focus on Corruption & Health.

Figure 17: Key Actors in the Health System



Source: TRANSPARENCY INTERNATIONAL (2006) Global Corruption Report. Annual Global Corruption Report with a special focus on Corruption & Health.

The 2006 Transparency International Annual Report indicates that one of the key reasons for corruption is that medical equipment suppliers and pharmaceutical companies have privileged information about their own products and deliveries that assist them to corrupt the health care system. The Department for International Development (2010)[242], in its note on Corruption in the Health Sector sheds light on the fact that the relationships between medical suppliers, health care providers and policy makers are often opaque which make it difficult to detect conflicts of interest that can lead to policy distortions. Health service delivery is also often decentralised making it difficult to standardise and monitor service provision and procurement.

Although the focus of the study of Erlandsen (2008)[243] is on hospital performance, and therefore not specifically on medical hospital equipment as formulated in research objective 7 of the overall study, the three approaches used in this study to perform an international (i.e. cross-country) comparison can be considered as relevant. The first approach is based on the differences in unit costs of typical individual clinical interventions (i.e. medical services). Because there is no ready-made data on hospital outputs and inputs which would allow such a comprehensive international comparison, the input-data comes from aggregate output measures that are made comparable and homogenous for the patient case mix through the implementation of the Diagnosis Related Group (DRG) Classification systems[244].In a second stage, the unit costs per treatment are normalised for cross-country differences in the price level of goods and services in general by using an economy-wide Purchasing Power Parities (PPPs).

Thus, Erlandsen (2008) concludes that there are relatively large cross-country variations in unit-costs and therefore real improvements could be achieved. However, Erlandsen also states that several factors may be

[242]DEPARTMENT FOR INTERNATIONAL DEVELOPMENT (DFID) (2010) '*Addressing corruption in the health sector*. Practice paper

[243]ERLANDSEN E. (2008) *Improving the Efficiency of Health Care Spending: What Can be Learnt from Partial and Selected Analyses of Hospital Performance?*. OECD Economic Studies, No. 44, 2008/1.

[244]Diagnosis Related Group (DRG) classification system, which is a system for grouping patient treatments into a restricted set of clinically and economically homogenous groups, according to the resources used.

behind the substantial variation in cost performance across countries, reducing the cross-country comparability. These include:

- Different Diagnosis Related Group (DRG) systems used by the countries implying that the interventions that are covered between the countries may not be fully comparable;
- Variation in the methodology used to calculate the individual cost-weights (i.e. aggregate output measures), for example:
    - the cost components that are included in the national cost base used to estimate national cost-weights;
    - differences in trimming methods used to detect outlier cases;
    - differences in the intensity with which care is provided;
    - whether or not a specific intervention is performed as a day surgery;
    - extent to which the cost-weights are representative for the country as a whole.
- Different weights to the use of medical equipment versus the use of labour intensive care;
- Economies of scale;
- (Unalterable) national characteristics;
- Institutional factors.

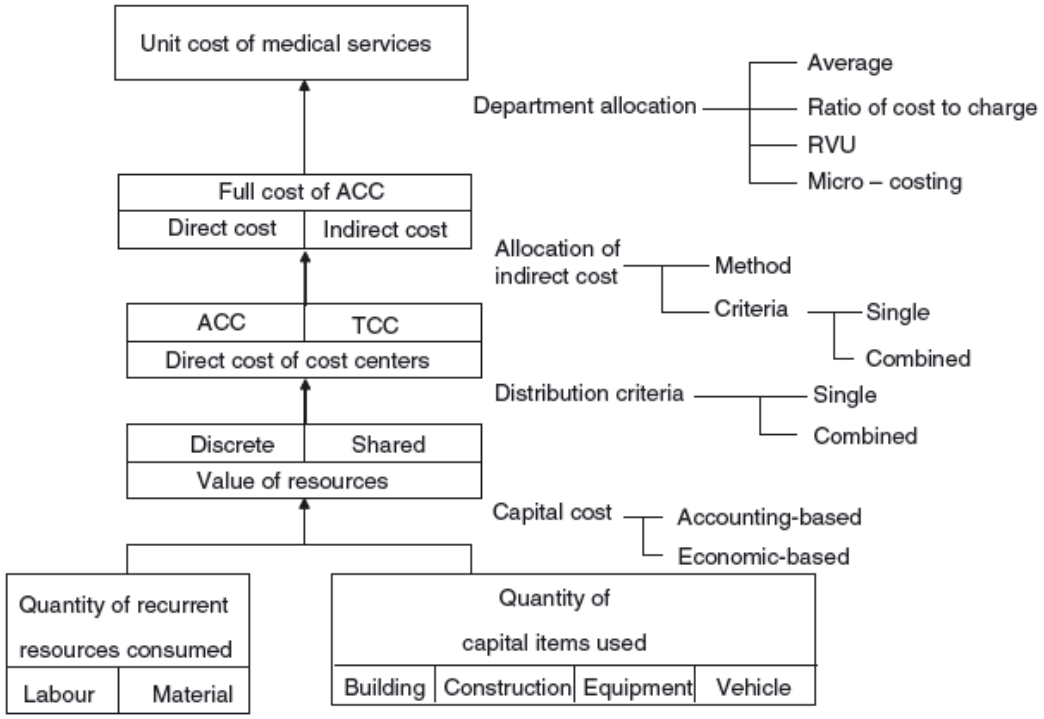
The study conducted by Borgonovi et all (2008)[245] – 'Financing Medical Devices for Italy & Spain' – for the European Health Technology Institute Socioeconomic Research does not specifically focus on price of standardised units, but does draw attention to standard reference prices used in Italy to measure the volume of devices that are bought/funded as a control measure. The 2003 Financial Law in Italy established the Medical Devices Committee (*Commissione Unica sui Dispositivi Medici-CUD*), whose main objectives were to define a national database of medical devices present in the market (*Repertorio Nazionale*) and to regularly update it on the basis of clinical and economic criteria. The introduction of reference prices for medical devices has gained much attention. The 2007 Financial Law introduced reference prices for selected medical devices, to be used in procurement arrangements between the medical device producers and providers of healthcare services. More specifically, the list applied to devices whose total expenditure exceeded half of the total public expenditure for medical devices in the previous two years. The Ministerial Decree (October 11th 2007) defined the first list of medical devices affected by reference pricing. This list includes coronary stents and hip and prostheses components, among others. In Italy, inpatient medical technologies are purchased through open public tender procedures and, generally, negotiations with the manufacturer take place at provider level. Several Regions have established agencies in charge of centralised purchasing and negotiation with the industry. The study goes on to say that the government introduced reference pricing at the central level for a wide category of medical devices has been extensively criticised (mainly by the industry), and that it is too early to draw any conclusions on its real impact on the procurement mechanisms across national territory.

Riewpaiboon et al. (2007)[246] explore the variance of unit costs of hospital medical services resulting from different costing methods, however it does not analyse standard unit costs for medical equipment in particular. The figure below describes the study's conceptual framework.

[245]BORGONOVI E. et al. (2008) *Financing Medical Devices in Italy & Spain*. Conference Paper, 7th European Conference on Health Economics.

[246]RIEWPAIBOON A., MALAROJE S. and KONGSAWATT S. (2007) *Effect of costing methods on unit cost of hospital medical services*. Tropical Medicine and International Health, Volume I2, number 4, p. 554-563.

Figure 18: Conceptual framework for the variance of unit costs of hospital medical services



Source : Riewpaiboon A., Malaroje S., Kongsawatt S., (2007), 'Effect of costing methods on unit cost of hospital medical services' -, Tropical Medicine and International Health, Volume I2, number 4, p. 554-563.

As presented in the figure above, the study concludes with unit costs for certain medical services (such as for example surgery) that are calculated on the basis of different costing methods (i.e. accounting-based approach and economic-based approach) and the analysis of the impact of the different costing methods on the standard unit cost variance for hospital medical services. Although standard unit costs are mentioned, the study does not make reference to standard procurement prices for unit costs of medical equipment.

In 2011, Ecorys (2011)[247] performed a sector study on the structure and operation of the market for medical equipment. This study discusses the possibility of comparing the price of medical equipment internationally. Based on the results of the study and the difficulties encountered, the study concludes that it is difficult to compare prices internationally due to the large differences between countries. These differences can be found in the health system, the regulation, the way the equipment is bought, the market organisation, the market characteristics, etc. In addition to these reported differences, the prices of medical equipment are also subject to the way the medical equipment is procured, in particular the level of service (guarantees, advice, maintenance) provided when the medical equipment is procured.

11.2.1.4. (Re-) training

The literature review did not retrieve any relevant study on the topic of (re-)training. The publicly available literature that has been identified is typically concerned with evaluating the effectiveness of training as compared to unit costs per different types of training.

11.2.1.5. Data limitations

There is a general consensus in the literature that any conclusions and recommendations on the topic of standardised unit prices should be cautiously treated due primarily to data limitations (i.e. the limited availability of data and the low quality of data).

[247] ECORYS (2011), *Sectorstudie medische hulpmiddelen: Onderzoek naar de structuur en werking van de markt voor medische hulpmiddelen*, Rotterdam, Nederlandse Mededingingsautoriteit (NMa) & het Ministerie van Volksgezondheid, Welzijn en Sport (VWS).

The limited availability of data renders the collection and use of reliable data difficult. As a result, the statistical significance of the conclusions is typically limited. Flyvbjerg et al. (2003)[248] performed a data collection and refinement exercise on cost development data of transport infrastructure projects (i.e. rail, fixed links and roads) over a period of four years and summarize their effort as "time-consuming" and "difficult". They make the following observations:

- The relevant project period (from the decision to build to the completion of the project) may cover several fiscal years meaning that the reconstruction of the total costs can entail long and difficult archival work and complex accounting.
- For public funded projects, the funding and accounting procedures are typically unfit for keeping track of the multiple and complex changes that occur in total project cost over time.
- For private funded projects, the cost development data is often classified as confidential in order to prevent competitors from using the information.
- As the project owners may not want to disclose information on potential cost overruns; data should be treated with caution.

The selection of sample projects is typically done on the basis of data availability, rather than on the basis of a statistically sound methodology (i.e. random selection of projects out of a large population of transport infrastructure projects). Consequently, potential biases may arise:

- Projects which are well managed regarding data availability – and therefore included in the sample - may also be well managed in terms of other aspects surrounding the project (such as project management, finance, etc.), resulting in a better than average performance;
- The availability of accurate data, which allows the evaluation of performance, may contribute to enhance the performance when this data is used by the project management to monitor the projects;
- The risk that project managers have an interest in not making cost development data publicly available when there is a negative record in terms of cost escalation;
- The risk that project owners present only cost development data in order to present their projects as favourably as possible.

Another major limitation is the quality of the data. The data collection processes performed in the different studies clearly show that the retrieved data is lacking in terms of specification (i.e. granularity) and/or quality. According to Flyvbjerg et al. (2008), it is often unclear which items are included in specific cost estimates and which items are excluded. For instance, it is sometimes difficult to assess if specific costs, such as land acquisition costs, rolling stock costs, management costs, taxes, are included in the implementation costs or not. Furthermore, it is unclear whether costs are given in constant or in current prices and to which (base) year a given cost figure pertains.

The necessity of clear cost definitions is supported by international associations and organisations (e.g. BCIS and RICS (2011)[249] in the infrastructure sector). The purpose of this cost analysis is to provide data that allow comparisons between the costs of achieving various functions in a project with those of achieving equivalent functions in other projects. In order to do so, BCIS and RCIS (2011) clearly state that, while a generic data structure could be used, specific definitions are needed to make them clear to the experts involved in the projects (i.e. drafting of definitions that transcend the specific cases).

These observed limitations are supported by the International Transport Forum (ITF) (2010)[250], which has been collecting and publishing data on five main transport infrastructure modes (i.e. road, rail, inland waterways, maritime ports and airports) since the late 1970's. Despite this relatively long time series, ITF concludes that the data often suffers from problems of definition (i.e. lack of detailed common definitions between countries) and coverage (i.e. availability of data), resulting in significant variances from one country to another. This makes international comparisons difficult.

[248] FLYVBJERG B. et al. (2003) How common and how large are cost overruns in transport infrastructure projects?. Transport reviews, Volume 23, Number 1 (2003), pp. 71-88.

[249] BUILDING COST INFORMATION SERVICES (BCIS) and ROYAL INSTITUTION OF CHARTERED SURVEYORS (RICS) (2011) *Standard Form of Civil Engineering Cost Analysis*. Consultation Documents 1, 2, 3 and 4.

[250] INTERNATIONAL TRANSPORT FORUM (ITF) (2010) *'Investment and maintenance in inland transport infrastructure 1995-2008*. Summary of Aggregate Trends & Definitions and Used Methodology.

Therefore, the ITT concludes that there is a strong need for having more precise common definitions in order to improve the quality of and comparability of data series of the Investment in Transport Infrastructure database[251].

The ex post evaluation study performed by Ecorys (2005)[252] on a sample of projects (in the environment and transport sector in Greece, Ireland, Spain and Portugal) co-financed by the Cohesion Fund (1993-2002) reveal that it is difficult to establish a systematic database on unit costs due to:

- Diversity in the type of projects;
- Insufficient information and data about the cost details to arrive at unit costs;
- Project characteristics (i.e. differences in the number of tunnels and bridges, geomorphologic conditions, location of projects, etc.);
- The absence of a common cost base year (i.e. the costs associated to the projects change over the years).

Finally, the European Court of Auditors (ECA) indicates that it is currently using standardised unit prices for specific audit purposes only an ad hoc basis. They do not have (or intend to develop) a database of standardised unit prices.

11.2.2. *Existing cost databases*

Despite the major data limitations identified in the literature review, three main databases have been constructed: the ROCKS Worldwide Database, DG REGIO database and Africa Infrastructure Country Diagnostic database. These databases compile standard unit prices for certain types of products or services.

11.2.2.1. ROCKS initiative

Unit cost averages for infrastructure have been prepared by the Transport Unit of the World Bank as part of its ROCKS initiative (Road Costs Knowledge System). The initiative includes an overview of average, minimum and maximum costs for various road works, including new construction[253]. The database has more than 3,000 records that are compiled into a single Excel file and provides a basis for future data collection.

The ROCKS Worldwide Database (Product IV) created with data collected primarily from World Bank Implementation Completion Reports, Project Appraisal Documents, and actual Civil Works Contracts, but also from Project Supervision Reports, Pavement Management Information Systems, and Procurement and Disbursements Reports. The database contains more than 3,000 records. All data has been compiled into a single Excel file and provides a basis for future data collection.

Another ROCKS product is a *Set of Preliminary Average and Range Unit Costs* (Product V), which provides costs for a selected number of work types and predominant work activities in a selected single currency (US dollars) and a single reference date (year 2000). An overview of the ROCKS data collected for roads in Europe and the Middle East is presented in the table overleaf.

Evidently, the cost of infrastructure projects varies largely, and for a variety of reasons, including technical, economic, and institutional and project management reasons. The Polish road example discussed previously indicates that costs per km vary significantly, from EUR 12 000 for the preventive treatment of a road to EUR 2.2 million for construction of a dual carriageway.

[251]This database contains annual data from ITF Member countries Administrations and Statistical offices.

[252]ECORYS (2005) *'Ex Post Evaluation of a sample of projects co-financed by the Cohesion Fund (1993-2002)'.*

[253]WORLDBANK (2013) *Road Costs Knowledge System (ROCKS)* [WWW] Worldbank. Available from: http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTTRANSPORT/EXTROADSHIGHWAYS/0,,contentMDK:20510818~menuPK:1097394~pagePK:148956~piPK:216618~theSitePK:338661~isCURL:Y,00.html.

The table below summarises the main advantages and limitations of the ROCKS database.

Table 88: Advantages and limitations of ROCKS Initiative	
Advantages	*Limitations*
– The ROCKS database is the largest publicly available database; – The ROCKS database could be used as a benchmark database to compare approach and unit cost values.	– The main objective of the system is to develop an international knowledge system on road work costs that could be used primarily in developing countries. Thus, it cannot be directly applied to EU member states; – The ROCKS database lacks comprehensive information on the methodology applied and assumptions made.

11.2.2.2. DG REGIO – Work package 10

One of the main objectives of the Work Package 10 final report (i.e. 'Efficiency – Unit costs of major projects')[254] is the development of a database of unit cost benchmarks and project characteristics, which can assist the Commission in the appraisal of future public procurements of major infrastructure projects. For this, a three-tier approach (Level 1, Level 2, Level 3) has been developed to reflect various degrees of disaggregation, as well as a set of (sector-specific) unit 'generally accepted' cost definitions for major infrastructure projects. The database is populated with major infrastructure projects carried out in the European Union. The report presents the estimated and actual unit costs for projects co-financed by Cohesion Fund and ISPA during the 2000 – 2006 programming period. These are presented separately for road, rail, water and waste projects. Once a feasible set of unit cost definition(s) has been determined, the available data have been normalised in order to make the data comparable to other unit cost benchmarks (i.e. normalisation in reference to currency and normalisation in reference to inflation).

This publicly available database (i.e. spread sheet tool "EU Fund Database") is structured as a set of input, normalisation and output sheets. The project specific data is put into the input sheets, after which it runs through a number of normalisation sheets that adjust the data for inflation and currency rates and therefore converts the data into comparable benchmark costs. The output sheets display project and sector specific data. The database is based on a sample of 325 projects, from the period of 2000 – 2006, in the following countries: Czech Republic, Estonia, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Portugal. The data was collected from the European Commission (Level 1 data) and from project managers (Level 2 data)[255].

DG REGIO emphasised that the unit cost database (or DG REGIO database) cannot be used in order to prevent or detect corruption as stated in a November 2012 letter:

"As was stated in the meeting with you, we do not believe that our unit cost database is suitable for your purposes, and nor was it designed for that."

[254]This report is part of the 'Ex post evaluation of Cohesion Policy programmes 2000 – 2006' of the European Commission (Directorate-General for Regional Policy's) and is financed by the European Regional Development Fund (ERDF).

[255]DG REGIO (2009) *Work Package 10, Efficiency: cost unit major projects*.

According to a high level analysis, the main advantages and limitations of the DG REGIO database are listed in the table below.

Table 89: Advantages and limitations of DG REGIO – Work Package 10

Advantages	*Limitations*
– The DG REGIO study provides a good platform that could be further developed in terms of increasing the amount of project specific data, the level of detail and the scope; – The study focuses on the same geographic scope as the study (i.e. EU member states); – The primary focus of the study is on infrastructure projects (i.e. rail and road transport); – The methodology appears to be easily applicable and scalable, depending on the amount of detailed information available; – The data is collected by using templates that could be further customised.	– The data has not been independently verified and validated for its accuracy, consistency, and/or definitions used; – The scope (i.e. coverage) might be too small to derive reliable conclusions; – The data is based on completed projects for which final reports have been submitted and may therefore present a geographic bias towards southern Mediterranean countries.

11.2.2.3. Africa Infrastructure Country Diagnostic – Unit Costs of Infrastructure Projects in Sub-Saharan Africa

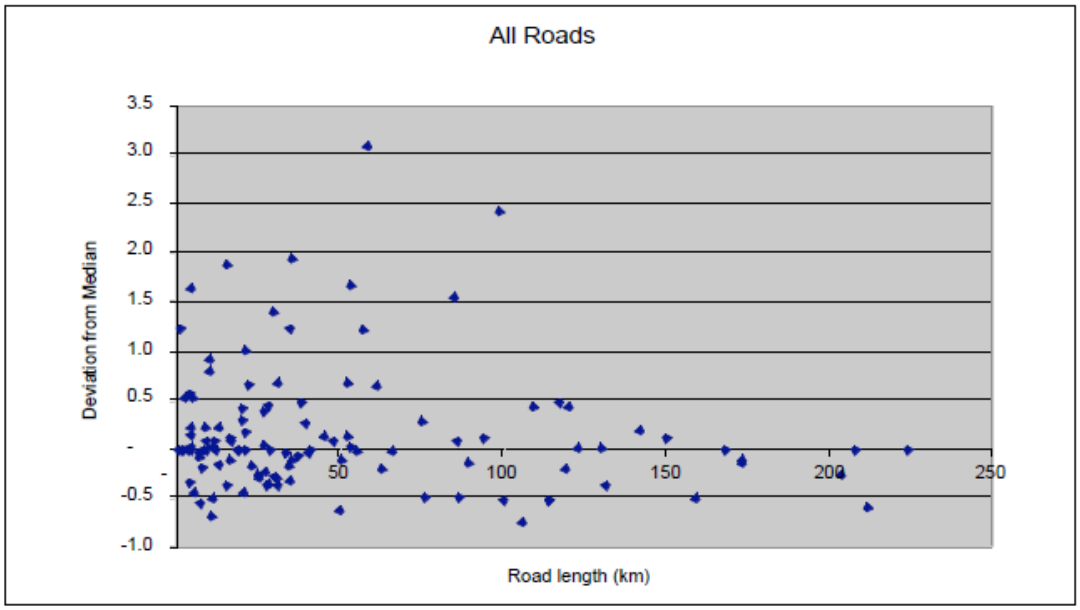
The objective was to design, generate, and analyse a database of the unit costs of infrastructure projects in Sub-Saharan Africa over the past decade. The actual unit costs have been gathered from recently completed projects, which meant obtaining documentation on projects procured some years ago. But in recognition of practitioners' concerns about an escalation in unit costs for infrastructure development in Sub-Saharan Africa, a more focused exercise to understand the evolution of unit costs — from design to procurement — for road projects during the period 2005 - 2006 was incorporated in the study. The results complement the historic database by shedding light on recent cost trends and their likely explanations.

The data for the database has been obtained from four development finance institutions. The central data source was the bill of quantities (BOQ) drawn up for each civil works contract. Supporting information, including among others project appraisal and completion reports, procurement documents and subsequent change orders, was also collected. Although the initial intention was to compile a representative sample of projects (with the target of 150 contracts per sector), practical constraints limited it to 115 road contracts, 144 water contracts, and 58 electricity contracts over a shorter period of time (approximately 2002 to 2006).

Because the organization and content of BOQs differ widely, data had to be converted to the template as dictated by specific projects. Certain cost categories were excluded — notably initial studies, taxes, and design and supervision. For roads, the study excludes certain major structures. Some contracts (especially in the water sector and to a lesser extent in electricity) combine various infrastructure outputs in one contract. The study separated those outputs, allocated nonspecific costs across them, and standardized the data into real 2006 U.S. dollar values. On this basis, unit costs could be calculated as the total contract cost relevant to a specific output, minus the excluded cost categories described above, divided by the units of output[256].

[256]AFRICA INFRASTRUCTURE COUNTRY DIAGNOSTIC (AICD) *Unit Costs of Infrastructure Projects in Sub-Saharan Africa.*

Figure 19: The distribution of unit costs for roads around the median



Source: ACID – Unit Costs for Infrastructure Projects in Sub-Saharan Africa[257]

According to a high level analysis, the main advantages and limitations of the Africa Infrastructure Country Diagnostic database are listed in the table below.

Table 90: Advantages and limitations of Africa Infrastructure Country Diagnostics

Advantages	*Limitations*
– The primary focus of the study is on infrastructure projects (i.e. rail and road transport); – The data is collected by using templates that could be further customised; – The study includes analysis of cost overruns.	– The countries in scope for the study are in the Sub Saharan African region; while the methodology can be applied, the values of unit costs themselves cannot be applied in the EU directly; – The sample size collected in this exercise is relatively small to derive general conclusions; – Although the level of standardization is quite high compared to other studies analysed, information on assumptions could be better stated.

11.2.3. *Conclusions*

This review finds little available data on standard unit prices in the context of public procurement and corruption detection / prevention. Indeed, studies that provide a theoretical foundation or that have tried to verify/falsify such theory, that corruption can be detected or prevented by the use of prices of standardised units, either in investigation or in the procurement process, have not been retrieved. Nor were any studies found that explicitly link corruption and prices of standardised units in the sectors under investigation.

Many difficulties and challenges were encountered in view of data gathering and standardising/normalising retrieved data. Among the five sectors analysed (i.e. Road/Rail construction; Water/Waste; Urban/Utility construction; Training; and R&D/High tech products) only specific data on standard unit prices has been collected for certain infrastructure projects in the road and rail sector. For the other sectors, the literature review did not provide any data on the standard unit prices calculation as such.

[257]AFRICA INFRASTRUCTURE COUNTRY DIAGNOSTIC (AICD) *Unit Costs of Infrastructure Projects in Sub-Saharan Africa.*

On the basis of the relevant literature on infrastructure projects, several limitations with respect to data gathering and calculation of standard unit prices have been highlighted. It is safe to say that these limitations also apply to the other sectors.

More specifically, the comparison of projects within a particular sector can be very complex due to variations in specifications, production location, size, equipment used, etc. The diversity in terms of types of projects and methods of implementation make it extremely difficult to gather data and arrive at a numerical definition of a standard unit price. For example, in the medical equipment sector, procurement is also often decentralised making it difficult to standardise and monitor service provision and procurement. Moreover, the methods of procurement can differ across countries, rendering the comparison even more complex.

There is general consensus in the literature reviewed that it is difficult to gather relevant and highly detailed information (i.e. with an appropriate level of granularity) to construct statistically significant standard unit prices. In addition to the difficulties in data gathering, there is also a common agreement that data that could be collected is often heterogeneous and impacted by different factors (such as for example site conditions).

The standard unit price approach, as has been explored here by analysing three databases, allows for cross–country comparisons. However, it has proven to be methodologically challenging to develop standardised unit prices, because of the difficulties in gathering reliable unit cost benchmarks and in isolating a variety of cost elements. Hence, it is necessary to have generally accepted cost and price definitions and to make several assumptions for technical, organisational, micro and macro realities that influence the development of the average price.

This database analysis corroborates the limitations and difficulties that are reported in the literature. The Africa Infrastructure Country Diagnostic (AICD) study reveals that the development of a unit price database is methodologically challenging for both empirical and conceptual reasons. The empirical challenge lies in locating, analysing and capturing the essence of extensive and complex contractual documents that record the actual costs of implementation. This has been confirmed by the DG REGIO study, which states that the necessary information to develop the database was difficult to acquire from the Member States due to the fact that the Member States are not required to submit this kind of information to the European Commission in order to receive funds and/or to facilitate ex-post evaluation. The lack of information and data has an impact on unit cost benchmarks because they are only useful when they accurately reflect the average cost of sufficiently disaggregated components of the projects. The conceptual challenge lies in finding a way to remove extraneous cost elements so that each type of intervention is boiled down to a standardised core that is more readily comparable across specific projects.

Another important limitation for developing a standard unit price database is the necessary condition that the cost and price definitions are applied in the same way by different entities and/or when comparing different time periods (i.e. the definitions need to be ‘generally accepted and applied’).

11.3. Analysis of procurement prices of standardised units

11.3.1. *Objective*

The overall objective of setting up a procurement price of standardised units is to control the public administration’s efficiency and effectiveness in managing public resources. In light of this study, this section explores the possibility of using the procurement price of standardised units in order to prevent or to detect possible cases of corruption when a certain type of product/service is procured by a public authority. The price of standardised units may therefore act as an indicator of possible corruption in a context of public procurement. Hence, this information should support the authorities to evaluate the tenders that have been submitted by using the price of standardised unit as a baseline (i.e. the “norm”) to assess the tenders/projects and point out any price distortions which could require further investigations.

In order to construct a price of standardised units, a representative sample has been selected from the Tenders Electronically Daily (TED) database. This database is the online version of the 'Supplement of the Official Journal of the European Union' and is dedicated to European public procurement[258]. The CPV classification code system has been used to select 6 products/services groups in 5 sectors (i.e. Road&Rail construction; Water&Waste; Urban&Utility construction; Training; and R&D and High tech products) in the TED-database. The selection of the sectors where EU Funds are spent is presented in more detail in Chapter 3 of this report.

Table 91: Sectors and product groups used in the sample

Sector	*Product group*	*CPV*
Road/rail construction	Railway track construction materials	34946100
	Construction work for highways	45233130
Water/waste	Construction waste water plants	45252127
Urban/utility construction	Runway construction works	45235200
Training	Staff development services	79633000
R&D/High tech products	Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices	33150000

All the selected procurement cases in the total population were tendered in the period 2006-2010 and procured by an economic actor in one of the eight selected countries for further analysis. The total sample is composed of 217 projects to be analysed[259].

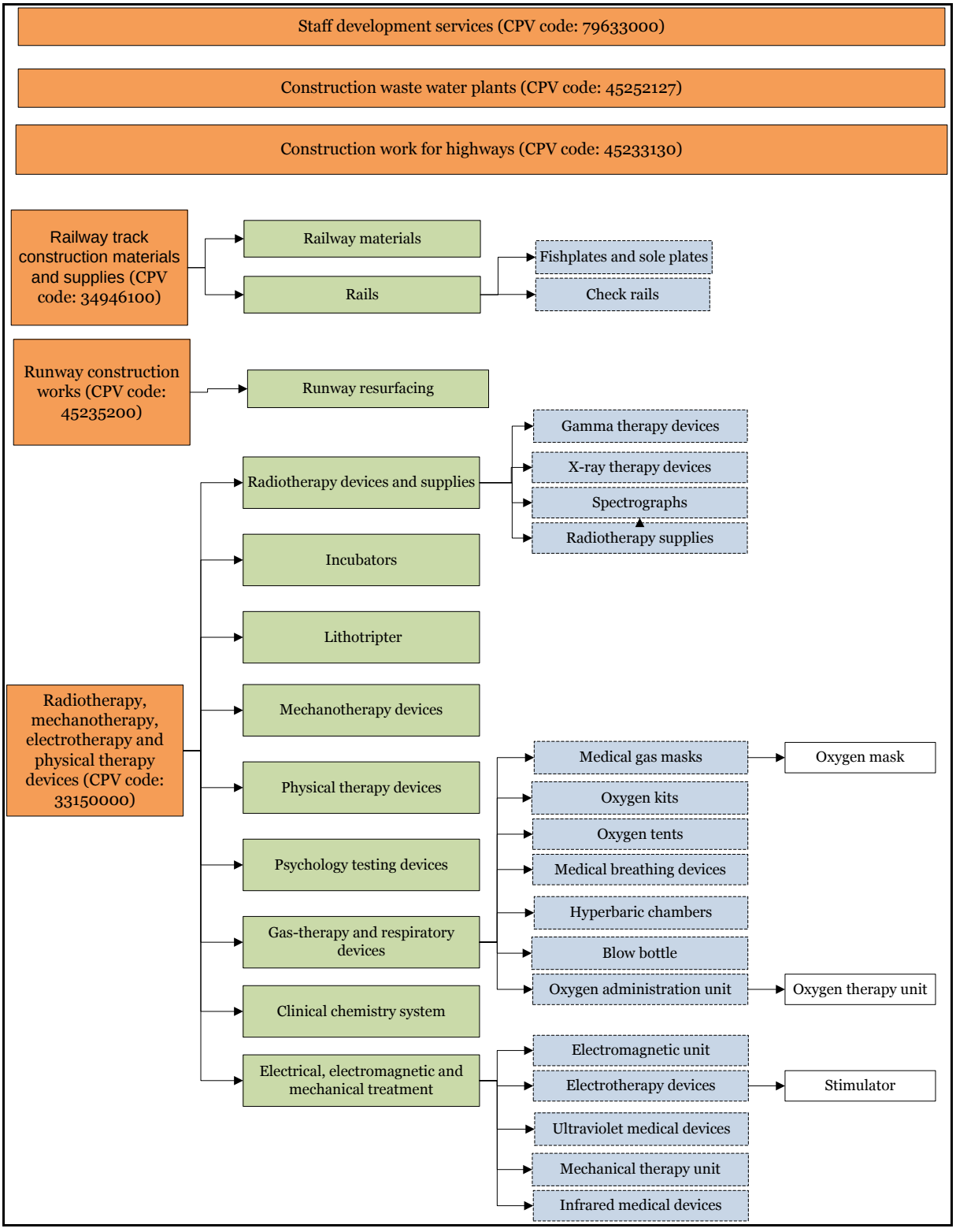
The graph below shows the six product groups' classification under the Common Procurement Vocabulary (CPV)[260]. It sheds light on which products or services are included in these groups. For three product groups, sub classifications are provided whereas for the three others, the CPV code classification provides no further breakdown.

[258] http://ted.europa.eu/.

[259] Please note that data have not been transmitted for all the projects. Only contract value for 201 cases is provided in the TED-database, and then can be subject to a deeper analysis.

[260] The CPV establishes a single classification system for public procurement aimed at standardising the references used by contracting authorities and entities to describe the subject of procurement contracts.

Figure 20: Classification of the six product groups under the CPV classification (TED database from the European Commission)



The TED database contains projects for which several CPV codes are used, without giving a price division across the codes used. This is not the case for the selected projects under the six product group selected for this study. These are only referenced under one CPV code, which is essential for the construction of prices for standardised units in order to avoid double counting or overestimation of the final results.

11.3.2. *Member States' experience*

11.3.2.1. Lithuania

In Lithuania, only one database contains a list of standardised unit prices and this database contains the prices for training and conference services only. This database was prepared at the request of the implementing agency which administers European Social Funds in order to set the amount of the budget that could be financed from EU structural funds.

In the Lithuanian construction sector the SISTELA database is used for calculation of work estimates. This SISTELA database contains information about construction materials, machinery, and labour costs statistics. Accumulated and systematized this database can be used to perform various comparative price calculations, analyse price dynamics, assess and predict changes in construction costs, prepare proposals for the construction project and assess the estimated prices.

The lack of a database containing information about the prices in the market was identified in the Lithuanian National Anti-Corruption Programme (NACP). One of the measures of the NACP is to create a price comparison model that enables comparison of unit prices in public and private sectors. This model would enable efficient evaluations of public sector procurements. The creation and implementation of this model has not yet begun.

11.3.2.2. Romania

In 2010, the Romanian Ministry of Transport published on its website 12 standard costs related to investments financed from public funds in transport infrastructure. Standard costs were established considering both direct and indirect costs. According to the Ministry of Transport the following standard prices were established:

- For one kilometre of highway in mountain area the costs should not exceed EUR 6.1 million;
- For one kilometre of highway in hill area, the costs should not exceed EUR 5.05 million;
- For one kilometre of highway in plain area standard cost was settled at EUR 3.86 million.

According to Ministry of Transport, these costs represent a guideline – not a benchmark – and are annually updated based on the Consumer Price Index published by the National Statistical Institute.

A press article published in 2011 highlights that the cost of one kilometre of highway constructed in Romania is almost double in comparison with the costs incurred in Bulgaria. The main reason for this represents the unprofitable way in which public tenders for construction works are organized. An article published in 2012 indicates that the Transilvania highway from Romania is the most expensive highway from Europe, one kilometre costing EUR 15 million.

In the near future, it appears that more expensive highways will be constructed in Romania. Targu Mures – Iasi- Ungheni will cost EUR 20 million per kilometre, while Comarni – Brasov will be constructed at an expected cost of EUR 17 million per kilometre. The costs are substantially higher than the guidelines provided by the ministry of transport.

Although the existing legislation provides guidance in relation to the standard unit price, at least in the civil and infrastructure construction sectors, those standard prices are not being used and do not provide a basis for reporting or benchmarking.

11.3.2.3. The Netherlands

Most organisations interviewed in the Netherlands do not calculate or use standardised unit prices, noting several reasons for this:

- Education and training are tailor-made;
- Projects vary in character and location and thus require a different prices;
- Each project involves several and different procurements;
- Detailed cost calculations are not performed;
- Standardised unit prices are seen as unworkable since prices are dependent on the market system.

The limited use of benchmarks (or only a few attempts) to compare procurement of services also seems to present a transparency issue: only limited information on procured products and services is made public, when not required by law.

Road construction, maintenance and renewal

In the construction sector, estimating of a work is common. *Rijkswaterstaat*, the Dutch authority responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands, has a special department which calculates standard unit prices for procurements. The national cost price file (*Landelijk Bestand Kostprijszaken*) is a large database that contains cost price data including unit prices at different levels: primary means (costs of labour and of equipment), rates for equipment including operation costs and fuel, prices of design elements (e.g. price per m2 of surfacing) and index numbers for objects (e.g. price per kilometre of a specific highway type). This database is used to estimate works that will be procured. The database was not made available for this study.

The NVBK (Dutch Association Construction Cost Experts) in the Netherlands is a commercial entity which has developed a spread sheet containing standard unit cost prices for the calculation of the specifications of work. Also other commercial parties (SDU, Reed) provide surveys of index numbers and unit prices, at the level of raw materials and component parts. This data is not publicly available.

Almost all identified data is used for ex ante calculations. Some of the data is also used as benchmark material but, according to *Rijkswaterstaat*, the data is not directly used to detect irregularities in bids, or to discover potential corruption.

Health sector: purchase of medical equipment

In 2011, Ecorys conducted a study on the structure and functioning of the market for medical devices in the Netherlands, on behalf of the Dutch health ministry and the Netherlands Competition Authority. The study presented some interesting findings on the procurement of medical equipment and medical devices by hospitals in the Netherlands and is relevant for the analysis of standardized unit prices in this sector of the economy. Only academic hospitals (8 in total) in the Netherlands are obliged to purchase their devices through public procurement; other hospitals are not public organisations and are therefore permitted to procure their equipment and devices according to their own procurement rules and procedures.

One of the findings is that public procurement by the hospitals almost never results in bids from abroad: all bids are from Dutch companies or from Dutch branches of foreign companies, for reasons such as language barriers (manuals in foreign languages) or the perceived lower quality of foreign products. Within hospitals and other health care institutions, there is no real understanding or knowledge of the real cost of a medical product. Moreover, there is little or no exchange of information on prices and volumes between hospitals and other health care institutions.

The study on the structure and functioning of the Dutch market for medical equipment and devices also finds that health insurance companies have only a very limited role in the procurement of medical equipment and devices. Moreover, even for health insurance companies, the expenditure on medical equipment lacks transparency. Information on medical equipment and device prices are hardly publicly available because most procurement is considered private purchasing.

In most instances, the prices of medical devices are not comparable, due to their dependence on varying product specifications, contract durations, purchase volumes and associated services, such as training and logistics. The possibilities to benchmark the costs and prices between hospitals are very limited, according to the study. The same goes for comparison of prices between the Netherlands and other EU Member states, due to the grave differences between these countries: different health care systems, market regulations, procurement methods, market structures and market circumstances, etc. No academic studies or other reports were found that compare Dutch prices for medical equipment with prices in other EU countries.

Public agencies for joint procurement

Public agencies for joint procurement, mostly cooperation of medium and small municipalities, do not calculate standardised unit prices. These cooperatives do however compare prices, first and foremost with the estimates as calculated by the principal municipal bureau that ordered the procurement. Secondly, in some instances, a comparison can be made between the actual bid and prices of previous (awarded) bids of the same company in the same municipality. However, It is not allowed to compare prices from one bid in one municipality with all prices in all bids for similar procurements in other municipalities; such information is treated as business confidential. Comparison is legally possible between prices of awarded bids, but this is not done in a structured manner.

A problem for comparison of (awarded) bids, and of calculating standardized unit prices is, according to public agencies for joint procurement, the fact that the context of different municipalities (size, demography, geography, etc.) and the composition of the respective procurements differ too much.

11.3.2.4. Italy

According to evidence gathered through interviews in Italy, there are no national guidelines indicating standardised unit prices.[261] Instead, they are established at regional and sub-regional level. Decentralised local authorities use the so-called "*listino prezzi*" (list of prices) to make estimations in the assignment of public works and services at territorial level.

In 2011, the Italian government has introduced innovative legislation to reduce the level of variability and improve efficiency in the management of public resources[262] This legislation requires small municipalities (under 5,000 inhabitants) to use the "*centrale unica per la committenza*", a public body dedicated to managing public works and services for multiple municipalities. The aim of the law is to avoid the fragmentation of public bids and the constitution of consortia for group of municipalities to acquire services at bigger territorial level, with the results of economy of scale.

Under the pressure of the current economic crisis, the Italian government is also trying to enhance the role and method of the *Concessionaria Servizi Infomativi Pubblici* (*Consip*, a Public Informative Services Dealer), which is a public joint stock company owned by the Ministry of the Economy electronically managing the acquisition of public goods and services.

The regional and sub-regional procurement agencies should now deploy when established for specific sectors the Consip agreement for the acquisition of a specific goods or service, before going to the market. With the aim of reducing costs and increasing transparency all the Public administration (for instance health and schooling institutions) have to use a central and regional catalogues for all the bids that are under the community thresholds. The peripheral public institutions have to constantly monitor the Consip database[263] and make prices comparison to be sure that they are compliant with Consip's 'better value for money' parameter. Otherwise, they might incur in some form of sanction from the Court of Auditors[264].

Thus far, Consip has provided agreements and list of prices for so for the following sectors : power energy, gas, fuel, heating fuel, mobile and landline communication, informatics system for the management of service; maintenance works (heating, air conditioning and lifts), cleaning, pest control, waste treatment and gardening. The manpower deployed is calculated according to its official price at the territorial level. The list provided is not exhaustive and leaves several sectors to the discretion of the regional and sub-regional tiers of government. Even though there is an effort to harmonise practices with regard to the use of standardise prices, prices are characterised by a high variability across sectors, segment of activity and territory. Efforts have been made to calculate prices ex ante, but methodologies have proven to be difficult.

Road Infrastructures

In the field of road infrastructures, technicians commonly rely upon *Azienda Nazionale Autonoma delle Strade* (*ANAS*, a National Corporation for Road)[265] and on the prescription of the "*Osservatorio sui contratti pubblici*"

[261]Interview Leonardo Miconi (Autorita' di vigilanza per i contratti pubblici).

[262]Law 214/2011 Conversione in legge, con modificazioni, del decreto-legge 6 dicembre 2011, n. 201, recante disposizioni urgenti per la crescita, l'equita' e il consolidamento dei conti pubblici.

[263]See: www.acquistinrete.it.

[264]See: http://www.linkiesta.it/consip-spending-review.

[265]Full price list available.

(Observatory on public contracts). Research on road infrastructures prices was carried out by University of Pisa in 2007[266], using a Value Analysis[267] methodology and taking in consideration the number of vehicles per day per kilometre of road and different typologies of road and the related territorial specificities. The following price list for motorways and urban roads is available in some studies, presenting the standard cost per square meter emerging for the assessment of different "types of work" (i.e. normal roads, tunnels or viaduct/bridges).

Table 92: Motorways in Italy – cost per linear and square meter		
Type of work	*Cost/m²*	
Normal Road		€ 3 107.04
Tunnel		€ 86 222.48
Viaduct/Bridge		€ 36 952.50
Normal road		€ 65
Tunnel		€ 1 808
Viaduct/Bridge		€ 36 952.50

Source: University of Pisa (2007).

Table 93: Urban roads in Italy – cost per linear and square meter		
Type of work	*Cost/m²*	
Normal Road		€ 217.11
Tunnel	Not planned for urban road area	
Viaduct/Bridge		
Normal Road		€ 24.12
Tunnel	Not planned for urban road area	
Viaduct/Bridge		

Source: University of Pisa (2007).

11.3.2.5. Other Member States

Country studies of Poland, Hungary, France and Spain did not identify clear and relevant examples of calculations or use of standardized unit prices.

11.3.3. *Methodology*

11.3.3.1. Theoretical approach

The concept of procurement prices of standardised units is first decomposed in its three main components:

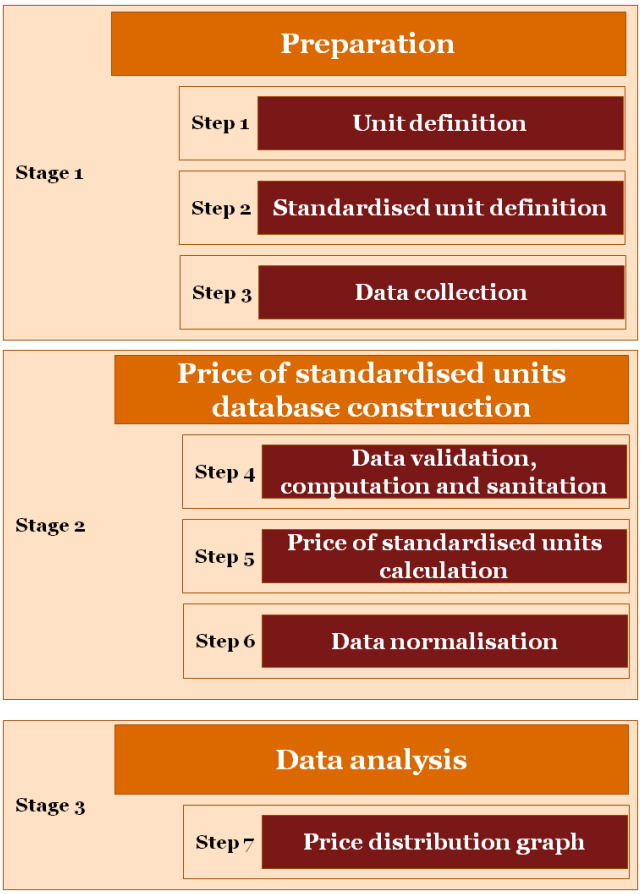
- **Procurement**: the price of standardised units is constructed only for the domain of public procurement, excluding comparisons with private sector procurement;
- **Price**: the result should be expressed in a currency value, taking into account a reference year. Exchange and inflation rates are used to normalise the final results obtained;
- **Standardised units**: the result should be expressed in a homogeneous unit and defined according to the product/service procured. Moreover the result should allow comparisons within a product group as the unit will be standardised. This means that the main characteristics of a project should be taken into consideration in order to control the price difference as much as possible, and to the extent of the data availability.

In order to establish standardised unit prices, a three-stage approach has been followed.

[266] P.L. Maffei "La determinazione dei Costi Standardizzati per la categoria di opere strade e autostrade Metodo, strumenti e sperimentazione su casi di studio" available from: http://www.avcp.it/portal/public/classic/AttivitaAutorita/ConsultazioniOnLine/_consultazioni/_allegatoConsultazione?idAllegato=976b5a570a7780a500a95cd7347dcdf9

[267] See Larry Miles.

Figure 21: Price of standardised units' methodology



The **preparation stage** includes three steps which refer to specific actions to be carried out before performing the computation of the prices of standardised units.

- **Step 1 – Unit definition.** The starting point is the definition of the measured unit (e.g. kilometres, square meters and number of items). It will differ according to the specific product/service analysed.

The success of this first step depends on the homogeneity of the products/services analysed.

- **Step 2 – Standardised unit definition.** After the definition of a unit, the following step consists of identifying a number of external factors that have an influence on the total cost of the project, and hence on the price. Without considering these external factors, the price for the standardised unit equals the total cost of a project divided by the number of units for each product group.

From a practical point of view, three main external factors need to be considered when a price for a standardised unit is constructed and used to compare the project's price amongst EU funded projects:

✓ **Contractor characteristics** include the contractor's location, which has an impact on the wage level and the price of the materials. A wide of range in the wage level is observed in Europe (the average wage level in Europe is EUR 32.10 per hour for the ISCO 2 level[268] and the variance is -EUR 28.30 for Bulgaria and +EUR 18.70 for Luxembourg). Furthermore, the contractor's pricing strategy influences the total price and will depend on the type of enterprise (the price invoiced by an SME is likely to be different from the invoice of a large company) and how the contractor's work structure (internal staff deployment vs. use of external subcontractors). This pricing strategy is difficult to evaluate as it is generally considered confidential and can vary across time and client segments and according to the products or services procured. Contractor characteristics do not depend on the product group, but should be seen as a general consideration.

[268] ISCO is a tool for organising jobs into a clearly defined set of groups according to the tasks and duties undertaken in the job. (http://laborsta.ilo.org/applv8/data/isco88e.html) ISCO 2 represents the 'Professionals' group. The data on the ISCO 2 wage level for the 27 Member States is provided by Eurostat.

- ✓ **Project characteristics**: each project is defined by its inherent specificities and designed according to the client's needs. For example, a highway construction project can be more costly than another due to the specific asphalt used, according to the client's explicit request or due to the number of tunnels/bridges on the highway.
- ✓ **Location characteristics**: the location of the project itself can have an impact on the total price and on the standardised unit price. The location characteristics will influence the project characteristics (e.g. a waste water plant in a rural/remote area requests other technical specificities than a waste water plant constructed in an urban area). Especially for infrastructure projects, the geotechnical and geological conditions will have a significant impact on the total cost.

In order to establish the last two types of characteristics for each product group, opinion from technical experts is required. Without having this technical opinion, the main external factors can only be derived from common sense.

- **Step 3 – Data collection.** Once the data to be collected has been defined, the data collection process can begin. A questionnaire is sent to the relevant authorities, and possibly to the contractors themselves, in order to gather all the data necessary to calculate prices for the standardised units.

The second stage consists of **building the database** in order to calculate the prices of standardised units. It includes three steps allowing the construction of standardised unit prices for each product/services group analysed.

- **Step 4 – Data validation, computation and sanitation.** Once the relevant data has been collected, it is important to perform a validity and sense check. This third step is aimed at ensuring that the data quality is sufficient to construct the price of standardised unit and to consider the major external factors (next to any corruption effect) implying a price difference.

  The importance of the external factors should be tackled by putting a certain weight to them or by having a sample in which the projects have the same characteristics. The latter approach would imply a reduction of the sample size, which lead to non-representative samples at the end. Therefore the validity of the final results will be challenged.

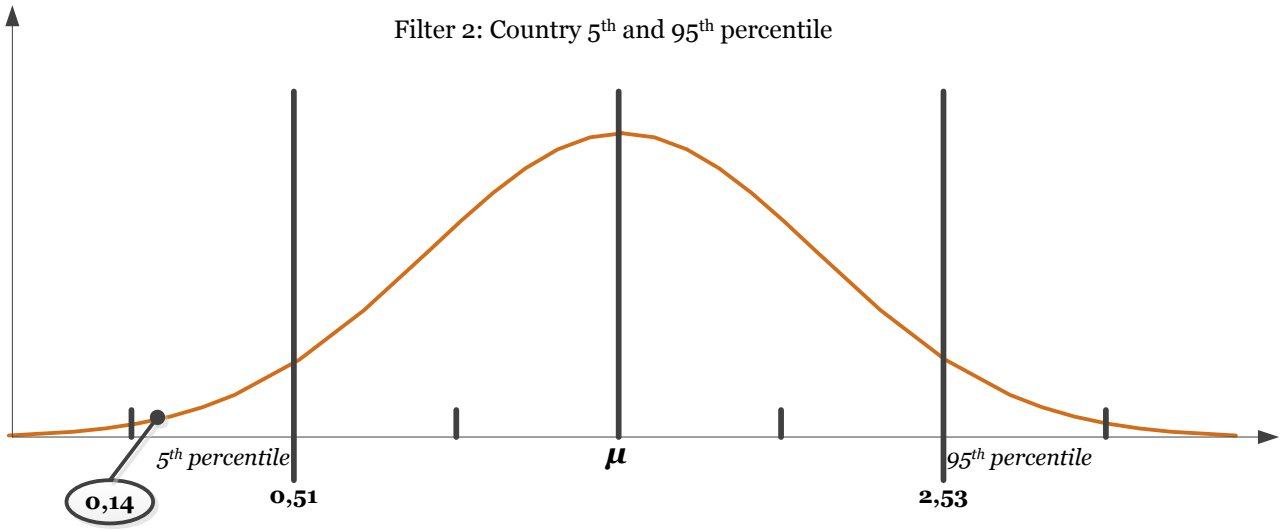
  After this validation and sanitation exercise, the data can be consolidated in a database that is the primary source of data to be used in constructing the standardised unit prices.

- **Step 5 – calculating standardised unit prices.** After undertaking all previous steps, a price of standardised units can be calculated for each product group defined, with the result expressed in a currency value per unit.
- **Step 6 – Data normalisation.** Information consolidated in the database needs to be normalised for currency (i.e. different geographies) and inflation (i.e. different time intervals) effects. It is essential to determine a base year and a general currency to ensure the overall data comparability.

In the last stage, the **data analysis** can be presented using a price distribution graph. The purpose is then to detect any outliers for which additional investigations need to be performed.

- **Step 7 – Price distribution graph.** The final step of the methodology is to plot the price of standardised units in a price distribution graph, which is expected to have the form of a Gauss distribution curve (see Figure 24). The presentation under a Gauss distribution curve depends on the quality of data collected and the data comparability as well as the sample size. Data must be comparable in order to use this kind of graph effectively.

Figure 22: Example of price distribution graph



In the graph, the majority of the data will be grouped within a bandwidth in which the actual procurement unit price is considered as 'normal'. If the actual procurement unit price lies above or below certain threshold, the contract can be considered as and outlier or possible case of corruption and thus subject to further investigation.

A threshold must be defined according to the best practices and experiences. For example, the above graph considers values between the 5th and 95th percentile as normal. The threshold should be refined as soon as the database will be completed. Indeed, a bigger sample will increase the precision level and will allow adjusting the threshold.

Moreover, the prices of standardised units need to be tested with a number of selected contracts (i.e. corrupt and non-corrupt) in order to determine if the "norm" is significant to detect corruption in public procurement contracts in the European Union.

11.3.3.2. Practical approach

In order to construct prices of standardised units based on the data collected for the 6 product groups (see section 11.3.1), the theoretical approach has been used as a basis. However, all the steps have not been performed due to the low quality and quantity of the data.

For each step, the applied methodology is described as well as the issues encountered.

Step 1 – Unit definition

Railway track construction materials and supplies

Two units of measure can be used in order to express a price of standardised unit related to this particular product group. On one hand, the railway track construction materials and supplies can be expressed by the number of items that is used to construct the railway track (e.g. a price per railway track). On the other hand, the number of kilometres of railway track can be used to express the price of standardised unit of railway track construction materials and supplies.

At the first sight and according to the CPV classification (see Figure 22 Classification), the product group analysed contain a majority of product deliveries. The number of items could then be seen as the most appropriate unit for the quantitative data analysis. However, the additional data collected on the procurement cases performed for the quantitative analysis reveals that a lot of projects are related to maintenance services. This would imply that the number of kilometres is a more appropriate unit of measure.

Construction work for highways

The considered unit of measure to express the price of standardised units is the number of kilometres of the project (i.e. the total length of highways constructed).

Construction waste water plants

The unit of measure applied is the "Population Equivalent (PE)" unit. The PE unit is a metric allowing comparisons between various sources of waste water (i.e. domestic, commercial, industrial), and converting them in to a single equivalent number. Therefore the price of standardised units should be expressed in EUR per PE for every project of waste water treatment plant construction.

Runway construction works

The most appropriate unit of measure to express the price of standardised units is m² (i.e. the total surface of the runway). This unit considers the total length but also the width of the runway.

Staff development services

The CPV classification does not provide any further details whereas this product group can include a variety of products/services. Therefore, all kind of staff training sessions aimed at developing professional ability of the civil servants or any professional staff of an administration are considered. The most appropriate unit has been defined as the number of hours, meaning that the price of standardised units will be expressed in EUR per hour of training.

Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices

The product group encompasses various devices that cannot be considered as a homogenous set (as described in Figure Classification). Considering this high variety among the product group itself, the unit of measure that will be used to express the price of standardised units is the number of devices. The price of standardised units will be then expressed in euro per device and a comparison will only be allowed among the same type of medical devices. For example, it does not make any sense to compare the price for a standardised unit of a project aimed at providing oxygen masks with the standardised unit of a project aimed at providing electrotherapy machines.

The table below summarises the unit selected for each of the six product groups defined in the sample used:

Table 94: Unit used for each product group

Sector	*Product group*	*CPV*	*Measure of unit*
Road/rail construction	Railway track construction materials	34946100	Number of Units (used) / Number of kilometres[269]
	Construction work for highways	45233130	Number of kilometres
Water/waste	Construction waste water plants	45252127	Population Equivalent
Urban/utility construction	Runway construction works	45235200	Number of m²
Training	Staff development services	79633000	Number of training hours
R&D/High tech products	Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices	33150000	Number of units (devices)

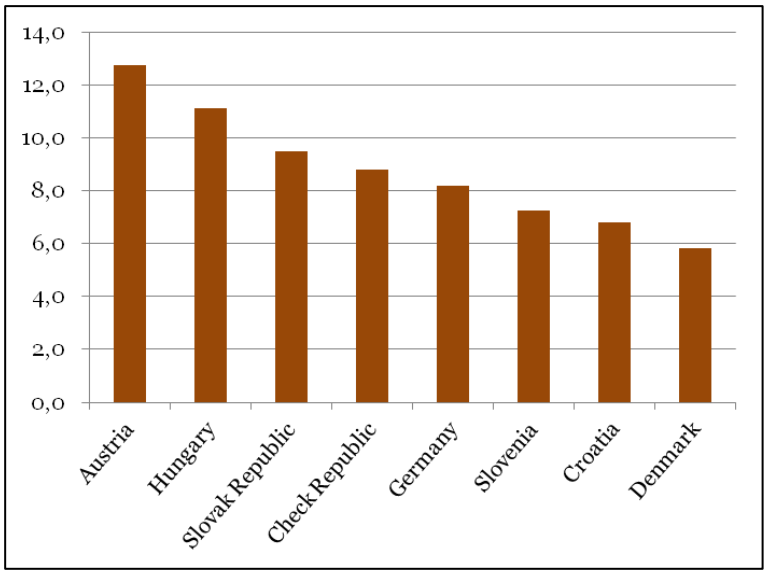
This exercise leads to the first difficulty of setting-up a price of standardised units. Indeed, the homogeneity of the product group should be ensured within each product group in order to define an accurate unit allowing comparisons in the next steps

[269] This unit has been chosen in order to calculate the price of standardised units.

Step 2 – Standardised unit definition

As described in the theoretical approach, external factors play an important role in the cost variance amongst the projects. In that respect, some journalists and NGOs investigated how EU Funds have been used in several Member States. For example, the Financial Times[270] published a research report of several Member States showing the cost per km in the road construction sector for EU funded projects. The journalists established an extremely high cost for Italian road construction. In follow-up interviews with the journalists, they underscore they used "rough calculations" based on a simple division of the total costs of construction and the length of constructed road (km) - and did not engage in statistically robust calculations of "standard unit costs". This means that abnormal values cannot be challenged for corruption purposes. In the Czech Republic, NGOs calculated average costs of road construction by using a similar approach. The average cost per kilometre varies from EUR 8 million to EUR 15.2 million[271]. However, not all data could be retrieved. Additionally, the Authority for Road Transport in the Czech Republic provided a more statistically reliable calculation (by considering tax structure on labour, materials and energy, as well as labour laws, financial borrowing costs, etc.). Their findings illustrate how standard costs differ across countries, with some unexpected results: the Czech Republic appears to be more expensive than Slovenia, Germany, Denmark and Croatia, but cheaper than Slovakia, Hungary and Austria. The costs are calculated on the basis of the price of the winning bid. As a result, the Authority is reluctant to accept the notion of "price of standardised units" due to the intrinsic variations in influencing factors (e.g. level of competition, prices of materials and cost of workforce, geological composition of the area of the construction).

Figure 23: Standard unit Prices in million € (converted from Czech crowns 1=€ 0,038)[272]



The implication is that the methodology underpinning the elaboration of prices for standardised units hinges on accurate and detailed price data. The question is then the following: which level of detail should be covered by the price of standardised unit in order to be qualified as an accurate indicator for possible cases of corruption? The quality of the price of standardised units as an indicator of potential case of corruption depends on the consideration of the external factors and to the level/quality of data collected. Nevertheless it has been proven that various data (related to the projects themselves and the external factors) are difficult to collect. This has been supported by the literature, the owners of the DG REGIO database, the interviews and the data collection exercise carried out for this study's purpose.

[270] http://www.ft.com/cms/s/0/6fd4c734-f327-11df-9514-00144feab49a.html.
[271] http://www.bezkorupce.cz/wp-content/uploads/2010/01/cenadalnic_cast1_predrazenedalnice.pdf.
[272] http://www.rsd.cz/doc/informacni-servis/ceny-dalnic/$file/letak_a5_web.pdf .

Moreover, several interviewees (from public authorities and European associations active in the six product groups in scope) mentioned that it is essential to firstly define a standard product or service per category. Even if they consider this first step as crucial, they also indicate the difficulty linked to this task. Indeed, the characteristics of a standard are various and the standard should be continuously updated considering evolution of technology (e.g. the technical requirements for medical equipment applicable in 2000 are different than those applicable in 2013). The wide scope of the EU funded projects is then considered as an important difficulty encountered when a price of standardised unit is analysed (e.g. technical specifications, location).

The reader can find below a detailed analysis of the external factors for each product group. The purpose is not to obtain an exhaustive list of the characteristics per product group, but to highlight the most important characteristics having an influence on the total price.

Railway track construction materials and supplies

The project's characteristics include the type of construction and the level of service. Construction type reflects the type of project to be built, whether adding a track ("cost to add"), upgrading a current infrastructure ("cost to upgrade"), or building a new infrastructure ("cost to build"). The level of service defines the role of a railway project. Passenger, freight, and mixed use are the possible service types for a railway, where the intended service will determine the types of speed levels that are allowable. Next to the speed, the types of track should also be considered (i.e. single or double track).When more than a single track is required, larger space and more materials will be required, thereby increasing the cost.

It should also be noticed that the security policy can greatly influence the cost of a certain project. For example, due to several bad experiences in the last 10 years, the Belgian railway sector decided to invest more resources in increasing the security on the Belgian rail. This means that they could be more disposed to accept a higher price for more secure components leading to higher overall rail safety than other countries.

Next to the project's characteristics, the total cost of a railway track construction project is influenced by the location characteristics (mainly geotechnical and geological constraints). The terrain on which the railway track will be constructed has an important cost impact. It reflects the engineering costs associated with the design of the railway dependent on the maximum ruling grade, length of grade, and occurrence of special structures (e.g. stations, bridges, corners). The type of surface should also be considered as the type of terrain will affect the construction costs. Depending of the exact scope of the project, the land use characteristics should be considered as well. They reflect the most likely value of land encountered to build a railway. Finally, specific locations may require night work implying a positive cost impact as well.

Construction work for highways

As for the other infrastructure projects, the project characteristics are linked to type of construction and the service requested for road construction projects. The latter component includes the number of carriageways, of lanes, of bridges, of tunnels, etc. That will be part of the project or with which the project should engage.

The location characteristics will also have a major impact on the total cost. Indeed, the locality (urban, semi, rural), the type of terrain (mountain, hilly, level) and the surface conditions (hard, normal, soft) will affect the total price as the contractor has to spent more time to prepare the terrain and install its building site. Moreover, the location can have an impact on a project planning as some areas should require a night work (which will increase the total cost). Specific locations can require night work implying a cost increase for the contractor and then for the final client. Finally, depending of the exact scope of the project, the land use characteristics should be considered as well.

Construction waste water plants

The cost of projects related to waste water plants construction can also be greatly impacted by project characteristics. The number of pumping stations requested by the project is an example of technical specificities.

Geological and geotechnical constraints as well as the locality in which the plant is subject to be constructed may have also an important impact on the total cost of the project. It is easy to understand that constructing a waste water plant in an urban area may lead to a different cost vs. erecting the plan in a more rural/remote area.

Runway construction works

When a runway needs to be constructed or repaired, the project's characteristic such as the type of component used, the capacity of the runway to be achieved, the runway strip dimensions need to be considered as having a cost impact on the total cost of a runway project.

The location characteristics will also greatly impact the total cost (i.e. type of component used, geological and geotechnical constraints, locality). As mentioned by the Dublin Airport Authority, the location characteristics can be a major cost impact for runway projects:

"Cost benchmarking of runway projects is notoriously difficult to carry out in a meaningful manner as there is such a wide disparity between cost inputs. These inputs are influenced by geographical location, proximity of runway site to neighbouring buildings and associated mitigation costs, whether land purchase is required, at what cost, and so on."[273]

Staff development services

In order to perform a relevant comparison of the price of standardised units, several project characteristics should be considered in order to avoid confusion between a potential indication of corruption and price differences explained by the characteristics of the training itself. The following main factors have been identified:

- Number of people trained (and economies of scale linked);
- Provision of materials (e.g. syllabi, digital support);
- Type of training (e.g. ex-cathedra, e-learning, workshop, "train-the-trainer").

The place where the training should take place can also have a cost impact due to the travel cost of the trainers.

Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices

Considering the various products included in this group, the main factors to be considered when a price of standardised unit is obtained will be difficult to determine with precision. If a contract is only linked to a specific product in the product group, the project characteristics would be less relevant. However, the additional services that can be provided next to the product delivery itself (such as training, maintenance services) have a cost impact that cannot be ignored. The location characteristics are considered less relevant for the provision of medical devices.

Several external factors can have an important influence on the total price of a project. These factors are directly linked to the contractor, the project's and location's characteristics. By considering them, the analysis should then be able to explain a part of the variance amongst the price of standardised units. However the difficulty lies in an accurate definition of the characteristics that need to be taken into account and to understand how they can influence the total price. In order to do so, technical expert opinions are requested.

Step 3 – Data collection

A questionnaire has been sent to the contracting authorities in order to retrieve data of the projects related to the 6 product groups.

General data (i.e. where the project will be executed, the overall scope…) can be found in the tender documents. The TED database is one of the main sources of information. However, it is also important to collect data about project and location characteristics. At present, this kind of information should be collected through questionnaires and interviews with the contracting authorities.

Considering the actual granularity of available data in the TED database, the data collection exercise has proven to be extremely difficult and time consuming. Next to that, all the contracting authorities were not able to provide the researchers with the requested data. On a representative sample of 133 cases defined according to the TED database selection in the first stage, data have been collected only for 80% of these cases (without considering the quality of the data provided). To further emphasise the difficulty linked to the data collection, the responsible persons of the DG REGIO database indicated that the data collection took several months without achieving the ultimate expected high level of data quality.

[273] DUBLIN AIRPORT AUTHORITY (2009) *Capital Investment Programme 2010-2014 – Proposals for consultation*.

Moreover, collecting data several months/years after the execution of a project or even after project award increases the risk of losing data and/or decreasing the quality of the data collected. For example, the staff member previously responsible within a contracting authority may have left his/her function. Moreover, data archiving is performed differently amongst the contracting authorities directly impacting the quality of the data.

Finally, there is a risk regarding the data interpretation. A clear definition of the data expected needs to be set up upfront. For example, collecting information on location constraints implies a clear definition of the different location constraints. Data misinterpretation can lead to wrong inferences being drawn.

Step 4 – Data validation, computation and sanitation

The data collected has been computed in a excel document allowing calculations of prices of standardised units in the next step. The data was cross-checked in order to ensure a correct data formatting allowing calculations under Excel. Missing data was not considered.

Step 5 – Price of standardised units' calculation

Prices of standardised units have then been calculated. This step has been done only for the product groups with sufficient data (in terms of quality and quantity).

The price of standardised unit for a product group corresponds to the average of each project's price of standardised unit.

It should be noted that the external factors have not been considered as the data collection does not allow collecting enough data. Moreover, as mentioned above, expert opinion (or at least more in-depth analysis) is needed in order to understand how these external factors (mainly the project's and location's characteristics) can influence the final price of a project. Consequently, the data collected on the external factors (where available) have been used in order to qualitatively appreciate the total cost difference inside a product group.

Step 6 – Data normalisation

The prices for standardised units have been normalised in order to take into account the inflation and the exchange rates. From a practical point of view, the HIPC (or Harmonized Indices of Consumer Prices) has been applied to the final results obtained. The data received from the various contracting authorities contacted were already put in euro value. Therefore there is no need to use the exchange rate.

Step 7 – Price distribution graph

Due to the low quality of the data collected, this graph has not been constructed for the product groups analysed. Indeed, the standard deviation in each product group is so important that the curve become flat meaning that its utility is then challenged.

11.3.4. *Findings*

In light of determining the relevancy of prices of standardised units as a possible indicator to prevent or detect corruption, a quantitative analysis has been performed with regards to:

- The procurement information provided via the TED-database;
- The additional data collected via the country teams.

11.3.4.1. Analysis of the TED-database

The TED-database contains active procurement notices from the European Union, the European Economic Area and beyond and is updated on a daily basis. Due to the European scope of this database and the fact that it is available to the European Commission, as well as that it compiles information on procurement notices, a quantitative analysis has been performed of the information that is provided via the TED-database with regards to the procurement cases that have been identified in the total population. This quantitative analysis has been focused on answering the following research questions:

- Could the TED-database be used as a first step in the methodology proposed to construct prices of standardised units (as described above of this chapter)?;
- Could the information provided via the TED-database be used as an indicator for corruption with regards to the procurement of a contract in one of the 6 selected products/services (in light of the general research question of this study)?

First of all, it should be noted that, although the total population equals 217 cases, only 201 procurement cases (i.e. contracts which have been procured between 2006–2010 in one of the eight selected EU Member States) have been analysed as the total contract value was not provided for all the identified cases. The distribution of the procurement cases among the selected countries is as follows:

Table 95: Overview of the country distribution of the TED-database analysis

Country	*# of Procurement Cases*
France (FR)	68
Hungary (HU)	25
Italy (IT)	21
Lithuania (LT)	7
The Netherlands (NL)	11
Poland (PO)	35
Romania (RO)	16
Spain (SP)	18
TOTAL	**201**

The following table presents the distribution of the procurement cases among the selected CPV classification codes, as well as the total contract value that has been reported.

Table 96: Overview of the CPV distribution of the TED-database analysis

CPV-code	*Total Contract Value*	*# of procurement cases analysed*
33150000 - Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices	€ 27 953 268	25
34946100 - Railway track construction materials	€ 82 934 066	43
45233130 - Construction work for highways	€ 1 621 922 428	86
45235200 - Runway construction works	€ 140 096 813	13
45252127 - Construction waste water plants	€ 162 205 768	28
79633000 - Staff development services	€ 5 420 363	6
TOTAL	**€ 2 040 532 706**	**201**

As presented in the previous table, the total sum of the contract values of the 201 procurement cases of the total population equals EUR 2 billion of which the majority comes from the CPV classification code '45233130 – Construction work for highways', representing 79,49 % of the total sum of the contract values. However, this CPV classification code also represents the largest number of procurement cases identified in the total population. Therefore the minimum, maximum, range, median and average contract value has been analysed for each CPV classification code to have a better insight on the information provided via the TED-database and which is relevant to answer the two research questions.

Table 97: Minimum, maximum, range, median and average contract value of the total population in the TED-Database				
Minimum value	*Maximum value*	*Range*	*Median*	*Average*
34946100 - Railway track construction materials				
€ 37 839	€ 26 930 356	€ 26 892 517	€ 462 490	€ 1 928 699
45233130 - Construction work for highways				
€ 114 820	€ 180 191 888	€ 180 077 068	€ 5 628 808	€ 18 859 563
45252127 - Construction waste water plants				
€ 134 200	€ 57 108 640	€ 56 974 440	€ 4 065 479	€ 5 793 063
45235200 - Runway construction works				
€ 4 249 500	€ 25 389 752	€ 21 140 252	€ 10 338 490	€ 10 776 678
79633000 - Staff development services				
€ 139 248	€ 2 499 999	€ 2 360 751	€ 599 193	€ 903 394
33150000 - Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices				
€ 8 905	€ 14 802 933	€ 14 794 028	€ 426 163	€ 1 118 131

Source: PwC Analysis and TED-database.

Based on the figures presented in the previous table, it can be concluded that the range between the minimum and maximum contract total value for each CPV classification code in the population has a rather large variance. For example, the range for the CPV classification code '45233130 – Construction work for highways' is equal to EUR 180 077 068 while the average value is equal to EUR 18 859 563 and the median value equals EUR 5 628 808. Hence, a number of projects are significantly higher in total contract value in comparison to the majority of procurement cases identified in the population for this CPV classification code. However it should be noted that the TED-database does not provide enough information to make supported conclusions, due to the limited comparability of the different contracts of the population because the difference in total contract value can be related to various elements (e.g. differences in the size of the project, differences between the countries, different economic situation, corruption, etc.). Therefore, it can be concluded that the applicability of the TED-database as a possible indicator of corruption, when a contract is procured, is limited because it lacks the necessary comparability of the contract values (i.e. a standardised norm to compare the contract with). An analysis of the information provided via the TED-database is only relevant to give a certain sense of direction without presenting conclusive statements.

Also with regards to the opportunity of using the TED-database as a first step in the methodology to construct prices of standardised units, has the TED-database restricted possibilities in its current version due to the limited information that is reported in the database (e.g. no information on a measure of unit). If the TED-database could be expanded in the future with relevant additional information (in particular on the measures of unit and project characteristics), it could present a number of advantages in light of the analysis of prices of standardised units as it provides information on tenders on the level of the European Union, as well as on specific procurement contracts.

11.3.4.2. Analysis of the data collected

As presented in Chapter 9 'Stage III: Applying a representative sample of cases', the 217 identified procurement cases of the total population have been forwarded to the country teams (in France, Hungary, Italy, Lithuania, the Netherlands, Poland, Romania and Spain) which were responsible for collecting additional information on these procurement cases. Each country team has received an overview of the procurement cases that have been tendered in their respective country and they have been asked to contact the relevant economic actor(s) in order to collect the required information via a questionnaire. Among other things, this questionnaire was focused on collecting the necessary data to construct prices of standardised units for the different CPV classification codes that have been selected, as well as to collect a number of project/site characteristics that have an (major) influence on the total price of a contract in order to make the different contracts comparable.

Our country teams have gathered additional information for 114 procurement cases from the 217 cases that have been identified within the total population. Out of the eight selected countries, input has been received from all countries. No validity and/or sense checks have been performed on the data collected and used the data as provided by the country teams in the quantitative analysis. Only a number of data sanitations have been performed in order to be able to treat the data under an excel format.

Table 98: Overview of country and CPV classification code distribution of the population and sample

Country distribution	*# of procurement cases (population)*	*# of procurement cases collected*
France (FR)	78	11
Hungary (HU)	26	27
Italy (IT)	23	16
Lithuania (LT)	8	5
The Netherlands (NL)	12	10
Poland (PO)	35	17
Romania (RO)	16	16
Spain (SP)	19	12
TOTAL	217	114
CPV classification code distribution	*# of procurement cases (population)*	*# of procurement cases collected*
34946100 - Railway track construction materials	47	32
45233130 - Construction work for highways	89	39
45252127 - Construction waste water plants	31	18
45235200 - Runway construction works	13	10
79633000 - Staff development services	7	3
33150000 - Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices	30	12
TOTAL	217	114

Similar to the TED-database analysis, an analysis has been performed of the additional data collected in light of determining if the concept of prices of standardised units can be used as an indicator for corruption. This quantitative analysis is done at the level of the "overall contract value of the project" (and if available, the revised overall contract value) for the actual costs as reported by the country teams and focuses on the minimum and maximum price of standardised unit, as well as the median and average price of standardised unit.

In a number of particular cases when the total sample has a number of contracts that skew the data upwards or downwards, the median presents a more useful guide than the average price of standardised unit. The data for inflation is normalised with 2006 as the base year for the normalisation. This normalisation has been done by applying the 'Annual Average Rate of Change' HICP-inflation rates as reported by EUROSTAT. HICP stands for 'Harmonised Indices of Consumer Prices' and is a set of economic indicators that are constructed to measure the changes over time in the prices of consumer goods and services acquired by households. Therefore, the HICPs give a comparable measure of inflation in the euro-zone, the European Union, the European Economic Area and other countries including accession and candidate countries. They are calculated according to a harmonised approach and a single set of definitions[274]. There is no need to normalise the data in terms of currency as the reported "overall budget of the project" is indicated in EUR for all the projects analysed.

Although the country teams have collected additional data for 114 procurement cases, it was only possible to construct a price of standardised unit for 60 procurement cases (on the level of "overall budget of the project" divided by a measure of unit) because not all the required additional information was provided by the economic actors who have been contacted by the country teams. Therefore the results presented in the following paragraphs should be interpreted with the necessary level of caution.

[274]EUROSTAT (2013) *Harmonised Indices of Consumer Prices (HICP)* [WWW]. Available from: http://epp.eurostat.ec.europa.eu/portal/page/portal/hicp/introduction.

Railway track construction materials (CPV: 34946100)

In the total population of procurement cases, 43 procurement cases have been identified in the TED-database that correspond to the CPV classification code '34946100 Railway track construction materials'. The minimum contract value is equal to EUR 37 839, while the maximum contract value is equal to EUR 26 930 356, resulting in a range of EUR 26 892 517. The average contract value that has been reported in the TED-database is equal EUR 1 928 699.

Table 99: Overview of TED-database analysis for Railway track construction materials

Minimum value	Maximum value	Range	Median	Average
34946100 - Railway track construction materials				
€ 37 839	€ 26 930 356	€ 26 892 517	€ 462 490	€ 1 928 699

Source: PwC Analysis and TED-database.

Our country teams have collected information on 32 procurement cases that are related to the 'Railway track construction materials' and they are distributed among the different selected countries as presented in the table below.

Table 100: Overview of procurement cases collected for Railway track construction materials

Country	*# of procurement cases collected*
France (FR)	0
Hungary (HU)	27
Italy (IT)	0
Lithuania (LT)	1
The Netherlands (NL)	0
Poland (PO)	2
Romania (RO)	0
Spain (ES)	2
TOTAL	32

It was not possible to construct a homogeneous and significant set of prices of standardised units for the different procurement cases collected by the country teams because of the difficulty to apply a measure of unit that is applicable to all the procurement cases of the sample.

This is related to the great variety of railway track construction materials that have been procured by the various procurement cases. As previously discussed, two units of measure have been identified that can be used in order to express a price of standardised unit for this product group: the number of units that is used to construct the railway track on the one hand and the number of kilometres of the railway track on the other hand.

As the procured projects include in general a large quantity of supplies and/or services, it seems that the total number of kilometres (of the contract) to report the prices of standardised units is the most relevant. This conclusion is supported by the fact that most of the collected procurement cases in the sample are 'regular maintenance' contracts (i.e. the materials are bought to maintain a certain number of kilometres of railway track). If this measure of unit (i.e. the number of kilometres of the railway track) is applied to the sample, it is possible to construct a price of standardised unit for 14 procurement cases.

Table 101: Quantitative analysis of Railway track construction materials *(N=14)*

Minimum value	*Maximum value*	*Range*	*Median*	*Average*	*Standard deviation*
34946100 - Railway track construction materials					
1 165 €/km	43 318 €/km	42 152 €/km	5 462 €/km	11 203 €/km	13 772 €/km

Source: PwC Analysis.

The variance in the price of standardised units between het minimum and maximum value is quiet large. This variance can be explained by the following reasons. Firstly, the various contracts are focused on different types of railway track construction materials and therefore it can be expected that there is a great variance in total cost of a contract. For example, the purchase of one bolt will have a different cost than the purchase of one grooved rail. Secondly, also within a number of contracts there are various types and sizes of railway track construction materials (i.e. bolts, screws, nuts, precast panels, railway clips, sleepers, switches, cables, transit rails, rails, crossovers, etc.) procured which makes it difficult to construct a heterogeneous price of standardised unit. Also the fact that a large number of the different contracts are stock-purchases (i.e. the purchase of railway track materials for a certain period) has an impact on the comparability of the different contracts. Finally, the sample of procurement cases demonstrates that the international comparability of the procurement cases is limited due to the fact that a number of contracts are focused on a construction method that is only used in a limited group of countries.

In terms of project/site characteristics, information about the project/site characteristics has been received for all the 14 procurement cases for which a price of standardised unit was calculated. The following project/site characteristics were asked to the competent authorities:

- Number of components/units provided;
- Number and type of tracks (i.e. single, double, etc.);
- Total length of project;
- Type of train;
- Type of surface;
- Number of stations;
- Locality (urban, semi, rural);
- Environmental constraints (difficult, normal, easy);
- Capacity (i.e. how much can be carried);
- Number of crossings.

However, no direct relationship between het project/site characteristics and the price of standardised unit has been identified.

Construction work for highways (CPV: 45233130)

Regarding the –product group "Construction for Highways", a total population of 86 procurements has been identified in the TED-database. Note that the minimum value is equal to EUR 114 820 and the maximum value is equal to EUR 180 191 888, which means that there is a large variance. The average contract value is EUR 18 859 563.

Table 102: Overview of TED-database analysis for Construction work for highways

Minimum value	*Maximum value*	*Range*	*Median*	*Average*
45233130 - Construction work for highways				
114 820 €/km	180 191 888 €/km	180 077 068 €/km	5 628 808 €/km	18 859 563 €/km

Source: PwC Analysis and TED-database.

As already discussed previously, the level of detail (i.e. only information in terms of contract value and no information in terms of a measure of unit to express a price of standardised unit) that is provided via the analysis of the TED-database is insufficient to present relevant conclusions regarding the prices of standardised units for this product group. However, it does present a good first direction of the product/service in general.

The data collection exercise that has been performed by the country teams has resulted in the collection of 39 procurement cases that are related to the CPV-code '45233130 Construction work for highways'. These procurement cases are distributed among the selected countries as presented in the following table.

Table 103: Overview of procurement cases collected for Construction work for highways	
Country	*# of procurement cases collected*
France (FR)	2
Hungary (HU)	0
Italy (IT)	7
Lithuania (LT)	3
The Netherlands (NL)	8
Poland (PO)	6
Romania (RO)	12
Spain (ES)	1
TOTAL	39

Regarding the construction of highways, a general measure of unit that can be applied to construct a price of standardised unit is the total number of kilometres that is built by the project. If this measure of unit is taken as a basis for the development of a price of standardised unit, such a price of standardised unit for 25 procurement cases could be constructed. However, in light of the previous discussions in this chapter, it should be noted that this general measure of unit does present a number of shortcomings such as for example the fact that two projects of the same length, could have a different price of standardised unit due to a difference in the number of lanes that is built.

Table 104: Quantitative analysis of Construction work for highways					
Minimum value	*Maximum value*	*Range*	*Median*	*Average*	*Standard deviation*
45233130 - Construction work for highways					
162 877 €/km	25 594 038 €/km	25 431 161 €/km	1 294 361 €/km	4 329 330 €/km	6 689 291 €/km

Source: PwC Analysis.

As presented in Table 104, the minimum price of standardised unit that has been reported is 162 877 €/km, while the maximum price of standardised unit is equal to 25 594 038 €/km, resulting in a variance of 25 431 161 €/km which is a rather large variance. This is supported by the considerable difference between the average and median price of standardised unit, which indicates that the sample is possibly skewed upwards by a number of outliers. Also the large standard deviation supports this fact, as the standard deviation measures how spread the data is. It should be noted that the same general trend for prices of standardised units can be found in the DG REGIO database[275], which has been constructed in light of the 'Ex post evaluation for Cohesion Fund' study. The actual maximum level 1 price of standardised unit (i.e. price of standardised unit calculated on the basis of the 'all-in' cost of the project) in the database equals 37 564 034 €/km, while the range is the same because the minimum value is 0 €/km. However, it is important to highlight that the DG REGIO database has not been developed for the purpose of preventing or detecting corruption and uses 2007 as a base year. One of the elements that could explain this upward bias could be corruption. Therefore, the project/site characteristics were examined that have been identified as potential elements of influence on the price of standardised units in order to adjust the price of standardised unit accordingly. The following project/site characteristics were asked to the relevant actors:

- Number of carriageways;
- Number of lanes;
- Number of bridges;
- Number of tunnels;
- Terrain (mountain, hilly, level);
- Locality (urban, semi, rural);
- Surface conditions (hard, normal, soft);
- Environmental constraints (difficult, normal, easy).

[275]DG REGIO (2013) Ex post evaluation for Cohesion Fund (including former ISPA) 2000 – 2006 [WWW] European Commission. [Available from: http://ec.europa.eu/regional_policy/sources/docgener/evaluation/pdf/expost2006/unit_cost_database.xls].

Complete information about these project/site characteristics for 16 of the 25 procurement cases has been received for which a price of standardised unit was calculated. However, no direct relationship between a project/site characteristic and a higher or lower price of standardised unit could be identified for most of the project/site characteristics that are collected from the economical actors. It has been noticed that there is a relationship between the geographic area and the price of standardised units. For example, a different price of standardised unit for Italy and The Netherlands was distinguished in comparison to the prices of standardised units reported for Poland. A possible explanation for this low level of correlation between the price of standardised units and most of the characteristics can be found in a different interpretation of the requested information by the various actors who were responsible for providing the information. For example a certain contract reports that 37 bridges have been built on a road of 36 kilometres, while the terrain condition is 'level'. Also a number of the procurement cases include the planning phase as part of the project, while other procurement cases exclude the planning phase from the total budget.

The fact that the sample of procurement cases with information on project/site characteristics consists of only 16 procurement cases from 3 different countries has also an impact on the explanatory power of the analysis, as well as on the average out effect of possible outliers (i.e. adjustment for project specific factors). Therefore, it can be concluded that the sample of prices of standardised unit for the CPV classification code 'Construction work for highways' is not large enough and/or that the information provided by the economic actors is not good enough. As well as that the unavailability of project/site characteristics on the one hand, and the limited value of the project/site characteristics on the other hand makes it difficult to dive deeper in to the analysis to verify if a higher price of standardised units is related to a specific project/site characteristics. In light of the previous, it is important to stress that the results of this analysis should be treated with the necessary level of caution and is only provided to present a general insight on prices of standardised unit for this CPV classification code.

Construction waste water plants (CPV: 45252127)

Regarding the CPV-code 45235200 'Construction waste water plants', 28 procurement cases have been identified in the TED-database with a minimum contract value of EUR 134 200 and a maximum contract value of EUR 57 108 640. This corresponds to a range of EUR 56 974 440.

Table 105: Overview of TED-database analysis for Construction waste water plants (N=28)

Minimum value	*Maximum value*	*Range*	*Median*	*Average*
45252127 – Construction waste water plant				
€ 134 200	€ 57 108 640	€ 56 974 440	€ 4 065 479	€ 5 793 063

Source: PwC Analysis and TED-database.

In terms of additional data collection, the country teams have collected additional information for 18 procurement cases, which are spread among the selected countries as presented in the following table.

Table 106: Overview of procurement cases collected for Construction waste water plants
(N=17)

Country	*# of procurement cases collected*
France (FR)	6
Hungary (HU)	0
Italy (IT)	0
Lithuania (LT)	1
The Netherlands (NL)	1
Poland (PO)	3
Romania (RO)	2
Spain (ES)	5
TOTAL	18

In order to express these procurement cases in a price of standardised unit, the Population Equivalent (PE) was opted as the most applicable measure of unit. The term Population Equivalent is usually used to describe the capacity of a waste water treatment plant and can be defined as 'The organic biodegradable load having a five-day biochemical oxygen demand (BOD5) of 60 g of oxygen per day', according to the 'Directive 91/271/EEC of 21 May concerning urban waste-water treatment'. Based on this general measure of unit, it was possible to construct a price of standardised unit for 7 procurement cases of the total sample.

Table 107: Quantitative analysis of Construction waste water plants *(N=7)*

Minimum value	*Maximum value*	*Range*	*Median*	*Average*
45252127 - Construction waste water plant				
8 €/PE	778 €/PE	770 €/PE	66 €/PE	207 €/PE

The prices of standardised units for the CPV classification code for 'Construction waste water plants' demonstrate the same general directions as the previous quantitative analysis. A large variance between the minimum and maximum value can be identified, as well as the fact that there is a considerable difference between the median and average price of standardised unit which indicates that there are potentially a number of upward or downward outliers. In light of the analysis of the project/site characteristics and the possible correlation of these characteristics with the price of standardised unit, it can be concluded that the information provided by the country teams is insufficient to draw any significant conclusions on the one hand, and that the number of prices of standardised units that has been constructed is to limited to average out the specific characteristics that are accompanied by each individual project. However, based on the previous results and the descriptions provided for each case, it could be assumed that the large variance is related to the distinction between a construction (i.e. building of a new waste water treatment plant) and reconstruction (i.e. modernisation of a current waste water treatment plant) project.

Runway construction works (CPV: 45235200)

The TED-database contains contract value information on 13 procurement cases that correspond to the CPV classification code 45235200 'Runway construction works', the minimum contract value is EUR 4 249 500 and the maximum contract value is EUR 25 389 752, resulting in a range of EUR 21 140 252.

Table 108: Overview of TED-database analysis for Runway construction works *(N=13)*

Minimum value	*Maximum value*	*Range*	*Median*	*Average*
45235200 – Runway construction works				
€ 4 249 500	€ 25 389 752	€ 21 140 252	€ 10 338 490	€ 10 776 678

Source: PwC Analysis and TED-database.

However, on the basis of the number of procurement cases for which additional data has been collected and the fact that it was only possible to construct a price of standardised unit for only 3 procurement cases, no more in-depth quantitative analysis could be performed.

Staff development services (CPV: 79633000)

In total, 6 procurement cases have been identified in the TED-database that are related to the CPV-code 79633000 'Staff development services'. This total sample size reports a minimum contract value of EUR 139 248 and a maximum contract of EUR 2 499 999, resulting in a range of EUR 2 360 751.

Table 109: Overview of TED-database analysis for Staff development services

Minimum value	*Maximum value*	*Range*	*Median*	*Average*
79633000 - Staff development services				
€ 139 248	€ 2 499 999	€ 2 360 751	€ 599 193	€ 903 394

Due to the fact that on the basis of the additional information provided by the country teams a price of standardised unit for one procurement case could be constructed, there was insufficient data to present a further quantitative analysis.

Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices (CPV: 33150000)

In terms of the CPV-code 33150000 'Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices', 25 procurement cases have been identified in the TED-database of which the reported minimum contract value equals EUR 8 905 and the maximum contract value equals EUR 14 802 933. This corresponds to a range of EUR 14 794 028.

Table 110: Overview of TED-database analysis for Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices

Minimum value	*Maximum value*	*Range*	*Median*	*Average*
33150000 - Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices				
€ 8 905	€ 14 802 933	€ 14 794 028	€ 426 163	€ 1 118 131

Source: PwC Analysis and TED-database.

The country teams have collected additional information for 12 procurement cases, which are spread among the selected countries as presented in the following table.

Table 111: Overview of procurement cases collected for Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices

Country	*# of procurement cases collected*
France (FR)	1
Hungary (HU)	0
Italy (IT)	4
Lithuania (LT)	0
The Netherlands (NL)	0
Poland (PO)	6
Romania (RO)	0
Spain (ES)	1
TOTAL	12

As already discussed in the previous sections of this chapter, it is difficult to apply a general measure of unit that is applicable to all the procurement cases related to this CPV classification code because the product group encompasses a lot of various devices that cannot be considered as a homogenous set of devices. This is supported by the additional information provided by the country teams. The products that are procured by the contracts in the sample are very diverse: equipment for neuroradiology, a spectrometer, equipment for a tomography, EPID systems to PRIMUS accelerators, additional equipment to accelerator (MLC interface), equipment for physiotherapy, etc.

Considering this high variety among the product group itself, the unit of measure that has been used to express the price of standardised units is the number of devices procured by the contract. However, this measure of unit is only applicable of a large dataset of procurement cases is available in order to compare the procurement contracts which are focused on the same type of medical devices. It does not make any sense to compare the price of standardised unit of a project aimed at providing oxygen masks with the standardised unit of a project aimed at providing electrotherapy machines. Due to the limited number of prices of standardised units (i.e. 10) that could be calculated, as well as the great variety of the medical equipment that has been procured and its impact on the homogeneity of the procurement cases, the results presented in the following paragraphs are non-robust and lack any statistical significance.

Table 112: Quantitative analysis of Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices

Minimum value	*Maximum value*	*Range*	*Median*	*Average*	*Standard deviation*
33150000 – Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices					
900 €/u	778 220 €/u	777 320 €/u	132 143 €/u	244 877 €/u	259 983 €/u

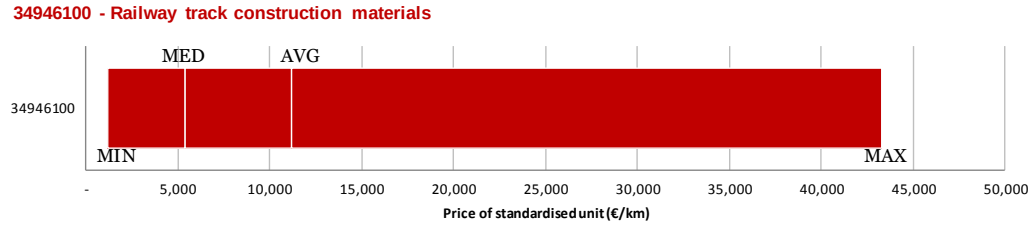
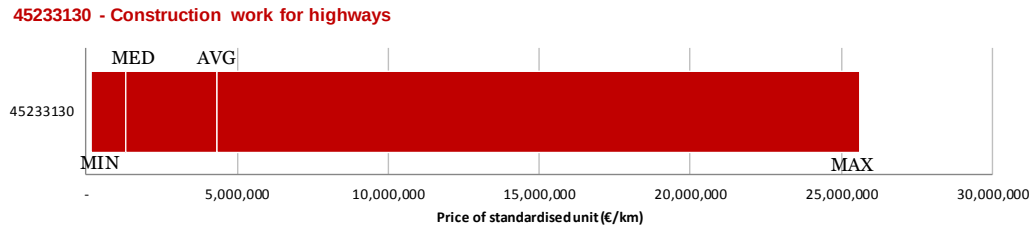
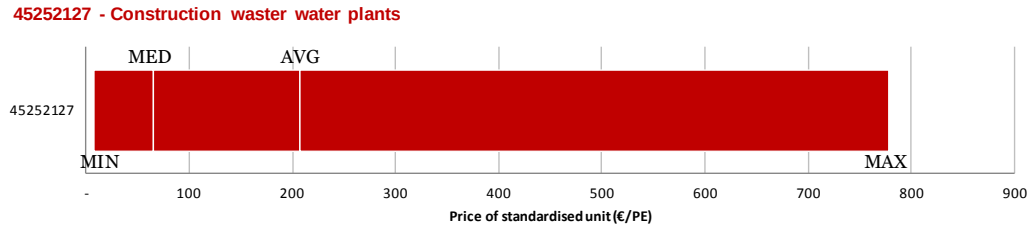
Source: PwC Analysis.

The quantitative analysis of the prices of standardised units for the CPV classification code 'Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices' has the same general direction as presented in the previous quantitative analysis. The variance between the minimum and maximum value is rather large, as well as the difference between the median and average price of standardised unit which indicates that there are potentially a number of upward or downward outliers. In light of the analysis of the project/site characteristics and the possible correlation of these characteristics with the price of standardised unit, it can be concluded that the information provided by the country teams is insufficient to draw any significant conclusions. Also the fact that the products - which are procured by the procurement cases in the sample - are very diverse in type has a big impact on the spread of the prices of standardised units and this heterogeneity is reflected in the table above.

Summary

The below table summarises the results for the price of standardised unit.

Table 113: Summary table of prices of standardised unit

Minimum value	*Maximum value*	*Range*	*Median*	*Average*	*Standard deviation*
34946100 - Railway track construction materials					
1 165 €/km	43 318 €/km	42 152 €/km	5 462 €/km	11 203 €/km	13 772 €/km
					
45233130 - Construction work for highways					
162 877 €/km	25 594 038 €/km	25 431 161 €/km	1 294 361 €/km	4 329 330 €/km	6 689 291 €/km
					
45252127 - Construction waste water plant					
8 €/PE	778 €/PE	770 €/PE	66 €/PE	207 €/PE	295 €/PE
					
45235200 - Runway construction works					
Insufficient data to present a further quantitative analysis.					
79633000 - Staff development services					
Insufficient data to present a further quantitative analysis.					
33150000 – Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices					
900 €/u	778 220 €/u	777 320 €/u	132 143 €/u	244 877 €/u	295 983 €/u
					

Limitations

The limitations and difficulties that have been highlighted by the literature and database review are confirmed by the quantitative analysis performed. This implies that an accurate price of standardised unit cannot be calculated in order to perform a significant comparison within each product group.

The main limitations and difficulties encountered are the following:

- **Data collection process**. The consortium's experience, supported by the results of previous quantitative analyses, indicates that the availability of the required information is limited and therefore it is difficult to collect this data. The process requires a lot of resources and time. The data are coming from different procurement authorities at different levels, and from different sources (contract, tender documents, official publications…). Moreover, all the contracting authorities were not able to provide the requested data as the data have not been systematically recorded or archived;
- **Data quality**. When data was available and collected by the country teams, the quality of this data can be questioned due to a number of reasons. This has an impact on the accuracy of the analysis performed. The main reason is the different interpretation of the cost definitions by the different actors who provided the information. For example, in a number of procurement cases is the planning phase included in the total contract price while this has not been included for other procurement cases. Depending on contract specificities, the total price may be subject to revision (e.g. a large project that covers several years). Moreover the total price can also cover additional services or products which are not considered as the principal. Therefore the project is classified under a specific CPV code without any information about these additional services or products, which can greatly influence the price;
- **Data management**. Compiling such a database to obtain prices for standardised units requires a considerable amount of resources and time. Next to the compilation task, the cost of maintenance and updating the database should be considered. The constant update of this database is essential in order to consider the fast-moving technology, the price/wage evolutions, as well as to increase the sample size and then to increase the final results credibility;
- **Products homogeneity within a product group**. Based on the CPV classification, several product groups have been defined. The product groups gather projects that are related to the same sector and to the same type of work performed. However the homogeneity in terms of sector and type of work is not sufficient. For example, the projects under the medical equipments products' group concern the provision of equipments that are different. This heterogeneity makes a price of standardised unit analysis senseless;
- **Projects comparability**. As mentioned in the above sections, the external factors have an important role in the price variance across all the projects within each product group. Considering all the relevant external factors is a time-consuming task which requested the input of technical experts. Insulate these external factors will imply to reduce the sample size and then challenge the credibility of the final results;
- **Indicator for corruption**. As proven by the conclusions in the previous sections, the applicability of a database with prices of standardised units to prevent or to detect corruption is in its current version limited. Due to the encountered limitations and difficulties, it was not possible to construct a set of prices of standardised units with the necessary level of statistical significance and comparability. This resulted in a set of prices of standardised units with a large variance between the minimum and maximum value.

11.4. Analysis of market prices

11.4.1. *Objectives*

In economics, market price is typically defined as the economic price for which a good or service is offered in the marketplace. It is primarily determined by the interaction of supply and demand. Therefore, the market price represents the real price that should be paid on a free market, in case no restrictions are applied. In this chapter, the market price is considered as equivalent as the retail prices.

Economic forces such as supply, demand, general economic conditions and competition change constantly and directly impact the market price accordingly. First, the supply and demand have a significant effect on the price of goods and services according the basic economic model. Second, the general economic conditions affect the prices of all goods and services, but the effect will not be the same for every product. Inflation and deflation affect the value of the euro. The economic boom and bust cycles affect available production capacity.

Third, when competition does not exist, the forces of supply and demand may not work effectively. The buyer or supplier may have an advantage in the pricing decision process. Technical specifications that are not well defined or are too restrictive, proprietary or aimed at one solution could influence the price competition.

The market price can be considered as a strategic piece of information allowing companies to define their position on the market by offering a competitive price. The public authorities may also have an interest in understanding the market price when they determine budgets for tendering purposes.

The Commission also added an analysis of market prices as an objective to this study. This analysis is aimed at identifying any corruption through price manipulations. Indeed an official price can be compared to the market price and then use the difference as a measure of price manipulation. In that respect, Hsieh and Moretti (2006)[276] apply it to detect and estimate corruption under the Iraqi Oil-For-Food program administered by the United Nations. While the total amount of corruption that is estimated is considerable—around USD 1.3 billion—it amounts to only about 2 per cent of the total volume of oil sold. Another study in 2007[277] compares the official amount spent for road construction projects in Indonesia to an independent engineering estimate of what the road actually cost to build. It appears that on average 24% of the total cost of the road was subject to corruption.

However, some authors (for instance, Bandiera et al (2009)[278]) mention that not all price mark-ups are corruption. They could simply reflect incompetence or a lack of incentives in obtaining good prices for the government.

11.4.2. *Relationship with the price of standardised units*

The price of standardised units' concept has been investigated in the previous subsection. Despite the considerable limitations in the construction and interpretation of a price of standardised units for public procurement related to EU funded projects, the theoretical concept can be compared to the market price concept.

Without considering any corruption effects, the market price is expected to be different from the price of standardised units estimated for a public procurement contract. This is explained by several factors:

- **Higher competitive pressures on the public market**. The price will be negatively linked to the competition on a market: more competition on a market means a lower level of price for products and services. According to a PwC study[279], on average 5.4 offers were generally received for each public tender in 2011. Spain and Germany are considered as the most competitive markets receiving about 8 offers on average. Open procedures and joint purchasing procurements have typically a higher level of competition and then result in more offers being submitted. Local government markets have been found to be more competitive than central government (i.e. local authorities apply the open procedure more frequently than national or federal governments and local authorities typically receive more offers per procurement than other levels of government)
- **Magnitude of a project under public tender procedure**. Public procurement projects are generally seen as important projects in terms of scope: the quantity of the products or services to be provided is generally greater than under a private contract; the duration of the project is expected to be longer; and public procurement is seen as an important tool for achieving wider economic, social and related objectives (Arrowsmith, 1998; Thai, 2001). Contractors take interest in these projects as it allows them to fill their order book. In addition, upon completion, these contracts represent a good stepping stone to enter new markets or to enhance the competitive position of the contractor vis-à-vis competitors.
- **Guarantee of public authority**. In contracting with public authorities, the risk of bankruptcy and non-payment are typically limited.

At the same time, it is widely accepted that administrative procedures used by contracting public authorities represent a greater burden on bidding companies than in de private sector. Public authorities that are tendering may also rely on market price information in order to determine an appropriate budgetary envelope.

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[276] HSIEH C.R. and MORETTI E. (2006) *Did Iraq Cheat the United Nations? Underpricing, Bribes, and the Oil for Food Program. The Quarterly Journal of Economics*, 121(4):1211-1248.

[277] OLKEN B. (2007) *Monitoring Corruption: Evidence from a Field Experiment in Indonesia*. Journal of Political Economy, 115: 200-249.

[278] BANDIERA ,O., A. PRAT and T. VALLETTI (2009), *Active and Passive Waste in Government Spending: Evidence from a Policy Experiment*. American Economic Review, 99(4):1278-1308.[Available from: ftp://www.ceistorvergata.it/RePEc/rpaper/RP115.pdf].

[279] PwC, LONDON ECONOMICS, ECORYS (2011), *Public Procurement in Europe: Costs and Effectiveness*.

11.4.3. *Data collection*

In order to collect relevant data on the market prices related to the six product groups selected as a sample for this study, a number of relevant European representative associations active in the five sectors (i.e. Road/Rail construction, Water/Waste, Urban/Utility construction, Training and R&D/High technology products) have been contacted. The associations were identified on the basis of internet research. They were contacted by telephone in the period March 2013. On average, three associations per sector have been contacted.

Moreover, the questionnaire aimed at benchmarking the procurement systems of EU Member States allowed to determine which national authorities are familiar with the price of standardised units. A further investigation (via follow-up calls) has been performed with the national authorities that have positively answered to the SUP sheet in the questionnaire. Seven national authorities have been contacted for a further investigation. During the follow-up calls, specific questions on the price of standardised units and market prices were raised in order to understand how they are using these concepts in their job.

Next to the data collection via the questionnaire and the business associations' calls, a search on Eurostat has been carried out in order to find relevant data on market prices. The Prodcom database[280] offers statistics on the production of manufactured goods for all EU Member States according to the Prodcom classification of products (8-digit code, containing about 4 500 different types of manufactured products). This database offers three types of information:

- The annual value of production (in Euros);
- The annual physical volume of production (depending of the unit selected);
- The unit value which corresponds to the value of production divided by total volume for each product.

In most cases, the statistics show the amount produced and sold of each product. However, for some products the total production includes not only what is sold, but also what is retained by the producer for use in the production of another product. Moreover, producers engage in other activities besides production (installation, repair and maintenance, finishing etc.) that contribute to turnover but not to the value of production. These activities are not counted in the production value. Consequently, the Prodcom statistics can only be used as an approximation of the market prices for certain produced goods. By definition, the Prodcom database cannot be used in order to determine the market prices for services like staff development services. In addition, production data are not collected for every Member State and the data are expressed in current prices. Finally it should be noted that the Prodcom classification is not the same as the CPV classification.

11.4.4. *Findings*

The data collection related to the market prices has been carried out through two channels: conducting interviews with authorities /associations and performing a rapid documentary research on publicly available information. The purpose of the documentary research was not to deliver a literature review, and is then not exhaustive.

11.4.4.1. Results from interviews with authorities and associations

Following the interviews, a number of findings can be reported. Overall, the associations suspect that market prices data exist and could be of value to their individual members. For business associations, the usefulness of having precise market prices data on specific product groups is less relevant. As a result, they do not own nor have immediate access to the data for the product groups targeted in this study. The fact that the data may be of importance to their member companies (and therefore not easily made available) was mentioned.

The majority of the authorities which were contacted do not render available their data and/or request payment of a fee prior to granting access. For example, RFI in Italy each year publishes a book of market prices for rail infrastructure. Any supplier which is interested in working for RFI is in a position to consult the information in the book. However, this book is not used for the EU-funded projects. Another example is the city of Maastricht. The city has invested in the compilation of a market price database. This database allows the contracting authority to estimate the reasonable price for certain products like the asphalt. The database is not publicly available.

[280] EUROSTAT (2013) Prodcom – Statistics by product [WWW]. Available from: http://epp.eurostat.ec.europa.eu/portal/page/portal/prodcom/data/tables_excel.

The Slovenian department for Public Procurement seems to be the exception as it has developed a database including the retail prices as well as the unit prices for certain type of procurements (i.e. tender for office furniture, such as computers, printers, screens, paper, and services, such as cleaning services)[281]. For example, the market price for a laser printer (black and white) is EUR 279.40 whereas the price obtained through public procurement is EUR 110.85.

Even though interviewees agree in principle on the usefulness of such data, few companies and authorities invest resources to obtain the required information. This can be explained by the effort that is required to retrieve the data and keep the data up-to-date, and the commensurate money outlays.

The interviewees particularly underscore the effort it takes to set up and maintain a market prices database. The database can be constructed internally, meaning that internal staff is entirely or partially devoted to the task, or externally, meaning that an external service provider delivers the data on a recurrent basis according to a specific contract with the company or the authority. For example, the Slovenian department for Public Procurement indicated that the maintenance of the database is particularly time-consuming considering market volatility and the technical specifications which can evolve quickly over the time.

Finally, certain confusion was encountered on the part of interviewees between two critical concepts: the market price and the price of standardised units. Interviewees often mistake the price of standardised units (which is a unit cost in their mind) for the market price. It has often been necessary to explain the difference between both concepts and to visualise the procurement market as a separate market in which both concepts can differ.

11.4.4.2. Prodcom database (Eurostat)

The Prodcom database contains information on industrial production in Europe. According to the Prodcom classification, some products were identified related to road/rail construction and R&D/High technology products[282] which are part of the representative sample.

The table below shows the median unit value and the unit value for 10 PRODCOM codes identified as having a link with the five sectors of the sample. The unit value is calculated at an EU-27 level meaning that the total value of the EU-27 production is divided by the total volume at an EU-27 level. The median is calculated from the available unit values for all countries over the last two years. The data are related to the year 2011 and are expressed in EUR.

[281] http://www.djn.mf.gov.si/narocniki/baza-trznih-informacij.

[282] As the PRODCOM database is not constructed by using the same classification than the TED database (CPV code), an exact matching cannot be found meaning that comparability is not directly possible. The definition behind each PRODCOM code and CPV code are not precisely defined and there is always a space for interpretation when these databases are developed.

Table 114: Unit value according to the PRODCOM database (Eurostat) in 2011				
PRODCOM code	*Description*	*Unit*	*Median (€) (EU 27 level)*	*Unit value (€) (EU 27 level)*
Road/rail construction				
16101010	Railway or tramway sleepers (cross-ties) of wood, not impregnated	m3	202,50	230.17
16103200	Railway or tramway sleepers (cross-ties) of impregnated wood	m3	375.75	417.08
24107500	Railway material (of steel)	kg	0.76	0.94
25941115	Other screws and bolts for fixing railway truck construction material, iron or steel	kg	2.59	2.55
30203100	Railway or tramway maintenance or service vehicles (including workshops, cranes, ballast tampers, track-liners, testing coaches and track inspection vehicles)	item	568 254.90	868 306.80
R&D / High tech products				
26601115	Apparatus based on the use of X-rays, for medical, surgical, dental or veterinary uses (including radiography and radiotherapy apparatus)	item	12 041.86	45 900.22
26601130	Apparatus based on the use of alpha, beta or gamma radiations, whether or not for medical, surgical, dental or veterinary uses, including radiography or radiotherapy apparatus	item	3 972.29	3 495.49
26601300	Ultraviolet or infrared apparatus used in medical, surgical, dental or veterinary sciences	item	786.67	100.47
32502180	Ozone therapy, oxygen therapy, aerosol therapy, respiration apparatus	item	21.60	4.14
32995910	Breathing appliances and gas masks (excluding therapeutic respiration apparatus and protective masks having neither mechanical parts nor replaceable filters)	item	62.18	12.50

Source: Eurostat

The unit value related to “railway or tramway maintenance or service vehicles” and “Apparatus based on the use of X-rays, for medical, surgical, dental or veterinary uses” are the most expensive (i.e. EUR 868 306 and EUR 45 900 respectively). A large difference is also observed between the median and the unit value implying that the results distribution is not even and the extreme values play an important role in the unit value definition.

Another example are breathing appliances and gas masks for which the average unit price in Europe is estimated at EUR 12.50 per item. If the definition of a gas mask can be easily understood, the definition of a breathing appliance can lead to a more complex interpretation exercise.

11.4.5. *Conclusion*

Even if some data on market prices have been found, they are not directly linked to the six product groups selected as the representative sample for this study. The data collection on market prices did not allow for an identification of a database for the targeted product groups considering the availability of the data. A number of respondents indicated that they use a market prices database. However, the respondents consider the information as strategically important and are therefore reluctant to make available the data.

Consequently, a comparison between the market prices data and the procurement prices for standardised units cannot be performed for the product groups selected in the sample. Nevertheless, it is interesting to see that the price difference between the market price and the price of standardised unit can be important as indicated in the Slovenian database for some particular set of products (e.g. printers or computers).

The comparison between the price awarded for a public tender and the market price has been already investigated by some authors, and evidence of corruption has been detected. However, not all price mark-ups are corruption and a direct link should be established automatically.

11.5. Overall conclusions and recommendations

11.5.1. Conclusions

In the context of the general objective of this study, the focus of this chapter was on exploring the opportunity of implementing prices of standardised units as a standalone tool and/or indicator in the previously discussed framework to prevent or detect possible cases of corruption when a certain type of product/service is procured by a public administration. Therefore, a critical assessment of relevant studies and databases in the field of prices of standardised units has been performed, as well as the development of a theoretical methodology to calculate prices of standardised units and a quantitative analysis on the basis of a sample of collected procurement cases, and finally a qualitative analysis of market prices.

From a purely theoretical perspective, the analyses performed demonstrate that a price of standardised unit can be envisaged as a tool and/or indicator for detecting and preventing potential cases of corruption. However, from a practical point of view, the limitations to the approach – primarily due to limited data availability and quality – bring discredit to the use of a price of standardised unit. Moreover a direct link between the price of standardised unit and corruption has not been demonstrated.

The literature agrees that it is difficult to collect relevant and highly detailed information (i.e. with an appropriate level of granularity) from the different economic actors to construct prices of standardised units with statistical significance. In addition, the data is often heterogeneous and impacted by different factors (such as project and site conditions that lead to variations in specifications, production location, size, equipment used, etc.). Moreover, the quality of the existing data is not sufficient enough from a general point of view. Consequently the comparison across projects within a particular product group is typically very complex. The diversity in terms of types of projects and methods of implementation makes it extremely difficult to arrive at a numerical definition of a price of standardised unit. These limitations and difficulties are corroborated by the database analysis.

Furthermore, the theoretical methodology and quantitative analysis on the basis of a sample of collected cases have highlighted several limitations, particularly linked to the homogeneity of projects within a product group, which has an impact on project comparability, data collection, data granularity, data quality and data management. Despite the limitations encountered, a price of standardised units has been calculated for some product groups. However, it should be noted that these prices of standardised units cannot be considered as statistically significant (meaning that an extrapolation exercise cannot be performed) and that they have been calculated for information purposes only.

In general, the different product groups that have been analysed have a rather large variance and exhibit considerable difference between the average and median price of standardised unit. It indicates that the sample is possibly skewed upwards by a number of outliers. Also the reported standard deviation is rather large, which means that there is a big spread in the data. Therefore, no significant conclusions can be drawn from the quantitative analysis. As consequence, the findings are not significant and robust enough to support any findings and/or conclusions in terms of corruption detection or prevention in general.

Nevertheless, not only can the market price be considered as a strategic piece of information allowing companies to define their position on the market by offering a competitive price, public authorities (should) also have an interest in understanding the market price when they determine budgets for tendering purposes.

11.5.2. Recommendations

Given the previous conclusions regarding the limitations and difficulties of constructing prices of standardised units, it can be recommended that a number of (organisational) conditions need to be met in order to use a price of standardised unit as an additional source of information which could support prevention and/or detection of corruption:

- **Data collection (general).** Due to the absence of a centralised collection point within the European Union, it is difficult to collect all the relevant data from the different economic actors in order to construct a statistically significant price of standardised units. Therefore, a centralised procurement administration to which contractors and contracting authorities are obliged to systematically report highly detailed project data and progress (in a standardised format) should be created, in order to facilitate the data collection and treatment on a European level. However, an intermediate level on the national level (i.e. decentralised

collection point) could be introduced in order to facilitate the data collection exercise, given the language differences and the local characteristics (such as regional responsibilities).

- **Data collection (database).** The highly detailed project data and progress reports need to be stored in a database that is applicable to perform calculations. At this moment, the TED database is the closest database on the European level that could be applied for the purpose of this study. However it does not contain enough information in its current format. Therefore, it should be assessed if the current TED-database can be expanded with a number of qualitative fields that provide the possibility of constructing a more accurate price of standardised unit (i.e. measure of unit, project/site characteristics, detailed cost information, etc.) vs. the construction of a new database.
- **Data quality (definitions)**.It is necessary to arrive at generally accepted cost and price definitions and to make several assumptions for technical, organisational, micro and macro realities that influence the development of the average price. These definitions and assumptions should be applied uniformly by the different economic actors and/or when comparing different time periods (i.e. the definitions need to be 'generally accepted and applied'). This could be controlled and verified by an Audit Committee in order to ensure that the definitions are applied on the same basis, as well as to verify data accuracy and correctness.
- **Data collection (dataset)**: A database with a large amount of procurements/projects is necessary; as a large dataset of projects is required in order to 'average out' mitigating factors and assess (possible) casual trends between project and site characteristics and the price of standardised units. Considerable resources (in terms of time and employees to collect and treat the data) have to be made available to fill and maintain this database. Overall, this represents a cost to public administration (and the tax payer) which needs to be weighed vis-à-vis the added value of corruption prevention and/or detection.
- **Comparability (project and site characteristics)**. Our analyses have demonstrated that project and site characteristics impact prices of standardised units. Therefore, it is opportune that information related to project and site characteristics is collected, which would allow the creation of relatively homogeneous project groups in order to compare projects.
- **Future development**. The database will need to be maintained and regularly updated in order to retain its relevance.

Since understanding the market price when determining budgets for tendering purposes is also in their interest, public authorities that are tendering should invest (more) in collecting and sharing market (price) information, in order to determine an appropriate budgetary envelope. The better and more structured this collection of market (price) information and the broader this is shared amongst public authorities at regional and national level and even between EU Member States, the higher the chance that anomalies – e.g. potentially corruption - will be detected.

12. Positive and negative practices in public procurement

In this chapter, identified negative procurement practices are described, which contribute to the increase of overall corruption costs, as well as positive/best practices that lead to the prevention of corruption and to lower costs in the whole tender/grant cycle (preparation, selection and implementation). Particular attention will be given to best practices in leniency/voluntary disclosure programs.

12.1. Framework to assess positive and negative practices in public procurement

The procurement practices listed in this chapter, positive and negative, are presented in a framework based on 5 key principles to manage the risk of corruption. These principles are assessed for the 5 phases of public procurement, already used to identify and categorise quantitative and qualitative indicators of corruption in public procurement projects ("red flags" – see chapter 9). This enables to draw conclusions on the necessity of specific practices given the individual (or combined) weight of specific indicators of corruption resulting from the comprehensive methodology to measure the costs of corruption in public procurement. Using this framework not only allows drawing conclusions on practices identified in the Member States, but also on their apparent absence.

12.1.1. *A sound public procurement system*

According to Ware et.al.,[283] a sound public procurement system is governed by several basic principles:

- A sound public procurement system is **based on rules –** Countries should therefore have an adequate legal and regulatory public procurement framework in place to promote fairness and discourage discrimination and favouritism, thus ensuring healthy competition;
- A sound public procurement system encourages **competition in bidding for government contracts**. In most cases, competition results in better quality and lower cost. However, certain special circumstances require alternative modes for letting contracts lead to better results. Successful alternative modes presuppose that rules and regulations should be clear and unambiguous on the circumstances that justify the use of such alternative modes. Moreover, there should be clear rules to limit discretion in deciding when to use these alternatives.
- A sound public procurement system promotes **transparency**, not only to generate competition which in turn leads to savings and lower prices,[284] but also to increase the public confidence that government is providing legitimate services for their citizens rather than increasing their private wealth or that of their relatives, friends or interests. This objective is best achieved by enforcing transparency in decision making throughout the entire procurement process. Transparency in public procurement requires the timely release of data and information that is sufficient to allow understanding of the way the procurement (system) is intended to work, as well as how it is functioning in practice.

[283] GLENN T. WARE ET. AL., *Corruption in Public Procurement. A Perennial Challenge*, in : J. EDGARDO CAMPOS AND SANJAY PRADHAN (ED.) (2007), The Many Faces of Corruption. Tracking Vulnerabilities at the Sector Level (The International Bank for Reconstruction and Development / The World Bank).

[284] According to Commission Staff Working Paper, Evaluation Report Impact and Effectiveness of EU Public Procurement Legislation, part I, SEC(2011) 853 final, the evaluation finds that the procurement Directives have boosted openness and transparency, that this has triggered increased competition, and that this in turn translates into savings. New econometric analysis carried out in the context of the evaluation finds that even incremental increases in transparency or openness can yield tangible savings. Publication of a contract notice results in a saving of 1.2% compared to contracts where neither contract nor prior information notice was published. Using an open procedure is associated with further 2.6 % savings. Based on these findings, a contracting authority that publishes an invitation to tender and uses an open procedure may expect total benefits equivalent to savings of 3.8 % on the final contract value. For restricted procedures, the corresponding saving appears smaller at around 2.5%.

- A sound public procurement system strengthens **accountability** so that government officials can be held responsible for the proper implementation of public procurement rules and regulations and the decisions they make in actual procurement cases. Such accountability requires a credible sanctioning system for violations of rules with adequate internal controls and audit procedures; a complaints system for bidders as well as appropriate administrative; and judicial review bodies attributed with the authority to impose corrective measures.
- A sound public procurement system is **economic**. This means that the government should procure goods, works and services at a reasonable cost and with reasonably good quality: value for money.
- A sound public procurement system is **efficient**. Procurement rules and procedures must encourage the completion of the procurement process within a reasonable length of time. Moreover, public procurement rules and procedures should also ensure the timely delivery of the goods, services and works procured.

When assessing practices in public procurement, these key principles will be taken into account.

12.1.2. *Managing the risk of corruption*

Three organisations (the Institute of Internal Auditors (IIA), the American Institute of Certified Public Accountants (AICPA) and the Association of Certified Fraud Examiners (ACFE)) joined forces and formulated 5 key principles for an effective management of the business risk of fraud.[285]Here, these principles are translated into *5 Key Instruments to Manage the Risk of Corruption*:

Box 4: 5 Key Instruments to Manage the Risk of Corruption

Instrument 1: *As part of an organisation's governance structure,* ***a corruption risk management program*** *should be in place, including a written policy (or policies) to convey the expectations of the board of directors and senior management regarding managing corruption risk.*

Instrument 2: *Organisations should perform* ***periodical risk assessments*** *to assess the corruption risk exposure and to identify specific potential schemes and events that the organisation needs to mitigate.*

Instrument 3: ***Prevention techniques*** *to avoid potential key corruption risk events should be established to mitigate possible impacts on the organization.*

Instrument 4: ***Detection techniques*** *should be established to uncover corruption events when preventive measures fail or unmitigated risks are realized.*

Instrument 5: *A* ***reporting and investigation process*** *should be in place to solicit input on potential corruption, and a coordinated approach to investigation and corrective action should be used to help ensure potential corruption is addressed appropriately and timely.*

These 5 Key Instruments to Manage the Risk of Corruption help to ensure that the basic principles for a sound public procurement system can be achieved and monitored. Each instrument is a category of practices – rules, procedures, processes, tools and methodologies, different in character, form and composition per situation– that are being used (or that are absent) to manage the risk of corruption in each phase of the procurement process.

Ideally, all principles of sound public procurement should be applied to all stages of public procurement, and for each stage, key instruments appropriate to ensure sound working of these principles should be in place. In practice, the technologies and methodologies that enable the proper functioning of such instruments are being used for more than one stage of public procurement. Data from a database that contains all cases of corruption in public procurement collected in the post bidding stage can, for instance, be used in the definition of contract characteristics (avoid bad practices in the pre-bidding stage), the contracting phase (for prequalification criteria in the bidding stage) and contract award (evaluation of bidders in the bidding stage).

[285] ACFE (2010) *Managing the Business Risk of Fraud, a practical guidance*, p. 10. For the ACFE, fraud — occupational fraud — in which an employee abuses his or her position within the organization for personal gain, is defined very broad, encompassing a wide range of misconduct by employees at every organizational level. In the 'occupational fraud and abuse classification system' of the ACFE, the three main categories are corruption, asset misappropriation and fraudulent statements. See: ACFE (2010), Report to the nations on occupational fraud and abuse. 2010 global fraud study. p. 6-7.

12.1.3. *Effects of positive practices, contribution of negative practices to corruption*

The growing number of empirical studies of corruption in the last two decades has identified a large set of economic, socio-cultural and institutional variables as significant determinants of corruption. But according to Abbink and Serra (2012), these studies have mainly relied on cross-country data and subjective measures of corruption. In their study, they assert that there are many reasons to believe that the empirical findings generated by these studies cannot be used to draw conclusions about the design of effective anti-corruption policies, for two main reasons:

- Measurement error represents a serious limitation of these studies, which in many instances employ subjective indexes of country-level corruption;
- Findings of different authors often contradict each other[286].

The same conclusion is drawn by Johnsøn, Taxell, and Zaum (2012), who link the relatively limited amount of operationally oriented research and rigorous evaluations of anti-corruption efforts to the view that corruption measurement problems (due to its clandestine, hidden nature) make it impossible to draw valid conclusions on the effectiveness of anti-corruption programmes[287]. They identify three principal measurement problems with regard to corruption:

- Precisely measuring the scale of corruption – the whole purpose of the development of a comprehensive methodology to estimate the costs of corruption in public procurement was to overcome this problem.
- Measuring change in corruption levels – if precisely measuring the scale of corruption is not possible, how should changes in corruption levels be measured?
- Establishing causality between anti-corruption reforms and changes in corruption levels, and plausibly attributing changes to anti-corruption measures – even if changes in corruption levels could be measured, did these changes occur in spite of or thanks to anti-corruption efforts? And how should the contribution of individual measures be calculated?

In a review of existing literature, Johnsøn, Taxell, and Zaum conclude that evidence on the effectiveness of four direct anti-corruption interventions (anti-corruption authorities, anti-corruption strategies, anti-corruption laws and Financial Intelligence Units) is mostly weak: "Many qualitative case studies exist, but these rarely set out to measure effectiveness in an objective or methodologically robust fashion. Relevant and reliable data is missing in many of the studies. … Even though several of the reviewed studies provide very strong evidence that procurement reforms can help to reduce corruption, the overall strength of the evidence is only fair, given the small number of studies. The limited size of the evidence also means that it does not compare the impact of different kinds of procurement reforms, such as e-procurement, forensic accounting, or procurement units."[288]

The World Bank tried to measure its success in reducing corruption. In a 2008 report, it was stated: "The degree of the World Bank's success in reducing corruption is extremely hard to assess since measuring results is intrinsically and analytically difficult and since monitoring of results have only in a few cases been undertaken alongside anti-corruption measures. Clearly also, assessing the effect of the anti-corruption actions by the Bank which is only one of many institutions involved in AC, brings up the attribution problem. There is limited information that may help us decide whether the results are due to the Bank's actions or to other factors, or to the combined efforts of the Bank and others. It is also difficult to construct the counterfactual. What would have happened if the Bank had not intervened? Even given the many uncertainties, a main overall conclusion is that there were not a great many successes in terms of reducing the problem of corruption."[289]

Also in this study, it was not possible to measure the effects or effectiveness of individual practices, positive or negative, towards public procurement. An overall decrease of the number of cases of corruption, or detection of a higher number of cases of conflict of interest can have various grounds, not limited to one or some practices.

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[286] ABBINK, K., and D. SERRA (2012), *Anticorruption policies: Lessons from the lab*. Available from http://faculty.smu.edu/dserra/AbbinkSerra_Final.pdf [accessed 25 April 2013].

[287] JOHNSØN, J., N. TAXELL, and D. ZAUM (2012), Mapping evidence gaps in anti-corruption: Assessing the state of the operationally relevant evidence on donors' actions and approaches to reducing corruption. U4, issue 2012.7.

[288] JOHNSØN, TAXELL, and ZAUM (2012), 13.

[289] FJELDSTAD, O.-H. and J. ISAKSEN (2008), *Anti-Corruption Reforms: Challenges, Effects and Limits of World Bank Support Background Paper to Public Sector Reform: What Works and Why? An IEG Evaluation of World Bank Support* (IEG Working Paper 2008/7).

Moreover, such changes in the level of corruption depend on the level of corruption, which remains an estimate (and in this study, only estimations for very specific product groups in certain sectors of the economy could be made).

12.1.4. *What makes a positive practice? Theory and experiments*

A practice in this study is considered a positive practice when it contributes *in theory* to the basic principles for a sound public procurement system. The focus in listing the positive practices is on those practices that are neither implemented nor in use in *all* EU Member States. A negative practice is one that *in theory* hinders the proper functioning of the basic principles for a sound public procurement system. As the practices – either positive or negative - have not been tested for their absolute or relative contributions, there is no ranking of the practices.

Besides theory, an interesting new field of research in the field of corruption are laboratory and field experiments. The literature on laboratory experiments to investigate corrupt transactions is growing. What these studies have in common is the attempt 'to simulate scenarios conducive to (different forms of) corruption in a perfectly controlled environment, making it possible to identify the effects of various monetary and non-monetary incentives on individuals 'propensities to act corruptly'.[290] These experiments range from the relation between corruption and gender to individuals' propensities to whether act corruptly relate to culture.

According to Armantier and Bolyy[291], lab experiments offer two key advantages: "*first, corrupt behavior is unambiguously observed at the individual level; second, the researcher controls both the environment and the characteristics of the subjects' population. As a result, the researcher is in a unique position to test possible corruption deterrents (e.g. higher wages, monitoring and punishment) and to identify micro-determinants of corruption (e.g. gender, religion).*" Some of the tests are even repeated in different environments, in some cases with the same outcome leading to conclusions that lab experiments on corruption have empirical relevance, and some attitudes toward corruption may be universal.

Although laboratory experiments on corruption, corruptibility and measures to fight them, seem self-suggesting, it is interesting to note that experiments on corruption and corruptibility are few and experiments that address the incentive-compatibility and effectiveness of anti-corruption measures in public procurement are even fewer in number.[292] The ones performed though show some interesting results, and where relevant, these results will be mentioned for the positive practices identified.

Results from laboratory experiments should however be treated with caution. There are especially legitimate questions that can be asked about the external validity of the still small set of corruption experiments, as for similar experiments in general. Dušek, Ortmann and Lízal see two main issues: that of representative samples and that of representative stimuli: "*As regards representative samples, most experimental economists work with a convenience sample of subjects – traditional college students. As regards representative stimuli, most studies follow the convention among experimental economists of using abstract laboratory environments.*"[293]

Another problem is highlighted by Hollyer[294]: "*Existing experimental and quasi-experimental evidence indicates that both top-down and bottom up anti-corruption interventions have been successful in some instances. Yet similar interventions have failed in other instances. It seems highly probable that differences in the impact of both types of interventions can be explained by differences in the environments in which these interventions took place. The effectiveness of attempts to combat corruption is conditional on factors that vary across countries, regions, municipalities and villages.*"

[290]SERRA, D. and L. WANTCHEKON (2012), *New Advances in Experimental Research on Corruption. Research in Experimental Economics*, Volume 15.

[291]ARMANTIER, O. and A. BOLYY (2010), *Can Corruption Be Studied in the Lab?*

[292]See also: DUŠEK, L., A. ORTMANN and L. LÍZAL (2005), *Understanding corruption and corruptibility through experiments*. Prague Economic Papers, 2, 2005.

[293]Ibidem.

[294]HOLLYER, J.R. (2011), *Is it Better to Empower the People or the Authorities? Assessing the Conditional Effects of 'Top-Down' and 'Bottom-Up' Anti-Corruption Interventions*. MacMillan Center for International and Area Studies, Yale University.

The practical relevance of the emerging literature on laboratory experiments will not be fully established as long *as the question of external validity* remains unanswered. Because lab experiments sometimes fail to incorporate some relevant features from the field (e.g. appropriate stakes, environment, population), lab and field experiments do not always produce identical results[295]. Moreover, it is essential to determine whether or not the insights gained in lab experiments on corruption can be extrapolated. Field experiments might help to gain such insights. The difference between a lab experiment and the controlled field experiment is that subjects in the field act without knowing that they were participating in an experiment. Armantier and Bolyy, in their study that describes a field experiment to test the outcomes of a laboratory experiment, provide some evidence to support to the external validity of corruption experiments. However, the authors warn that the external validity question should be examined for other forms of corruption (e.g. embezzlement, nepotism) too, and that more realistic corruption scenarios should be considered than the one they used, with very specific task, stakes, and a specific subject pool in their experiment that may not be representative of actual corruption.

This forms, according to Sequeira[296] the challenge "*to identify sources of exogenous variation in institutional setups and organizational rules, within or across countries, and develop appropriate measures that allow for a better understanding of the relationship between institutional context and patterns of corrupt behavior. Conceivably, even field experiments could be designed to test behavioral responses of corruption to changes in different types of rules, which may affect some individuals or firms but not others. Researchers should also be sensitive to the possibility that corruption can generate asymmetric responses among different agents (individuals or firms), and that this broader set of behavioral responses will have implications for the overall efficiency costs and distributional implications of corruption. Understanding the whole range, distribution and intensity of behavioral responses to different types of corruption will certainly continue to figure prominently in the corruption research agenda.*" It can only be recommended that more research will be developed and performed on causality and effects of measures that fight corruption, not only in a laboratory environment, but also in field experiments, repeated in different contexts and environments in such a way that more general conclusions can be drawn.

In this study, bearing the difficulties as described here above in mind, no attempt has been made to construct the optimal or ideal set of practices. The 5 Key Instruments to Manage the Risk of Corruption have been used as a mere *Idealtype*, emphasizing the logical and consistent traits of the set of instruments to manage corruption in public procurement. These traits are defining ones, not necessarily desirable ones, and this *Idealtype* does not exist anywhere in reality. It is rather a set of 'measures' that can be used in comparing the phenomena of managing the risk of corruption in public procurement.

Positive (or good) practices, are assumed to offer a good solution to a problem, and are in many instances presented as a model to be copied in other states or situations. This method however does not result in an absolute standard, but in what is dubbed by Van der Vleuten and Verloo a 'pioneer standard': a *context-specific way* of coping with a problem that is dressed up as a standard without specifying the scope conditions that facilitated its success.[297] Van der Vleuten en Verloo present a number of valid reasons to doubt the effectiveness of ranking and benchmarking in improving policy making in terms of effectiveness and accountability. They state that best practices[298] hamper rather than promote good performance, because their link to performance quality is equivocal: "Past reputation tends to be rewarded without taking into account the context-specific character of any 'best' practice. Accordingly, good practices discourage states with other practices to improve their performance, as their practice is not recognised, while best practices enable those with the 'right' style to do window-dressing without incentivising performance improvement. This shift favours certain states and prejudices others."[299]

[295]ARMANTIER, O. and A. BOLYY (2012), *Comparing Corruption in the Lab and in the Field in Burkina Faso and in Canada*. The Economic Journal, 2012.

[296]SEQUEIRA, S. (2012), *Advances in Measuring Corruption in the Field* (London School of Economics).

[297] VLEUTEN, A. VAN DER, and M. VERLOO (2012), Ranking and benchmarking: The political logic of new regulatory instruments in the fields of gender equality and anti-corruption. *Policy & Politics vol 40 no 1*,pp. 73-88.

[298] In this study, positive practices were identified instead of best (or good) practices, which avoid issues with regard to ranking and absolute standards partially. Some arguments however also are valid for positive practices.

[299] VLEUTEN, A. VAN DER, and M. VERLOO (2012), p. 84.

Another aspect of positive practices is that the right balance has to be found between the different positive practices that can be implemented, and that this balance varies for every context. This is true for positive anti-corruption practices in public procurement, even if it is not known exactly how effective they are individually or in conjunction. According to Beck (2012): "*On one hand, the establishment of strict rules that limit discretionary power can hinder public officials from manipulating a procurement process. On the other hand, anticorruption policies can rely on effective monitoring mechanisms and impose high sanctions in case of malfeasance. This acts as a deterrent in case the probability of detection is sufficiently high and penalties exceed the profits from illegal transactions. However, in practice strict rule bound systems are often contra productive because limiting discretion of public procurement agents goes along with administrative burdens and impedes an appropriate and expedient contract realization. At the same time, the implementation of monitoring mechanisms that control the process of decision-making often generate high costs and hinder proceedings. While a regulatory system is necessary to fight corruption in public procurement, it is difficult to define practicable procurement rules and find the best balance between limiting areas of responsibility and monitoring policies.*"[300]

Important to notice here is that these and other doubts were considered and taken into account as much as possible. It was not tried – neither in the identification of positive and negative practices, nor in the benchmark – to rank practices or Member States. Moreover, the fact that the context (other practices and structures as well as the – unknown – level of corruption) is relevant was considered as well. This was another reason not to focus on specific, most probably context relevant effects of practices, but merely on their (theoretical) potential to contribute to the increase of overall corruption costs (negative practice), as well as to prevent corruption and lower costs (positive practice) in the whole tender/grant cycle.

12.1.5. *This and other stock-takings of positive practices*

The objective to identify positive/best practices in public procurement that lead to the prevention of corruption and to lower corruption costs is on one hand helped by a vast amount of studies, handbooks and guidelines on this particular topic, while on the other hand hindered by the fact that a great deal of positive practices have already been described that the risk of copying existing good overviews is paramount. Handbooks from OECD, OSCE, World Bank, GRECO and other international and national institutions all present corruption risks in public procurement as well as practices or guidance to counter these risks. They often start with a statement that "few activities create greater temptations or offer more opportunities for corruption than public sector procurement"[301] and therefore pay special attention to this aspect of the public administration. These handbooks and guidelines will not be repeated here, although they were studied by the consortium before assessing the EU Member States for this and for the next chapter (benchmark of procurement systems).

There are also many (comparative) studies on legislation in the field of bribery and corruption[302] as well as on public procurement, as well as their implementation, impact and effectiveness[303], although these studies do not focus on the effectiveness of these legislation with regard to prevent or detect fraud and corruption. These studies will not be repeated or extensively quoted here either. However, some references to missing legal aspects or best legal practices are presented where deemed relevant.

[300]BECK, L. (2012), *Anticorruption in Public Procurement. A Qualitative Research Design* (PhD Thesis. Passau, Universität Passau), p.130.

[301]OSCE (2004), *Best Practices in Combating Corruption*. Available from: http://www.osce.org/eea/13738?download=true [Accessed 20 March 2013], p.103 – however without any empirical foundations to this statement.

[302]E.g. ASSER INSTITUTE CENTRE FOR INTERNATIONAL AND EUROPEAN LAW with POLISH INSTITUTE OF INTERNATIONAL AFFAIRS (2012), *Prevention of fraud, corruption and bribery committed through legal entities for the purpose of financial and economic gain. Comparative Overview*. Project in the European Commission programme "Prevention of and Fight against Crime" 2007-2013 - DG HOME Project HOME/2010/ISEC/AG/081. Available from: http://www.asser.nl/upload/documents/20121205T032523-Comparative%20Overview%2026%20Oct%202012%20final.pdf [Accesed 20 May 2013].

[303]E.g.: Commission Staff Working Paper, Evaluation Report Impact and Effectiveness of EU Public Procurement Legislation, SEC(2011) 853 final, Brussels 27 juni 2011, Commission Staff Working Paper, Annual Public Procurement Implementation Review 2012, SWD(2012) 342 final (Brussels 9 October 2012).

In February 2013, the Commission published a study executed by the Asser Institute on Manual for preventive measures and best practices against fraud, corruption and bribery committed through legal entities for the purpose of financial and economic gain.[304] In this manual, the focus is on preventive practices and measures developed by public and private entities which goes beyond criminal and company law. The manual takes into consideration general policies of civil and administrative nature as well as the use and role that soft-law measures (recommendations, opinions, regulations, policy strategies; non legislative acts adopted by public entities as well as regulatory authorities and NGOs) play.

In its Manual, the Asser Institute pays special attention to public procurement, since "…the market of public procurement is extremely vulnerable to corruption, fraud and organised crime, hence, next to measures broadening access, instruments are needed to ensure that entities or persons likely to commit such crimes are prevented from participating to public tender procedures"[305] Based also on a number of national reports from experts in the field, the conclusions for best practices in public procurement are:

"Administrative screening and the exclusion of previously convicted candidates" is a well-established principle among the Member States by now. However, the system could be improved and unified in terms of legal definitions provided for the grounds of exclusion, and the spectrum of crimes that shall be precluding bidders from tender.

An interesting aspect that stems from the national reports is the use of internet and websites in order to facilitate creation of **databases and cadastres**, which the authorities and other stakeholders have access to. This allows for **more transparency of the procurement procedure** and ensures **better flow of information between the participants**.[306]

Although some similar practices are listed in this chapter and some references made to this Manual and other handbooks and studies, in this project no attempt was made to repeat all the work ('a project, which spanned 15 months in total') of the Asser Institute, nor of other organisations. What is however interesting is that no single positive practice database or portal exists at EU-level, that contains all results of this previous work and makes is accessible in a user-friendly manner to all involved in public procurement.

The negative and positive/good practices are particularly identified in the data collected throughout the 27 Member States of the EU, with an emphasis on the 8 selected Members States that were assessed in more detail (see chapter 3). Whether practices identified in one Member States is also present in some or all other Member States is not always assessed in detail, except for the ones in the benchmark in the next chapter.

12.1.6. *Presentation of the positive and negative practices*

For each of the *5 Key Instruments to Manage the Risk of Corruption* a description of what negative and positive/best practices were encountered in Member States of the EU is included in the following, with a focus on the 8 selected Member States that were assessed in more detail during the conducted fieldwork. Furthermore, practices that hinder the proper management of the risk of corruption, or even directly conflict with the basic principles for a sound public procurement system are listed as negative practices. Moreover, apparent absences of instruments to manage the risk of corruption are indicated as a possible negative practice as well (possible, because it is impossible to prove that the absence of certain instruments leads to the increase of overall corruption costs, or that other instruments in that particular context are already sufficient). The negative and positive/best practices have been used as the foundation for the compilation of the benchmark against which the procurement systems of all EU Member States were tested – see chapter 14.

A positive/best practice in a certain Member States is marked in **green**, a negative practice in **red** and a practice with an innovative or positive character but a bad implementation is marked in **orange**.

Unless indicated otherwise, the practices were collected in the course of this study: via the assessment of 25 Member States by the ECLAN-network, of via the in depth country studies of the 8 selected Member States.

[304] ASSER INSTITUTE CENTRE FOR INTERNATIONAL AND EUROPEAN LAW WITH POLISH INSTITUTE OF INTERNATIONAL AFFAIRS (2013), *Manual for preventive measures and best practices against fraud, corruption and bribery committed through legal entities for the purpose of financial and economic gain.*

[305] Ibidem, 53. The Manual however does not provide any foundations for this vulnerability assessment of the public procurement market.

[306] Ibidem, 56.

12.2. Corruption risk management policy: a firm (legal, institutional, technical) basis to protect public procurement against corruption

Anti-corruption policies and programs

Next to procurement legislation (in place in all EU Member States) and anti-corruption laws (in place in some Member States and with a different scope), many Member States choose to strengthen their efforts with a dedicated anti-corruption policy or program. For instance in **Poland**, where in 2012 the Ministry of Interior and Administration in cooperation with other central offices prepared the document '*Government Anti-Corruption Program for 2012-2016*' ('*Government Program*').[307] This programme is a continuation of activities envisaged by previous (carried out since 2002) government anti-corruption programmes. Its main objective is to decrease the level of corruption in Poland achieved by the implementation of two specific objectives:

- Strengthening prevention and education in the area of corruption;
- Increasing the effective elimination of corruption crimes.

Moreover, the document sets out detailed objectives, goals and number of activities as well as the institutions involved in its accomplishment. The mechanism of implementation and evaluation of the 'Government Program' has also been included.

The new anti-corruption law in **Italy** includes mandatory anti-corruption plans to be developed every year by each Public Organisation, through the overview of an Anti-Corruption responsible. These plans will have to highlight the activities in which the risk of corruption is higher; foresee those prevention mechanisms in the areas of training and audit that allow the central public administration to successfully prevent the risks of corruption; ensure that a systematic mechanism of report to the hierarchy is put in place, notably for those activities where the risk of corruption is higher; provide adequate monitoring tools to ensure the respect of the terms of reference and the successful conclusion of public bids and procurement procedures; identify specific mechanisms that allow for the inquiry about the relations between the public administration and all those private subjects that have concluded contracts and ensure they are interested in authorisation mechanisms or are entitled to economic benefits.

Hungary has no comprehensive anti-corruption policy and program in place. While two comprehensive anti-corruption programs have been prepared by the previous government, none of these have been adopted.

Benefits of an anti-corruption policy or program: Having an anti-corruption policy or program with clear objectives that focuses the efforts of the various actors involved in the fight against corruption can be regarded as a positive practice, especially when it is evaluated and renewed periodically. It provides a framework with common objectives for all the (very different) actors involved, it underlines the importance of the fight against corruption and the commitment of all involved to take on this fight and it mobilises and aligns resources to this end. Such a policy can identify information gaps, flaws in the intra- and inter-organisational cooperation and exchange of data and information and efficiency en effectiveness of the entire system to prevent, detect and investigate and prosecute corruption in public procurement. An anti-corruption policy should therefore be as SMART as possible, explicitly defining the roles and responsibilities of each of the actors involved. In order to win the commitment of all organisations involved, it helps to develop such a national anti-corruption program for public procurement in a joint effort with all these stakeholders, public and private alike.

Code of ethics/good governance

In terms of principles and values for public employees, many EU Member States have drawn up their own ethical Codes of Conduct, either incorporated into civil service legislation or independently.[308] In the **Netherlands**, the Civil Service Act (*Ambtenarenwet*) is amended to include the duty for public organisations to have their own integrity policy and code of conduct.

[307]CENTRALNE BIURO ANTYKORUPCYJNE (2012) *Rządowy program Przeciwdziałania korupcji na lata 2012-2016*. Available from: http://cba.gov.pl/portal/pl/48/1531/Rzadowy_program_Przeciwdzialania_Korupcji_na_lata_20122016.html [Accessed 28 September 2012].

[308]Ministry of the Spanish Presidency, Technical Secretariat-General, Public employment in European Member States (Madrid 2010), p.10.

In **Spain**, the Code of good governance for members of the Government and high-ranking officials of the Central State Administration (*Código de Buen Gobierno de los miembros del Gobierno y de los altos cargos de la Administración General del Estado*) establish an explicit commitment on the part of state officials (ministers, secretaries of State, higher-ranking officials, and those working in top positions in the public sector, etc.) to act in accordance with the demands of their positions and in terms of a series of ethical principles laid down in the text. A law relating to conflict of interest situations amongst high-ranking state officials lists a series of obligations for personnel affected by this norm with the aim of avoiding such situations. Regarding Civil servants, the Basic Statute of the Public Employee contains a code of conduct for all public employees. This code is based on the general obligation of all employees working in public administrations to fulfil their duties diligently and to be guided by the general interests of the state. The Code lays down 12 ethical principles and elaborate behavioural norms.

In **Hungary** a comprehensive code of ethics, including rules for conflicts of interests, gifts and on post-employment restrictions, is also missing. The last element, post-employment restrictions, is of particular interest (and not only in Hungary): according to a comparative study of public employment in EU Member States by the Spanish Presidency of the EU, "There is a lot of mobility between … the public and private sector".[309]

Benefits of codes of conduct: A code of conduct for the public sector, especially when incorporated in civil service legislation can be judged as a positive practice. A code of conduct provides clarity about the boundaries of appropriate behavior, a basis for administrative and legal action when these lines are passed – corruption is about breaking rules, but I order to be able to brake a rule, a rule must be established first - and a signal to third parties and the public that an organisation and its employees are willing to lay down the principles and duties they live up to. Although it is not a code of conduct that prevents corruption or other misbehaviour from occurring, but the people it regards, such a code helps to identify inappropriate behavior and it provides a structure to discuss dilemmas as well as to report incidents.

New forms of public procurement (public-private-partnerships and delegations of public services), which are sometimes concluded for a very long period time (e.g. 20 or 30 years), generate a multiplication of stakeholders involved (e.g. consulting engineers/technicians) and a dilution of roles and responsibilities. Codes of good governance for only government officials and civil servants are insufficient: ethical codes should also encompass contractors as well.

Legal provisions must apply to all stakeholders involved

Corruption risk management should not only focus on the contractors, but also on subcontractors and others involved in the proper execution of the contract. In **Hungary**, a common problem identified is that contractors do not pay sub-contractors. This is a way for contractors to lower bid prices (price dumping), gain higher profits and eliminate competition. Legal procedures can last several years and the practice very often leads to bankruptcies of companies (mostly SMEs). In the new Public Procurement Act, sub-contractors need to sign a declaration that they have been duly paid by the contractor. In practice these statements are sometimes manipulated (e.g. sub-contractors are put under pressure to sign it), or second or third layer sub-contractors are still not paid.

It is also important to prevent public entities to shift procurements to (public) enterprises that are not subjected to public procurement laws. In **Spain** a very important improvement and transparency guarantee was ensured by subjecting public enterprises to requirements of advertising and transparency, assimilating them to public entities. This homogenization represented an important improvement in the fight against corruption since it avoided that the public administrations resorted to these administrative entities to manage operations with the purpose of avoiding being subject to the obligations established in the Public Procurement Law.

Benefits of legal provisions that apply to all stakeholders involved: It is a positive practice to apply legal provisions for public procurement to all stakeholders involved. This should range from the code of conduct to obligations for transparency and provisions with regard to liability. This way, a level playing field is created, allowing procuring authorities to work under the same conditions and provisions as contractors and diminishing chances of covering illegitimate acts in subcontracts.

[309] Ibidem, p.14.

Missing, and therefore negative practices

In none of the selected 8 Member States, a comprehensive corruption risk management program for public procurement has been identified. The absence of rules and regulations enforcing a comprehensive and periodical risk assessment, imposing a system of risk management, force standard evaluations of cases of corruption and dissemination of retrieved indicators and lessons learned, etc. can be regarded as a negative practice.

12.3. Corruption risk assessment

Performing corruption risk analysis

In some Member States, a structured, periodical corruption risk assessment is performed. In **Lituania**, the prevention efforts of the Special Investigations Service (STT), a specialized anti-corruption institution, include corruption risk analysis. It consists of two main stages involving state and municipalities institutions and the STT. First, each institution performs a self-assessment of corruption likelihood. This self-assessment is performed according to criteria set in Corruption Prevention law and the Self-Assessment Methodology[310] approved by the STT. Common assessment elements are set in the Corruption Prevention Law[311], such as:

- Corruption related criminal activity committed;
- Organisation of control and supervision;
- Separation between state officials' functions;
- Regulation of tasks and responsibilities;
- Association of activities with licences, concessions, discounts or other additional rights allotment or restriction;
- Requirement of other state or municipality institutions approval.

Secondly, the STT assesses different activities of state and municipal agencies and gives consultation concerning the preparation of anti-corruption programmes. The STT corruption risk assessment is performed according to the approved risk assessment procedure[312], using a set of common criteria like:

- Previous attempts to affect state or government institutions' servants or decisions implemented in violation with the law;
- Corruption cases detected in the state or government institution;
- Inadequate supervision system over the state or government institution;
- A state or government institution is an independent budget allocation manager;
- The National Audit Office, Seimas (parliament) controllers or other control institutions detected violations in the institution; and
- Other information about corruption cases (e.g. from operational information, public complaints, information given by society information tools).

The current public procurement risk assessment methodology in **Lithuania** brought positive changes and enables to perform more ex ante assessments to prevent violations. However, the Public Procurement Office stated that the methodology is insufficient.[313] Data of public procurement is not processed and analysed in a consistent way, the sequence of the purchase process is not observed. There is a huge number of information and it is difficult to process it in a systematic way seeking to identify risks in public procurements. The Public Procurement Office is currently implementing a *central public procurement risk assessment model creation and implementation project*. This model will contain a central risk analysis model with modern data analysis tools and information system processing information from various data sources. As the project is at a very early stage, there is little information on the model, the data analysis tools and data sources, and no information on its results and effects yet.

[310] SPECIAL INVESTIGATION SERVICE (2011) Guidelines on the detection of areas of activities of State or local government bodies where there is the highest probability of corruption.

[311] SEIMAS OF THE REPUBLIC OF LITHUANIA (2002) *Corruption prevention law of the Republic of Lithuania.*

[312] GOVERNMENT OF LITHUANIA (2002). *The procedure of corruption risk assessment.*

[313] PUBLIC PROCUREMENT OFFICE OF LITHUANIA (2011). *Public procurement documentation on creation of central risk assessment model and information system.*

In **Greece**, procedures regarding public procurement fall under the jurisdiction of the Unified Authority for Public Procurement. The Authority has the power to carry out checks and monitor the on-going procurement procedures and execution of contracts by screening data ex-officio. To this end, it requires the contracting authorities and stakeholders of the public and the private sector to provide relevant information and data. With the use of risk assessment methods, the Authority examines particularly the procedures of procurement and execution of public contracts falling within the scope of European law or co-financed by European programs.[314]

In **Poland**, the subject of corruption risk is covered in a separate chapter in the annual reports of the Supreme Audit Office (SAO) since 1999. The SAO presented a detailed analysis of the individual risk of corruption in its 2000-2004 reports. The Parliamentary Commission adopted a comprehensive opinion on the assessment of anti-corruption legislation in 2008, in which the SAO indicated the main corruption mechanisms and corruption risk areas.

Institutionalising a form of structured and periodical corruption risk assessment in public procurement, at national and at regional and local levels, can be regarded as a positive practice.

12.4. Corruption prevention techniques

Screening of contractors and beneficiaries, debarment and blacklisting

Debarment/blacklisting entail the exclusion from public contracting including public procurements. The European Union adopted a procurement directive[315] which makes debarment of companies and persons convicted of bribery compulsory everywhere in the European Union. This directive contains provisions stating that companies or persons found guilty of corruption shall be debarred from participating in public tendering in the EU, meaning both in the European Community and its Member States.

The actual impact depends on the implementation by the Member States and on the contracting authorities in the Member States being aware of corruption convictions. Article 45 of this EU directive relies on contracting authorities asking (potential) contractors to confirm whether or not they have been found guilty of corruption. In case of suspicion, contacting a designated competent body in order to gather more information is possible. However, in **most Member States** there does not exist a single national database on corruption cases (see subsection 12.6).

A number of countries[316] have established preventive measures which limit the possibility for bidders previously convicted for illegal activities in question to participate in public procurement tenders (Austria, Cyprus, Germany, Estonia, Finland, Italy, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia and Sweden). The following practices are included:

Limits to participation and screening of bidders

- Bidders convicted of corruption and related crimes are precluded from participation in public procurement procedures according to the national administrative laws and the public procurement directives in **Estonia, Finland, Germany, Portugal, Romania** and **Slovakia**.[317]
- In **Lithuania**, **Luxembourg**, **Poland**, **Slovenia** and **Sweden**, contracting entities are required to exclude those who have been convicted of bribery from the bidding, whereas in **Finland** such requirement arises in the context of mandatory grounds, including aggravated or non-aggravated bribery, or participation in an organized criminal group.[318]
- In **Luxembourg**, the contracting authority may exclude tenderers from participation in public procurement contracts for up to two years for lack of commercial probity.[319]

[314]ASSER INSTITUTE (2012), *Comparative Overview*, p. 106.

[315]Directive 2004/18/EC on the co-ordination of procedures for the award of public works contracts, public supply contracts and public service contracts. Directive 2004/18/EC covers contracts awarded by central government, local authorities and other bodies in the public sector (such as schools, universities and health authorities).

[316]ASSER INSTITUTE CENTRE FOR INTERNATIONAL AND EUROPEAN LAW with POLISH INSTITUTE OF INTERNATIONAL AFFAIRS (2012), *Prevention of fraud, corruption and bribery committed through legal entities for the purpose of financial and economic gain. Comparative Overview*.

[317]ASSER INSTITUTE (2012), *Comparative Overview*, p. 105.

[318]Ibidem.

[319]Ibidem.

- In **Austria**, the purchaser has to exclude entrepreneurs from participating in a tender procedure if a final conviction against them or, in the case of legal persons and certain other entities, against natural persons on their managerial body exists. In **Austria**, the purchaser may even withdraw from a contract already awarded if the tenderer or a person acting for him during the award procedure has committed a criminal offence suitable to influence the award decision.[320]
- In **Finland**, the procurement contract can be annulled or reversed immediately, if a public procurement unit states that it would not have entered into the contract with the company in question had it known that this company had been guilty of a bribery offence. Also an enterprise which has given false information can be shut out of the procurement procedure.[321]
- In **Lithuania**, the Public Procurement Office may, upon violations of the law or possible manifestations of corruption at the procurement stage, refer the material to law enforcement institutions for further investigation or suspend the public procurement.[322]
- Purchasers in the **Netherlands** have some possibilities to screen their potential contractors according to the Public Administration Probity in Decision-Making Act (BIBOB). The Central Organisation for Certificates of Good Conduct (COVOG) of the Integrity and Screening Agency checks for criminal records.
- In the **Netherlands**, the EDRF Managing Authority does not use a checklist to verify whether beneficiaries are trustful and has no information whether the applicant has several other applications or grants running, which causes a fragmented view. Based on experience with the projects further research can be undertaken by posing the beneficiary more detailed questions.
- In **Romania**, public officials who are involved in this process of verifying the existence of any conflict of interest often times rely only on the data available at the Romanian Trade Registry, which show the shareholding structure of a company at the time when the interrogation was filed, without offering information on changes of shareholding structure.
- In **Poland**, the Head of the Public Procurement Office published a 'List of unreliable contractors'. Contractors were placed on this list after final court ruling confirming that they have caused damage during the fulfilment of public contract. This matter is governed by the Public Procurement Act (article 24)[323] which states that economic operators who caused damage by failing to perform a contract or by performing a contract improperly, and if such damage was stated by a legally valid decision of the court in the past three years prior to the launch of the procedure, should be excluded from contract award procedures. Moreover, Polish law provides for the compulsory exclusion of any contractor whose contract was terminated by the contracting authority for reasons falling under the contractor's responsibility, if the value of the non-executed part of the contract amounted to at least 5% of the contract. In the Commission's view, these provisions go beyond the exhaustive catalogue of acceptable grounds for exclusion for reasons relating to the professional qualities of a contractor.[324] Here, one can argue that a perhaps positive practice in the light of fighting corruption is confined by existing legislation.
- In **France**, legal as well as natural persons can be excluded from public tenders when being sentenced for corruption (res judicata, registered in a criminal record). [325]
- In the **Czech Republic**, no measures excluding convicted entrepreneurs from public tenders have been introduced. [326]
- In **Italy**, the penal code states that any person convicted for certain crimes (including involvement in a mafia-type criminal association and bribery), is punished with an accessory penalty of prohibition to contract with the Public Administration from 1 to 3 years. Furthermore, in order to obtain public contracts, corporations have to present the "anti-mafia" certification released by the Chambers of Commerce. [327]

[320] Ibidem.

[321] Ibidem.

[322] Ibidem.

[323] URZĄD ZAMÓWIEŃ PUBLICZNYCH (2012) Ustawa z dnia 29 stycznia 2004 r. – Prawo zamówień publicznych [WWW] Urząd Zamówień Publicznych. Available from: http://www.uzp.gov.pl/cmsws/page/GetFile1.aspx?attid=5705 [Accessed 30 October2012].

[324] As provided for in Article 45 of Directive 2004/18/EC of 31 March 2004 on the coordination of procedures for the award of public works contracts and public supply contracts.

[325] ASSER INSTITUTE (2012), *Comparative Overview*, p. 106.

[326] Ibidem.

[327] Ibidem.

Documentation requirements

- In **Slovakia**, all tender participants are legally required to prove their eligibility by providing an excerpt of their criminal record, and confirmations from the court and the tax office. In Slovenia, contracting entities may require all tenderers to provide proof of their integrity and the ministry of finance is planning to create a black list of bidders. [328]
- On every public procurement procedure in **Austria, Germany, Lithuania, Luxembourg** and **Sweden**, entrepreneurs must present a non-conviction certificate from the basic criminal court. [329]
- **Austrian** procurement authorities have access to a database known as ANKÖ193 (Contractors Cadastre Austria) with information on companies participating in tenders, including registration, business performance, past court procedures and convictions. Companies can register themselves voluntarily and subsequently have to provide this information. The ANKÖ is not a public register. [330]
- In **Spain**, there is a high number of contractor profiles (more than 8.000), whose information is not centralized in a unique platform, making it difficult to monitor as a whole/in an aggregated manner.
- In **France**, candidates tendering for a public contract have to certify on honour that they are not in a situation forbidding them to tender. This relates among others to social and tax obligations, as well as to all bans / interdictions to tender any public contract. The submission of such a certificate is not obligatory, but it exempts the person or contractor from giving all the certificates and official certificates at this stage of procedure. [331]

Another point, not raised in the interviews during the country assessments, is the risk with regard to the use of intermediaries. Theoretical investigations[332] suggest that, by eliminating uncertainty with respect to whom and how much to bribe, by reducing the risk of breaching of corrupt deals and by lowering the chances of detection, intermediaries facilitate corruption, reduce welfare and render anti-corruption policies less effective. Whether, in order to reduce corruption, the use intermediaries for the provision of public services should be regulated or prohibited is still an open question. Screening of intermediaries could be a minimum requirement, since they become an integral part of the procurement process.

Screening of contractors and beneficiaries, especially their ultimate beneficiary owners, and even intermediaries can be considered a positive practice that is not yet a common practice in all Member States. The debarment obligation in the EU procurement directive is in theory a positive practice as well, that leads to prevention of corruption, but its implementation still needs improvement to make it an effective instrument in practice.

Screening of staff and job rotation

A possibility to maintain the integrity of all public officials and civil servants in any way involved in public procurement is to perform a background screening. This is already common practice in many Member States.

In **Poland**, a legal duty exists for many categories of public officials (e.g. MPs, judges, prosecutors, members of the Civil Service Corpse etc.) to make formal yearly statements about the state of their property. Those statements may be subject to supervision and control by the superiors of the officials and by the CBA. Statements concerning some categories of officials (e.g. ministers, MPs) are available publicly (also available via the Internet). Issuing a false statement is considered a crime.

Also in **Poland**, the Act on the Restrictions on the Economic Activities of the Persons Performing Public Functions prohibits many categories of public officials to engage in economic activities whilst being in office. Infringing the provisions of this Act can be the basis for disciplinary proceedings or for revoking from the post. The Act orders also many categories of the public officials to disclose any advantage (material or immaterial) they have received.

[328] ASSER INSTITUTE (2012), *Comparative Overview*, p. 105.

[329] Ibidem.

[330] Ibidem.

[331] Ibidem.

[332] See: ABBINK, K., and D. SERRA (2012), *Anticorruption policies: Lessons from the lab*. Available from http://faculty.smu.edu/dserra/AbbinkSerra_Final.pdf [accessed 25 April 2013].

In the **Netherlands**, part of the recruitment and selection process of top managers for the national administration includes a screening performed by the General Intelligence and Security Service (AIVD). An important element in this screening is the potential response to bribes/corruption. This screening is repeated every 5 years. Furthermore, top managers in the national administration have to take an oath in which special attention is paid to integrity. Top managers have to report all their additional functions which are checked on their potential conflicts and/or incompatibility with their future position. Mayors and administrators at local and regional level also have to comply with a comparable set of rules with regards to screening and integrity. Pre-employment screening, including all staff involved in procurement, is an integral part of the hiring process at Rijkswaterstaat, the executive arm of the Dutch Ministry of Infrastructure and the Environment, which is responsible for the design, construction, management and maintenance of the main infrastructure facilities in the Netherlands.

In **Hungary**, since January 2011 all public sector employees are obliged to undergo a so-called "solidity check". This check sets up trick situations to assess how employees react when being offered a bribe or when asked to abuse his or her official powers in exchange for certain benefits. Checks are carried out by the National Protective Service. This measure was introduced to curb bureaucratic corruption and foster the integrity of state employees.

In **Romania**, all parties involved in the evaluation process (both evaluation committee and bidders) have the obligation to submit a conflict of interest declaration. A conflict of interest means that the person in question should immediately restrain from further activity in the procedure and notify the manager of the fact, without delay, or any other person who entrusted the performance of the activity to them. Persons who in the discharge of their official positions are in a situation in which there is a conflict of interest , are not entitled to be involved in the verification/assessment process of submitted offers.[333]

Abbink and Serra[334] point to towards intrinsic motivations that result from the internalisation of social norms through primary and secondary socialisation and not being corrupt as a social norm, a rule of behavior which is enforced internally by guilt and externally by social disapproval and social sanctions that result in feelings of shame. This according to the authors suggests the implementation of different anti-corruption policies aimed at changing the "value systems" rather than the "incentive systems" existing in an organisation or a society. According to Abbink and Serra, "*the emphasis on non-monetary incentives in the fight against corruption also motivates the implementation of reforms in the selection of public officials, where more weight should be given to screening for intrinsically motivated individuals*". Experiments – like performed by Barr and Serra[335] - suggest that suggests that the way participants played the bribery game reflected the anti-corruption social norms and values that they internalised.

A risk signalled by some respondents in the **Netherlands** is that organisations increasingly hire temporary staff or even external bureaus for public procurement functions: they tend to fall out of the screening scope and the rules applicable to the staff of the administrative organization.

Another risk concerns the high turnover of public officials within management authorities such as in **Romania**, according to a 2011 review of the Court of Accounts.[336] On the other hand, one practice – not mentioned during the interviews in the country studies – that proved in experiments a positive practice is job rotation: Within the **German** federal government, regular staff rotation is a precautionary measure against corruption in public administration. Abbink[337] conducted an experiment to study the effect of this policy where pairs of potential bribers and public officials were randomly re-matched in every round. The outcome has been compared to cases where the identity of the pairs interacting remained fixed. Abbink's conclusion is that rotation of interacting pairs significantly reduces the levels of bribes as well as the frequency of inefficient decisions due to bribery.

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[333] ASSER INSTITUTE (2012), *Comparative Overview*, p. 106.

[334] ABBINK, K., and D. SERRA (2012), *Anticorruption policies: Lessons from the lab*. Available from http://faculty.smu.edu/dserra/AbbinkSerra_Final.pdf [accessed 25 April 2013].

[335] BARR, A. and D. SERRA (2010), *Corruption and culture: An experimental analysis*. Journal of Public Economics, 2010, 94.11: 862-869.

[336] CURTEA DE CONTURI A ROMÂNIEI (2012), *Raportul public pe anul 2011* (ROMANIAN COURT OF ACCOUNTS, *The Public Report for the year 2011. Synthesis*). Available from: http://www.curteadeconturi.ro/sites/ccr/RO/Publicatii/Documente%20publice/2013/Raport%20public%20anul%202011/RAPORTUL%20PUBLIC%20PE%20ANUL%202011.PDF.

[337] ABBINK, K.(2004), *Staff rotation as an anti-corruption policy: an experimental study*. European Journal of Political Economy, 2004, 20.4: 887-906.

This conclusion is supported by Ryvkin and Serra, who found in theoretical study that "when individuals are uncertain with respect to their opponent's intrinsic corruptibility, they are less likely to engage in corruption. Therefore, our uncertainty result provides theoretical support to anti-corruption measures, such as staff rotation in public offices, aimed at increasing the social distance between public officials and private citizens (or firms) ... [E]ven in the context of one-shot petty bribery exchanges, where uncertainty regarding the intrinsic corruptibility of one's potential corruption partner may act as a corruption deterrent".[338]

Benefits of screening and job rotation: Pre-employment screening and in-employment screening is a positive practice when it regards all involved in public procurement: public officials, civil servants, as well as temporary staff and external parties hired to facilitate public procurement. This positive practice needs a periodical update of the screening and an obligation for all staff to report changes in their personal circumstances. Screening should not only focus on job qualifications and formal background antecedents, but also on intrinsic motivation. Job rotation can be regarded as positive practices as well, although it brings extra costs (re-training, (re-) screening, etc.) and a good trade off should be made between costs of job-rotation when compared to estimated costs of (potential) corruption.

Financial disclosure / assets declaration

Financial disclosure (also known as asset declaration) refers to a system where public officials must periodically declare information on their assets, income, business activities, interests, etc. Financial disclosure/assets declaration systems can be used for the prevention, detection and investigation/prosecution of corruption. In turn these can lead to promoting accountability and awareness among public officials, avoiding conflict of interest.[339] Some Member States have a formalised financial disclosure/assets declaration system in place, though developed in various ways in terms of who has to declare (all public officials or only members of the executive, legislative and/or judiciary), the type of information requested from the filer (e.g. including details about relatives' assets as well), the frequency of the declarations (annual declarations during the entire mandate or only upon assuming and leaving office only) and public access to disclosed information (in **Romania**, information is published online, and freely accessible to the public).

In **Hungary**, the obligatory assets declaration obliges civil servants to declare their assets at the start and at the end of their tenure. Deputy state secretaries, state secretaries for administration issues, top level officials, and political advisors are obligated to declare their assets at regular intervals. The assets declarations include information on the incomes, commercial interests, and financial status of the persons concerned and the members of their households. In practice, the assets declaration system functions poorly, according to Transparency International.[340]

In the **Netherlands**, the government decided in 2012 to actively publish the administrative expenses of ministers, directors-general and top managers in the ministries and executive agencies. Expenditure, by or on behalf of ministers and top officials will be published by disclosing the source documents (invoices, receipts, expense reports with attachments and credit depreciation) on a website. The publication of this data concerning the expenditure of ministers and Directors-General will not be a periodically but a continuous process to take place.

In **Estonia**, According to the Anti-Corruption Act, the officials are obliged to submit annually declarations of their economic interests.[341]

In **Lithuania**, the Chief Official Ethics Commission (COEC) owns and uses a database with private interest declarations of public servants *and prospective public servants*. This private interest declaration database is integrated with the State Tax Inspection database to ensure validity of data. There are plans to integrate the private interest declaration database with the Country's Register Centre databases, so that the data would become even more reliable.

[338] RYVKIN, D. and D. SERRA (2010), *How corruptible are you? Bribery under uncertainty*, Florida State University.

[339] ROSSI, I. and T. BLACKBURN, 'Why do financial disclosure systems matter for corruption?' [Online] *Blogs.Worldbank.org*. Date posted: 8 November 2011. Available from: http://blogs.worldbank.org/psd/why-do-financial-disclosure-systems-matter-for-corruption.

[340] TRANSPARENCY INTERNATIONAL (2011), *Corruption Risks in Hungary 2011. National Integrity System Country Study Hungary 2011*.

[341] MINISTRY OF THE SPANISH PRESIDENCY, TECHNICAL SECRETARIAT-GENERAL (2010), Public employment in European Member States, p.64.

Professional public procurement and adequate wages

In **most Member States**, civil servants dealing with public procurement matters are not specifically trained to ensure transparency and the need to avoid corruption practices. Their background is more academic or theoretical and no specific training requirements need to be fulfilled by civil servants working in public procurement departments. This lack of professionalism in the management of public procurement opens a window of opportunity for corruption.

For instance in **Italy**, lack of capability of public administrations in managing highly complex infrastructure or systems is an important reason for mismanagement of procurement procedures. This gives room for fraud and corruption, particularly within contexts were interferences with powerful private cartels, if not criminal organisations, can distort the policy-making process towards the identification of policy needs not necessarily justified by the real needs of citizens and enterprises. Also the role of external consultants in supporting the tendering process can give room to corruption, particularly in a context of scarce management capabilities within the public administrations, though this is often difficult to prove in practice. Still, addressing the role of external actors in the policy-making process requires complex, lengthy and costly investigations.

In the **Netherlands**, a Public Procurement Expertise Centre (PIANOo), was set up to professionalise procurement and tendering in all government departments with a view to improving efficiency and compliance with the rules. PIANOo brings procurement and tendering experts together, pools knowledge and experience and provides advice and practical tips. The Expertise Centre also fosters dialogue between public contracting authorities and private sector companies.

Also in the **Netherlands**, NEVI, the Dutch Association for Purchasing Management, already founded in 1956, is the principal authority for matters concerning purchasing in the Netherlands. NEVI has a platform particularly for public procurement professionals where they can meet, exchange experiences and knowledge. NEVI also provides training like “Increasing awareness of purchasing activities for non-buyers of a public organization”.

Another point that is raised a number of times is that of wages of public officials. In a laboratory experiment, Van Veldhuizen[342] found that increasing the wage of public officials dramatically reduces their corruptibility. In particular, he found that when they experienced low wage, public officials accept 91% of bribes, whereas when they experienced a high(er) wage, public officials accept only 38%. Moreover, public officials with a high wage are 27 percentage points less likely to choose the corrupt option. It must be noted that a robustness check suggests that a positive monitoring rate may be a necessary condition for fair salaries to affect the corruptibility of public officials. However, there is some evidence that an appropriate wage positively influences public officials to refrain from corruption.

Benefits of professionalization and adequate wages in public procurement: Specialised, well trained and well paid public procurement staff that share their expertise, knowledge and (market) intelligence, also across Member States’ borders, is a positive practice.

Centralised public procurement

In the table below, an overview is presented of the existence of a central purchasing body for public procurement in the EU Member States. In this overview, all types of central purchasing bodies, however different in form and scope of products – ranging from only office supplies computer hardware and software and telecommunication equipment to everything except military and health related material - are included:

[342] VELDHUIZEN, R. van (2011), *Bribery and the Fair Salary Hypothesis in the Lab*.

Table 115: Existence of a central public purchasing bodies in the EU Member States	
Austria	yes
Belgium	yes
Bulgaria	not operational
Cyprus	yes
Czech Republic	not operational
Denmark	two
Estonia	yes
Finland	yes
France	yes
Germany	yes
Greece	yes
Hungary	yes
Ireland	yes
Italy	yes
Latvia	yes
Lithuania	yes
Luxembourg	no
Malta	yes
Netherlands	no
Poland	no
Portugal	yes
Romania	no*
Slovakia	no
Slovenia	no*
Spain	no
Sweden	yes
United Kingdom	yes

* But plans exist to start a central purchasing body. Source: Commission staff working paper: Evaluation Report Impact and Effectiveness of EU Public Procurement Legislation[343]

Limited governance experience and capacity at the local level, especially in situations where a culture of favouritism exist, foster corruption and impede its effective prevention, detection and investigation. In **Lithuania**, a study performed by PwC Lithuania in 2011 on the impact of public procurement on EU aid efficiency and utilisation, revealed that lack of experience and insufficient resources of small procuring organisations is a big problem.[344]

Also in **Lithuania**, the increase of amounts of procurements executed via the Central Purchasing Organisation increased efficiency of public procurements. Due to the spread of centralised public procurements the state used funds more efficiently (according to the Lithuanian parliament; unclear is how the Lithuanian parliament isolated and measured the effect of centralisation in the context of other possible influences): in 2009 the objects purchased were one third less costly compared to 2008.[345]

[343] EUROPEAN COMMISSION (2011), *Commission Staff Working Paper, Evaluation Report Impact and Effectiveness of EU Public Procurement Legislation*, SEC(2011) 853 final, Brussels 27 juni 2011, *Part 2, ANNEX 7: CENTRAL PURCHASING BODIES.*

[344] PwC (2011) *The impact of public procurement on EU aid absorption rates and efficiency*. Available from: http://www.esparama.lt/es_parama_pletra/failai/fm/failai/Vertinimas_ESSP_Neringos/Ataskaitos_2011MVP/Viesuju_pirkimu_vertinimo_ataskaita_LT.pdf [Accessed 17 September 2012].

[345] SEIMAS OF THE REPUBLIC OF LITHUANIA (2011) *National Anti-Corruption Programme 2011-2014 of the Republic of Lithuania*.

Also in **Spain**, there is an increase in the centralization of the local/regional public procurement platforms. Most regions have a unique platform for the tenders of all the different regional departments.

The total amount of public procured goods, works and services for all municipalities in **the Netherlands** totals around EUR 16 billion per year. Many municipalities set up public agencies for joint procurement to join their forces. The main activities of these public agencies for joint procurement include: supporting and performing individual and joint purchase and procurement process, drafting of purchase plans, performing purchase scans and evaluations, supporting development of purchase and procurement policies, and acting as help desk and centre of expertise in the field of purchase and procurement in municipalities. Advantages for cooperation in purchase and procurement are: professionalisation of the purchase function, tailor made purchasing, cost effectiveness and more flexibility in a changing legal (procurement) environment. It is also believed that the public agency for joint procurement is contributing to a reduction of the risk of fraud and corruption, but this cannot be founded on facts or research. The professionalisation of the purchase functions on the one hand and the fact that potential bidders know that their bids for procurements for several municipalities pass the same purchase agents contribute to this.

Benefits of centralised or joined procurement: Centralised or joined procurement is regarded as a positive practice, especially for small organisations and for unordinary procurements because

- It is an enabler for the professionalisation of the public procurement function;
- It most probably can pay its staff, due to economies of scale, better (appropriate wages), a good practice – see here above;
- It helps (share the burden of) collecting and sharing market (price) information (see below) – relevant in the light of the recommendations from chapter 11 on prices of standardised units; and
- It increases the distance between bidders and procuring authorities, which proved in experiments to be a good practice.

Market studies and collection of market prices

As pointed out by the OECD[346] and highlighted in chapter 11 (on prices of standardised units), market studies are very useful for procurement practitioners as input to define procurement requirements, select the appropriate tender method, analyse and evaluate proposals/submissions from bidders/suppliers and better determine the outcome of the best solution in terms of outcomes, price and risk. A market study can also be used to solicit ideas and opinions on the feasibility of particular requirements and the capability and capacity of the market to deliver. Moreover, public authorities also have an interest in understanding market prices in order to determine an appropriate budgetary envelope.

From the country studies as well as in the research for chapter 11, it became clear that regular and structured market studies are not a common element in all public procurement procedures in **the EU Member States**. For complex and high value procurements, market consultations and market analyses are performed more often. No evidence has been found of active cross border (or even cross-national) sharing of market intelligence or individual market studies/analyses in the **EU Member States**.

In **Hungary**, there are initiatives to develop and make use of unit costs databases for evaluating tender proposals to combat overpricing, but these are still in their infancy. Although in **Romania** the existing legislation provides guidance in relation to the standard unit price, at least civil and infrastructure construction sector, those standard prices are not being used and do not represent a reporting or benchmarking base. Also in the **6 other Member States** that were studied in more detail, no practices of collecting/analysing of prices of standardised units in public procurement were encountered.

In chapter 11, some positive practices are already mentioned: RFI in **Italy** each year publishes a book of market prices for rail infrastructure and any supplier which is interested in working for RFI is in a position to consult the information in the book. However, this book is not used for the EU-funded projects. Another example is the city of Maastricht in **the Netherlands** that invested in the compilation of a market price database, allowing the contracting authority to estimate a reasonable price for certain products, like asphalt. The database is also not publicly available.

[346] See: OECD procurement toolbox on: http://www.oecd.org/governance/procurement/toolbox/.

The **Slovenian** department for Public Procurement developed a database including the retail prices as well as the unit prices for certain type of procurements (i.e. tender for office furniture, such as computers, printers, screens, paper, and services, such as cleaning services)[347].

Even though authorities interviewed agree in principle on the usefulness of such data, few of them invest resources to obtain the required information. This can be explained by the effort that is required to retrieve the data and keep the data up-to-date, and the commensurate money outlays. The lack of structured market analysis and sharing of market intelligence, also across EU Member states, is considered to be a negative practice.

Raising awareness

Raising awareness of the potential risks of corruption is organised in different ways, by various actors in the EU Member States. In many cases, NGO's and think tanks are involved, or even the main actors in awareness programs. In some Member States however, the national government is the main driver. The Central Anti-Corruption Bureau in **Poland** publishes corruption reports statements and prepares publications for corrupt practices and measures to combat and prevent corruption. These publications are distributed to all relevant institutions involved in preventing and combating corruption. Preventive and educational activities of the Bureau are carried out in cooperation with other agencies and non-governmental organisations (NGOs) involved in fighting corruption.

In the **Netherlands**, PIANOo, the Dutch Public Procurement Expertise Centre, was set up to professionalise procurement and tendering in all government departments with a view to improving efficiency and compliance with the rules. PIANOo brings procurement and tendering experts together, pools knowledge and experience and provides advice and practical tips. The Expertise Centre also fosters dialogue between public contracting authorities and private sector companies. Although integrity and professionalisation of the procurement gets attention, not much information is available regarding corruption at the PIANOo website. The Netherlands Competition Authority (NMa) also promotes awareness towards contractors and provides risk indicators.

In **Italy**, the University of Bologna, Department of Statistics, has developed the serious game "*Lost legality. Play your role*"[348] for high school students which aim at showing – in a playful manner – what corruption is, how its dynamics work and what citizens can do to prevent and fight it. The project supports a bottom-up and preventive approach which tries to develop an awareness of functioning of institutions and legality among young people. During the game, which lasts about 4 hours and is moderated by researchers of the University, students are divided into two groups (honest and corrupt people) and can play characters which are stripped with different powers: the prosecutor, the policeman, the journalist, the citizen. The project is still in a pilot phase and is carried out with very limited financial resources and mainly thanks to the efforts and enthusiasm of the researchers. The project management at the University of Bologna is trying to develop a Convention with high schools so that the role-play can become sustainable and up-scaled in several institutes throughout the country.

In **France**, the *Service Central de Prévention de la Corruption* (SCPC) takes a leading role in advising the French Ministries and the local administration on detecting corruption, assists law enforcement authorities in their fight against corruption and is in charge of raising public awareness on the matter of corruption.

In **Lithuania**, the prevention efforts of the Special Investigations Service (STT) include (next to activities like anti-corruption review of legislation involvement in the preparation and implementation of the National Anti-Corruption Programme and provision of information about persons seeking or holding an office with state or municipal agencies) the delivery of anti-corruption education of the public and awareness rising of the public.

Abbink and Serra[349] point to research that demonstrates that intrinsic motivations result from the internalisation of (social) norms through socialisation. Not being corrupt can according to them be thought of as a social norm, "a rule of behavior which is enforced internally by guilt and externally by social disapproval and social sanctions that result in feelings of shame". Research suggests the implementation of different anticorruption policies aimed at changing the *value systems* rather than the *incentive systems* existing in society.

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[347] http://www.djn.mf.gov.si/narocniki/baza-trznih-informacij.

[348] As emerging by through experts' interviews and described by the responsible for the project.

[349] ABBINK, K., and D. SERRA (2012), *Anticorruption policies: Lessons from the lab*. Available from http://faculty.smu.edu/dserra/AbbinkSerra_Final.pdf [accessed 25 April 2013].

Changes in value systems call for education campaigns generating awareness not only about the existence and risks of corruption, but especially also about the costs of corruption. Such campaigns should encourage the display of social disapproval towards cases of corruption, personally experienced as well as high level cases brought to light by the media. Emphasis on non-monetary incentives in the fight against corruption helps to motivate implementation of reforms in the selection of public officials. In this regard, more emphasis should be given to screening for intrinsic motivation and integrity (see also *screening of staff*).

Awareness raising can thus be considered as a positive practice, but awareness raising programmes for the public sector are not institutionalised in all Member States and in most instances not specifically aimed at public procurement. Furthermore, most campaigns are aimed at what corruption is, how it works and what can be done to prevent and fight it. More emphasis on the costs of corruption and the harm is does to society may help to change the value system, which is suggested of importance as well.

Transparency

According to the OECD's *Government at a glance*[350] public availability of procurement information is largely determined by the type of information. OECD member countries more frequently make information available about the pre-tendering and tendering phases of the procurement cycle, including laws and policies and selection and evaluation criteria. In comparison, fewer countries publish information about events that occur post-award, such as justification for awarding contracts (in the EU, Belgium, Estonia, Finland, Germany, Hungary, Poland, Spain always publish these), contract modifications (in the EU, Belgium, France, Hungary, Italy, Slovakia, Spain always publish these) or information that allows the tracking of procurement spending (in the EU, only Hungary and Estonia always publish these). According to the OECD, Estonia and Italy (together with non-EU Member States Iceland, Japan and Korea) stand out as making the most types of procurement information available to the public.

[350]OECD, *Government at a Glance 2011* (2011). Data were collected by the OECD 2010 Survey on Public Procurement which focused on the level of transparency, participation and available remedies in central government procurement processes. Respondents to the survey were OECD country officials responsible for procurement at the central government level. A total of 33 OECD members, as well as Brazil, Egypt and Ukraine responded to the survey. No results are presented for 6 EU Member States: Bulgaria, Cyprus, Latvia, Lithuania and Malta.

Table 116: public availability of procurement information

	Laws and policies	General information for potential bidders	Selection and evaluation criteria	Contract award	Specific guidance on application procedures	Tender documents	Procurement plan of anticipated tenders	Justification for awarding contract to selected contractor	Contract modifications	Tracking procurement spending
Austria	●	●	●	●	●	●	●	❍	●	❍
Belgium	●	●	●	●	●	●	●	●	●	❍
Czech Republic	●	●	●	●	●	●	●	●	●	●
Denmark	●	●	●	●	●	●	●	●	●	❍
Estonia	●	●	●	●	●	■	●	●	■	●
Finland	●	●	●	●	●	■	●	●	❍	❍
France	●	●	●	●	●	●	●	■	●	■
Germany	●	●	●	●	❍	●	❍	❍	❍	❍
Greece	●	●	●	●	●	●	●	●	❍	❍
Hungary	●	●	●	●	●	●	●	●	●	●
Ireland	●	●	●	●	●	●	●	●	●	❍
Italy	●	●	●	●	●	●	●	■	●	■
Luxembourg	●	●	●	●	●	●	●	■	■	●
Netherlands	●	●	●	●	●	●	●	●	●	❍
Poland	●	●	●	●	●	●	●	●	■	❍
Portugal	●	●	●	●	●	●	●	●	●	●
Slovakia	●	●	●	●	●	■	●	❍	●	❍
Slovenia	●	●	●	●	●	●	●	■	●	■
Spain	●	●	●	●	●	●	●	●	●	❍
Sweden	●	●	●	●	●	●	●	●	❍	❍
United Kingdom	●	●	❍	●	●	❍	●	●	❍	❍

● Always
■ Upon request
● Sometimes
❍ Not available

Source: OECD, Government at a Glance 2011.

In **Lithuania**, the purchase of services, works and goods in 2009 was more transparent and one third cheaper compared to 2008. There is a constant growth of public procurements executed via e-procurements and amount of procurements executed via the Central Purchasing Organisation (CPO). The reformed system of public procurements ensures a higher transparency and decreases the causes for appearance of corruption (according to the Lithuanian parliament).[351]

In **Lithuania** even more information on public procurement process is disclosed than required by the directive of Public Procurement of European Commission. In cimparison to other EU Member States, Lithuania ranks among the top countries when it comes to disclosure of public procurement information. Currently initiatives are considered to disclose publically even more information (e.g. the agreement, the proposal of the winner, annexes and protocols).

Italy has a systematic practice in allowing the access to EU Funds data through Open Sources technologies and formats. This is particularly due to a recently activated website (Open Cohesion)[352], which allows accessing

[351]SEIMAS OF THE REPUBLIC OF LITHUANIA (2011) *National Anti-Corruption Programme 2011-2014 of the Republic of Lithuania*
[352]http://opencoesione.gov.it/

information in the fund allocation for the EU Cohesion Funds by Region, Policy Area and type of Service/Product procured. The website not only allows to interactively navigating through such information, but also provides the data in open source technologies which can be easily downloaded and further analysed independently.

Information on projects funded with EU Structural Funds implemented in the **Netherlands** (including the project beneficiaries) can be retrieved from the website www.europaomdehoek.nl. According to the Dutch Court of Audit in 2012, in addition to substantive project information, this website discloses the proportion funded from the ERDF and the proportion funded from other public and private sources. However, half of the 20 projects implemented by the 15 largest ERDF recipients are not listed. With regard to ESF, none of the projects implemented by the top 15 ESF recipients in 2010 were listed on the website at the end of 2011.[353]

In **Spain**, the Autonomous Communities of Valencia and Catalonia have developed a positive practice in the framework of negotiated contracts without publicity, making the publicity of the tender compulsory and allowing by law all enterprises to participate without the necessity to having been invited beforehand.

In **Finland**, measures have been set out to address the problem of biased contracting decisions: all bidders taking part in the procurement procedure have the right to obtain information on all bids made in the procedure once the final decision on procurement has been made. Also the general public has the right to such information.[354]

Transparency is also a driver for e-procurement. According to a study performed by IDC in 2012 for DG MARKT,[355] policy makers and contracting authorities agree about the main drivers of e-procurement adoption: they all rank as the top three: achievement of savings, transparency, and efficiency/productivity benefits. According to the same report, all the EU27 national governments collect some data about e-procurement, but in a non-systematic, incomplete way, with variable frequency: "There are relevant information gaps: both policy makers and Contracting Authorities would like to have more data about drivers and barriers, benefits achieved through e-procurement, the value and take-up of e-procurement." When e-procurement is used to enhance competition, at least one experiment suggests that, under uncertainty, monopolistic public good provision has the same corruption-reducing effect as competitive public good provision.[356]

Experimental study of how improved information reduces corruption is still very much in its infancy. There are theoretical reasons to suspect that information will reduce corruption and macro-level data and perception indices indicate that corruption levels are lower in places where information is more readily accessible. Evidence on how specific information and general informational campaigns work when it comes to reducing corruption start to build up as well. But not all of the studies thus far consistently produced the expected results, although some are promising. A field experiment by Peisakhin [357] demonstrated that applicants for public services who make use of the freedom of information law attain almost the same results as those who bribe. Moreover, according to Winters et.al., "*illustrating that a link exists between corruption and the availability of information, however, does not show the mechanisms through which increases in information reduce corruption. In fact, if both reduced corruption and increased information result from some other characteristic of societies, such as economic development or openness to trade, then the observed relationship between information and corruption may be spurious*".[358] And of course, only more information, in general, is not very effective in improving decisions: *People deserve accurate information with which to make informed decisions, so disclosure is inherently desirable. However, whether (and to what extent) information actually improves economic outcomes [*such as less corruption, PwC*], depends critically on* what *information is delivered,* how *it is delivered, and* how *it is utilized by receivers*.[359]

353On 30 May 2013, http://www.europaomdehoek.nl/projecten displayed 74 projects funded with more than EUR 2 million from ESF, and 971 projects in total co-funded with ESF.

354ASSER INSTITUTE (2012), *Comparative Overview*, p. 106.

355IDC (2012), *Study on e-Procurement Measurement and Benchmarking MARKT 2011/097/C - Lot 1 – Public Procurement Performance Indicators - D1 - e-procurement Landscape Report*.

356RYVKIN, D. and D. SERRA (2010), *How corruptible are you? Bribery under uncertainty*, Florida State University.

357PEISAKHIN, L. (2012), *Transparency and corruption: Evidence from India*. Journal of Law and Economics, 2012, 55.1: 129-149.

358WINTERS, M. S., P. TESTA and M.M. FREDRICKSON (2012), *Using field experiments to understand information as an antidote to corruption*.

359LOEWENSTEIN, G., D. CAIN and S. SAH (2011), *The limits of transparency: pitfalls and potential of disclosing conflicts of interest*. American Economic Review, 2011, 101.3: 423.

Optimal transparency in public procurement can however, certainly from a theoretical perspective and supported by macro-level data, be regarded as a positive practice, which still is not common practice in all EU Member States. Additional experiments to research how information and transparency influence the (prevention/reduction of) corruption is needed however. Emphasis should not (only) be given on providing more information on public procurement, but on providing all relevant information in a user-friendly way.

12.5. Corruption detection techniques

Audits and evaluations

In chapter 7 the importance of audits and evaluations for the detection of corruption is already underlined. In many EU Members States, audits and evaluations of projects that are publicly procured are quite common, although in most Member States the objective of these audits are not aimed at detecting corruption or fraud. Regarding the effectiveness of the expenditure of the EU Funds it seems that since there are at times an "urge to spend", the objectives are in many instances rather vague. This is not helpful for effective evaluations. Moreover, it appears that in many Member States there is not an equal "urge to evaluate".

In **Romania**, all the departments of public institutions who are responsible for analysing the public procurement process have tools and procedures designed to help them identify corrupt practices or irregularities in the process of public procurement. These tools are in form of paper checklists, containing several sets of questions aimed at detecting possible acts of corruption or other irregularities within the public procurement process, and their effectiveness is not always visible. Due to time pressure and high volume of work, the quality of the public tender review is often poor.

Also in **Romania**, the Ministry of Transport and the Authority for Payments for Rural Development have a mandatory control procedure to review all public tenders 10 days from the date when the contract was awarded. This complete and timely review of the procurement tender has a positive impact in detecting any irregularities.

A Managing Authority in the **Netherlands** evaluates projects according to an assessment framework (*toetsingskader*), with questions such as 'does the project meet the minimum requirements, does the project meet the objectives and principles of the program and can the project be regarded as a priority within the program?'

The many existing controls (both at project and system level) in the **Netherlands** account already for more than 5% of the total EDRF-expenditure. In the Dutch control system of EDRF (Audit Authority, Certifying Authority and Management Authority), corruption or the fight against corruption is not a theme within the Programs as there seems to be no reason for it. Also the managing authority for the only European Social Fund program in the Netherlands does not specifically look for signals of corruption. Therefore, no link is made between projects and pricing for example, or an analysis of a database with the goal of retrieving corruption. Searching for corruption is not a primary focus.

In **France**, the Regional Audit Chambers control local and regional authorities that engage in public procurements every three years. These controls are implemented on contracts signed and executed in the previous three years (ex-post verification). These controls are reported to be relatively superficial and do not always enable to detect cases of corruption or fraud.

In **Spain**, for public and infrastructure works, a field where Structural Funds are very often involved, problems mainly arise with respect to the contract modifications made during the contract implementation process. Although some Fund Managers justify this model referring to the practical approach of its use, there is a high need to increase surveillance to ensure that the contract is set into practice fulfilling what was established in the technical conditions defined at the beginning of the public procurement process.

In **Romania**, according to a 2011 review of the Court of Accounts, the required annual fieldwork reviews, conducted in order to verify the completeness of the activity performed by the beneficiaries, were not always performed. In the **Netherlands**, the Managing Authority of EDRF performs 'verification on the spot' at minimum once per project.

Audits should be independent and reliable. A negative practice indicated in **Italy**, is the inflation or falsification of invoices, which allow for a formally correct project implementation, and profit for the implementing company: this method can also be used to corrupt public officials - or external bodies - in charge of auditing the project.

Benefits of audits and evaluations: Audits and evaluations are positive practices when performed well, in an independent manner and according to other good audit and evaluation standards. The value of audits and evaluations for detecting corruption in public procurement increases when corruption is one of the objectives and when the results are shared, also between EU Member States. To have an equal standard of audits and evaluations, it is beneficiary to have more (EU-wide) standards and qualification levels for civil servants and auditors involved in the management, control and audit of public procurement.[360]

Innovative tools and techniques

Detection and investigation of corruption cases could be improved if more relevant data of good quality on public procurement would be made publicly available for analysis, such as:

- Needs assessments of the projects;
- Breakdown of the main components of a project with, where available, a statement on standard prices per component;
- Information on the bids received (number of bids, names of companies involved etc.);
- Number and reasons of bids terminated;
- Key outputs offered in the winning proposals;
- Detailed information on contract modifications;
- Monitoring and evaluation reports of the projects;
- Detailed information on the companies the state has contracted (e.g. ownership, number and value of contracts won etc.); and
- An overview of the companies blacklisted (due to e.g. corruption).

If this data would be freely and easily accessible, in an open and standardised format, together with data on convicted court cases and of company registries, this could significantly foster the detection and investigation of potential cases of corruption. It would allow for example IT tools to easily scrape, link and analyse the necessary data and detect potential irregularities, fraud and corruption. In this section we describe positive practices in the EU Member States, for innovative tools and methodologies in general and at EU level: see chapter 5).

In **Hungary**, several initiatives are going on in the country in order to combine the public procurement database with other relevant databases (NDA database, company registry database, data on yearly financial accounts of companies, networks with other companies). Especially interesting is the attempt to visualise the links of the bidding companies to other companies, which could help the Competition Authority to identify market concentration and cartels.

The **Italian** Authority for Supervision of Public Contracts (*Autorità di Vigilanza sui Contratti Pubblici*) centrally collects detailed information about public procurement in regions and local entities, via submission of specific files every time a contract is approved. Also, cross-checking of available data can allow getting certain level of details at the project level, including number of bidders, types of good/service required, etc. There is currently a project to elaborate such data in such a way to get intelligent analysis of chances of corruption.

A new promising database developed by the Fiscal Police in **Italy** at the local level over the past years aims to support the fight against tax evasion, but is being extended to investigate corruption as well. This database gathers detailed information on fiscal matters and is currently used by the Fiscal Police as a further support to cross-check data; in particular, it builds on the Fiscal Police's experience that most corruption cases are linked to tax evasion, and as such can be detected through misconducts in tax declarations. Therefore an analysis and cross-checking tax status for EU Funds beneficiaries allows identifying possible grey cases to be further investigated. The database has been recently launched and as such is still at a piloting stage, its primary goal being assessing tax fraud and tax evasion.

[360] As recommended in EUROPEAN PARLIAMENT, DIRECTORATE-GENERAL FOR INTERNAL POLICIES (2011), *How does organised crime misuse EU funds?* (study conducted by PwC), Brussels, European Parliament, p. 58.

CAPACI[361] is another project in **Italy**, run under the Ministry of the Interior and supported by the Police Forces Coordinating Authority in Italy (National Police, Local *Carabinieri* and Fiscal Police amongst others) and aims at building a database of bank accounts for all contractors involved in large infrastructure procurement projects so to monitor the financial flows within bank accounts of enterprises involved in the implementation of large-scale infrastructure projects, and consequently to identify any suspicious patters which might be a flag for a misuse of public funds (including, although not necessary limited to, corruption). This database allows the immediate availability of financial information on single transactions and a complete picture of the chain. It is not necessary for the investigator to have access to the banks, because the banks themselves make the data available that is automatically aggregated and represented according to pre-established procedures *(for example, considering operations exceeding certain amounts, financial markets, categories of recipients)*.

Currently, it is part of a EU-funded initiative[362] (DG HOME) aimed at testing and expanding the tool through the exchange of similar experiences with other EU Member States and it is planned to be operational with the mandatory introduction of SEPA[363] credit transfer system in 2014. A full methodology and set of indicators, as developed in the pilot phase, is currently under approval and includes a full mapping of all contractors and sub-contractors involved in the implementation of the monitored infrastructure projects, as well as a set of indicators through which monitoring of the financial flows across the identified banking accounts for all the contractors and the possible flags can be reviewed.

According to the representative of the Dutch National Public Prosecutor's office a similar method used in the **Netherlands** by the so called *Real Estate Intelligence Centre* is perceived to be a potentially good method to detect and investigate corruption. This fusion centre[364] links data from databases from the Tax and Customs Administration, the Fiscal Information and Investigation Service, police, Public Prosecutor's office and the Financial Intelligence Unit. This vast amount of data is being searched for anomalies with regard to ultimate beneficial owners, geo-scan applicable to cities, play the role of the fraudster and define the target groups). Especially when it comes to detecting high variations in real estate, this fusion centre proved a positive practice. It remains however important to have a founded suspicion/ suspect for the start of an investigation, based not only on a data mining exercise.

However, in the **Netherlands** each Operational Program for the management of EU Funds has its own separate system and database, there is no central database. There are neither links between the different systems nor databases. The absence of possibilities for automated analysis is a disadvantage of the databases which impedes to identify eventual suspicious patterns or suspicious cases. In addition, the databases used have no direct link to the European Commission.

In many **EU Member States**, there appears to be a lack of awareness of which databases each institution has - and whether these databases can be linked to each other. Overall, institutions are aware of their own databases but seem to be unaware of the synergies that could occur by connecting them to the databases of other institutions.

In **Hungary**, the data in the public procurement database is not complete and of mixed quality. In addition, it is not presented in a standardized and open format which makes it difficult, if not impossible, to analyse. For example, data in different formats (including pdf) are uploaded/dumped in the database and it is often unclear whether the figures presented are gross or net figures. Private parties and academic researchers have constructed their own databases of public procurement based on the official notifications in the gazette and have found very significant differences between their data and the official data in the database. As one public procurement scholar stated explicitly, there does not exist any reliable and comprehensive data on public procurement in Hungary.

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[361] Information from the presentation held by Prefect Bruno Frattasi (Frattasi, 2012) at the conference of the CRIM Committee of the European Parliament, September 2012.

[362] This will be achieved by: "i) developing an automatic alarm system in Italy to signal suspect financial movements in relation to large public contracts; ii) analysing the compatibility of the system with norms, procedures and strategies in other MS; iii) testing the system on two large contracts in Italy, and on other contracts in selected EU countries, iv) presenting the benefits of the system to the other countries of the EU, and providing detailed training in selected countries; v) providing a set of guidelines to the EC and to other interested countries; vi) providing an overview of the feasibility of extending the system to other parts of the EU" (Formez, 2010).

[363] The EU financial instrument mandatory as from February 1, 2014.

[364] A fusion centre in this context manages the flow of data, information and intelligence across all levels and sectors of government (and private sector where appropriate and possible). It goes beyond establishing an information/intelligence centre or creating a computer network: the fusion process supports the implementation of risk-based, intelligence- and information-driven prevention, detection, and investigation of fraud and corruption.

12.6. Corruption investigation and reporting

Databases and statistics on corruption in public procurement

In 2010, for the fourth edition of the European Sourcebook of Crime and Criminal Justice Statistics[365] – a data collection initiative that started in 1993 under the umbrella of the Council of Europe – efforts were made to extend the coverage beyond ordinary ('street level') crimes and to include offences such as fraud and corruption. According to the Sourcebook, information on corruption was available in half of the countries and they varied in definition. Some of the data is displayed below:

Table 117: Corruption offences and persons convicted for corruption in the EU27

	Corruption offences per 100 000 population					*Persons convicted for corruption per 100 000 population*				
	2003	***2004***	***2005***	***2006***	***2007***	***2003***	***2004***	***2005***	***2006***	***2007***
Austria	-	-	-	-	-	-	-	-	-	-
Belgium	1	1	1	1	-	0.1	0.2	-	-	-
Bulgaria	16	12	13	8	8	0.4	0.4	0.9	1.1	1.3
Cyprus	0	1	1	2	1	0	0.3	0	0.8	0.5
Czech Republic	2	3	1	1	1	0.7	1	1	0.7	1.1
Denmark	0	0	1	0	-	0.1	0	0	0.1	-
Estonia	6	4	7	9	8	-	-	-	-	4.1
Finland	0	0	0	0	0	0	0	0.1	0.1	0.1
France	-	-	-	-	-	0.4	0.5	0.4	0.5	-
Germany	2	2	2	2	3	0.5	0.5	0.3	0.3	0.4
Greece	-	-	-	-	-	-	-	-	-	-
Hungary	7	5	8	4	3	3.6	3	3	3.5	2.5
Ireland	0	0	0	0	0	-	-	-	-	-
Italy	-	-	-	-	-	0.9	0.8	-	-	-
Latvia	-	-	-	-	-	0.9	1.9	2.1	2.3	2.6
Lithuania	6	4	4	14	13	-	-	1.1	8.2	8.1
Luxembourg	-	-	-	-	-	-	-	-	-	-
Malta	-	-	1	6	-	-	-	-	-	-
Netherlands	-	-	-	-	-	0.1	0.1	0.1	0.1	-
Poland	5	7	11	13	16	2.1	3.5	4.5	5	6.5
Portugal	1	1	1	1	-	0.5	0.5	0.6	0.7	-
Romania	50	49	38	38	34	0	0.1	1.4	1.4	1.3
Slovakia	3	4	4	5	4	0.7	1	0.9	1.3	3.6
Slovenia	2	1	1	2	1	0.3	0.3	0	0.2	0.7
Spain	-	-	-	-	-	-	-	-	-	-
Sweden	-	-	-	-	-	-	-	-	-	-
UK: England& Wales	-	-	-	-	-	-	-	-	-	-
UK: Northern *Ireland*	-	-	-	-	-	0.0	0.0	0.1	0.0	-
UK: Scotland	0	0	0	0	0	0.0	0.0	-	-	-
Mean	**5.9**	**5.5**	**5.2**	**5.9**	**6.1**	**0.6**	**0.7**	**1.0**	**1.5**	**2.5**

Source: WODC, European Sourcebook of Crime and Criminal Justice Statistics – 2010.

[365] MINISTERIE VAN VEILIGHEID EN JUSTITIE, WETENSCHAPPELIJK ONDERZOEK- EN DOCUMENTATIECENTRUM WODC (2010), *European Sourcebook of Crime and Criminal Justice Statistics*, The Hague.

In this study on corruption *in public procurement*, the same difficulties were encountered in retrieving figures on corruption: in many Member States, neither databases nor statistics on prosecution and conviction of corruption are available. Obtaining such figures for corruption *in public procurement* is even more difficult.

A public opinion poll from 2009 showed that 70% of the respondents shared the opinion that corruption in **Slovenia** is a serious problem and is becoming more serious over time. The Eurobarometer showed similar results for Slovenia: in 2007, 89% of respondents thought that corruption is a serious problem in Slovenia, while in 2009 the percentage increased to 94%. Also, the Commission for the Prevention of Corruption (of the Republic of Slovenia) receives greater numbers of cases each year. On the other hand, criminal statistics show a completely different picture – one would assume that corruption does not exist in Slovenia. In 2010 there were only 2 convictions on crimes of corruption. The Commission for the Prevention of Corruption could not find any document related to corruption in Slovenia related to EU Funds. The Budget Supervision Office (of the Ministry of Finance), a body responsible for reporting on the irregularities in disbursements from the EU Funds (through Irregularities Management System) to OLAF and the European Commission, said that up until now, they have never encountered such an irregularity which would amount to corruption, or even a suspicion of corruption.

In the **Czech Republic**, for the pre-trial phase of prosecution of bribery, the most representative source of data is Evidential Statistical System on Criminality ("*Evidenčně statistický systém criminality*") and the annual Report on internal security and public order in the territory of the Czech Republic ("*Zpráva o situaci v oblasti vnitřní bezopečnosti a veřejného pořádku na území České republiky*", English summary available online) compiled by the Ministry of Interior. More user-friendly statistical information on corruption related crimes are contained in the Governmental Strategy for Combating Corruption, which is based on information contained in abovementioned databases. A summary of bribery cases in years 2009-2010 is contained in the table below:

Table 118: Persons indicted/sentenced for bribery in the Czech Republic[366]

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*
Acceptance of bribe*	48/49	51/28	45/26	30/20	41/23	91/24	39/27	37/51	42/26	31/28	19/-
Bribery*	106/68	149/83	120/108	96/53	103/74	82/82	96/45	65/51	76/50	68/51	4/-
Indirect bribery*	4/1	1/3	3/3	3/2	6/0	2/1	3/2	2/1	6/0	3/1	1/-

* First figure refers to number of indicted persons, second figure after "/" to number of sentenced persons. Note: Data for 2011 is not available yet. Sources: Yearbook of Criminality 2000-2010, National strategy 2011-2012. Yearbook of Criminality contains slightly different data regarding number of persons sentenced for acceptance of bribes (e.g. 26 for 2009 or 24 for 2006) and regarding provision of bribes.

Also in **Hungary**, databases that include information on corruption exist. The Unified System of Criminal Statistics of the Investigative Authorities and of Public Prosecution (ENYÜBS) is the official record-keeper for law enforcement agencies. These records include information collected by the police and the National Tax and Customs Administration and are public and freely available on an individual case basis. Criminal courts also keep records of their cases, but these records may only be accessed with prior judicial authorization.

General statistics on corruption are also available in **Poland**. Since 2000, Poland experienced a growth in the number of corruption cases with the highest number of 9.631 in 2007. In 2010, 8 305 corruption crimes were reported, which equates to an increase by almost 8% compared to 2009.[367] The increase in corruption crimes reported in 2010 is believed to be the outcome of more effective detection of corruption crimes, rather than growth of corruption in general. In 2009, almost 600 pre-trial proceedings were instituted for corruption crimes.

For instance in **France**, the *Service Central de Prévention de la Corruption* is, since January 1st 1993, entrusted by law to centralize all the necessary information to spot and prevent offences against probity. However, France has no centralized computerized collecting mechanism that would help SCPC to fulfill this role. Besides, there is no department that is able to quantify and describe the many varied forms of corruption in France, nor is there any element of reliable benchmarking and objectives as far as court referrals, offence typologies and follow-up of procedures are concerned.

[366] Number of sentenced persons can be higher than the numbers of persons indicted due to overlap between calendar years in the judicial statistics.

[367] CENTRAL ANTI-CORRUPTION BUREAU (2011) *The anti-corruption handbook for entrepreneurs*, Warsaw.

In **Belgium**, information on the number of convictions is not gathered systematically. The statistical services of neither the Ministry of Justice, nor the individual courts provide numbers on the nature of the offences for which convicted persons were trialled.

In **Spain** there is no accurate information or reliable statistics on the existing level of corruption in the public administrations and/or the private sector. The National Statistical Institute (*Instituto Nacional de Estadística, INE*) provides statistics on the Gross Domestic Product (GDP) regularly, as well as annual figures on certain areas of "Security and Justice" (e.g. "Convictions statistics", "Magistrate's Court Statistics", "Statistics from the Courts of Minors"). The classification and searching criteria do not provide a proper view of percentages of corruption, neither on corruption cases in these figures. Moreover, the statistics on "Security and Justice" are dissociated from the statistics on GDP. The Annual Reports of the Spanish General Prosecution Office (*Fiscalia General del Estado*), and of the Specialized Anti-Corruption Prosecution Office (*Fiscalia Especial contra la Corrupcion y la Criminalidad Organizada*) provide the most reliable figures and case-related information on the Spanish investigations and prosecutions carried out in cases of corruption (including cases related to EU Funds).

In the **Czech Republic**, major data of judicial prosecutions of corruption cases are published by Ministry of Justice in the Yearbook of Criminality (in Czech language), available at the webpage of the ministry. The Yearbook is structured according to individual offences, as classified by Czech Penal Code. The database also contains data about categories of penalties imposed regarding individual offences.

In **Sweden**, the criminal registers maintained by the National Police Board contain information on corruption suspicions/convictions, but the information is not structured so that the extent of corruption is readily identifiable, nor is the information available to the general public.

In **Lithuania** however, specific criminality indicators for the corruption in public procurements are collected as from 2011. This does not allow for determining trends yet. The criminality rates indicate that there were 11 people punished due to corrupt activities in the area of public procurements. None of them were imprisoned.[368] At the same time, according to Special Investigation Service of the Republic of Lithuania, criminal activity in public procurements in **Lithuania** seems to become the character of organized crime, as more and more officials are involved in them; the material damage for the state grows.[369]

In **Poland**, central evidence of corrupt cases in the area of public procurement does not exist. The most extensive criminal data is contained in the police statistical database 'TEMIDA'. There is no technical possibility to separate information related to public procurement from 'TEMIDA' database.

No centralised databases on detected corruption cases in public procurement were identified in any of the **27 EU Member States**.

Good, accurate and detailed statistics on corruption, especially on corruption in public procurement, help to increase the overall understanding of corruption and the effect of counter measures. They allow for EU comparison and analysis, as well as for national, tailored policies and interventions.

Good functioning system for whistle blowers

The Commission's Vice-President Maroš Šefčovič recently reminded his staff of whistleblowing obligations: "Whistleblowing is a *key weapon in the Commission's armoury against corruption and fraud. The Commission doesn't just* allow *staff to blow the whistle if they encounter serious irregularities; it* obliges *them to do so. These guidelines give staff the confidence to know when and how to blow the whistle, as well as reassurance that they will be protected and remain anonymous if they wish.*"[370] The same is true for the Member States, when it comes to corruption in public procurement.

[368] PROSECUTION OFFICE OF THE REPUBLIC OF LITHUANIA (2011). *2011 annual report of Prosecution Office*. Available from: http://www.prokuraturos.lt/LinkClick.aspx?fileticket=NRvV4mY9rm4=&tabid=413 [Accessed 04 September 2012]

[369] SPECIAL INVESTIGATION SERVICE OF THE REPUBLIC OF LITHUANIA (2011) *2011 Annual report*. Available from: http://www.stt.lt/documents/planavimo_dokumenatai/ATASKAITA_2011.docx.pdf [Accessed 06 September 2012].

[370] EUROPEAN COMMISSION PRESS RELEASE (6 December 2012): Commission issues new guidelines to remind staff of whistleblowing obligations.from http://europa.eu/rapid/press-release_IP-12-1326_en.htm [Accessed 18 March 2013].

According to an OECD-survey in 2009[371], Belgium, Greece, Ireland and Luxembourg offered no protection to whistle-blowers, neither legal, anonymity nor any other protection. The other 14 Member States in the survey[372] have had protection in place, most of them a legal protection. It was not assessed whether this protection was sufficient and/or whether it worked in practice, whether in the Member States, civil servants have the '*confidence to know when to blow the whistle, and how, as well as reassurance that they will be protected and remain anonymous if they wish'.*

The protection of whistle-blowers is not ensured sufficiently in **France**. Despite the Article 40 of the Code of Penal Procedure, there are few cases of corruption that are denounced. Employees are protected when they denounce corruption, but there should be more incentives and protections. For instance a system of anonymous statement, as in organised crime cases. There is no real programme for the protection of witnesses. The same goes for **Spain**, where the lack of protection of whistle blowers is identified as one of the main obstacles to the detection and eradication of corruption. Anonymity is not sufficiently ensured, even during the formalities of corruption investigations.

In **Belgium**, Especially the lack of whistle-blower protection is an issue that recurs regularly[373]. There is no whistle-blower protection in the public (except in the Flemish region) or private sectors, nor are there sanctions for civil servants who fail to inform the public prosecutor about crimes witnessed in the execution of their duties[374]. A proposal for legal whistle-blower protection for federal public servants is currently being prepared, but a proposal for a bill is not yet under revision in the federal parliament.

In the **Netherlands**, in 2012, an Advisory Desk for Whistle blowers was set-up as an independent entity by the Dutch ministries of the Interior and the ministry for Social Affairs and Employment. It provides (potential) information, support and advice to whistle blowers in the public and private sector. Moreover, a Dutch bill has been filed for establishment of a "House for Whistle blowers", to be organized in the office of the National Ombudsman. Upon the passing of this legislation, the House for Whistle blowers will independently investigate complaints from whistle blowers. Additionally, it will provide protection and support (legal, financial and moral-psychological) for the whistle blowers during the investigation of the incident, and help the whistle-blower to find a new job opportunity.

In **Lithuania**, new technologies are being introduced to report about shadow economy in Lithuania. One of the initiatives is implemented by the State Tax Inspectorate. This institution introduced an application for mobile phones named "Inform". This application provides a possibility to inform about the cases of non-payment of taxes in an easy and effective way – by using a mobile phone app.[375]

In the **Czech Republic**, Endowment Against Corruption (Nadační fond proti korupci),[376] a foundation established in 2011, not only attempts to analyse and medialise cases of corruption but also declared an award of one million Czech crowns (approximately EUR 40 000) for a whistle-blower who will *"expose a corruption case with major economic implication or especially abominable corrupt practices."*

In **Hungary**, a hotline is opened by the National Development Agency for citizens and companies to report on suspected irregularities. This hotline is very actively used and since 2007 53 irregularities have been detected based on hotline reports. In **Romania**, several public institutions have implemented whistle blower facilities in the form of an email address or a telephone hotline, publicly advertised on the web page of each these institutions. These facilities can be used by any individual to report a case or a suspicion of fraud or corruption. According to the institutions involved, all allegations received through whistle blower hotlines are closely monitored and investigated in due time.

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371 OECD (2009), "Detailed Data from the 2009 Survey on Integrity", in *Government at a Glance 2009*, OECD Publishing.

372 Only 18 of the 27 EU Member States were included in this survey.

373 GRECO (2011), *Lessons learnt from the three Evaluation Rounds (2000-2010)*, http://www.coe.int/t/dghl/monitoring/greco/general/Compendium_Thematic_Articles_EN.pdf , 32.

374 See also: Corruptie in België: "De situatie verbert niet", Gazet van Atwerpen 26 October 2010, http://www.gva.be/nieuws/binnenland/aid984617/corruptie-in-belgie-de-situatie-verbetert-niet.aspx .

375 See the website of Valstybinė Mokesčių Inspekcija (State Tax Inspectorate): www.vmi.lt/lt/?itemId=10828231 [Accessed 19 May 2013].

376 See the website of Nadační fond proti korupci (Anticorruption Endowment): www.nfpk.cz [Accessed 19 May 2013].

The new anti-corruption law in **Italy** has recently been approved by the Italian Parliament and a norm supporting "whistle blowers" is included. After a series of parliamentary debates and lobbying from NGO's, a final version of the law includes the definition of "whistle blowers" as important agents in the identification of corruption, as well as encourages the introduction of measures – as part of anti-corruption plans required within each organisation - to facilitate their role and ensure their anonymity within public organisations

For instance in **Poland** there is limited social acceptance and low esteem given to whistle blowers. Whistle blowers are associated with common informers, snitches or narks and their activity is considered wrong or at least undesirable for the rest of the society.

A good system for whistle blowers that actually functions is a positive practice, but not yet a common practice in the EU Member States. However, the effectiveness of these possibilities for whistle blowers depends on two main elements:

- Adequate protection for whistle blowers: adequate legal protection that is enforced and trusted by the public;
- Public acceptance of those who blow the whistle.

Investigation

Box 5: Successful investigative techniques to investigate corruption

In June 1999 a research project was conducted by the FBI to determine how the majority of corruption cases are developed and what techniques are most often utilized in successful corruption investigations. To identify the sources of corruption investigations, over 200 successfully completed corruption cases were reviewed in detail and over 100 corruption Case Agents representing 36 different field offices were contacted to relate their individual experiences. Research conducted to determine the most successful techniques employed in corruption investigations revealed that the two techniques utilized most frequently were consensual monitoring[377] and the use of informants and cooperating witnesses. These two techniques were used in half of all cases reviewed and received extremely high ratings for effectiveness in conducting successful corruption investigations. Three other techniques which were employed in approximately 25% of the cases reviewed and received high ratings for effectiveness were the use of financial analysis, pen registers/trap and trace coverage and telephone toll analysis. Used less frequently but receiving the highest ratings for effectiveness were the use of undercover operations and wiretapping. Based on this research, it is evident that sophisticated investigative techniques must be utilized to achieve sustained success in the corruption battle.

Source: http://www.icac.org.hk/newsl/issue2/fbi.html

According to the Special Investigation Service in **Lithuania**, corruption can be best detected if operational (latent) activities are carried out during the public procurement process or even during the pre-bidding phase. In this case possibly illegal actions can be recorded on real time basis. Also, in this case it is easier to track the cause – consequence relations. There is a low success rate of investigations after the purchasing process is over (there is not enough information for investigation and evidence). The special investigation service has informants and special agents in place to try to infiltrate among officials, and provide high value information. However the operational (latent) methods are expensive and also very time and resources consuming.

In criminal investigation in **Poland**, the Central Anti-Corruption Bureau officers are entitled to use police tools and special measures such as operational control (e.g. wiretapping), undercover operations and technical surveillance. Beside the Central Anti-Corruption Bureau, corruption in **Poland** is investigated by the police and the prosecution, which are entitled to use two methods.

[377] The investigative interception, overhearing, or recording of a private conversation by the use of mechanical, electronic, or other devices with the consent of at least one, but not all, of the participants (as contrasted to non-consensual monitoring, where no participant consents).

The first method is governed by Article 19 of the Police Act,[378] which provides that police officers have the right to apply the following methods of detecting and investigating corruption:

- Correspondence content control (physical as well as e-correspondence);
- Consignment content control;
- Use of wiretapping systems;
- Police provocations (including controlled giving of bribes).

The second method might be used during the inquiry or the investigation phase. This method includes, among others: interrogation, use of the wiretapping systems and appointment of experts.

Hungary has no independent and well-established anti-corruption agencies. In addition, various actors lack sufficient institutional, technical and financial resources to fulfil their tasks adequately. The **Hungarian** Prosecutor's Office was granted, in November 2010, a separate budget to fund anti-corruption activities and is now establishing special anti-corruption units.

In **Hungary** actors involved in monitoring and implementing EU Funds and law enforcement agencies do not cooperate and share information effectively. One of the prosecutors interviewed stated, for example, that managing and controlling agencies often focus solely on getting their money back through administrative and civil law procedures even if there are strong suspicions that a criminal act has been conducted. In **Lithuania**, none of the investigating institutions possess any sophisticated data mining tools for detection and investigation. Also in **Romania**, it appears that the mechanisms to properly detect and combat corruption are fragmented; there is little integration across the various governmental bodies and agencies, especially with regards to sharing electronic information.

European and international cooperation in police and justice matters is not sufficient to efficiently fight international corruption. Accessing the financial information contained in bank accounts in another Member-State takes too much time (weeks or even months because there needs to be an agreement of the prosecutor of the concerned country), or is simply impossible (e.g. when countries refuse to cooperate such as Luxembourg, or Jersey and Guernsey islands). Differences in the judiciary systems of all European countries imply administrative burdens that prevent an efficient fight against corruption.

Competent and independent investigating agencies with sufficient investigative competencies, adequate sharing of information and intelligence (preferably via automated means) and national and international cooperation seem prerequisite for the proper investigation of corruption in public procurement.

Prosecution/the judicial system

In this part of the study, the objective is to identify negative procurement practices are described, which contributes to the increase of overall corruption costs, as well as positive/best practices that lead to the prevention of corruption and to lower costs in the whole tender/grant cycle (preparation, selection and implementation). Whether and to what extent prosecution of corruption or the judicial system as a whole in a particular environment can contribute to the prevention of corruption can of course be debated. We considered the efficiency and effectiveness of the judicial system not in the scope of this study on corruption in public procurement for two main reasons:

1. The functioning, especially efficiency and effectiveness of a judicial system with respect to corruption in public procurement can only be studied as part of the overall functioning of the judicial system in its context of overall criminality, priorities and resources, mandate, quality and competencies of its staff, etc. There could for instance be very good reasons to give priority to other types of fraud and corruption, or to totally other forms of crime in a certain context, which make the judicial system neither inefficient nor ineffective in the field of corruption in public procurement;
2. To study whether a judicial system of whether prosecuting authorities are effective in the field of fighting corruption in public procurement, one needs to know what the (changes in) corruption levels are in the context where this system of these authorities operate. As for all practices described here above, this poses a problem.

[378] POLICJA (2012), *Ustawa z dnia 6 kwietnia 1990 r. o Policji* (Dz.U. 1990 Nr 30 poz. 179) [WWW] Policja. Available from:www.policja.pl/download.php?s=1&id=59555 [Accessed 28 September2012]

However, the assessments of the EU Member States, the 8 selected Member States as well as other Members States assessed on a general level, it was learned that there are at least several negative perceptions with regard to prosecution of corruption in public procurement and with the judicial system in this regard. Frequently mentioned opinions are that there are considerable delays in the adjudication of justice - it can take many years before a case is finally judged. Another issue raise is that the coordination between investigation and prosecution is lacking. Not all Member States concentrate corruption cases in one national unit as a means to enhance the knowledge and competence of the investigators/prosecutors who work in a specialized field. The exclusive focus on corruption also prevents that other – sometimes less complex – crime cases are given priority over the prosecution of corruption. Most heard complaint is that there is a lack of resources and that the scarce resources lack the proper specialised training, given the complexity of the cases. In Latvia, special investigatory groups have been created and during the first half of 2011 more than 20 requests for mutual legal assistance on criminal matters were sent to 16 foreign countries. The average time of investigation of a criminal case has been 318 days starting from initiation of criminal proceedings till submission of a case to the Prosecutor's Office for prosecution.[379]

Again, no in-depth study was made of the efficiency and effectiveness of prosecuting authorities or the judicial systems as a whole, but based on the many opinions expressed, it is recommended to further investigate to most optimal organisation and functioning of prosecuting authorities and judicial systems in the fight against corruption in public procurement – given the 2 constraints mentioned earlier.

12.7. Leniency and voluntary disclosure programmes

As part of the objective to identify positive and negative practices, particular attention is given to best practices in leniency/voluntary disclosure programs. Leniency or a leniency policy is typically a reduction in the legal sanctions accompanied by protection to wrongdoers that self-report helping to convict the rest of the gang involved in the corrupt deal. Leniency is thus linked to whistle-blowers, although whistle-blowers are in most instances witnesses of e.g. corrupt practises instead of the wrongdoers themselves. A voluntary disclosure program for corruption offences grants leniency if a bribe-taker or bribe-giver self-reports his offence before detection. Such voluntary disclosure programs grant leniency with regard to the applicable penalty to anybody who is in a certain codified situation and meets the conditions that the program sets, and not on a case by case basis where the reduction in the penalty is subject to discretion by prosecutors or judges, as in a plea bargain.

Voluntary disclosure programmes are already a common practise in the fight against cartels. For instance the European Commission encourages companies that are involved in a cartel to come forward with evidence to help the Commission to detect cartels and build its case.[380] The first company to provide sufficient evidence of a cartel to allow the Commission to pursue the case can receive full immunity from fines; subsequent companies can receive reductions of up to 50% on the fine that would otherwise be imposed. To benefit from the Leniency Notice, companies can approach the Commission directly or through a legal adviser. In recent years, most cartels have been detected by the European Commission after one cartel member confessed and asked for leniency.[381] The same applies for the non-EU members of the European Economic Area (EEA). The EFTA Surveillance Authority monitors compliance with EEA rules in Iceland, Liechtenstein and Norway, enabling them to participate in the European internal market. The Authority will grant total immunity from fines to the first company to submit evidence of a cartel unknown to, or unproved by, the Authority, where the Authority is competent to handle the case under the EEA Agreement. Immunity from fines will reward firms that provide important insider information and evidence to the Authority.[382] Also in many EU Member States, voluntary disclosure programmes exist.

[379] See: www.knab.gov.lv.

[380] EUROPEAN COMMISSION (2006), *Commission Notice on Immunity from fines and reduction of fines in cartel cases* (OJ C298, 8 December 2006), p.17.

[381] See: http://ec.europa.eu/competition/cartels/overview/index_en.html.

[382] See: http://www.eftasurv.int/competition/cartels-and-the-leniency-programme/

The idea of deterring a collaborative crime by shaping the incentives of criminal partners so that one of them has the incentive to betray the others and report information to law enforcers is well established, according to Spagnolo[383]. The Prisoner's Dilemma story, where each among the partners in crime are promised a light sentence in exchange for cooperation to convict the other criminal partners is familiar to most countries' standard law enforcement practice. These schemes have been the main and most successful tool in the fight against mafia in Italy and other countries, and they are currently regarded as the most important and effective instrument in the hands of competition authorities in their fight against cartels. Literature on voluntary disclosure programmes as an instrument in the fight against corruption is scarce.

According to Spagnolo and also to Nell[384], asymmetric schemes like voluntary disclosure programmes could, when properly designed and implemented, be effective in the fight against corruption as well. In his dissertation, Nell[385] and Lambsdorff and Nell[386] argues that "*a bribe-taker should be penalised less for taking bribes and more for reciprocating a bribe. Accordingly, leniency should be conceded to a bribe-taker only if he reports his misconduct after having obtained a bribe. Likewise, it is pointed out that a bribe-giver should be punished for giving a bribe, but not for accepting the bribe-taker's reciprocity. Self-reporting should result in leniency only if a bribe-giver was successful in obtaining the requested favour. Such a strategic design has the potential of breaking the 'pact of silence' and of destabilizing corrupt deals.*"

Nell[387] lists three primary reasons for voluntary disclosure programs may prove to be more adequate for fighting corruption than post-detection exchanges such as plea bargains:

- Voluntary disclosure programs codify the extent of leniency and thus reduce legal uncertainty, which promotes self-reporting;
- Voluntary disclosure programs significantly strip judges and prosecutors of their discretionary powers and therefore also of the possibility to administer justice corruptly;
- Voluntary disclosure programs can be designed such to reflect the unique nature of corrupt deals and to exploit their Achilles heel: if leniency is granted to those who self-report only at a certain stage of a corrupt deal, the trust in mutual compliance and silence among corrupt partners can be severely shattered.

Lambsdorf and Nell[388] warn that in cases of repeated transactions, asymmetry and leniency may be fruitless. Asymmetry and leniency may unfold their effects rather in one-shot, large-scale transactions which oftentimes are part of grand corruption schemes.

Nell assessed (in 2007) the existence of voluntary disclosure programs for active and passive bribery in 26 countries, including Austria, Bulgaria, Czech Republic[389], Estonia, Finland, Germany, Hungary, Latvia, Malta, Romania, Slovakia, Slovenia and Sweden. The countries employing voluntary disclosure programs *for active bribery* are Bulgaria, Czech Republic, Hungary, Latvia, Romania, Slovakia and Slovenia. All countries grant leniency *at any stage* of a corrupt deal. Nell argues that such voluntary disclosure programs run the risk of being abused by corrupt crooks to enforce their deals. To counter this, Nell emphasises that leniency should only be granted if the bribe was reciprocated.

Voluntary disclosure programs for passive bribery exist in Hungary. In Hungary, leniency is granted if a public official solicits or extorts, agrees to accept or accepts a bribe. This is according to Nell to be supported because a public official can thus escape the trap of a long-lasting criminal career. However, from the perspective of destabilizing corrupt deals leniency should only be conceded to a public official if the bribe was actually given to him. Such a strategic destabilization element is missing in Hungary.

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[383] SPAGNOLO, G. (2012), *New Tools to Fight Corruption and the Need for Complementary Reform*.[Available from: http://freepolicybriefs.files.wordpress.com/2012/06/free_policy_brief_spagnolo.pdf].

[384] NELL, M. (2007), *Three Essays on Anti-Corruption Legislation and Reform*. Dissertation [Avalaible from: http://www.opus-bayern.de/uni-passau/volltexte/2008/1198/pdf/Nell_Mathias.pdf].

[385] Ibidem.

[386] LAMBSDORFF, J. and M. NELL (2007), *Fighting corruption with asymmetric penalties and leniency*. CeGE Discussion Paper, No. 59.

[387] NELL, M. (2007), *Three Essays on Anti-Corruption Legislation and Reform*.

[388] LAMBSDORFF, J. and M. NELL (2007), *Fighting corruption with asymmetric penalties and leniency*.

[389] The old Criminal Code of the Czech Republic knew a provision on 'effective repentance', meaning that in a case in which an offender provided or promised a bribe for the sole reason that he or she was asked for it and under the condition that he or she immediately and voluntarily notified the fact to a public prosecutor or to the police, such an offender was exempted from punishment. However, the provision of effective repentance for corruption-related offences has been removed from the new 2010 Code, which was motivated with its seldom usage. See: MUSZYŃSKA, B., P. NOVÁKOVÁ and W. VAN ROSSUM (2012), *Fighting corruption in Polish and Czech legal cultures*.

Also in Poland (not assessed by Nell) a leniency/voluntary disclosure programme exists, called 'the Good behaviour/impunity clause'. This programme was intended to allow the person who paid a bribe to avoid punishment. The perpetrator of this crime will not be punished if he performs 'voluntary disclosure', which should be understood as revealing to the enforcement authorities all relevant circumstances of the committed crime before they find them.

The purpose of implementing such provisions was also to break the so-called 'solidarity of perpetrators' of corruption i.e. conspiracy of silence between the person who takes a bribe (property or personal benefit) and the person who grants it.

According to Polish law, only the perpetrators of bribery (person who paid a bribe) can benefit from impunity; it is not permitted for those who received a bribe. The good behaviour/impunity clause applies to the following crimes regulated in the Criminal Code:

- Active bribery;
- Active paid favouritism, trading in influence;
- Electoral corruption;
- Corruption in business transactions, economic corruption.

Many authors[390] theoretically analysed leniency programmes directed against cartels, showing that such programmes could be an effective tool to destabilize, detect and deter cartels. Many attempts to analyse the effectiveness of leniency programs *empirically* remain inconclusive, as identification is only derived from detected cartels. Therefore, as per Klein, "it is not clear whether a possible success of a leniency program that is indicated by more uncovered cartels is due to more efficient cartel prosecution or due to more existent cartels."[391]

In a laboratory experiment, Bigoni et. al.[392] tested on the channels through which different law enforcement strategies deter cartel formation. With leniency policies offering immunity to the first reporting party a high fine is the main determinant of deterrence, having a strong effect even when the probability of exogenous detection is zero. Deterrence appears then mainly driven by 'distrust', the fear of partners deviating and reporting. Absent leniency, the probability of detection and the expected fine matter the most, and low fines are exploited to punish defections. The results, according to the researchers, appear relevant to several other crimes sharing cartels' strategic features, including *corruption* and financial fraud. Schickora[393] found that while giving a briber the option to blow the whistle (here, not only a witness but also an offender can blow the whistle) against a public official that demanded a bribe is effective in reducing corruption, the possibility to whistle-blow *after* the official has made his reciprocity decision *increases* the chance that corruption will take place. However, Schickora shows that under asymmetric leniency conditions, whistle-blowing reduces the occurrence of corruption by giving the official a chance to avoid reciprocation without incurring the risk of being penalised by the 'client' via whistle-blowing.

Although most existing leniency and voluntary disclosure programmes are in the field of competition and fighting cartels, this practise appear to be relevant for the fight against corruption as well, not only from a theoretical view but also based on results from laboratory experiments. Further research, also on the conditions necessary for a good functioning of leniency and voluntary disclosure programmes, is necessary, as well as structured assessments of existing leniency and voluntary disclosure programmes.

[390] ROUX, C. 'Leniency Programs and Their Role in Fighting Cartels: Success or Defeat?', SILBYE, F. (2010), 'Optimal Leniency Programs with Case-Dependent Fine Discounts', in: *Topics in Competition Policy*; HINLOOPEN, J. (2003), 'An Economic Analysis of Leniency Programs', in: *De Economist(* 2003, 4, 415-432); MOTTA M. and M. POLO, 'Leniency Programs and Cartel Prosecution', in: *International Journal of Industrial Organization (*2003, 21 (3)), 347-379.

[391] KLEIN, G. (2011), 'Cartel Destabilization and Leniency Programs–Empirical Evidence', in: *ZEW-Centre for European Economic Research Discussion Paper 10-107.*

[392] BIGONI, M., FRIDOLFSSON, S., LE COQ, C. and SPAGNOLO, G. (2012), *Trust and Deterrence*. CEPR Discussion Paper no. 9002. London, Centre for Economic Policy Research [Available from: http://www.cepr.org/pubs/dps/DP9002.asp].

[393] SCHICKORA, J.T. (2011), *Bringing good and bad Whistle-blowers to the Lab*. Munich Discussion Paper No. 2011-4, Department of Economics, University of Munich [Available from: http://epub.ub.uni-muenchen.de/12161/1/WB_Schikora.pdf].

12.8. Concluding remarks

A sound public procurement system is based on rules, encourages competition in bidding for government contracts, promotes transparency, strengthens accountability, is economic (value for money) and is efficient. Overall, 5 key instruments to manage the risk of corruption help to ensure that the basic principles for a sound public procurement system can be achieved and monitored:

1. A corruption risk management programme;
2. Periodical risk assessments;
3. Prevention techniques;
4. Detection techniques;
5. A reporting and investigation process.

It is almost impossible to draw valid conclusions on the effectiveness of anti-corruption measures and programmes as it is almost impossible to measure the scale of corruption precisely. Thus, it is impossible to measure change in corruption levels too. Furthermore, it is difficult, if not impossible, to establish causality between anti-corruption reforms and changes in corruption levels: did these changes occur in spite of or thanks to anti-corruption efforts? And how should the contribution of individual measures be calculated?

Laboratory and field experiments have demonstrated some promising results, which provide support for some of the positive measures in controlled circumstances that could be repeated in different contexts and in the field as well. These methods are still in their infancy and only aimed at corruption in many areas, not only at corruption in public procurement.

It is therefore possible to identify practices that can work in theory as a positive or as a negative practice in prevention, detection and investigation of corruption, and for some, additional evidence from experiments is available to support this theoretical applicability. Of these, some are especially helpful to prevent or detect activities, behaviour and/or circumstances that lead to the appearance van red flag-situations. Below, the main positive practices that were identified in this study are listed – whenever relevant, it is indicated which practice helps to prevent or detect a specific red flag-situation (with a link to the significant red flags from chapter 7):

Corruption risk management policy: a firm (legal, institutional, technical) basis to protect public procurement against corruption

- An anti-corruption policy or program with clear objectives that focuses the efforts of the various actors involved in the fight against corruption in public procurement;
- Ethical Codes of Conduct, either incorporated into civil service legislation or independently that encompass not only government officials and civil servants, but contractors as well;
- A comprehensive corruption risk management program for public procurement, that is implemented in the entire public procurement process and periodically maintained/updated;
- Corruption risk management that not only focus on the contractors, but also on subcontractors and others involved in the proper execution of the contract [*also helps to recognise connections between bidders that undermines competition, red flag 17*];
- No shift (outsourcing) of public procurement activities from public entities to either private or public enterprises that are not subjected to public procurement laws, nor bound by similar explicit rules or agreements for executing such activities [*this practice is also very relevant in the light of two red flags: contact office not subordinated to tender provider (red flag 4) and contact person not employed by tender provider (red flag 5)*].

Corruption prevention techniques

- Proper screening of contractors and beneficiaries, especially their ultimate beneficiary owners [*this might also prove relevant to recognise connections between bidders that undermines competition, red flag 17*];
- Adequate implementation of the debarment obligation in the EU procurement directive;
- Pre-employment screening and in-employment screening of all those involved in public procurement: public officials, civil servants, as well as temporary staff and external parties hired to facilitate public procurement, including periodical update of the screening and an obligation for all staff to report changes in their personal circumstances and not only focused on job qualifications and formal background antecedents, but also on intrinsic motivation [*this practice is also very relevant in the light of two red flags: contact office not subordinated to tender provider and contact person not employed by tender provider, red flags 4 and 5*];

- Job rotation – performed in the right balance between costs of job-rotation when compared to estimated costs of (potential) corruption;
- A formalised financial disclosure/assets declaration system that regulates who has to declare, the type of information requested from the filer, the frequency of the declarations and public access to disclosed information;
- Specialised, well trained public procurement staff that share their expertise, knowledge and (market) intelligence, also across Member States' borders [*professional staff should be able to structure the procurement process in such a way that tenders are not exceptionally large, to prevent amending the bid specification after contract awarding as well as prevent substantial changes in the project scope/costs afterwards, to recognise artificial bids and to prevent that not all/no bidders are informed of the award and its reasons - red flags 9, 13, 15, 16 and 19*];
- Centralised or joined procurement, especially for small organisations and for unordinary procurements, also as an enabler for the professionalisation of the public procurement function;
- A structured market (price) analysis and sharing of market intelligence, also across EU Member States' borders;
- Institutionalised awareness raising programmes for the public sector, specifically aimed at public procurement and with more emphasis on the costs of corruption and the harm corruption does to society, which may help to change the value system of public officials;
- Optimal transparency in the entire public procurement process, maximal public availability of relevant, easy to access and easy to use procurement information [*to avoid that award contracts and selection documents are not public and to avoid that not all information is filled in TED or national public procurement databases, red flags 20 and 25*].

Corruption detection techniques and corruption investigation and reporting

- Independent audits and evaluations performed according to good audit and evaluation ((EU-wide) standards and qualification levels for civil servants and auditors involved in the management, control and audit of public procurement), where corruption is one of the objectives and results are shared, also between EU Member States [*this practice should be focussed especially also on all the identified significant red flags, as well as on the outcome of the application of the methodology on samples of public procurements, in order to raise efficiency and effectiveness of audits and evaluations*];
- Data analysis of easily accessible, relevant and good quality data on public procurement [including use of significant red flags as indicators as well as applications of the comprehensive methodology to estimate probability of corruption], to detect potential irregularities, fraud and corruption, such as:
    - Needs assessments of the projects;
    - Breakdown of the main components of a project with, where available, a statement on standard prices per component;
    - Information on the bids received (number of bids, names of companies involved etc.);
    - Number and reasons of bids terminated;
    - Key outputs offered in the winning proposals;
    - Detailed information on contract modifications;
    - Monitoring and evaluation reports of the projects;
    - Detailed information on the companies the state has contracted (e.g. ownership, number and value of contracts won etc.); and
    - An overview of the companies blacklisted (due to e.g. corruption).
- Links to experiences with detecting tax evasion through detection with help of data analysis, as well as experiences with *fusion centres*, inter-organisational cooperation centres where databases and knowledge/experience of staff from different authorities are joined to fight (tax-)fraud;
- Good functioning system for whistle blowers, including proper protection of whistle blowers;
- Good functioning leniency and voluntary disclosure programmes, with adequate sanctions;
- Collection of meaningful, accurate and detailed statistics on corruption, especially on corruption in public procurement, to help increase the overall understanding of corruption and the effect of counter measures and allowing for EU comparison and analysis, as well as for national, tailored policies and interventions;
- Competent and independent investigating agencies with focus on investigation of corruption in public procurement, with sufficient investigative competencies, adequate sharing, at national and at EU-level, of information and intelligence.

13. Benchmarks of the procurement systems of EU Member States

This chapter presents the benchmarking results of the procurement systems in 27 EU Member States which contribute to the increase of overall corruption costs, as well as positive/best practices that lead to the prevention of corruption and to lower costs in the whole tender/grant cycle (preparation, selection, and implementation).

The results of the different components of this study, such as EU-wide data collection on procurement systems and anti-corruption measures, literature review, country reports, stakeholder interviews and interactions with the related national and regional authorities present a number of indicators in public procurement and fight against corruption. Indicators identified include the transparency of the tenders (time and manner of publication, bid prices, opening of the bids, information on subcontractors, final costs, etc.), types of tender procedures and selection criteria, enforcement of tender conditions in the implementation stage and leniency/voluntary disclosure programmes. Based on these indicators and best practices in EU Member States identified in Chapter 12 this chapter explores a set of benchmarks against which the procurement systems of all Member States are tested. The benchmarks are selected based on the EU wide analysis conducted for this study. The indicators that have already been assessed in other international or EU reports have been excluded in order to focus on those that can bring a new angle and an added value to the comparative analysis of public procurement systems in the EU Member States.

13.1. Structure and value of this benchmark

13.1.1. *Identification of the benchmarks*

In accordance with Chapter 12 the structure of this analysis is based on 5 anti-corruption benchmarks as shown in the figure below.



The benchmark on **Firm basis to protect public procurement against corruption** looks at the legal, institutional and technical situation in the EU Member States. This analysis also identifies the existence or the lack of specific public procurement procedures to detect and prevent corruption, procedures on implementation of risk assessments, code of Conduct/Code of Ethics for procurement employees to prevent corruption and conflict of interest, segregation of duties established in all procuring government organisations and the rights and protection of whistle-blowers.

The benchmark on **Risk assessment** is used to analyse the systems and methods of the EU Member State used for risk assessment of corruption in public procurement. The study explores if there are central and local databases for procurement data in the EU Member States, if there is an external database used on assessment of economic operators, if there is a database on corrupt cases in procurement and if there is a debarment database to verify/cross-check collected data. After that the EU countries are assessed based on the connection among these tools to provide a risk assessment on procedures and practices in public procurement.

The benchmark on **Prevention** focuses on how Member States prevent corruption in public procurement. The indicators used are enhanced professionalism to prevent risks of corruption in public procurement, prevention of risks of corruption in the pre-bidding phase, prevention of risks of corruption in the bidding phase and prevention of risks of corruption in the post-bidding phase. The study assesses if civil servants are screened on their competence and/or susceptibility to corruption, staff in government organisations involved in public procurement require a specialised education or training, equal information flow with all potential bidders,

risk assessment provisions or red flags applicable by contracting authorities defined by the public procurement legislation, screening on bidders, open and transparent communication on the debarment of bidders, measures in place to prevent bid rigging, if allegations are reported and registered centrally, and if signals and allegations of possible corruption are systematically analysed and investigated. The benchmark includes the efforts of the EU Member States on raising awareness and compliance systems for government organisations involved in public procurement. The main indicator used in this part of the analysis is the awareness of the government officials on vulnerabilities towards and risks of corruption. The study explores the level of the training of the staff of all procuring government organisations in EU Member States. Additional to that this research also explores if there is a centre of expertise on fighting corruption in public procurement in EU countries.

The benchmark on **Detection** looks at how Member States detect corruption when it's happening in public procurement. The benchmark focuses on the collection and processing of signals of possible corruption. The analysis is made based on procedures to record the complaints of the non-winning bidders, indicators extracted from actual corruption cases being shared with all staff in relevant government organisations involved in public procurement and the procedures to record the substantial changes in project scope/costs after the contract is awarded.

The benchmark on **Investigation and reporting** is used in this part of the study to analyse how corruption is investigated or if there are bodies to execute the investigation. The identified benchmark indicators are established independent units/judiciaries to investigate breaches, independent judicial system for corruption investigations, law enforcement agencies with adequate powers to investigate corruption in public procurement, widely known hotlines for reporting corruption including public procurement and corruption investigation units in relevant government institutions.

13.1.2. *Fragmented picture through fragmented data*

The benchmark was constructed on the basis of the good and negative practices identified as presented in the previous chapter. A questionnaire has been developed in close cooperation with and with consent of the Commission. This questionnaire is based on the assessments of the legal and procedural framework and available data in the 27 EU Member States, the country assessments of the 8 selected Member States, desk research and literature review on good and negative practices in public procurement and the analysis of all this as presented in the previous chapter. Based on this, a list of indicators that identify good practices were developed.

In a second step, all international (e.g. OECD, World Bank) and EU reports were analysed to eliminate those indicators which have already been analysed extensively – most of these about legal and institutional aspects[394] of prevention, detection and investigation of corruption. Based on the remaining indicators the survey questionnaire has been developed.

The list of indicators and survey questionnaire were both reviewed and approved by OLAF prior to the launch of the survey. DG MARKT was contacted as well, but they agreed to continue with the benchmark exercise before they could scrutinise the questionnaire.

The questionnaire was launched via email. The mailing list is constructed based on desk research and the international reports that were read to identify the indicators. The Commission (OLAF, DG MARKT and DG MOVE) also provided contact details of a great number of national authorities and organisations. Accompanied from a letter of recommendation signed by OLAF, the questionnaire was sent to 1060 national authorities and organisations in all 27 EU Member States. On top of that, the questionnaire was also sent out to 49 experts in the field of anti-corruption in all EU Member States.

[394] See e.g. ASSER INSTITUTE CENTRE FOR INTERNATIONAL AND EUROPEAN LAW with POLISH INSTITUTE OF INTERNATIONAL AFFAIRS (2012), *Prevention of fraud, corruption and bribery committed through legal entities for the purpose of financial and economic gain. Comparative Overview*, and EUROPEAN COMMISSION DG MARKT (2012) *EU Public Procurement Legislation: Delivering Results Summary of Evaluation Report*.

Table 119: Networks of contacts for the benchmark questionnaire / Number of addressees	
Networks of contacts for the benchmark questionnaire	*Number of addressees*
Launched 30 and 31 January 2013	
Public Procurement Network	88 e-mail adresses
Procurement Platforms	70 e-mail addresses (*retained from PwC's study for DG MARKT: eProcurement Golden Book*[395])
National authorities	18 e-mail addresses
National authorities list provided by DG MARKT	108 e-mail addresses
Anti-corruption authorities	67 e-mail addresses
Managing authorities for EU Funds	298 e-mail addresses
Beneficiaries for rails road, ERTMS and multi-modal projects	281 e-mail addresses received from DG MOVE
Launched 29 March and 3 April 2013	
PwC's Network of Experts in the field of Anti-Corruption (established on behalf of DG HOME)	49 email addresses
OLAF Anti-Fraud Communication Network	130 email addresses

Although the overall number of potential respondents (1149) is considerable and the time to deliver the completed questionnaires should have been sufficient (for most respondents more than 2 months), the overall response rate – even after several reminders and a series of telephone calls to clarify purpose and content of the questionnaire - proved to be low: only 73, questionnaires were returned distributed over 26 Member States[396], some only partially completed.

What became clear is that where a questionnaire was developed devoted to all aspects of the fight against corruption in public procurement (risk management, risk assessment, prevention, detection and investigation), most respondents could only provide data on a part of this continuum. Most national authorities involved in public procurement have only a limited view on investigation, whereas investigative agencies do not have knowledge with regard to preventive measures taken of innovative tools in public procurement. In many instances the consortium was asked whether it was necessary to fill out the entire questionnaire, since the respondent was only capable of answering some of the questions asked and lacked knowledge to answer the rest. Many questionnaires received where only partially answered. This leads to two observations:

- There seems to exist no comprehensive chain in the EU Member States ranging from public procurement to investigating corruption, integrating all parties involved and sharing and analysing data and information collected across all individual links in this – apparently non existing – chain. Although corruption in public procurement is an issue, public procurement and anti-corruption efforts seem to be organised separately from each other;
- To gather more (in depth) knowledge about policies and practices in public procurement that lead to the prevention of corruption, it is necessary to take this fragmentation into account and develop this benchmark in such a way that it recognises each parties role, responsibility and competences in the prevention, detection and investigation of corruption in public procurement (until a more comprehensive chain with a corresponding overview exists).

[395] PwC (2013), *e-Procurement Golden Book of Good Practice*. Study commissioned by the European Commission - DG MARKT. Available from: http://ec.europa.eu/internal_market/publicprocurement/e-procurement/golden-book/docs/e-procurement_golden_book_of_good_practice.pdf.

[396] No information from Greece was received. To benchmark Greece, information from open sources (THE ITALIAN PRESIDENCY, AUTHORITY FOR THE SUPERVISION OF PUBLIC CONTRACTS AND DEPARTMENT FOR THE CO-ORDINATION OF EUROPEAN UNION POLICIES (2010), *The comparative survey on the national public procurement systems across the Public Procurement Network*. Available from: http://www.publicprocurementnetwork.org/docs/ItalianPresidency/Comparative%20survey%20on%20PP%20systems%20across%20PPN.pdf [Accessed 14 March 2013]; EUROPEAN COMMISSION (2011), *Report From The Commission to the European Parliament and to the Council based on Article 8 of the Council Decision 2007/845/Jha of 6 December 2007 concerning Cooperation between Asset Recovery Offices of the Member States in the Field of Tracing and Identification of Proceeds From, or Other Property Related to Crime*. Available from: http://ec.europa.eu/dgs/home-affairs/news/intro/docs/1_en_act_part1_v8.pdf [Accessed 14 March 2013]; IDC (2012), *Study in e-Procurement Measurement and Benchmarking* MARKT 2011/097/C Lot 1 – Public Procurement Performance Indicators, EU Country Profiles Annex to D1.), the ECLAN-report on Greece produced for this study and the consortium's network was used. The overall scores for Greece are displayed in a different colour.

The wide-ranging questionnaire is most probably the reason why the response rate was much lower than initially expected, despite of the large amount of authorities, organisations and experts that were addressed and despite all the efforts (reminders, explanations and additional information sent) from the side of the consortium. But although the data is fragmented and the response rate was rather low, it is still possible to present at least a first view on the policies and practices in public procurement that contribute to the prevention, detection and investigation of corruption in the 27 Member States.

13.1.3. *Value of the benchmark*

As already mentioned in the previous chapter, it is possible to identify good policies and practices in procurement systems that lead to prevention of corruption *in theory*, but it is not possible to measure their effect in practice since it is very difficult to empirically measure the level of corruption in public procurement, let alone the change in the level of corruption in public procurement over time. Moreover, even when it was possible to measure the level of corruption in public procurement and the changes thereof, it would still be hardly possible – if at all – to determine the causality: if in a village the birth-rate is higher than elsewhere, and in this same village the number of storks has risen higher over the last years than elsewhere, this does not mean automatically that there is any (direct) correlation or causality between the two. The same goes for anti-corruption measures or even developed practices in public procurement and corruption level – both more difficult (if at all) to measure than births and storks.

So what can be concluded with regard to an EU Member State based on the mere presence of whistle blower protection, anti-corruption legislation, awareness raising programmes or innovative tools and methodologies to detect corruption in public procurement? Since no empirically founded conclusions can be made about the (changes in the) level of corruption in public procurement, one can only conclude that these policies and practices are there. And when compared, it can be concluded that some Member States have more or other practices and policies in place than others. But whether this results in anything, can at this moment not be concluded.

It is however relevant to start this benchmark, to improve and to repeat this benchmark over time, for at least two reasons:

- If practices and policies to prevent, detect and/or investigate corruption are *in theory* good to fight corruption in public procurement, there is no harm in implementing these in public procurement in those sectors of the economy where EU Funds are involved – provided that the costs of these measures are perceived as being in balance with their respective benefits;
- Since a first estimate of the probability of corruption in public procurement has been developed and tested in this study, it might become possible in the future to measure levels of estimated probability of corruption (and their estimated costs), as well as the development of these levels over time and in comparison between Member States. This might allow finding policies and practices that appear to contribute to low or decreasing estimated levels of probability of corruption in public procurement (and are absent in situations with high estimated levels of corruption). For these policies and practices, it could be worthwhile to further investigate their causality and their correlation with level of corruption in public procurement.

Further (experimental) research into the causality of practises and (changes in) the level of corruption is recommended. Moreover it is important to analyse in more depth the implementation of practises: it is difficult to assess whether practices are introduced because (or despite) of apparent or alleged high levels of corruption, or whether a proper implementation or functioning of the positive policies and practices is lacking, due to structural reasons or because a practise has only recently been implemented (or a combination of both).

13.1.4. *Analysis*

Our analysis focuses on the results of the collected data from the national and regional authorities as well as the experts in the 27 EU Member States. It is a comparative analysis based on the current situation in every EU Member State concerning the strategy and implementation of each pre-defined anti-corruption concept. Each of the benchmarking results is presented in the following sections.

The benchmarks were formulated as yes/no-questions. Respondents were allowed to provide additional information for each answer, or to make differentiations to the digital 'yes' or 'no' when they felt that an additional explanation was necessary. This option has not been used.

The tables in the following sections show the overall assessment of the collected data at Member State level. The scores on each of the indicators are represented as coloured dots, with the following values:

- Yes
- No
- No/insufficient input

Conflicting answers within one EU Member State were analysed thoroughly. National authority answers were preferred above regional authority results. When the comments included a reference to a legislation this outcome was chosen above a not documented negative answer. Some indicators couldn't be analysed due to lack of data provided by national and regional authorities of that particular country – these instances are presented as a black dot.

For each set of benchmarks, a graph is presented that displays the number of positives scores (green dots) per country, as well as the average score of the 27 Member States. As there was no input from Greece despite the extensive data collection efforts, the information was gathered from publicly available sources and reports of international organisations and the EU institutions. Therefore, there is a separate analysis made for Greece based on the set of benchmarks and presented with a different colour in the graphs.

In the concluding remarks, a graph presents the overall number of positive scores per Member State for all the benchmarks. These graphs should by no means be read as a ranking, since the composition of positive scores differs between Member States (even if they have an equal number of positive scores) and since for some Member States information on certain indicators is lacking. Moreover, the overview only pictures the number of positive scores, but neither the quality of a certain practice or instrument, nor how they are implemented and what their effectiveness is.

13.2. Analysis by EU Member State

The following sections and figures present the most important results of the benchmarking exercise and reflect the analysis of in a structured way. The colours represent the input of the national and regional authorities as explained below.

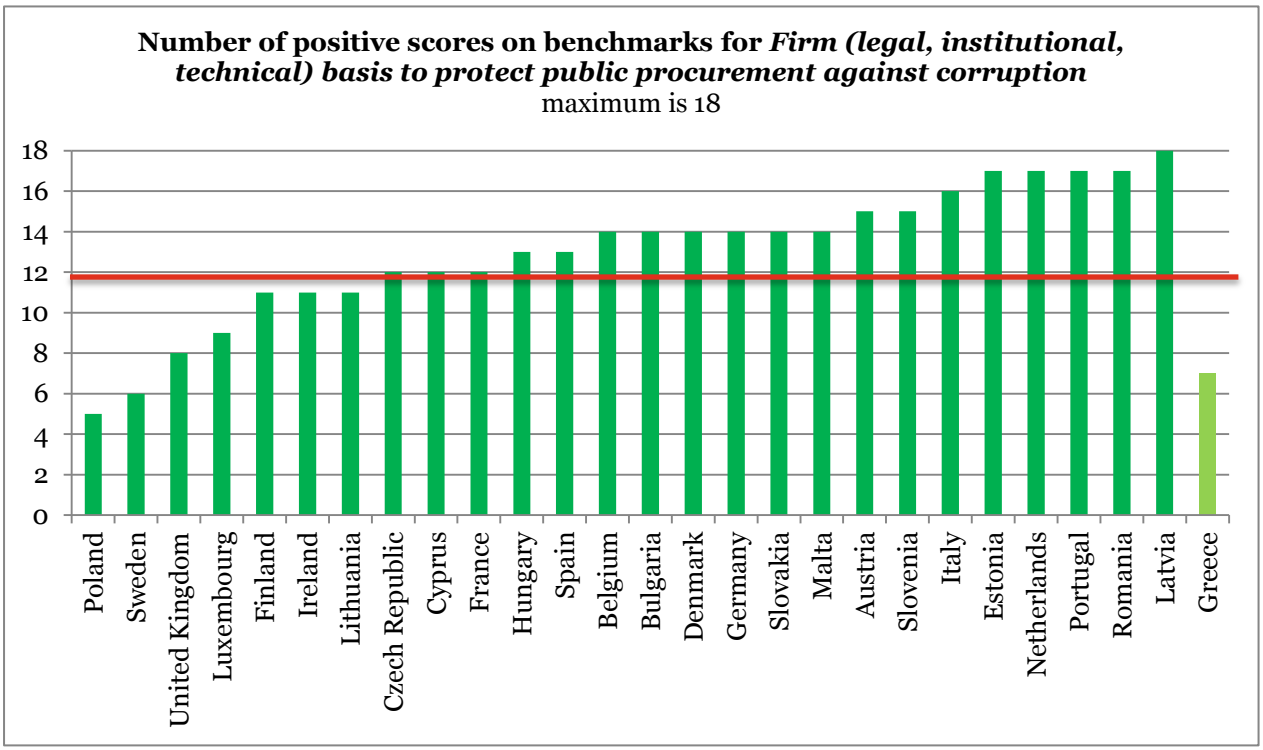
13.2.1. *Firm basis to protect public procurement against corruption*

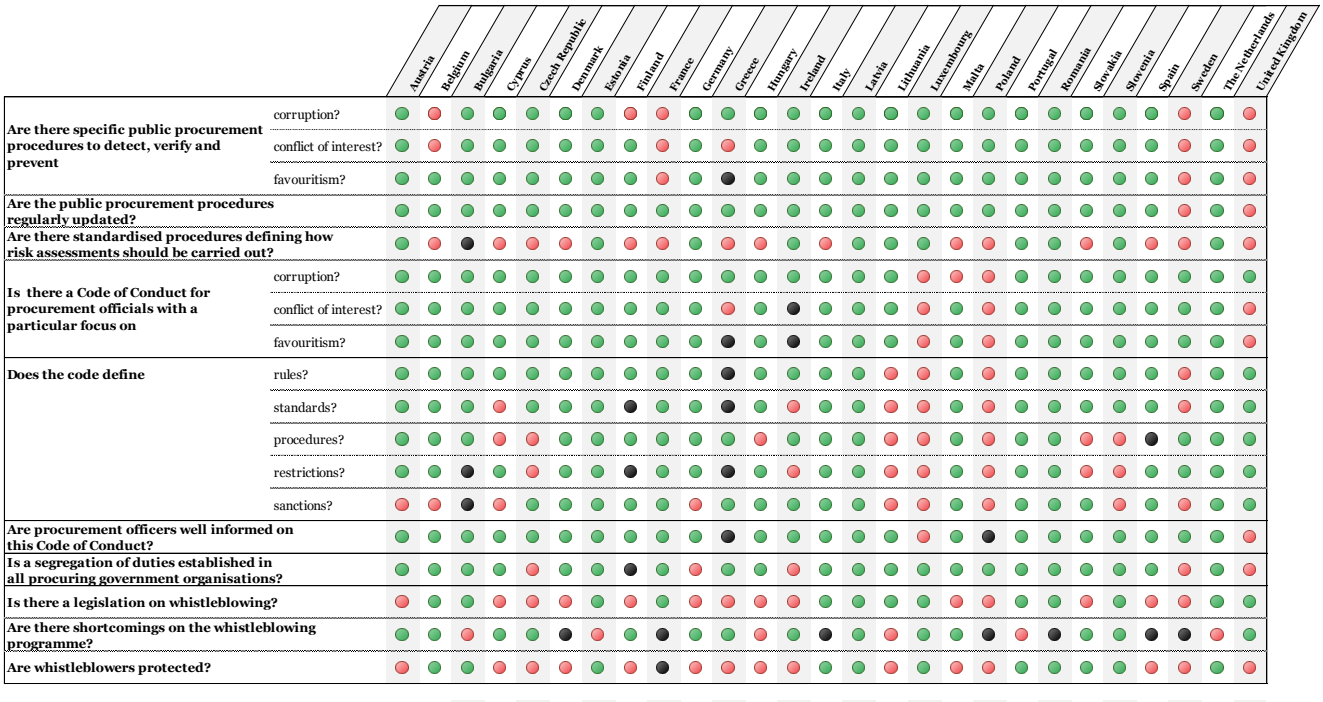
This section of the study looks at

- Whether public procurement *procedures* are in place aimed at prevention, detection and investigation of corruption, conflict of interest or favouritism;
- Whether these procedures are regularly updated:
- If there are any standardised risk assessment procedures;
- Whether codes of conduct exist;
- Whether procurement officers are well aware of these codes;
- Whether there is a segregation of duties established in all procuring government organizations; and
- If there is a whistle blowing legislation in place.

The first three benchmarks cover the practice concerning the public procurement procedures. Most countries have public procurement procedures which are updated regularly. For the legislation on whistle blowing the table marks a lot of "no's". Next to 14 countries that indicate they don't have a legislation, there were also a number of authorities who mentioned that this legislation has shortcomings and whistle-blowers are not protected by law. When analysing the questionnaires, the lack of information on the subject of the national and regional authorities was noticed. The limitations and shortcomings of the countries regarding the public procurement procedures and codes of conduct also indicates potential improvements, such as better recognition of the benefits of these anti-corruption measures.

There is a wide variety of scores on the benchmarks for Firm basis to protect public procurement against corruption, ranging from 4 to 18 (all) positive scores, the average being just below 13 positive scores.





13.2.2. *Risk assessment*

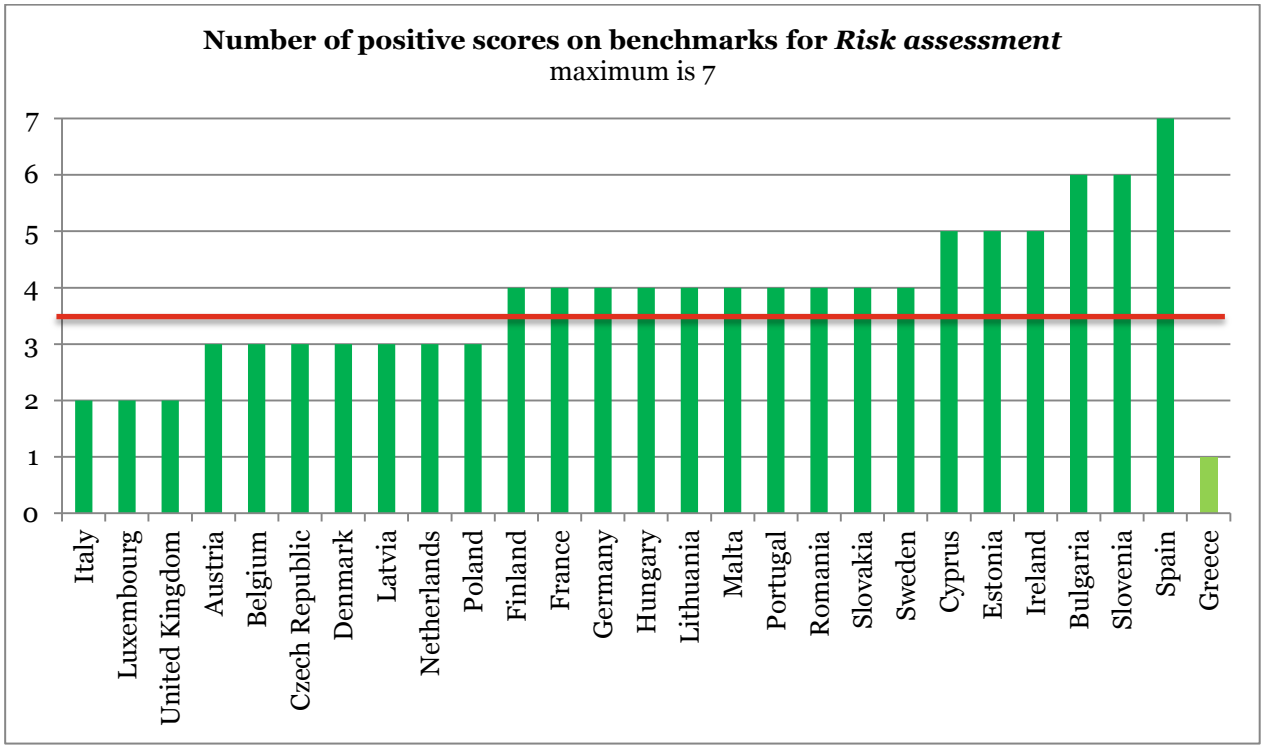
Risk assessments can prove to be a helpful element in the fight against corruption. This section analyses the systems and methods that the EU Member States use for risk assessment of corruption in public procurement. When looking at the systems and methods of the EU Member States used for risk assessment of corruption in public procurement, respondents pictured that in most Member States reviewing bodies independent from procuring agents exist and that these bodies are adequately resourced. E-procurement improves transparency, exchange of information and communication in almost all Member States. However, only four Member States have e-procurement platforms which contain a module designed for the detection of corruption.

And although there are central and/or local databases in the majority of the 27 Member States, only half of the Member States analyse such data on unusual patterns. When it comes to store data on all corruption cases in public procurement, authorities from only three Member States replied that such a database on central and/or local level exists.

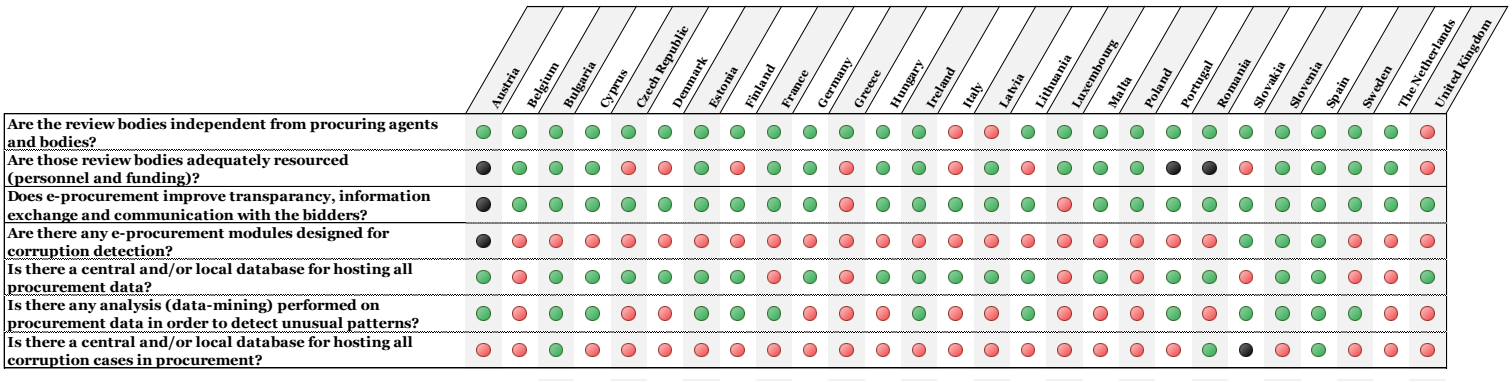
The collected data shows that in Cyprus, Czech Republic, Denmark and Italy there are initiatives and tools for risk assessment in public procurement. Finland has a central portal for notices which is connected to the EU TED-system. Databases from the portal of notices are also given yearly for study purposes to the Finnish Social Science Data Archive. Whereas the UK, Hungary and Lithuania only have a central database for public procurement, Italy has connected systems at the regional level. Latvia has the website of the Procurement Monitoring Bureau along with information about tenders. It also publishes information about entered contracts awarded by contracting units when negotiation procedure is applied. In Greece, eProcurement is not a generalized practice. However, awarded public contracts are made public in the internet. Greece is planning to launch its national public e-procurement platform in 2013.

In Portugal the BASE Portal compiles information on the negotiation and execution phases of a public contract. This information is sent to the portal by several contracting authorities (state, regional or local authorities, bodies governed by public law, associations formed by one or several of such authorities or one or several of such bodies governed by public law) and communicated at various stages in the public procurement process. There are also connections between the national and public databases. In Slovakia the public offices publish online the list of the business entities who participate in the public procurement in the List of Entrepreneurs. National databases of the business entities are not linked together. In Slovenia data on public procurement (including data on selected bidders) is connected only to the data from other public databases. Application "Supervizor", developed by the Anti-Corruption Commission, is an example of such a connection.

In Spain TRLCSP regulates the exchange of data from the existing public registers of Public Administrations. A central/ or local database for hosting all corruption cases in procurement is missing in most of the EU Member States.



Also on the benchmarks for risk assessment, the Member States score differ, ranging from 2 to 7 (all) positive scores (average is just below 4 positive scores).



13.2.3. *Prevention*

The comparative analysis of this section focuses on prevention:

- Whether civil servants involved in public procurement are screened and/or selected on a specialised education or training;
- Whether there is a pre-registration system for economic operators to register expression of interest for a bid in the forecast stage;
- Whether rules and procedures of debarment are clearly documented and publicly accessible;
- Whether the debarment lists and reasons for reference to the debarment rules are publicly available;
- Whether a list of bidders is communicated after the final submission date of the bids; and
- Whether the allegations are reported and registered centrally.

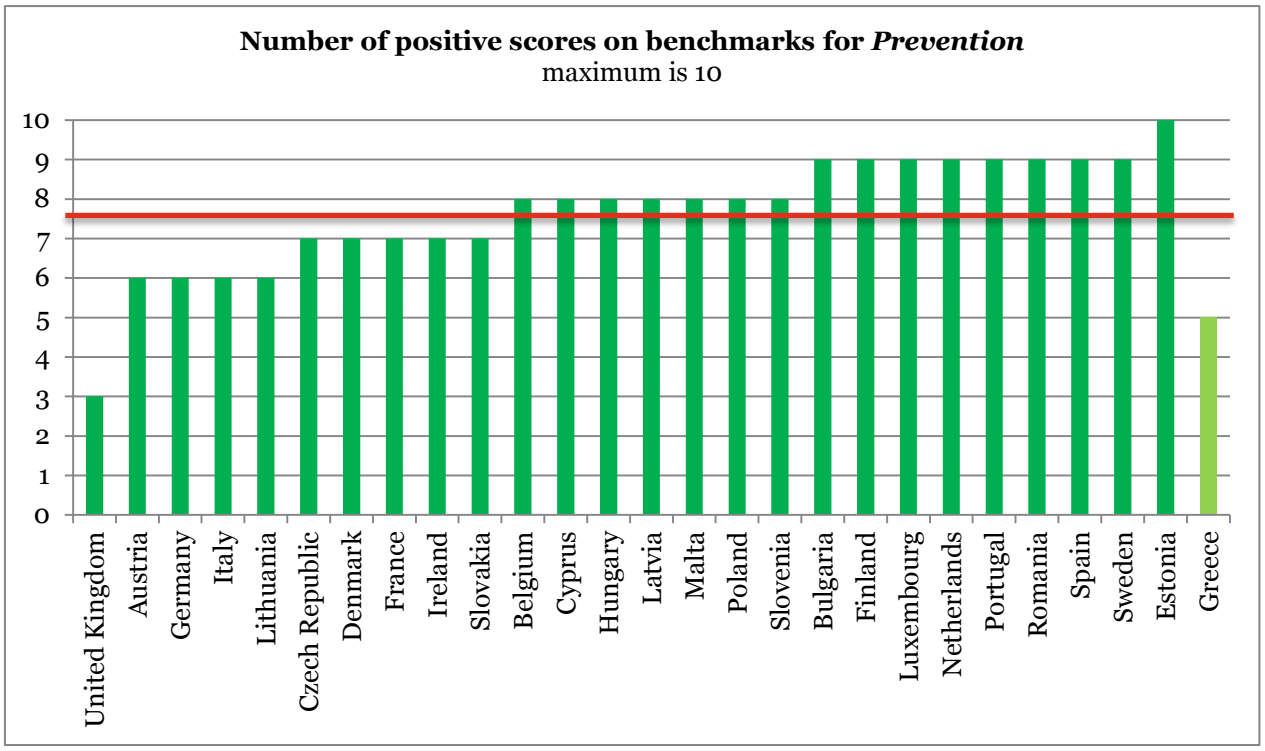
As shown in the table below the results look different compared to the previous sections. The collected data shows that many EU Member States have preventive measures against corruption in public procurement.

One of the first points indicated by the data is that the screening and selection of civil servants (involved in public procurement) is a common practice in a number of EU Member States. The screening on a specialised education or training is less common than the screening on their competence and susceptibility to corruption.

The use of a pre-registration tool for economic operators interested in specific public tenders is only implemented in nine EU Member States: Belgium, Cyprus, Estonia, Ireland, Lithuania, Portugal, Spain, Sweden and the Netherlands. This is a small number within the EU even though such a tool increases the chance of a fair competition during the tendering process.

Rules and procedures of debarment are clearly documented and publicly accessible in almost all of the EU Member States. This is also the case for the public availability of debarment lists and reasons with reference to the debarment rules. There are 18 Member States where all of these documents are publicly available.

For transparency reasons a list of bidders is communicated after the submission date of bids in nearly all Member States. A central register of reported allegations is not so common but available in more than half of the Member States.



	Austria	Belgium	Bulgaria	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	The Netherlands	United Kingdom
Are civil servants screened on their competence and/or susceptibility to corruption?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Are civil servants involved in public procurement screened on a specialised education or training?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Is there a pre-registration system/ tool for economic operators to register expression of interest for a bid in the forecast stage?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Is the technical qualification of economic operators that participate in public tenders verified (e.g. Request for references, request for certified skills/competences, quality assurance certificatesn etc.)?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Is the tender information dispatched to all potential bidders?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Is the financial capacity of economic operators that participate in public tenders is verified (e.g. Request for financial evidence, audit reports, etc.)?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Are rules and procedures of debarment clearly documented and publically accessible?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Are debarment lists and reasons with reference to the debarment rules publicly available?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Is a list of bidders communicated after the final submission date of the bids?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Are allegations reported and registered centrally?	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

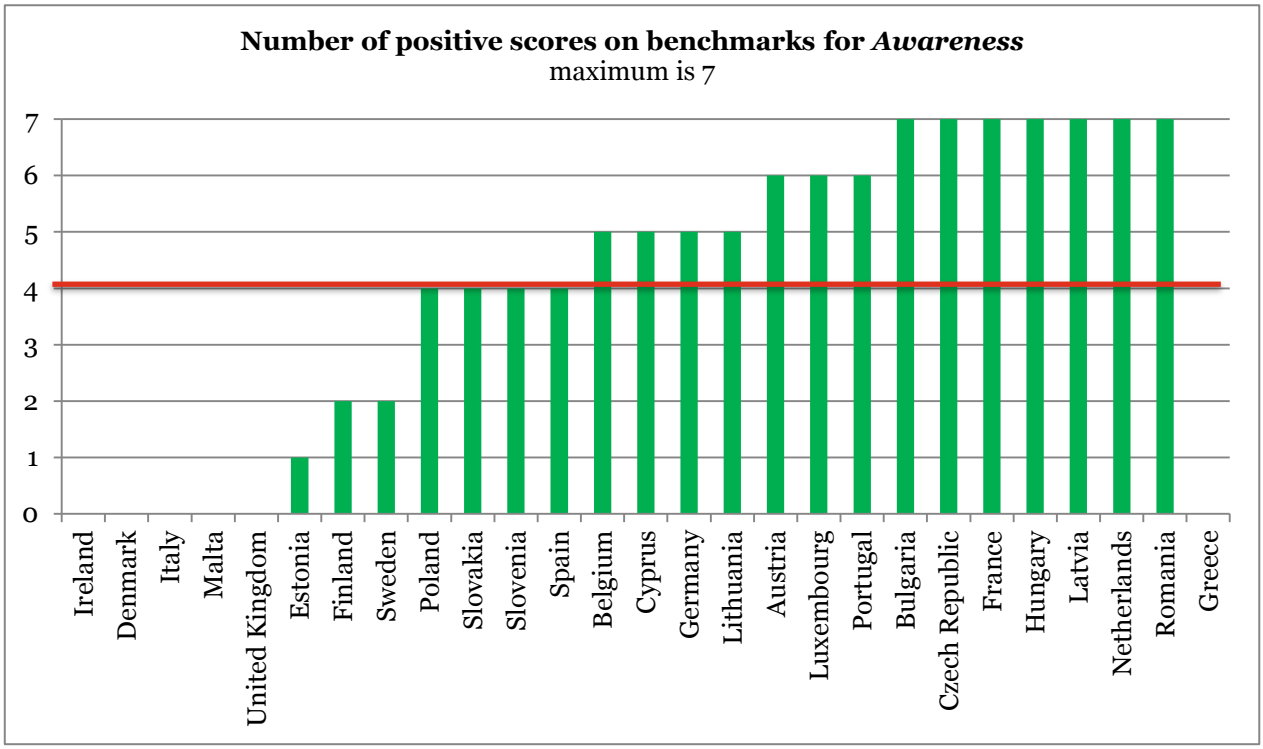
13.2.4. *Awareness*

Awareness is an important element of prevention. Therefore information from the EU Member States has been collected on:

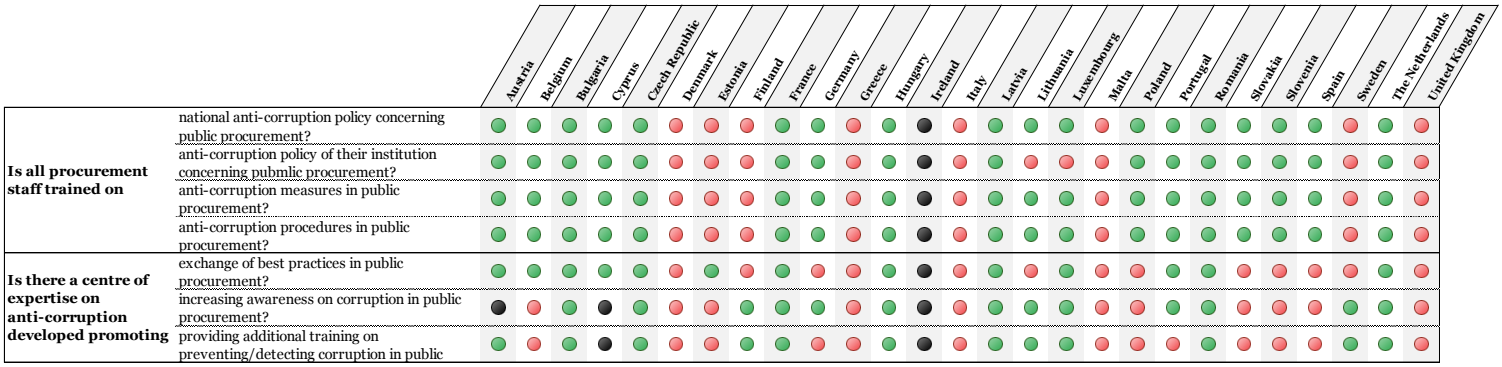
- Whether all procurement staff is trained on national anti-corruption policies concerning public procurement;
- Whether there are centres of expertise on anti-corruption promoting exchange of best practices of procurement, increase awareness on public procurement corruption and provide additional training on preventing/detecting corruption in public procurement.

When looking at the first question regarding training on national anti-corruption policies concerning public procurement, it can be noted that staff in 10 countries are not adequately made aware of the governing anti-corruption rules. There are training programmes given in 12 Member States. On the contrary, in quite some countries it was indicated that there are no such trainings conducted.

Regarding the centres of expertise there are also mixed results amongst Member States. While roughly half of the Member States have all these centres of expertise in place, the other half has none or just one.



Although the average number of positive scores on the benchmarks for awareness is above 4, the differences are very grave, with 4 Member States with no positive scores at all and 7 Member States with positive scores on all benchmarks.



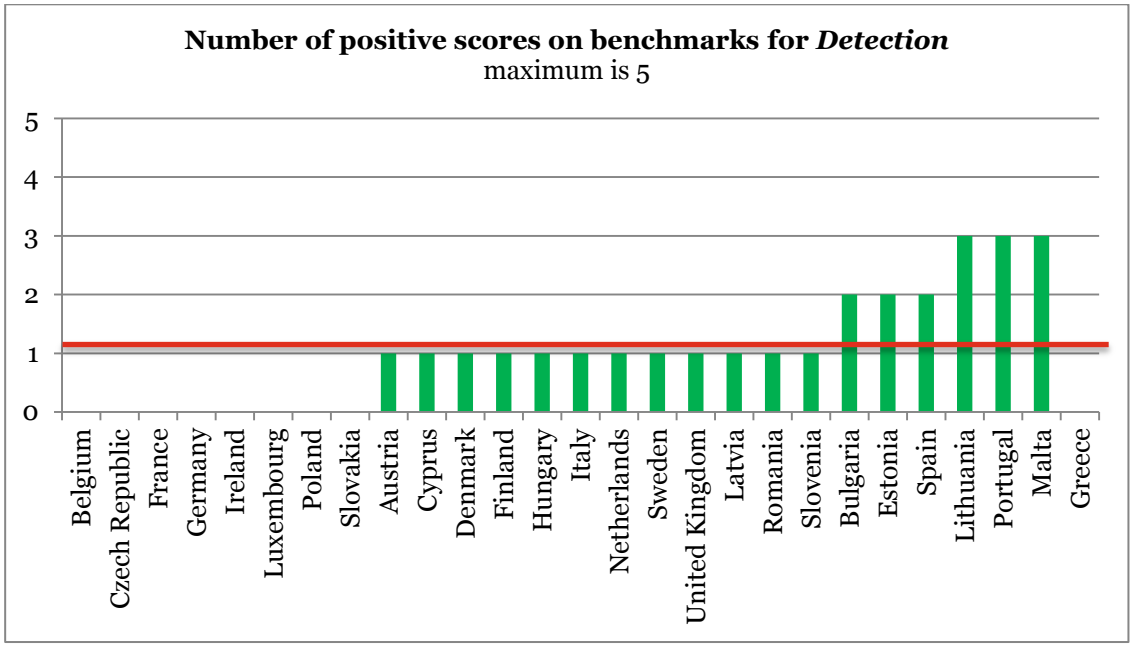
13.2.5. *Detection*

In this section the study looks at the performance of the EU Member States concerning the detection of corruption in public procurement. The benchmark indicators are based on whether statistics are available on complaints from non-winning bidders, on substantial changes in the scope of the project or the project cost after award, on splitting up of contract amounts, and situations wherein the public administration encountered situations in which it couldn't carry out these services internally.

In contrast to the previous sections, the results are mainly dominated by "no's". This is quite surprising as detection is a very important element in the fight against corruption. There is no EU Member State which has statistics available on all the corruption and detection related topics. Most of the statistics which are available exist for complaints from non-winning bidders. This is the case in roughly half of the EU Member States.

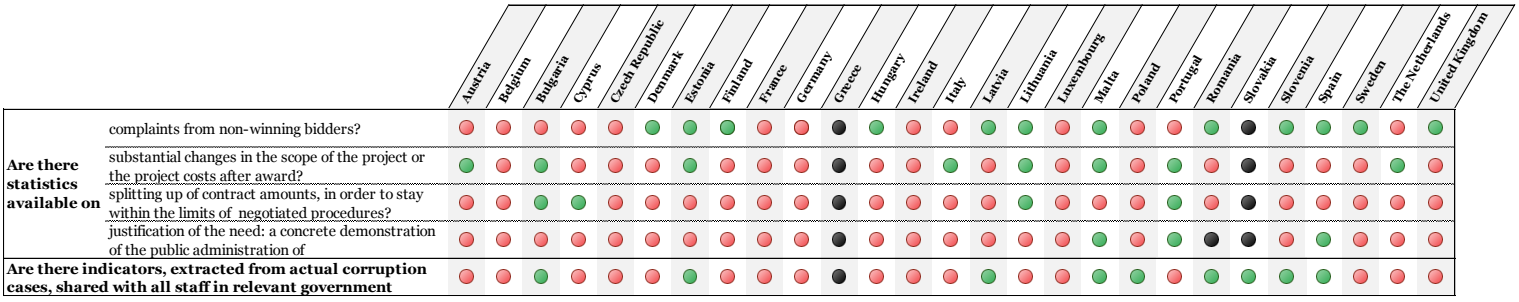
Statistics regarding substantial changes in the scope of the project are only available in 8 Member States. Only few countries have at least statistics on two categories. Statistics about the splitting up of contract amounts are only available in Bulgaria, Cyprus, Portugal and Lithuania.

The results also show that there are some EU Member States that share indicators of actual corruption cases with other staff in relevant government bodies. However, many Member States indicated the contrary.



The average number of positive scores on the benchmarks for detection is between 1 and 2, which means that the EU Member States score lowest on this part of the benchmark (with 6 Member States without any positive score). This indicates that there is potential room for improvement in the field of the detection of corruption in public procurement via data-collection and data-analysis and the use of corruption-indicators.

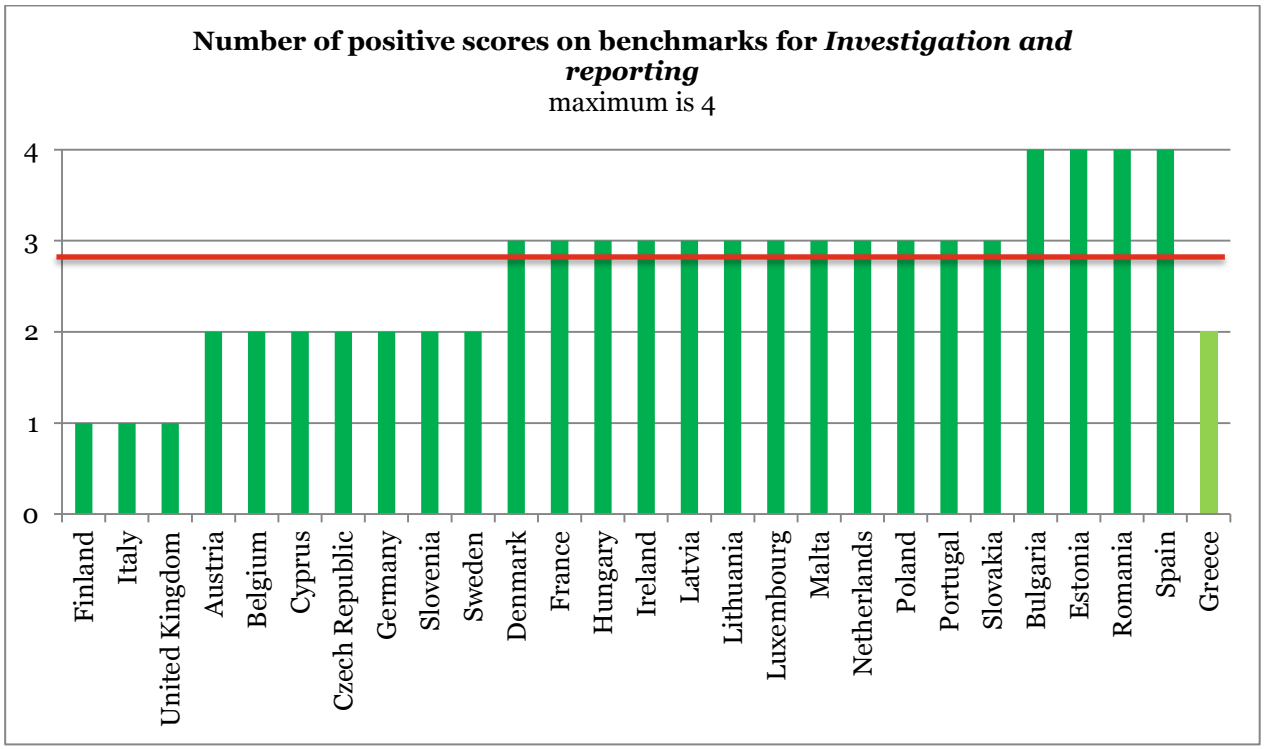
13.2.6. *Investigation and Reporting*



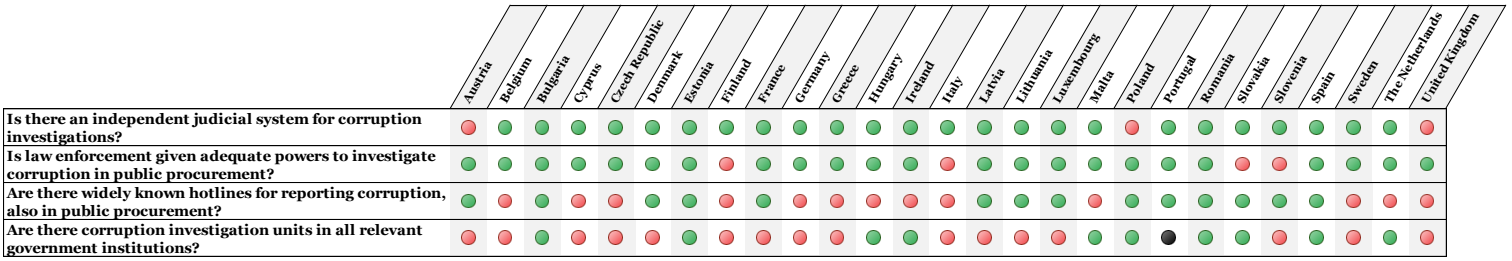
This part of the benchmarking exercise looks at the practices in all EU Member States regarding investigation and prosecution. In this section information has been collected on whether there is an independent judicial system for corruption investigations, whether law enforcement gives adequate powers to investigate corruption in public procurement, whether there are widely known hotlines for reporting corruption and if there are corruption investigation units in all relevant government institutions.

Most of the EU Member States who provided input stated that an independent judicial system for corruption investigations is existent. Also, the law enforcement gives adequate powers to investigate corruption in public procurement in most of these EU Member States. Exceptions however are noted in Finland, Italy, Slovakia, and Slovenia, where law enforcement is said to be granted insufficient powers to efficiently investigate corruption cases in public procurement.

Widely well-known hotlines for reporting corruption, also in public procurement, exist in 14 EU Member States. There are 10 EU Member States that indicate that there are corruption investigation units in all relevant government institutions.



On the benchmarks for investigating and reporting the numbers of positives scores vary as well, with numbers ranging from 1 positive score to 4 (all), with an average of almost 3 positive scores.



13.3. Concluding remarks

Since no empirically founded conclusions can be made about the (changes in the) level of corruption in public procurement, a benchmark of all 27 EU Member States on a number of indicators for aspects of their procurement systems can only demonstrate that certain policies and practices are in place. And, when compared, it can be concluded that some Member States have more or other practices and policies in place than others. But whether this results in anything – lower level of corruption in public procurement, higher rate of prosecuted cases of corruption in public procurement - cannot be concluded, at this moment.

It is however relevant to start this benchmark, to improve and to repeat this benchmark over time, for at least two reasons:

- If practices and policies to prevent, detect and/or investigate corruption are *in theory* good to fight corruption in public procurement, there is no harm in implementing these in public procurement in those sectors of the economy where EU Funds are involved – provided that the costs of these measures are perceived as being in balance with their respective benefits;
- Since a first estimate of the probability of corruption in public procurement has been developed and tested in this study, it might become possible in the future to measure levels of estimated probability of corruption (and their estimated costs), as well as the development of these levels over time and in comparison between Member States. This might allow finding policies and practices that appear to contribute to low or decreasing estimated levels of probability of corruption in public procurement (and are absent in situations with high estimated levels of corruption). For these policies and practices, it could be worthwhile to further investigate their causality and their correlation with the level of corruption in public procurement.

A benchmark of elements with regard to prevention, detection and investigation of corruption in public procurement requires a broad variety of data and information, scattered over a broad range of actors that mostly have only a limited view over the whole chain. Stimulating Member States to get a complete overview, or a more targeted approach that focuses on specific topics could help to get a better, more in-depth picture of the state of affairs in the respective Member States.

The benchmark that was performed for this study showed that when looking at the legal, institutional and technical situation in most of the EU Member States a firm basis to protect public procurement against corruption exists. With regard to the legislation on whistle-blowing as well as to the protection of whistle-blowers, respondents of almost half of the Member States replied that this was not yet well regulated.

When looking at the systems and methods of the EU Member States used for risk assessment of corruption in public procurement, respondents pictured that in most Member States review bodies independent from procuring agents exist and that these bodies are adequately resourced. E-procurement improves transparency, exchange of information and communication in almost all Member States. However, only four Member States have e-procurement platforms which contain a module designed for the detection of corruption. And although there are central and/or local databases in the majority of the 27 Member States, only half of the Members States analyse such data on unusual patterns. When it comes to store data on all corruption cases in public procurement, authorities from only three Member States replied that such a database on central and/or local level exists.

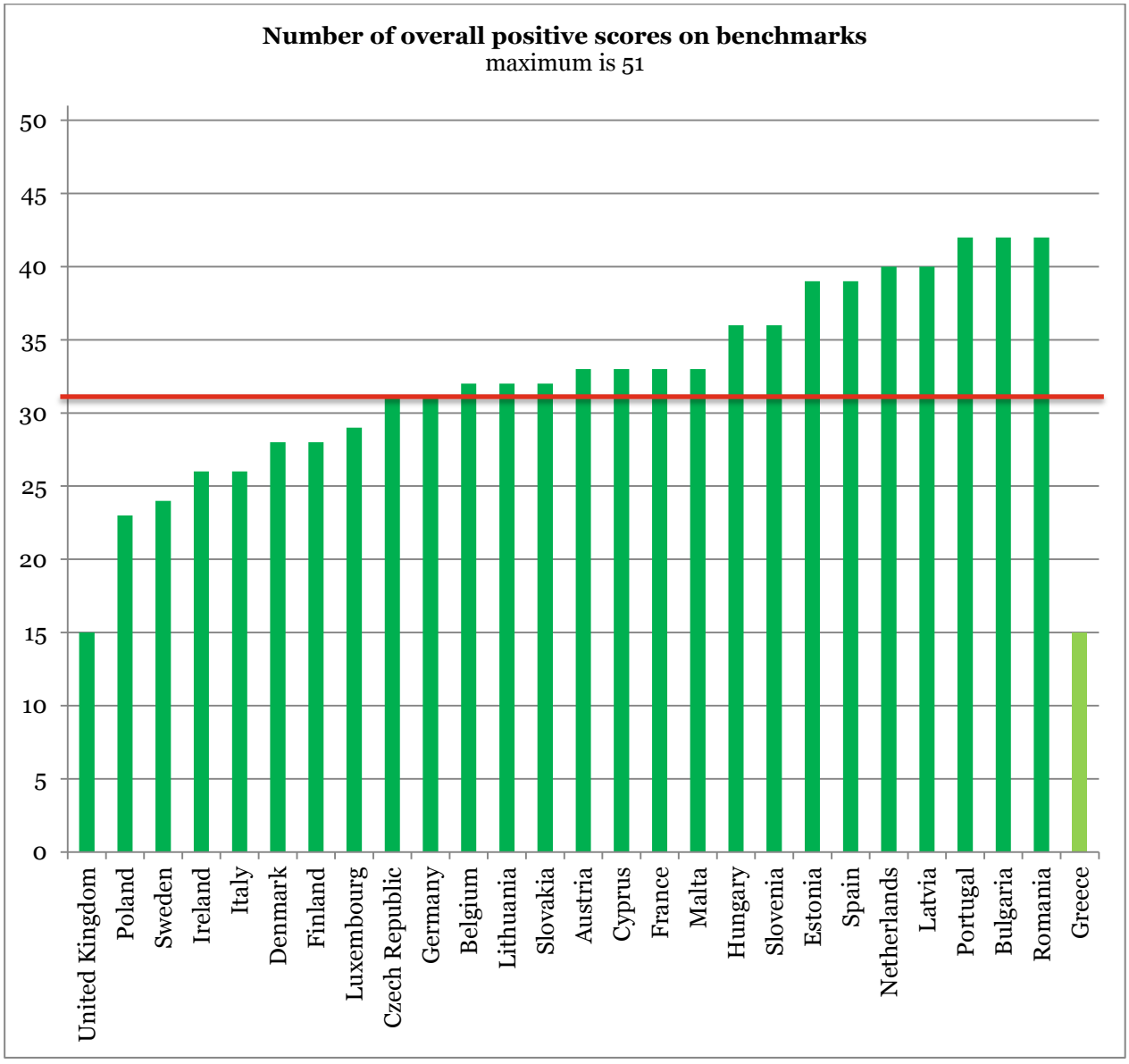
Most EU Member States have preventive measures in place against corruption in public procurement. Screening of civil servants (involved in public procurement) is a common practice in a number of EU Member States, but selecting them on a specialised education or training is less common than screening on their competence and susceptibility to corruption. Rules and procedures of debarment are clearly documented and publicly accessible in almost all of the EU Member States. This is also the case for the public availability of debarment lists and reasons with reference to the debarment rules.

The picture with regard to raising awareness in the Member States, by means of training of staff on national anti-corruption policies and establishing centres of expertise on anti-corruption is mixed. Since awareness programmes are on average not very resource intensive and easy to develop, this would be most likely area with room for improvement in a number of Member States.

The lowest numbers of positive scores are achieved in the benchmarks for detection of corruption in public procurement. The collection of data and statistics in the field of public procurement, useful for detecting possible irregularities or even corruption, as well as for the use of indicators that point to possible cases of

corruption are implemented only in a few Member States. Especially when bearing in mind the results of weighing and testing of red flags in this study, there is certainly room for additional efforts.

With regard to the investigation of corruption, most of the EU Member States which provided input stated that an independent judicial system for corruption investigations is existent. Also, the law enforcement gives adequate powers to investigate corruption in public procurement in most of these EU Member States. Widely well-known hotlines for reporting corruption, also in public procurement, exist in 14 EU Member States. There are 12 EU Member States that indicate that there are corruption investigation units in all relevant government institutions.



When all positive scores are added up, substantial differences between the Member States become visible – the number of positive scores per Member State ranging from 15 to 42, with an average of almost 32.

Again, this graph should by no means be read as a ranking of the Member States, since the composition of positive scores differs between Member States (even if they have an equal number of positive scores) and since for some Member States information on certain indicators is lacking. Moreover, the overview only pictures the number of positive scores, but neither the quality of a certain practice or instrument, nor how they are implemented and what their effectiveness is. On the other hand, it indicates that there are substantial differences between the Member States when it comes to having instruments and practices in place to prevent, detect and investigate corruption in public procurement. This could serve as a starting point for a discussion on the background of these differences and whether some Member States should not consider implementing some additional instruments or practices in this field.

When compared to common convictions about corruption in the different Member States and with perception indices like the Corruption Perception Index of Transparency International, the top three Member States – especially Bulgaria and Romania – might appear remarkable. However, also here it is difficult to tell form empirical evidence how true these convictions are when it comes to public procurement in these countries (the comprehensive methodology presented in chapters 7 to 10 only does not allow yet for such conclusions), and even when corruption levels in public procurement in these countries are high: it is not known whether these practices are introduced because (or despite) of these apparent or alleged high levels of corruption, or whether a proper implementation or functioning of the positive policies and practices is lacking (or a combination of both). Another element that is not included is time: it is unclear whether some practices exist already for a long time in some Member States, whereas other Member States just recently introduced them and time is needed to make them become effective and show results. Further research could help to shed light on differences in implementation and functioning of these and other practices, as an element to understand the causality between policies and practices in public procurement and (changes in) corruption levels.

14. Conditions and key actors for prevention, detection and investigation of corruption

14.1. Introduction

This chapter analyses the conditions, both in terms of incentives and disincentives, for key actors to effectively detect, prevent and investigate corruption cases in public procurement and in relation to the EU Funds. Particularly, the analysis focusses on the 8 Member States selected for this study (France, Hungary, Italy, Lithuania, the Netherlands, Poland, Romania and Spain). It identifies which actors detect corruption and in what proportion. It also identifies material, legal and other conditions for the effective enforcement of existing rules and procedures, with particular attention to the incentives/disincentives to investigate corruption cases and to recover misused funds.

14.2. Key actors

Based on the review of the Country Case Studies provided for this study, the following types of key actors have been identified:

- Actors specific to the EU Structural Funds at Member State level;
- Dedicated procurement agencies and bodies;
- National Courts of Auditors;
- Dedicated corruption prevention bodies;
- Specialised anti-corruption bodies;
- National investigative institutions.

Furthermore, the following informal actors will be mentioned as well:

- Civil society and social media networks;
- Media and investigative journalists.

The matrix below provides a general overview of the types of institutions involved in the fight against corruption and the recovery of misused funds in the 8 selected Member States. The classification provides a distinction among institutions following their specialisation in prevention, detection or investigation activities.

Table 120 : Overview of insitutions by specialisation			
	Prevention	*Detection*	*Investigation*
Actors specific to the EU Funds	MA's, Certifying Authorities, Audit Authorities		
Dedicated Procurement Agencies and Bodies	Italy, Hungary, Romania		The Netherlands
	Lithuania, Spain, The Netherlands, Romania	The Netherlands, Romania	
National Courts of Auditors		France, Italy, Lithuania, Hungary, Spain, The Netherlands, Romania, Poland	
Dedicated Anti-Corruption Institutions	France, Italy		France, Lithuania, Hungary, The Netherlands
		Spain	
	Romania		
National Investigative Agencies			Italy, Lithuania, Hungary, Spain, The Netherlands
		France, Poland	
Civil Society and Social Networks	France, Italy, Lithuania, Span, The Netherlands, Poland	Spain	
	Poland		
Media and Investigative Journalists		Investigative Journalists (Italy, Hungary, Lithuania, The Netherlands, Romania, France)	

14.2.1. *Actors specific to the EU Structural Funds*

Structural Funds regulations require that "management and control systems" for Operational Programmes are effectively set-up by Member States in accordance with Articles 58 – 62 of Regulation (EC) 1083/2006.[397] These systems should prevent, or, detect and correct irregularities and recover amounts unduly paid. If such amounts cannot be recovered, the Member State shall be responsible for reimbursing the European Union if the loss has been incurred as a result of fault and negligence on its part.

A specific Managing Authority is therefore identified for each Operational Programme within the EU (being it at the national or regional levels, set up by those Member States responsible for the funds and based on the governance structure and organisation of the State). Similarly, for each Operational Programme a Certifying and Audit Authority is designated, typically within the same institutional body where the Managing Authority lies (e.g. Central government's Ministry or Regional Government).

A key role in ensuring quality of financial allocation and financial audit is performed at the national or regional level, through local bodies of which powers and responsibilities are defined by law across EU Member States. Managing Authorities, Certifying Authorities, Intermediate Bodies and Public Beneficiary Bodies must provide systems descriptions as set out in Article 22 of the Implementing Regulation 1828/2006 (for the current programming period, with regulation to be renewed in the forthcoming period 2014-2020[398]).

[397] Council Regulation (EC) No 1083/2006 of 11 July 2006 laying down general provisions on the European Regional Development Fund, the European Social Fund and the Cohesion Fund and repealing Regulation (EC) No 1260/1999.

[398] The new proposals are designed to reinforce the strategic dimension of the policy and to ensure that EU investment is targeted on Europe's long-term goals for growth and jobs ("Europe 2020"). EU Commission (2013), EU Cohesion Policy 2014-2020: legislative proposals http://ec.europa.eu/regional_policy/what/future/proposals_2014_2020_en.cfm.

For all these bodies, the proportionality principle applies, so that "extent and intensity of Community controls should be proportionate to the extent of the Community's contribution. Where a Member State is the main provider of the financing for a programme, it is appropriate that there should be an option for that Member State to organise certain elements of the control arrangements according to national rules. In these same circumstances, it is necessary to establish that the Commission differentiates the means by which Member States should fulfil the functions of certification of expenditures and of verification of the management and control system and to establish the conditions under which the Commission is entitled to limit its own audit and rely on the assurances provided by national bodies."[399]

In practice, Managing Authorities play a key role in the prevention of fraud and corruption, e.g. through information and awareness campaigns. Detection of fraud and corruption is a shared responsibility amongst Managing, Certifying and Audit Authorities, with Audit Authorities playing a key role. However, audits focus mostly on processes and procedures, and not necessarily on the performance of projects and programmes, hence their contribution to the detection of corruption remains confined to the identification of irregularities in general. For this, performance audits are needed, but these are much rarer.

The performance of the EU Funds is also assessed by evaluations including external independent evaluations, for which the requirements are governed by EU Regulation 1083/2006. Evaluations of the Structural Funds are taken forward at the level of (or combinations of) Operational Programmes, and consist of Ex ante, On-going and Ex post evaluations. However, despite the existence of extensive evaluation mechanisms and practices across the EU, evaluators are not focussing on the detection of corruption but rather on the feasibility, advancement, and quality of results for the Programmes. In fact, although Ex post evaluations focus on the assessment of the performance of such programmes (including rationale, effectiveness and efficiency), no such evaluation reports have been encountered so far addressing corruption. This can be caused by the fact that evaluations often take place at programme-level, with limited attention paid to individual projects. Furthermore, the consortium's experience in evaluating the Programmes, as well as finding emerging from interviews for this study, suggests that evaluators are commonly lacking specific investigative skills required to detect underlying patterns of corruption, while neither evaluators nor commissioning bodies have incentives to overtly point to corruption.

14.2.2. *Dedicated Procurement Agencies and Bodies*

In the 8 Member States studied, prevention and detection activities are, in general terms, handled by dedicated procurement agencies and bodies. Besides the capitalise managing, contracting and auditing the use of EU Funds across all Member States, the great majority of the countries studied have established public authorities with the responsibility to supervise and coordinate public contracts. Some of them do also play an active role when it comes to prevention of irregularities, including corruption.

Italy's Authority for the Supervision of Public Contracts (AVCP) is a collegial body responsible for the regulation and inspection of transparency in Italian procurement practices. Further responsibilities to the AVCP have come from the entry into force of the recently approved Anti-Corruption Law. Next to the detection of corruption functions, the AVCP is accepted to play an active role of prevention of corruption in procurement practices through mainly the coordination and collection of sensitive procurement data from all the Italian Managing Authorities and the cross-analysis of patterns and trends.

Spain, despite being a decentralized country divided in Autonomous Communities, has put in place an administrative supportive body to supervise the appropriate application of the Spanish law on public procurement. The Consultative Board of Public Procurement is an advisory body that can be consulted for advice by all administration levels (central, regional and local). It has progressively been recognised as a guarantee institution for the application of Spanish and European law.

Similar to Spain, *Poland* and *Lithuania* also have established similar administrative supportive bodies with the aim to supervise and coordinate public contracts.

[399]Council Regulation (EC) No 1083/2006 of 11 July 2006 (69).

Other bodies in charge of procurement supervision or advice sit within Government ministries. In the *Netherlands*, for instance, the Ministry of Economic Affairs, Agriculture and Innovation hosts the PIANOo, the Dutch Public Procurement Expertise Centre. Set up to professionalise procurement and tendering in all government departments with a view to improving efficiency and compliance with the rules, PIANOo brings procurement and tendering experts together, pools knowledge and experience and provides advice and practical tips.

Among other centralised institutions, *Hungary's* National Protective Service (NPS) is worth mentioning for its special focus on prevention and detection duties. Appointed by the Hungarian government, the NPS focuses on offences such as bribery, forgery of official documents and crimes committed in place of service or related to the activity of the office (if the detection of crime is not falling with the competence of another authority). When suspicion of committing a crime is detected, the Service immediately reports it to the competent investigation authority to start the investigation, or passes the collected data to the prosecutor's office. The NPS is also the official Hungarian partner of the European Partners against Corruption (EPAC) and European contact-point network against corruption (EACN).

In *Romania*, the fully centralised procurement system is also supported by a supervision and coordination body. Worth mentioning is another Romanian institution, the National Integrity Agency, which has two main functions: determine the tax returns of public officials during the time they were employed in public institutions and verify any possible conflicts of interest and incompatibilities. By the time of ANI's creation in 2007, Romania was the only Member State to have such a specialized institution tasked to verify the accuracy of personal wealth declarations of public officials, as well as verification of conflicts of interest and possible incompatibility situations.

14.2.3. *National Courts of Auditors*

All 8 Member States studied have a well-established independent Court of Auditors with predominantly control and supervisory powers on how the State and the public sector's financial resources are established, managed and used.

Among its duties, *Romania's* Court of Accounts performs audits on public procurements involving national and European funds. The controls performed by the Supreme Audit Office in *Poland* have contributed to highlighting the presence of corruption in areas such as spatial planning, tax and customs and the purchasing of medical equipment. Since 1999, corruption risk has been covered in a separate chapter in the Polish Supreme Audit Office annual report.

Some countries have also created special audit authorities with ad hoc supervisory powers. Besides its Court of Auditors, *Spain* has another key actor involved in detecting corruption: the Internal Auditors of the Central Government. It is the administrative corps that performs the internal control of the state's public-sector economic and financial management and is the department responsible for managing the public accounting system. It is in charge of verifying, by means of the prior control of legality and financial control, that the economic and financial activity of the public sector observes the principles of legality, efficiency and efficacy.

14.2.4. *Dedicated corruption prevention bodies*

Two countries have put in place bodies with particular corruption prevention duties, France and Italy. *France*'s Central Service for the Prevention of Corruption (SCPC) is an administrative body under the supervision of the Ministry of Justice. Its core functions are the following:

- Centralize information related to corruption and to its constitutive infractions;
- Advise the Ministries and the local administration on how to best detect corruption;
- Assist the law enforcement authorities in their fight against corruption;
- Raise public awareness on the matters of corruption.
- Organise training courses for Universities and specialized schools (National School of Administration, National School of Magistrates, Police schools, etc.), professional organisations (MEDEF), as well as public institutions (TRACFIN) and private companies;
- Collaborate with many international organizations, such as UNODC, OECD, GRECO, World Bank and European Union.

Italy has also established an Anti-Corruption Service of the Ministry of Public Administration. After the ratification of the United Nations Convention against Corruption (UNCAC), an ad hoc Anti-corruption and Transparency Service was established. It was intended to allow the development of a systematic strategy for the prevention of the different types of illicit behaviour occurring in the public administration through mainly:

- Regular review of the updating and relevance of legal instruments and administrative practices;
- Identification of critical areas of the regulatory system;
- Checking the degree of vulnerability of the public administration to corruption and to the criminal behaviour associated with it;
- Promotion of awareness and information on the corruption practices.

14.2.5. *Specialised Anti-corruption bodies*

In the great majority of the Member States studied, special anti-corruption institutions run investigations in corruption matters. In some countries, such bodies are also involved in detecting and preventing corruption.

In *Romania*, The Fight Against Fraud Department – DLAF assures the protection of the European Union's financial interests in Romania. The Department has the competency for control of EU Funds, being the national coordinator of the anti-fraud fight. Established in 2005, DLAF has represented the beginning point in creating a Romanian anti-fraud system.[400] DLAF is also the contact point for the European Anti-Fraud Office (OLAF) and the Anti-Fraud Coordination Service (AFCOS) in Romania. It provides operational coordination at national level and performs investigations in collaboration with the representatives of the financial and fiscal control bodies, police or other agents of the public force. All law enforcement agencies and control bodies have the obligation to provide operational support to DLAF investigators, in order to enable the latter to discharge their mandate. DLAF is the body responsible for investigating offences against EU financial interests. DLAF carries out operative control following the allegations received from OLAF, National Authorities having competencies in managing the Community financial assistance, or other sources (e.g. individual citizens and other institutions). As such, DLAF investigators have unconditional access to premises, properties, means of transport or any other area used for economic purposes; it can take statements from the persons who have committed the illegal actions or from witnesses being present when the crime was committed; it can draft the process-verbal on the concrete circumstances regarding the committed crime; and it can retain *corpus delicti*.

Romania has a second investigative body specialised in the fight against corruption: The National Anti-corruption Directorate (DNA).[401] It is an independent prosecution body specialised in the fight against corruption. DNA conducts criminal investigations in cases involving corruption offences, in close cooperation with all the other relevant parties in the fight against corruption. In 2011, it was subject to an evaluation made by the European Commission. The results of the evaluation confirmed the fundamental role that the DNA plays in the fight against corruption.

The Anti-Fraud Coordination Service in *Hungary* (AFCOS) is one of the specialised units within the National Tax and Customs Administration of Hungary (NAV). The NAV is only operational since 2011, when the predecessor organisations (the Hungarian Tax and Financial Control Administration and the Customs and Finance Guard) were merged into a new and integrated organisation. The NAV is directed by the government and has investigative powers regarding, among other things, corruption cases, tax fraud, and money laundering. As for the AFCOS, it is an administrative body with 12 employees. It aims to ensure cooperation between OLAF and the Hungarian organisations and authorities, and to participate in and coordinate the domestic implementation of legal, administrative and operative obligations related to the protection of the financial interests of the European Union.

[400] http://www.antifrauda.gov.ro/en/about_us/who_we_are_and_what_we_do.
[401] http://www.pna.ro/sesizare.xhtml.

France can count on two main criminal investigative agencies, the BCLC and the BRDE, both specialised in the repression of corruption. The Central Brigade for Fighting Corruption (*La Brigade Centrale de Lutte contre la Corruption* - BCLC) falls under the administration of the Central Judicial Police Directorate of the French National Police Forces. It comprises police officers, gendarmes and one tax inspector within its staff. The BCLC specialised structure was created on the basis of the recommendations issued by GRECO and the OECD, which had previously evaluated France on its institutional capacity to address and fight corruption. The BCLC investigates all corruption offences as well as traffic of influence, abuse of power for private gains, misappropriation of public funds, etc.[402] Additionally, it can also investigate integrity infringement offences such as abuse of social goods or fiscal offences. The BCLC is an inter-ministerial body, accountable to the Ministry of Interior and to the Ministry of Defence. Internationally the BCLC plays an important role in ensuring a fast and reliable exchange of information with foreign competent authorities for the purpose of gathering the relevant financial intelligence and evidence of cross-border illicit behaviours. It also serves as a contact point for international fora which focus lies in the sphere of international corruption.

The Brigade of Repression of *Economic Crime (Brigade de Répression de la Délinquance* - BRDE) is a criminal investigative body located within the Ministry of Interior, responsible with the criminal investigation of corruption offences within the *prefecture* (police headquarters) of Paris. The BDRE has local competence in Paris and only has national competences in the course of a judicial instruction. The role of the BRDE is to lead investigations, by collecting all the pieces of evidence from the public procurement. There are various ways through which the BRDE can be seized for a corruption case: one of the competitors complains about the public procurement procedures; a person within the selected contractor denounces corrupted practices; there can be a control of legality by the prefecture if the contracts are above 200.000 Euros.

The Special Investigation Service (SIS)[403] is *Lithuania*'s separate institution tasked to fight against corruption. The SIS is independent of the executive and is the body responsible for coordinating the National Anti-Corruption Strategy, detecting and preventing corruption offences and ensuring coordination of anti-corruption measures, both among State institutions and between them and society. The SIS is accountable to the President and Parliament, and is required by law to submit reports to the President and Chairperson of the Parliament on the results of its activities and recommendations for improving its activities. These reports are not public. State authorities and institutions, political parties, public organisations and movements are explicitly prohibited from interfering in SIS activities. Moreover, investigation departments of the SIS are responsible in specific investigations to the Prosecution Office, and not even the SIS Director can interfere in their activities.

Spain has established the Special Prosecution Office Against Corruption and Organised Crime. It is a specialised office within the State Prosecution Service with a mandate to investigate and prosecute specific bribery and corruption-related offences.[404] It is competent for two major areas of offences: economic offences and offences committed by public officials in the exercise of their public duties. In order for the Special Prosecutor's office to intervene, the offences must be of particular significance (complexity, importance, damage, organised crime, etc.). The Special Prosecutor's Office against Corruption and Organised Crime constitutes the main tool for the purposes of detecting, investigating and prosecuting Spanish cases of corruption. In addition, its individual prosecutors (15 in total) are allowed to act before any Spanish judicial authority, wherever it is placed, both in the instruction and in the trial phase of the judicial

In the *Netherlands*, a special National Public Prosecutor for Corruption[405] is appointed with the task to investigate and prosecute corruption cases, as well as assist local public prosecution offices in their investigation and prosecution of corruption. The National Public Prosecutor for Corruption is specialised in the investigation and prosecution of corruption cases, but also investigates and prosecutes on other areas covered by the National Police Internal Investigation Department (*Rijksrecherche*), e.g. in the area of illegitimate use of force by law enforcement authorities and contributes to the development of relevant policies. Most cases are generally investigated by public prosecutors at regional level with the regional police forces. Another area dealt with by the National Public Prosecutor for Corruption is the combat against foreign corruption. Within the area of foreign corruption, investigations are mainly focused on financial transactions.

[402] http://www.police-nationale.interieur.gouv.fr/Organisation/Direction-Centrale-de-la-Police-Judiciaire/Lutte-contre-la-criminalite-organisee/Division-nationale-d-investigations-financieres-et-fiscales.

[403]http://unpan1.un.org/intradoc/groups/public/documents/untc/unpan018131.pdf.

[404]http://www.keepeek.com/Digital-Asset- management/oecd/governance/specialised-anti-corruption-institutions_9789264187207-en.

[405]Http://www.om.nl/vast_menu_blok/english/about_the_public/who_monitors_the/.

Prevention, detection and investigation activities are performed by *Poland*'s Central Anti-Corruption Bureau,[406] a special service that combats corruption in the public and private sectors, especially in the State and local government institutions. It also fights against any activity which may endanger the State's economic interest. It was established in 2006 with the following duties:

- Operational and investigational activities;
- Control activities;
- Analytical activities;
- Corruption prevention, including anti-corruption education of the society.

It therefore not only accomplishes its tasks through direct prosecution of corruption perpetrators but also by paying more attention to preventive and educational activities. These activities are carried out in cooperation with other agencies and non-governmental organisations (NGOs) involved in fighting corruption and bribery. Within the last years, the Central Anti-Corruption Bureau focused its activities on countering threats to key public procurements, privatisation processes and accomplishment of government programmes, particularly those covered by the "anti-corruption shield".

14.2.6. *National Investigative Agencies*

Although National Investigative Agencies are present across the 8 Member States studied, they feature substantial differences when it comes to their nature, degree of independence and focus areas.

In *France*, the Financial Intelligence Unit (*Traitement du Renseignement et de l'Action contre les Circuits Financiers clandestins - TracFin*) is an administrative investigative unit located within the Ministry of Finance that is charged with mainly detection and investigation duties. Independent from the judiciary and the law enforcement authorities, Tracfin receives and collects reports of suspicious transactions that financial entities, lawyers, notaries, casinos and other state institutions are obliged to deliver upon suspicion that they involve money derived from illegal activities. Tracfin will then analyse these reports and, in case indicators of a predicate offence are found, it will disseminate its financial intelligence to the competent law enforcement authorities to ensure that the funds are confiscated and that the crime perpetrators and the money launderers are sanctioned accordingly.

In Lithuania, Hungary and Spain prosecutors have both law enforcement and investigative powers. In *Hungary*, the Prosecutor's office is granted a separate budget for anti-corruption activities. *Lithuania*'s Organised Crime and Corruption Investigation Department of the Prosecutor General's Office is responsible for conducting pre-trial investigations in criminal cases regarding organised crime, as well as in corruption cases.

In Spain, before the investigating judge assumes the lead of a corruption case, the prosecutors are entitled to carry out a limited number of investigative measures. In this sense, they perform both detection and investigation activities. The investigations of the prosecutors cannot take more than six months, except for those undertaken by the Special Prosecution Office against Corruption and Organised crime, which can take up to one year.

As for *Poland*, it is within the National Police Headquarters that the Central Bureau of Investigation (CBI) has been placed. However, unless they are linked to organised crime, identification and fight against corruption are not statutory objectives of the CBI. It has two principal methods for detecting and investigating corruption: operational (correspondence content control, consignment content control, use of the wiretapping systems and police provocations) and procedural (interrogation and appointment of experts). To fight organised crime and corruption more effectively, the Central Investigation Agency cooperates (on the occasion of investigated cases) with the Central Anti-corruption Bureau, the Internal Security Agency and the Prosecutor's Office.

[406] www.cba.gov.pl.

14.2.7. *Civil society and social networks*

Civil society organisations, as well as individual citizens, have become increasingly involved in the fight against corruption. Several civil society organisations have established themselves as reference associations for the fight against corruption and the promotion of responsibility and transparency in the public administration sector.

Public campaigns, conferences, meetings and seminars are effective ways to raise awareness of the general public and of policy-makers about the patterns, the costs and the severity of corruption. Next to this, the spreading of social networks has certainly increased and facilitated the cross-border coordination capacity and information sharing among associations and the public, as well as their ability to spread their messages in a faster and far reaching way. They have also largely contributed to the empowerment of citizens who, individually or in groups, constitute an increasingly important power source in the prevention and detection of corruption activities.

Citizens and non-governmental organisations' initiatives are increasingly supported by the ever-growing role played by the social networks when it comes to provide access to information, facilitate coordination and cooperation initiatives among partners as well as inform government entities of problems in the delivery of services. Social networks, multimedia and digital platforms have largely proven the added value they can bring in spreading messages and bringing people together. The 15th of May movement in Spain, for example, has largely benefited from such advanced communication tools, thanks to which individuals, associations, movements and local governments have been able to coordinate and increase their reach.

Social networks are also largely used by the younger generation, whose attitudes and engagement in the fight against corruption remains highly needed. A collective youth conscience of corruption issues is essential to build a zero-tolerance society.

As for specific legal tools, when whistle-blower schemes or advocacy and legal advice services exist and are properly functioning, they positively contribute to increasing the proportion of corruption being detected by citizens and non-governmental organisations.

Civil society and the non-governmental organisations are increasingly crucial in the fight against corruption,[407] for several reasons:

- They generate public debate and discussions which, by bringing corruption issues to the surface, contribute to raising the public awareness; this should in turn also raise the sensitivity of politicians;
- They contribute to ensure that governments comply with their commitments;
- They encourage private companies to adopt compliance measures;
- They build networks and actively collaborate with international institutions, thus favouring the cross-border spread of information.

Transparency International is an international NGO with branches in all of the Member States studied. Transparency International is particularly active on raising transparency standards, in carrying out (annual) expert-based surveys and in publishing an annual report. Among its activities can also be mentioned advocacy and recommendations to central public administrations, research and consulting to enterprises and organisations, promotion of civic anti-corruption activities as well as the organisation and execution of educational programme for schools.

Bankwatch is a network of environmental and development organisations currently active in 12 countries across Central and Eastern Europe. Its mission is to monitor the activities of international financial institutions, such as the EU, the European Investment Bank and the European Bank for Reconstruction and Development. Particular attention is given to the prevention of environmentally and socially harmful impacts of internationally financed projects, as well as to the promotion of public awareness and participation.[408] Although Bankwatch is not specifically focused on the fight against corruption, it is well placed to detect public loss due to poor performance of internationally funded projects.

[407] http://www.oecd.org/daf/anti-bribery/anti-briberyconvention/19567549.pdf.
[408] http://bankwatch.org/.

At the national level, *Spain*'s *Manos Limpias* ("Clean Hands") is an organisation active in the denunciation of cases. Manos Limpias can be characterised by a certain ideological position. One of its main objectives is to denounce corruption related to the public sector by collecting information and complaints by individuals and performing case analysis. If corruption is identified, judicial institutions are informed by Manos Limpias, thus protecting the individual (whistle-blower) who has provided the information.

Specifically focusing on public procurement is the Spanish Public Procurement Observatory, created in 2011 by a group of university researchers with the aim to create a space for reflection and analysis on how to improve public sector procurement activities.

Transparency in the public procurement processes and expenditures is also ITACA's main focus. This not-for-profit national association based in *Italy* is formed for 90% by managers from the regional public administration. It is a technical organisation interacting with central public authorities and with the National Conference of the Regional Governors on normative matters related to procurement and public expenditure. ITACA does not explicitly target corruption, but rather transparency and effectiveness in the public procurement procedures.

Also in *Italy*, *Avviso Pubblico* is an association of local institutions (municipalities in particular) working on re-establishing a culture of institutions and legality in the country and actively preventing corruption and infiltrations of criminal organisations. Members regularly discuss normative modifications with Regions and Ministries and are open to local public administration of all parties, seeing their mission in fostering an institutional culture "without always having to wait for the intervention of the prosecutors". They are also active in educational programmes for school and citizens. In 2011, they published their first report.

Another NGO active in the fight against corruption is *France*'s association *Anticor*, formed by a group of activists which work to raise awareness among the population and to make politicians more accountable. It reunites individual citizens, investigative journalists and personalities from the judiciary. Their action spreads across regions and French cities, with its anti-corruption network and website being constantly enriched though blogs, interviews, citizen tools and public meetings reports. Their website also provides useful information on specific fraud and corruption cases.

In *Poland*, the Institute of Public Affairs, a leading think-tank and an independent centre for policy research and analysis, is active in the fight against corruption. Within the organisation, there is the Law and Democratic Institutions Programme,[409] where the main subject of interest is corruption. During 2006-2007, IPA carried out the project "Save public assets – corruption and the EU Funds". The aim of the project was to monitor corruption threats during the allocation and spending of the EU Funds. A group of international experts prepared the methodology for such monitoring, which will be employed by anti-corruption organisations not only in Poland, but also in Lithuania, Latvia, the Czech Republic and Hungary.[410]

14.2.8. *Media and investigative journalists*

The growing role of civil society in the fight against corruption is amplified and supported by the media, which have become increasingly sensitive to corruption. The media can play a key role in both deterrence and detection of corrupt behaviours. Of crucial importance therein is the role of investigative journalists.

Recently, investigative journalists coming from 46 countries have formed the International Consortium of Investigative journalists, which represent the largest cross-border journalism collaboration.[411] The power of this International Consortium was demonstrated by its recent discovery of 2.5 million digital files, and the unveiling of secrets of more than 120 000 offshore companies, thousands of individuals, politicians and agents, exposing hidden dealings in more than 170 countries.[412]

[409] Institute of Public Affairs (2013), http://www.isp.org.pl/index.php?id=1&lang=2.

[410] http://www.isp.org.pl/files/11037298020153324001222334457.pdf.

[411] http://www.icij.org/.

[412] http://www.icij.org/offshore.

Active on the EU territory and beyond, the London-based Bureau of Investigative Journalism produces quality investigations for press and broadcast media with the aim of educating the public and the media on both the realities of today's world and the value of honest reporting.[413] In 2010, together with the Financial Times, the Bureau published its research on the spending of EU Structural Funds, and pointed amongst others to a high number of irregularities therein.[414]

The role of investigative journalists in detecting crime in general and corruption in particular, varies however between Member States. Its effectiveness is influenced by the freedom of press, the journalistic traditions and the funding of such research. The role of investigative journalists as an actor was recently recognised by the European Parliament. In 2011, it launched a study on 'deterrence of fraud with EU Funds through investigative journalism in the European Union Member States'.[415]

Within this context, interviews for the *Lithuania* Country Study have revealed how media have become a powerful tool for the detection of corruption as well as for accountability of public officers. In particular, there are individual investigative journalists involved in publishing cases of suspected corruption. During the interviews it was mentioned that there is a positive trend in the number of journalists investigating corruption.

The media also play a relevant role in the detection and, mainly, the dissemination of information related to corruption cases in *Spain*. In the last five years a message of "zero tolerance" towards corruption has been included in the political agendas and the first steps have been taken in the fight against corruption, although much still has to be done. In this path, the role of journalism becomes of the highest importance. Although most of the Spanish media are characterised by a certain ideology, the plurality of media allows the citizens to triangulate the information and to extract a more objective version.

In *Romania*, investigative journalism is a matter of a group of individual reporters. In 2001 four reporters founded the *Centrul Roman pentru Jurnalism de Investigatie*.[416] As the European Parliament report on investigative journalism states, they were "finding funds and donations to work outside what they thought were corrupted local media, cover the uncover and in the meantime lift the level of reporting to international investigative standards."[417]

According to the same European Parliament report, *Italy* has been witnessing a revival of investigative reporting for the past four years. As a report on digital media by the Open Society Foundation states, an example of such revival is the publisher Chiarelettere, which has specialised in major journalistic investigations.[418] Moreover, Chiarelettere has supported the creation of a new newspaper, Il Fatto Quotidiano which, thanks to a crowd funding mechanism of subscriptions, is financially sustainable and can beneficiate from the contribution of several high-level reporters with extensive investigative skills.[419]

14.3. Conditions for effective investigations

For the 8 Member States that were assessed in detail during the fieldwork, this section presents and describes the national conditions that allow for the effective enforcement of those rules that regulate investigations and the recovery of misused funds. Particular attention will be paid to those incentives and disincentives influencing such enforcement, also for what concerns the conviction of corrupted behaviour. This section naturally builds on the results of the different components of this study, notably the country reports, the EU-wide data collection on procurement systems, as well as chapters 13 and 14 which have given an extensive overview of the corruption risk management policies and the benchmarking of procurement systems in the 8 selected Member States.

[413] http://www.thebureauinvestigates.com/who/.

[414] See http://www.thebureauinvestigates.com/2010/11/29/top-story-4/.

[415] On 10th April 2013, the conference "Follow the money across borders: How supporting investigative journalism exposes cross border organised crime and corruption" was organised in the European Parliament's premises to further discuss the role of investigative journalism in the fight against corruption and money laundering.

[416] https://www.crji.org/index_en.php.

[417] European Parliament (2012) Deterrence of fraud with EU funds through investigative journalism in EU-27. Study. Directorate-General for Internal Policies, Policy Department Budgetary Affairs, p. 91.

[418] http://www.opensocietyfoundations.org/reports/mapping-digital-media-italy.

[419] European Parliament (2012) Deterrence of fraud with EU funds through investigative journalism in EU-27. Study. Directorate-General for Internal Policies, Policy Department Budgetary Affairs, p. 117.

Incentives

In the great majority of the 8 key EU Member States, incentives to investigate corruption are mainly of a legal character. First and foremost, this requires the actual implementation of the legal dispositions, which must not only remain 'on paper'. Second, the legal definition of corruption and fraud needs to be well-clarified, without remaining too narrow. This is favoured, for example, when a legal text or anti-corruption law provides a definition of corruption which is applicable to both the public and the private sector, while encompassing both 'active' and 'passive' corruption. Efficient and flexible procedures to investigate corruption also play an important role in ensuring that administrative or legal hurdles do not hinder the chances to enforce the relevant laws.

Incentives to investigate corruption cases are mainly of a legal character. In Poland, for instance, **enforcement of existing rules and procedures** is quite effective due to the existence of proper mechanisms provided by the legal system. The legislative framework in Poland stipulates numerous controls and provides a comprehensive system of sanctions.

In *Romania*, effective enforcement is first of all favoured by the existence of a very comprehensive anti-corruption strategy for 2012-2015.

For both the fight against corruption and the recovery of misused funds, a **strong and continued political will** can be a crucial factor to ensure that the topic remains high on the political agenda and is followed by concrete initiatives. Also **a high public awareness** about corruption can strengthen the effectiveness of law enforcement, since it implies an increasing attention to corruption cases by the citizens, most notably when civil servants and politicians are involved.

For example, in *Spain* the creation of institutions and organisations to prevent, investigate and combat corruption only materialised after the emergence of a clear political will to reinforce the fight against corruption.

In the *Netherlands*, the Minister of Security and Justice expressed the intention in 2010 to "intensify the recovery of criminal assets". This initiative has been followed by a study within the police organisation on how to professionalise the fight against organised crime. In addition, this research provided input to a recovery programme, in which civil and criminal law instruments are deployed to recover the proceeds of crimes.

The cornerstone of law enforcement is formed by preventive and proactive investigations, focusing on the collection of corrupt cases. For this purpose, **both formal and informal tools to denounce corrupt behaviour (including whistle-blower schemes)** should be put in place. This seems indispensable for the public sector, but has also been developed in some cases by prominent private companies through, for example, the creation of whistle-blower systems and protection programmes. Countries such as *France*, *Italy* and *Romania* have adopted specific whistle-blower measures to encourage the denouncement of corruption. For public officials and civil servants, France's Penal Code has established the obligation to inform the competent judicial authorities in case of suspicion of fraud or corruption. Also for the private sector, the 2007 French law against corruption has established the protection of whistle-blowers in companies.

Further to this, it appears necessary to **give civil servants, prosecutors and police the right competences and resources** that can allow them to understand and identify patterns and dynamics, as well as risks and good practices that would increase the effectiveness of their initiatives and actions. The aim is also to ensure that those entitled to enforce the law possess the necessary broader knowledge and expertise on patterns and dynamics that may characterise, for example, corruption in the use of EU Funds. A narrow competence is ineffective in the sense that it poses serious limits to investigations of large-scale corruption patterns, which often require a mix of competences, i.e. legal, investigative, economic and sociological skills.

In *Romania*, for instance, enforcement is favoured by the fact that several Romanian public institutions have started to hold training courses for public officials in order to raise their awareness and to ease the enforcement process.

Moreover, **collaboration, awareness raising and sharing of information** seem to play a very important role, thus enhancing the effectiveness of actions addressed at detecting and investigating corruption.

In *France*, one commissioner officer from the National Police specifically liaises with the *Service Central de Prévention de la Corruption (SCPC)*. He notably disseminates the professional documentation issued by the SCPC to the SR (*Sections de Recherches*) in general, and to the financial investigators in particular.

Finally, **independent media**, sufficiently resourced to deploy investigative journalists play an increasingly important role in detecting corruption and in supporting formal investigations.

Disincentives

One of the most recurrent disincentives to effective investigations and law enforcement is the **non-implementation of corruption laws and rules to recover misused funds**. Rather than creating new regulations, it is important to ensure that existing ones are applied systematically and harmoniously. One of the risks is that, without the proper enforcement of laws, very few corruption cases will be discovered and that those that must be punished will eventually not be sentenced. In a long term perspective, without actual implementation, civil servants and investigators lose a fundamental motivation to further inquire corruption cases and pursue individuals. In its turn, this can create a climate which is considered to provide opportunities for new or continued corruption – simply because the risks of detection are considered low.

By the same token, **the lack of harmonised policies, procedures and conditions** appears as another disincentive for effective law enforcement and recovery of misused funds. Such fragmentation issues often characterise the mechanisms to properly detect and combat corruption. The same holds true for the **poor integration across various governmental bodies and agencies**, especially with regards to exchange of information and the existence of shared databases and common risk analysis.

One of the most recurrent disincentives in the fight against corruption is the **insufficiency of resources, both financial and human**, of the institutions that assume the task to detect and investigate corruption. This can be due to an overall insufficiency of resources of the judicial system, or due to a priority-setting. Within this context, it is important to underline that corruption cases can be complex, cumbersome and sensitive for prosecutors, which can lead to higher priorities for other types of crime prosecution. Nevertheless, some countries have shown how the increase of the number of investigative and prevention staff has brought visible improvement in the effectiveness of the institutions' actions.

A similar hurdle can be observed for the recovery of misused funds. The analysis of the information gathered for the 8 EU Member States has revealed that **it is often very difficult to access foreign bank accounts or to proceed with the confiscation of property** (property obtained through illegal methods). This is often due to the **lack of sufficient European and international cooperation** in police and justice matters. Accessing the financial information contained in bank accounts in another Member State is a time- consuming exercise, or is simply impossible. **Differences in the judiciary systems** of all European countries imply administrative burdens that prevent an efficient fight against corruption as well.

With regard to the EU Funds, actors across the system are encouraged to **absorb and disburse the Funds**. Actions which would unnecessarily interrupt this absorption and disbursement process are likely to be discouraged by actors in the system – including unfocused reviews and investigations in areas such as fraud and corruption, without there being clear signals or evidence to justify these.

Concerning the whistleblowing system, the lack of a real programme for the protection of witnesses and the absence of specific sanctions in case of non-denunciation are among the most prominent reasons for the non-effectiveness of such a system. Disincentives also arise when no reward scheme exists for informants that decide to collaborate and denounce illegal behaviours. What is more, the obligation of denunciation can be in conflict with other obligations of public agents: rules of administrative moral code, professional secrecy, conflict with the hierarchy principle and even when such a sanction is foreseen, in practice complicity by abstention is often not repressed.

The effectiveness of a whistle-blower system can be also hindered by the **limited social acceptance and low esteem given to whistle-blowers**. whistle-blowers are sometimes associated with common informers, snitches or narks and their activity can be considered wrong or at least undesirable for the rest of the society. This phenomenon often characterises societies where petty corruption and grease payments are socially accepted.

Above all, this **'silent' acceptance** for bribery hinders effective fight with corruption, as it affects the morale and ethics of whole societies.

14.3.1. *Conclusions*

Although coordination and supervision of public contracts is often assigned to designated public authorities, these bodies tend not to focus specifically on detecting corruption. Incidents of fraud and corruption are regularly detected by national audit institutions through the audits on procurements involving national and European funds, even though auditors are not necessarily geared towards the detection of corruption either.

With regard to the EU Structural Funds, designated bodies (i.e. Managing Authority, Certifying Authority and Audit Authority) have been set up in Member States to prevent, detect and correct irregularities and recover amounts duly paid. However, these actors are not geared towards the detection of corruption, and neither are the evaluators of these programmes.

Member States studied each have their own landscape of anti-corruption bodies, many focusing on investigation, but some focusing on prevention and detection as well. Most agencies include corruption in public procurement, amongst other forms of corruption as well.

The fight against corruption is however not only carried out by formal public institutions, but increasingly so by informal networks, such as NGOs, press and citizens. Especially in a context of high unemployment, scarce public resources and fiscal austerity, citizens and businesses alike appear to be less and less tolerant vis-à-vis fraud, money laundering and corruption. Such a change in attitude has at least three major consequences. Firstly, decision-makers are under increasing pressure to ensure transparency and reinforce, update and coordinate the national and international anti-corruption agendas. Secondly, private and civil actors are increasingly detecting corruption and denouncing corrupt behaviour to the competent authorities. This trend is supported by the creation of whistle-blower systems and protection programmes, which represent a real incentive to share and denounce illegal behaviour, both in private companies and in public institutions. It is also supported by political will, free and properly resourced press, and active social media networks. Thirdly, these societal trends and in particular the rise of social media networks provides new opportunities for formal investigators as well, who see an increase in the amount of leads and data to be pursued.

National Investigative Agencies, entitled with both enforcement and investigative powers, vary considerably across Member States in terms of resourcing, independence and effectiveness. Thanks to international arrangements and initiatives,[420] Member States have progressively established integrated anti-corruption institutions, with powers in prevention, detection and investigation. For instance, on the basis of the recommendations issued by the Council of Europe's Group of States against Corruption (GRECO), Member States have been actively identifying deficiencies in national anti-corruption policies, prompting the necessary legislative, institutional and practical reforms.

Because criminal acts including corruption are increasingly characterised by cross-border (and international) networks of individuals and organisations, cooperation at both the European and the international level becomes increasingly important. It requires bilateral cooperation between Member States as well as excellent cooperation with institutions such as Eurojust, Europol and OLAF.

[420] E.g. on the basis of the recommendations issued by the Council of Europe's Group of States against Corruption (GRECO), member states have been identifying deficiencies in national anti-corruption policies, prompting the necessary legislative, institutional and practical reforms.

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B. List of abbreviations

AA	Audit Authority
ABAC	Accrual Based Accounting
ACFE	Association of Certified Fraud Examiners
AICPA	American Institute of Certified Public Accountants
AT	Austria
BE	Belgium
BG	Bulgaria
CA	Certifying Authority
CBA	Cost Benefit Analysis
CF	Cohesion Fund
CPI	Corruption Perception Index
CPV	Common Procurement Vocabulary
CY	Cyprus
CZ	Czech Republic
DE	Germany
DG BUDG	Directorate-General for Budget
DG CNECT	Directorate-General for Communications Networks, Content and Technology
DG DIGIT	Directorate-General for Informatics
DG EMPL	Directorate-General for Employment, Social Affairs & Inclusion
DG HOME	Directorate-General for Home Affairs
DG MARKT	Directorate-General for Internal Market and Services
DG MOVE	Directorate-General for Mobility and Transport
DG REGIO	Directorate-General for Regional and Urban Policy
DG RTD	Directorate-General for Research and Innovation
DK	Denmark
EACN	European contact-point network against corruption

EC	European Commission
ECA	European Court of Auditors
ECN	European Competition Network
EDRF	European Regional Development Fund
EE	Estonia
EEA	European Economic Area
EL	Greece
EMAT	Economically most advantageous tender
EPAC	European Partners against Corruption
ES	Spain
ESF	European Social Fund
EU	European Union
EU27	The 27 EU Member States
EUROSTAT	Statistical office of the European Union (Commission DG)
FI	Finland
FIU	Financial Intelligence Unit
FP7	EU's Seventh Framework Programme for Research
FR	France
GDP	Gross domestic product
GRECO	Group of States against corruption
HU	Hungary
IE	Ireland
IIA	Institute of Internal Auditors
IMS	Irregularity Management System
IRR	Internal Rate of Return
I(C)T	Information (and Communication) Technology
IT	Italy
LT	Lithuania

LU	Luxembourg
LV	Latvia
MA	Managing Authority
MS	Member State
MT	Malta
NGO	Non-governmental organisation
NL	Netherlands
NPV	Net Present Value
OECD	Organisation for Economic Co-operation and Development
OLAF	Office de Lutte Anti-Fraude (European Anti-Fraud Office)
OSCE	Organization for Security and Co-operation in Europe
PETS	Public Expenditure Tracking Survey
PL	Poland
PT	Portugal
R&D	Research and Development
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
SMART	Self-Monitoring, Analysis, and Reporting Technology
TED	Tenders Electronic Daily
TFEU	Treaty on the functioning of the European Union
TI	Transparency International
UK	United Kingdom
US	United States (of America)
UNCAC	United Nations Convention against Corruption
UNODC	United Nations Office on Drugs and Crime

C. Reflections from experts

C.1. Expert panel

The members of the expert panel have been asked to review and comment on draft versions of the report. On 14 January 2013 the were asked to review the chapters on Existing methods, measures and systems of measuring risks and costs of corruption (literature review) and on the Comprehensive methodology to measure the costs of corruption in public procurement (version of 12 January 2013). Some of their reflections are presented in this section:

Ms. Mungiu-Pippidi: "The study does a very good job to identify and test procurement risks, despite limitations in the data. The resulting tool, however, is not one to be used by practitioners in their daily routine, but rather to confirm their more limited intuitions.... The method of comparing clean versus corrupt cases- to which I formulated some reservation in an earlier stage, and which even in well documented situations had poor explanatory power and raised doubts on the validity of the sample - is complemented enough by descriptive analysis, use of al TED database versus the study original database to make results robust. I now believe in the robustness of these results.... The sector approach is present and sector is found to show significant differences. As costs rather than mechanisms to generate costs were demanded I believe the project goes a long way to meet demands. ...".

Mr. Savona: "... progresses have been done in relation to the last time we met in Brussels and I hope that they will be appreciated by Olaf considering the time frame and the limited availability of data. One thing more: this project could be very useful for soliciting countries and international organizations for collecting better data in order to better monitor the phenomenon of corruption."

Mr. Kos: "The most important methodological 'invention' seems to be the introduction of an additional category of "grey" cases ..., which from the beginning does not look too convincing but later on becomes surprisingly scientific and useful.".

Mr. Levi has provided detailed and constructive comments on the draft. However Mr. Levi warns for the "illusory search for an absolute figure of fraud".

C.2. ECA and OECD

At OLAF's request, we have sent the drafts of the chapters on Existing methods, measures and systems of measuring risks and costs of corruption (literature review) and on the Comprehensive methodology to measure the costs of corruption in public procurement to the European Court of Auditors (ECA) and discussed the methodology and findings with the ECA in the presence of OLAF. ECA's impression of our draft report was that it is a "remarkable job", the method was "solid, logical, well explained and well founded"..." it gives confidence in the outcomes". What was unclear was "what the mission of the project was" from early on. A danger that the ECA needed to be addressed and explicitly explained (with regard to the use of "grey cases") is that our selection of cases could drive our definition, which in turn could drive our selection of red flags – a dangerous circular logic.

The same draft chapters were sent to the Organisation for Economic Co-operation and Development (OECD) who stated in a teleconference, that they think this is "a very interesting methodology, which is forward looking and innovative".

D. List of interviewed organisations

List of interviewed organisations at the EU level

European Commission	DG Enterprise
	DG Environment
	DG Climate Action
	DG Move
	DG Energy
	DG Research and Innovation
	DG Regional Development
	DG Taxation and Customs Union
	DG Home Affairs
	DG Employment
	DG Health and Consumer Affairs
	DG Communication and Network
	DG Budget
	DG Development and Cooperation
	OLAF
European Parliament	DG Finance
European Court of Auditors	
Eurojust	
Europol	
Fundamental Rights Agency	

List of interviewed organisations in France

Service Central de Prévention de la Corruption (SCPC)	
Conseil Régional Paris	
Association for the Worldwide Water Contract (ACME)	
Anticor association	
Central Brigade of Fight against Corruption (BCLC)	
Brigade of Repression of Economic Crime (BRDE)	
Former member of the SCPC	
Former offical of the BCLC	

List of interviewed organisations in Hungary

National Development Agency (NDA)	
World Organisation of Public Procurement Agencies and Associations (WOPPAA)	
K-monitor	NGO
Hungarian Business Leaders Forum HBLF	
Europe Ltd.	Independent Evaluator in Hungary of all open EU Phare and Transition Facility assistance programmes
Siemens	

List of interviewed organisations in Italy

Università degli Studi di Bologna	University
Legambiente Campania	NGO
Ministero delle Politiche Comunitarie	Government
Itaca	NGO
Transparency International	NGO
European University Institute	Academia
Autorità Valutazione Lavori Pubblici	State Audit Body
Corte dei Conti	State Audit Body
The Bureau of Investigative Journalism	Media
Legambiente Sicilia	NGO
Procura Generale	Judicial Institution
Università dell'Insubria	University
Guardia di Finanza	Local Police
Legambiente	NGO
Regione Lombardia	Regional Government Institution
Procura Roma	Judicial Institution
Assistant Prof. Transcrime	University
Avviso Pubblico	NGO
Università Cattolica del S. Cuore/Transcrime	University
Università di Pisa	University
Chamber of Commerce	Business Association
Procuratore Vibo Valentia	Public Prosecutor
GIP Palermo	Public Prosecutor
Formez	Governmental Administration
Dipartimento Servizi Condivisi (Shared Services Departement)	
SO.RE.SA (Regional Corporation for Health)	
Estav – Sudest Toscana (Sanitary Service for the South-East part of Tuscany)	
ANAS spa (National Autonomous Roads Corporation)	
AER TRE spa (Treviso Airport Corporation)	
AVDA spa (Aosta Airport Corporation)	
SAC spa (Catania Airport Corporation)	
SACAL spa (Lamezia Terme Airport Corporation)	
Regione Autonoma della Sardegna (Autonomous Region of Sardinia)	

List of interviewed organisations in Lithuania

Public Procurement Office	
Seimas (parliament) Anti-Corruption Commission	
Prosecution (Organised crime and corruption investigation department)	
Special Investigation Service (STT)	
Ministry of Justice of Lithuania	
Chief Procedure Ethics Commision	
Competition Council of Lithuania	
Investors' Forum	
Mykolas Romeris University, Lithuania	
Transparency International Lithuania Department (TILS)	
Lithuanian Builders Association	
Managing Institution of EU structural Funds	Ministry of Finance
Environmental Project management Agency	
Central Project Management Agency	
Transport Investment Direction	
European Social Fund Agency	
Vilnius City Municipality	
Vilniaus vandenys	
AB Lietuvos geležinkeliai)	
National Audit Office	

List of interviewed organisations in the Netherlands

Algemene Rekenkamer (Netherlands Court of Audit (NCA)	
Auditdienst Rijk	
BIOS - Bureau Integriteitsbevordering Openbare Sector (The Dutch National Office for Promoting Ethics and Integrity in the Public Sector)	
Ministerie van Economische Zaken, Landbouw en Innovatie (Ministry of Economic Affairs, Agriculture and Innovation)	
Ministerie van Financiën (Ministry of Finance)	
Ministerie van Infrastructuur en Milieu - Inspectie Leefomgeving en Transport (Ministry of Infrastructure and the Environment - Inspection Environment and Transport)	
Ministerie van Infrastructuur en Milieu - Rijkswaterstaat (RWS) (Ministry of Infrastructure and the Evironment)	
Ministerie van Sociale Zaken en Werkgelegenheid - Agentschap SZW (Ministry of Social Affairs and Employment)	
Ministerie van Sociale Zaken en Werkgelegenheid - Inspectie SZW (Ministry of Social Affairs and Employment - Inspectorate SZW)	
Ministerie van Veiligheid en Justitie (Ministry of Security and Justice)	

Managing authority **Operational Programme 'East Netherlands'** **Provincie Gelderland** **Europees Programmasecretariaat – Afdeling Subsidieverlening**
Managing authority **Operational Programme 'North Netherlands'** (Samenwerkingsverband Noord- Nederland (SNN))
PianOo Expertisecentrum Aanbesteden (Dutch Public Procurement Expertise Centre)
Openbaar Ministerie (National Public Prosecutor for Corruption (NPPC))
Rijksgebouwendienst
Rijksrecherche (National Police Internal Investigation Department)
Vastgoed Intelligence Center (Dutch Public Prosecution Service - Real Estate Intelligence Center)
National Ombudsman of the Netherlands
NMa - Nederlandse Mededingingsautoriteit (Netherlands Competition Authority)
RIEC's (Regional Information and Expertise Centres) / LIEC (National Information and Expertise Centre)
MKB Nederland
VNO NCW (The Confederation of Netherlands Industry and Employers)
Transparency International, Netherlands chapter
Corruptie.org / Saxion Hogeschool
WEF / PACI project
Bouwend Nederland
Vereniging Nederlandse Gemeenten (VNG) (Association of Dutch Municipalities)
One municipality
TenderNed
Stichting Inkoopbureau West-Brabant

List of interviewed organisations in Poland

Centralne Biuro Antykorupcyjne (Central Anti-Corruption Bureau)	Government
Urząd Zamówień Publicznych (Public Procurement Office)	Government
Agencja Bezpieczeństwa Wewnętrznego (Internal Security Agency)	Government
Najwyższa Izba Kontroli (NIK) (Supreme Audit Office)	State Audit Body
Ministerstwo Sprawiedliwości (Ministry of Justice)	Government
Ministerstwo Spraw Wewnętrznych (Ministry of Interior)	Government
Komenda Główna Policji (KGP) (Polish Police Headquarters)	Police

Centralne Biuro Śledcze (CBS) (Central Bureau of Investigation)	Police
Biuro Krymnalne (Criminal Bureau)	Police
Polska Agencja Informacji i Inwestycji Zagranicznych (The Polish Information and Foreign Investments Agency)	Government
Fundacja Konrada Adenauera w Polsce (Konrad-Aadenauer Foundation in Poland)	Representative of business environment
Polska Konfederacja Pracodawców Prywatnych Lewiatan (Polish Confederation of Private Employers Lewiatan)	Representative of business environment
Fundacja Stefana Batorego (Stefan Batory Foundation)	NGO
Instytut Spraw Publicznych (The Institute of Public Affairs)	NGO
Academics	
American Chamber of Commerce in Poland	Foreign investors associations
British Polish Chamber of Commerce	Foreign investors associations
ARCADIS sp.z o.o.	Private company dealing with public procurement (Infrastructure)
LEMITOR Ochrona Środowiska sp.z o.o.	Private company dealing with public procurement (Environment)
LABORATORIUM Corneal sp. z o.o	Private company dealing with public procurement (Health)
Akademia Kształcenia Zawodowego sp. z o.o.	Private company dealing with public procurement (Social/Employment)
LfC sp. z o.o	Private company dealing with public procurement (Research/Innovations)
Szpital im. Stanisława Leszczyńskiego	Hospital (Public Institution)
NZOZ Szpital w Puszczykowie im. prof. Stefana Tytusa Dąbrowskiego Sp. z o.o.	Hospital (Private Institution)
Akademia Medyczna we Wrocławiu	University (Public Institution)
Szpital Specjalistyczny Św. Wojciecha Adalberta Samodzielny Publiczny Zakład Opieki Zdrowotnej	Hospital (Public Institution)
PKP Polskie Linie Kolejowe S.A.	State-owned company
Urząd Miejski w Jaworznie	Self-government institution (executive)
Generalna Dyrekcja Dróg Krajowych i Autostrad Oddział w Gdańsku	Government Agency
Generalna Dyrekcja Dróg Krajowych i Autostrad Oddział w Poznaniu	Government Agency
Wodociągi i Kanalizacja – Zgierz Sp. z o.o.	Self-government Institution
Urząd Miejski w Łazach	Self-government Institution (executive)
Katowicka Infrastruktura Wodociągowo - Kanalizacyjna Sp. z o.o.	Self-government Institution

List of interviewed organisations in Romania

Department of Fighting Against Fraud	
General Anti- Corruption Directorate	
National Anti - Corruption Directorate	
National Integrity Agency	
Court of Accounts	
Ministry of Transport	
Authority for Payments for Rural Development	
National Authority for Regulating and Monitoring Public Procurement	
Cooperation and Verification Mechanism	
National Authority for Scientific Research	
Ministry of Justice	
Management Authority for Operational Program for Developing Human Resources	
Advanced Technologies Institute	

List of interviewed organisations in Spain

Castilla-La Mancha University	
University of Zaragoza - Estudio Jurídico Internacional	
Central Admministrative Tribunal of Contractual Appeals	
Fundación Ortenga y Gasset	
Anti-Fraud Office of Catalonia	
Consultative Board of Public Procurement of the Ministry of Taxes and Public Administration	
Fundación Fiasep	
Spanish Tax Agency (AEAT)	
Special Prosecution Office against Corruption and Organised Crime	
American Chamber of Commerce in Spain	
Special Prosecution Office against Corruption and Organised Crime	
Financial times	
US Embassy	
Manos Limpias	
ERDF Managing Authority, Ministry of Finance and Public Administrations	
Different Media	
Transparency International Spain	
Administrador de Infraestructuras Ferroviarias (ADIF)	Railway Infrastructure Administrator
Aeropuertos Españoles y Navegación Aérea (AENA)	Spanish Airports Authority
Agència Catalana del Aigua, Departament of Environment, Generalitat de Catalunya (Catalan Water Agency)	

Túnels i Accessos de Barcelona, S.A.	
Osakidetza	
Talavera de la Reina City Council	
Sociedad Aragonesa de Gestión Agroambiental (SARGA) – former Sociedad de Desarrollo Medioambiental de Aragón (SODEMASA)	
Department of Public Works, Housing and Transport, Region of Murcia	
Health Service of the Canary Islands, DG of Economic Resources	

List of interviewed organisations for the analysis of prices of standardized units

Belgium

EUCOMED	Sector association
MEDTECH EUROPE	Sector association
EDMA	Sector association
European Union Road Federation (ERF)	Sector association
European Construction Industry Federation (FIEC)	Sector association
EIM (European Rail Infrastructure Managers)	Sector association
UIC (International Union of Railway)	Sector association
EUREAU (European Federation of National Associations of Water and Wastewater Services)	Sector association
EWA (European Water Association)	Sector association
Union des Aéroports Français (UAF)	Sector association
Airport Council International Europe	Sector association
European Commission – DG Competition	Government
European Commission – DG Regio	Government
+ contact several administrations contacted for the benchmark questionnaire	

Italy

Centre for Research for Lifelong Learning (CRELL)	Sector association

Greece

European Centre for the Development of Vocational Training (CEDEFOP)	Sector association

E. Respondents in surveys

E.1. Overview of authorities that participated in the survey on the benchmarking of the procurement systems in EU Member States

The table below gives an overview of the national and regional authorities, beneficiaries of EU Funds managing related procurement cases and anti-corruption and procurement experts in the EU Member States that participated in this study. In total 80 completed surveys were received for the study, out of more than 1000 requests for participation that were sent.

Country	Authority
Austria	Federal Ministry of the Interior Affairs - Federal Bureau of Anti-Corruption, International Department
Belgium	Managing Authority - Brussels Region Department of the Coordination of the Structural Funds – Public Service of Wallonia DG HOME's Local Research Correspondent on Anti-Corruption (LRCC) for the EU Anti-Corruption Report ERDF Managing Authority - Agentschap Ondernemen INFRABEL NV - The Belgian railway infrastructure
Bulgaria	Managing Authority of Operational Programme Regional Development Ministry of Environment and Water - Managing Authority of OP Environment, Ministry of Environment and Water - Cohesion Policy for Environment Directorate Ministry of Economy, Energy and Tourism (MoEET) - Directorate "European Funds for Competitiveness" (EFC) - Legislation, Internal Control and Irregularities Department
Cyprus	Treasury of the Republic - Public Procurement Directorate DG HOME's Local Research Correspondent on Anti-Corruption (LRCC) for the EU Anti-Corruption Report
Czech Republic	Regional Council - Moravia-Silesia Office for the Protection of Competition - International and External Relations Department Regional Council of the North-East Cohesion Region

Denmark	Danish Competition and Consumer Authority
	Banedanmark - Legal Department
	Femern A/S – Contract Director
	National Procurement Ltd. - Statens og Kommunernes Indkøbs Service A/S
	Managing Authority - North Sea and Member States Programme - Finance Manager of the North Sea Region Programme Secretariat - JTS
	SaaS provider, Public Buying Counselling
Estonia	Estonian Security Police
	Central Criminal Police
	Ministry of Finance - Financial Control Department - Audit Authority regarding Structural Funds
	Ministry of Finance of the Republic of Estonia
	DG HOME's Local Research Correspondent on Anti-Corruption (LRCC) for the EU Anti-Corruption Report
	DG HOME's local expert of Second Opinion Network for the EU Anti-Corruption Report
Finland	Managing Authority - Regional Council of Southwest Finland
	Ministry of Employment and Economy - Competition Policy Unit
	National Bureau of Investigation
France	Directorate of Legal Affairs, Ministry of Economy and Finance
Germany	Department of Internal Investigations - Ministry of Interior and Sports
	Federal Ministry for the Economy
	Beschaffungsamt des BMI
Hungary	Public Procurement Authority - Department of International Relations and Training)
	National Development Agency
	DG HOME's local expert of Second Opinion Network for the EU Anti-Corruption Report
Ireland	National Procurement Service

Italy	Authority for Public Contracts Surveillance – Directorate for International and EU Relations
	Managing Autority - Department of Structural Policies and European Affairs - Vallée d'Aoste Region
	Managing Authority - ERDF Molise
	Managing Authority – Calabria Region
	RFI, MER MEC SpA -UNISIG Representative and UNIFE ERTMS Steering Committee member on behalf of MER MEC Spa
Latvia	Ministry of Finance - Audit Authority of EU Structural funds
	Corruption Prevention and Combating Bureau
	Procurement Monitoring Bureau of the Republic of Latvia
	DG HOME's Local Research Correspondent on Anti-Corruption (LRCC) for the EU Anti-Corruption Report
	DG HOME's local expert of Second Opinion Network for the EU Anti-Corruption Report
Lithuania	Ministry of Economy - Public Procurement Policy Formulation – Public Procurement Policy Division
	Transport Investment Directorate
	Public Procurement Office
	Public Procurement Office – Law Application Division
Luxembourg	Ministry of Sustainable Development and Infrastructure – Procurement Commission
	DG HOME's Local Research Correspondent on Anti-Corruption (LRCC) for the EU Anti-Corruption Report
Malta	Ministry of Finance - Department of Contracts
Poland	Public Procurement Office
	Polish National Police Headquarter - Combating Corruption Department of Criminal Bureau of Polish National Police
	Marshal's Office of the Lodz Region - Department of the Operational Programme Human Capital - Projects System Unit - Team for Anti-Corruption Prevention
Portugal	Procurement & Internal Audit Department
	North Portugal Regional Operational Programme - ON.2
	Anti-corruption expert

Romania	National Anti-corruption Directorate Ministry of Internal Affairs - Anti-corruption General Directorate - European Affairs and International Relations Department
Slovakia	Office for Public Procurement - Department of International Relations and European Affairs Anti-corruption expert National Criminal Agency Presidium of the Police Force
Slovenia	Ministry of Finance - Public Procurement Directorate - Department for Public Procurement System Commission for the Prevention of Corruption of the Republic of Slovenia
Spain	Ministry of Finance and Public Administration - Secretariat of the Central Administrative Tribunal of Contract Resources Ministry of Finance and Public Administration – Directorate General of State Patrimony – Secretariat of the Public Procurement Consultative Board DG HOME's local expert of Second Opinion Network for the EU Anti-Corruption Report
Sweden	Ministry of Health and Social Affairs Swedish Competition Authority Swedish Transport Administration Managing authority Interreg IV Sveden
The Netherlands	Maastricht Municipality – Financial Control Department Managing Authority ERDF NL Managing Authority Oost-Nederland Managing Authority Noord Nederland (SNN) Ministry of Economic Affairs
The UK	BiP Solutions Limited

E.2. Commission Directorates-General that participated in the survey on databases

The table below gives an overview of the DG's of the Commission that participated in the survey on databases in relation to collection and processing of data and information that might be useful for prevention, detection and investigation of corruption. Within each DG, often more directorates and bureaus were asked to respond. From some DG's no responses were received.

DGs participated in the survey
DG OIB
DG DIGIT
DG DGT
DG ECHO
DG EMPL
DG COMM
DG COMP
DG HR
DG MARKT
OLAF
SG

F. Defined sectors

In accordance with OLAF and based on the already collected corrupt, grey and clean cases, the following five sectors are defined as primary focus for this study:

- *Water Supply / Waste Water Treatment / Water Management*
- *Urban & Utility Construction*
- *Training*
- *Road & Rail Construction*
- *Research & Development / High Tech Products and Services*

All research directed on finding additional corrupt, grey and clean cases of public procurement should be aimed at cases in these five sectors. A more detailed description of what these sectors encompass is presented in this document, based on the appropriate CPV-codes.

F.1. CPV Codes

Water Supply / Waste water Treatment / Water Management

34144500-3: Vehicles for refuse and sewage
34144520-9: Sewage tankers

41000000-9: Collected and purified water

45232120-9: Irrigation works
45240000 : Construction work for water projects
45241000 : Harbour construction works
45242000 : Waterside leisure facilities construction work
45243000 : Coastal-defence works
45244000 : Marine construction works
45245000 : Dredging and pumping works for water treatment plant installations
45246000 : River regulation and flood control works
45247000 : Construction work for dams, canals, irrigation channels and aqueducts
45248000 : Construction work for hydro-mechanical structures

65100000-4: Water distribution and related services
65110000-7: Water distribution
65111000-4: Drinking-water distribution
65120000-0: Operation of a water-purification plant
65130000-3: Operation of water supplies

90733100-5: Surface water pollution monitoring or control services
90733200-6: Surface water pollution rehabilitation services
90733300-7: Surface water pollution protection services
90733400-8: Surface water treatment services
90733500-9: Surface water pollution drainage services
90733600-0: Transboundary water pollution management or control services
90733700-1: Groundwater pollution monitoring or control services
90733800-2: Groundwater pollution drainage services
90733900-3: Groundwater pollution treatment or rehabilitation

Urban & Utility Construction

44000000-0: Construction structures and materials; auxiliary products to construction (except electric apparatus)

45210000 : Building construction work
45211000 : Construction work for multi-dwelling buildings and individual houses
45212000 : Construction work for buildings relating to leisure, sports, culture, lodging and restaurants
45213000 : Construction work for commercial buildings, warehouses and industrial buildings, buildings relating to transport
45214000 : Construction work for buildings relating to education and research
45215000 : Construction work for buildings relating to health and social services, for crematoriums and public conveniences
45216000 : Construction work for buildings relating to law and order or emergency services and for military buildings

45220000 : Engineering works and construction works
ATTENTION: NOT: 45221000 : Construction work for bridges and tunnels, shafts and subways (see Road and Rail Construction)
45222000 : Construction work for engineering works except bridges, tunnels, shafts and subways
45223000 : Structures construction work

45235000 : Construction work for airfields, runways and manoeuvring surfaces
45235100 : Construction work for airports
45235110 : Construction work for airfields
45235111 : Airfield pavement construction work
45235200 : Runway construction works
45235210 : Runway resurfacing
45235300 : Construction work for aircraft-manoeuvring surfaces
45235310 : Taxiway construction work
45235311 : Taxiway pavement construction work
45235320 : Construction work for aircraft aprons
Perhaps here some overlap with Rail and Road Construction in terms of same market of suppliers (runway, taxiway etc)

45250000 : Construction works for plants, mining and manufacturing and for buildings relating to the oil and gas industry
45251000 : Construction works for power plants and heating plants
45252000 : Construction works for sewage treatment plants, purification plants and refuse incineration plants
45253000 : Construction work for chemical-processing plant
45254000 : Construction work for mining and manufacturing
45255000 : Construction work for the oil and gas industry
45259000 : Repair and maintenance of plant

71000000 : Architectural, construction, engineering and inspection services
71200000 : Architectural and related services
71300000 : Engineering services
71400000 : Urban planning and landscape architectural services
71500000 : Construction-related services
71600000 : Technical testing, analysis and consultancy services
71700000 : Monitoring and control services
71800000 : Consulting services for water-supply and waste consultancy
71900000 : Laboratory services

Here is potential overlap with sector road/rail construction and waste water treatment / water supply / water management
Here is NOT included: 65000000 : Public utilities, because this covers the operation of public utilities

Training

22111000-1: School books

79632000-3: Personnel-training services
79633000-0: Staff development services
79634000-7: Career guidance services
79635000-4: Assessment centre services for recruitment

80000000 : Education and training services
80400000 : Adult and other education services
80500000 : Training services

Road & Rail Construction

34621000-6: Railway maintenance or service vehicles, and railway freight wagons
34621200-8: Railway maintenance or service vehicles
34941200-7: Track rails
34941300-8: Tramline
34946000-0: Railway-track construction materials and supplies
34946100-1: Railway-track construction materials
34946200-2: Railway-track construction supplies
34947000-7: Sleepers and parts of sleepers
34920000-2: Road equipment
34921000-9: Road-maintenance equipment

45221000 : Construction work for bridges and tunnels, shafts and subways

45230000 : Construction work for pipelines, communication and power lines, for highways, roads, airfields and railways; flatwork
45233000 : Construction, foundation and surface works for highways, roads
45233100 : Construction work for highways, roads
45233110 : Motorway construction works
45233120 : Road construction works
45233121 : Main road construction works
45233122 : Ring road construction work
45233123 : Secondary road construction work
45233124 : Trunk road construction work
45233125 : Road junction construction work
45233126 : Grade-separated junction construction work
45233127 : T-junction construction work
45233128 : Roundabout construction work
45233129 : Crossroad construction work
45233130 : Construction work for highways
45233131 : Construction work for elevated highways
45233139 : Highway maintenance work
45233140 : Roadworks
45233141 : Road-maintenance works
45233142 : Road-repair works
45233144 : Overpass construction work
45233150 : Traffic-calming works
45233160 : Paths and other metalled surfaces

45233161 : Footpath construction work
45233162 : Cycle path construction work
45233200 : Various surface works
45233210 : Surface work for highways
45233220 : Surface work for roads
45233221 : Road-surface painting work
45233222 : Paving and asphalting works
45233223 : Carriageway resurfacing works
45233224 : Dual carriageway construction work
45233225 : Single carriageway construction work
45233226 : Access road construction work
45233227 : Slip road construction work
45233228 : Surface coating construction work
45233229 : Verge maintenance work
45233250 : Surfacing work except for roads
45233251 : Resurfacing works
45233252 : Surface work for streets
45233253 : Surface work for footpaths
45233260 : Pedestrian ways construction work
45233261 : Pedestrian overpass construction work
45233262 : Pedestrian zone construction work
45233270 : Parking-lot-surface painting work
45233280 : Erection of road-barriers
45233290 : Installation of road signs
45233291 : Installation of bollards
45233292 : Installation of safety equipment
45233293 : Installation of street furniture
45233294 : Installation of road signals
45233300 : Foundation work for highways, roads, streets and footpaths
45233310 : Foundation work for highways
45233320 : Foundation work for roads
45233330 : Foundation work for streets
45233340 : Foundation work for footpaths
45234000 : Construction work for railways and cable transport systems
45234100 : Railway construction works
45234110 : Intercity railway works
45234111 : City railway construction work
45234112 : Railway depot construction work
45234113 : Demolition of tracks
45234114 : Railway embankment construction work
45234115 : Railway signalling works
45234116 : Track construction works
45234120 : Urban railway works
45234121 : Tramway works
45234122 : Underground railway works
45234123 : Partially underground railway works
45234124 : Underground passenger railway transport
45234125 : Underground railway station
45234126 : Tramline construction works
45234127 : Tramway depot construction work
45234128 : Tramway platforms construction work
45234129 : Urban railway track construction works
45234130 : Ballast construction works
45234140 : Level crossing construction works
45234160 : Catenary's construction works
45234170 : Locomotive-substations construction works

45234180 : Construction work for railways workshop
45234181 : Construction work for rail track sectioning cabins
45234200 : Cable-supported transport systems
45234210 : Cable-supported transport systems with cabins
45234220 : Construction work for ski lifts
45234230 : Construction work for chair lifts
45234240 : Funicular railway system
45234250 : Teleferic construction work

Research & development / high tech products and services

30211100-2: Super computer
38636000-2: Specialist optical instruments
38970000-5: Research, testing and scientific technical simulator

33000000 : Medical equipments, pharmaceuticals and personal care products
33100000 : Medical equipments
33110000 : Imaging equipment for medical, dental and veterinary use
33120000 : Recording systems and exploration devices
33130000 : Dental and subspecialty instruments and devices
33150000 : Radiotherapy, mechanotherapy, electrotherapy and physical therapy devices
33160000 : Operating techniques
33170000 : Anaesthesia and resuscitation
33180000 : Functional support
33190000 : Miscellaneous medical devices and products

72000000 : IT services: consulting, software development, Internet and support
72100000 : Hardware consultancy services
72200000 : Software programming and consultancy services
72300000 : Data services
72400000 : Internet services
72500000 : Computer-related services
72600000 : Computer support and consultancy services
72700000 : Computer network services
72800000 : Computer audit and testing services
72900000 : Computer back-up and catalogue conversion services

73000000 : Research and development services and related consultancy services
73100000 : Research and experimental development services
73200000 : Research and development consultancy services
73300000 : Design and execution of research and development

G. Technical explanation of the model

Introduction

In this technical annex we will revisit the results and steps taken in Stage I and Stage IV of our analysis. In Stage I, we used a sample of corrupt/grey and clean cases and their scores on the 27 red flags to estimate a model that can accurately predict the occurrence of corruption in that sample. In Stage IV we used part of this model to predict corruption using the TED dataset, containing all EU-wide procured contracts above the threshold value.

Stage I: Build a Corruption-probability Model

In Stage I we build an econometric model to predict corrupt/grey and clean cases in the procurements we assembled for our database. This is the bottom-up analyses. The database consists of 24 corrupt cases, 72 grey cases and 96 clean cases.[421] These cases are not a random sample from the whole population of public procurements, but a selection which tries to ensure that we have enough corrupt/grey cases and that these cases are well-spread over the countries and sectors. Since the selection of cases is done within sectors and countries, we cannot interpret the coefficients of the country and sector dummies.

Table G.1: Scoring of corrupt/grey and clean cases on red flags

		Number of cases	Average number of red flags[422]	Level of transparency[423]
1a+1b	Corrupt	24	4.6	54%
1c	Grey	72	4.5	64%
2	Clean cases	96	1.8	80%

Since the corrupt and grey appear to be very similar in characteristics (especially in the number of red flags present), we group them together for econometric reasons, so-called corrupt/grey cases. In the following econometric analysis we want to find out which red flags (our independent variables) can explain corruption. This means that we have a limited dependent variable, being either corrupt/grey or clean. To take into account that we have a limited dependent variable, we use a Probit model. The Probit model estimates:

$$p_i = \Pr[y_i = 1 | x_i] = \Phi(\beta_0 + \beta_i x_i)$$

where $\Phi(.)$ is the cumulative distribution function for the standard normal distribution, which means that

$$p_i = \int_{-\infty}^{\beta_0 + \beta_1 x_i} (2\pi)^{-1/2} e^{-z^2/2} dz$$

and thus that $0 < p_i < 1$. (Cameron and Trivedi, 2005, p.464-5) Since we use this non-linear estimation model, the coefficients cannot be interpreted directly. We therefore estimate marginal effects and report them in the tables with estimation results. The marginal effect of the Probit model is: [424]

$$\partial p / \partial x_i = \phi(X\beta)\beta_i$$

with $\phi(.)$ as the probability density function for the standard normal distribution. (Cameron and Trivedi, 2005, p.467)

[421] Note that a total of 206 cases have been studied, of which 108 corrupt/grey and 98 clean cases. A quality check showed that 14 of these cases (of which 12 corrupt/grey and 2 clean) contained insufficient information on the red flags to be of use for the bottom-up analysis.

[422] The three red flags that consist of a number instead of a yes/no answer are not taken into account; all red flags are formulated positively.

[423] The level of transparency is calculated as follows: The country teams tried to answer 27 questions about each case. The more questions they were able to answer (no matter what the answer was) the higher the transparency. The percentage reported is the simple division of the number of questions answered by the total number of questions (27). Hence, if 20 questions could be answered for a certain case, the case scored a level of transparency of (20/27=) 74%.

[424] Note that this marginal effect is calculated ceteris paribus, with the values of all the other variables held constant at their median value.

Most independent variables are yes/no answers. [425] Although during the data collection we tried to answer as much questions as possible, inevitably quite some questions were hard to answer. This resulted in a substantial number of missing values, mostly because it was simply not known or because the question was not relevant for that specific public procurement. Excluding all cases with one or more missing answers would result in a database with only 15 of the 192 public procurements, unsuitable for any econometric analysis. To cope with this, we assume that when a certain question is not answered with a 'yes', it is answered with a 'no'. Practically this means that all missing values are interpreted as not increasing the expectation of corruption (based on the literature). The baseline idea of this interpolation method is in line with the presumption of innocence that we know from criminal law. Since it could be that information is hidden to cover up corruption, we introduce an extra independent variable called 'amount of missing information'. This variable is constructed by counting the amount of times the above explained interpolation method is used per case. So practically this variable is the number of missing values for each case. Note that we still have missing values that are not interpolated for red flags 12, 23 and 24; the questions for which the answers are not yes or no, but a percentage or a number.

We use econometrics to find out whether we can predict whether a case is corrupt/grey based on its characteristics. We estimate, as stipulated out above, a multivariate Probit model with sector-dummies and country-dummies to correct for these context variables.[426] The table below shows the results of our complete estimation with the maximum number of red flags.[427]

Table G.2: Probit model with the maximum number of red flags

#	*Short name of the red flag*	*Coefficient*	*Standard error*	*Marginal effect*
1	Strong inertia in composition of evaluation team	-0.254	(0.712)	-0.100
3	Multiple contact points	0.904*	(0.517)	0.301
4	Contact office not subordinated to tender provider	0.082	(0.616)	0.032
5	Contact person not employed by tender provider	1.027*	(0.610)	0.361
7	Shortened time span for bidding process	0.756	(0.769)	0.254
8	Accelerated tender	0.516	(0.870)	0.184
9	Tender exceptionally large	1.175***	(0.425)	0.379
14	Complaints from non-winning bidders	0.992**	(0.425)	0.336
15	Award contract has new bid specifications	0.758	(0.691)	0.256
16	Substantial changes in project scope/costs after award	1.093**	(0.456)	0.356
17	Connections between bidders undermines competition	0.492	(0.585)	0.177
18	All bids higher than projected overall costs	1.136*	(0.628)	0.341
20	Award contract and selection documents not public	0.746*	(0.428)	0.266
25	Awarding authority not filled in all fields in TED/CAN	1.125**	(0.446)	0.354
	Amount of information missing	0.298***	(0.049)	0.116
	Road & Rail Construction	-0.128	(0.487)	-0.050
	Urban & Utility Construction	-1.349***	(0.494)	-0.500
	Waste Water Treatment	-0.081	(0.609)	-0.032
	Research and Development	-0.412	(0.504)	-0.162

[425] Only 4 independent variables are not yes/no questions: red flag 12, 23 and 24 and the amount of missing information.

[426] Note that we do not interpret their results, because they might be the result of our method to gather cases. We tried to estimate the model(s) for separate sectors or countries, but the results were disappointing due to the limited number of cases that is then left.

[427] Red flags 10, 11, 13, 19, 21, 22 and 26 are dropped due to not enough variation (<10 yes/no). Red flags 12, 23 and 24 are dropped due to incomplete information. Red flag 2, 6 and 27 are dropped because they are too related to our selection procedure and can therefore be better seen as dependent variables than independent variables. The sector dummy 'training' was dropped because it explains the dependent variable perfectly. The country-dummy for the Netherlands is dropped to prevent the dummy-trap. Note that this econometric analysis uses information on whether a red flag is present or not. This means that the no-answers and the missing answers are grouped.

Romania	1.294	(2.353)	0.389
Hungary	-0.834	(2.344)	-0.323
Spain	-0.918	(2.345)	-0.352
Italy	0.211	(2.395)	0.080
Lithuania	0.901	(2.385)	0.303
Poland	-0.280	(2.337)	-0.110
France	0.136	(2.384)	0.052
Constant	-3.305	(2.365)	-0.100
Observations	192		
Pseudo R^2	0.55		

Source: calculations based on own dataset. Stars indicate that a coefficient is significantly different from zero with the following p-values: *** p<0.01, ** p<0.05, * p<0.1. We interpret the results in the main text with a 95% confidence interval. Note that Probit-regressions are non-linear and that therefore the estimated coefficient cannot be interpreted directly. The last column shows the marginal effect of each red flag and sector. To increase readability all red flags are positively formulated (meaning that the expected sign is positive).[428]

All the four significant red flags have the expected positive sign. Thereby, the explanatory power of the model (measured by the pseudo-R^2) is 0.55, which might be seen as rather good, since the only more or less similar study that we know – Unger and Ferwerda (2011) – reports a pseudo-R^2 of 0.103 in their main Probit estimation. (Unger and Ferwerda, 2011, p. 147).

Variation in the frequency of red flags can arise due to various reasons. There is a need to recognise that there are differences between sectors as well as Member States, and these differences need to be taken into account. Thus, the model makes use of so-called 'dummies'. A dummy variable basically means that the assigned value could be either zero or one; either a case is within a certain sector/country (value = 1), or it is not (value = 0). The set of dummy variables basically sets the context in which a certain case is situated. The calculation of the effect of a red flag is what economists call 'ceteris paribus', i.e. all else being constant.

Although the model contains country and sector dummies, the coefficients of these dummies cannot be used for the analysis of country or sector specific corruption. The reason lies in the approach to data collection. For interpretation of the coefficients, a random selection of cases for Stage I is required. As we collected a set number of corrupt/grey and clean cases - with numbers we have set ourselves for efficiency purposes - and as the coefficients of country and sector dummies are determined by the number and share of corrupt/grey and clean cases, the coefficients cannot be interpreted. More specifically, the effects of these context variables suffer from the so-called 'selection bias'.

Stage II: Estimate the public loss due to corruption

This Stage makes use of the same sample of corrupt/grey and clean cases. For both corrupt grey/ and clean cases, an estimate is made of the performance of the cases in terms of (in-)effectiveness and (in-)efficiency loss – which are together considered the direct public loss. The difference between the direct public loss of corrupt/grey and clean cases is attributed to corruption.

The Stage II is part of the comprehensive methodology, but not part of the Corruption-probability model, and we will therefore refrain from further explanation (see Chapter 8).

Stage III: Apply to representative sample

In the third stage, we apply the findings from Stage I to a representative sample of certain sectors and certain countries. Goal of Stage III is to generate a rough estimation of the amount of corruption in these sectors and countries. Stage III consists of three steps: 1) model estimation; 2) calculate the expected probability of corruption; and 3) calculate the confidence interval.

[428] Red flags 10, 11, 13, 19, 21, 22 and 26 are dropped due to not enough variation (<10 yes/no). Red flags 12, 23 and 24 are dropped due to incomplete information. Red flag 2, 6 and 27 are dropped because they are too related to our selection procedure and can therefore be better seen as dependent variables than independent variables. The sector dummy 'training' was dropped because it explains the dependent variable perfectly. The country-dummy for the Netherlands is dropped to prevent the dummy-trap. Note that this econometric analysis uses information on whether a red flag is present or not. This means that the no-answers and the missing answers are grouped.

In the first step we estimate the model from Stage I on the data from Stage I, but this time we exclude the context variables. The exclusion of context variable is necessary because the coefficient of these variables represent the distribution of corrupt cases over the different background categories in the data from Stage I. These coefficients are not applicable to the representative sample as the data from Stage I is not randomly collected and suffering from a selection bias. The adjustments of the original model by exclusion of context variables leads to a lower, but still quite significant predictive power of the adjusted model with a pseudo R-squared of 0.43. Due to the adjustment, there are correspondingly different coefficients, as can be observed when comparing the table below with the similar table presented in the section of this Technical Annex on Stage I. The adjusted model leads to the same conclusions as in the original model in terms of all highly significant coefficients in the original model also being highly significant (two or three stars) in the adjusted model with the same effect on the probability.

Table G.3: Econometric estimation using the maximum number of red flags – an effective model

#	*Short name of the red flag*	*Coefficient*	*Standard error*
1	Strong inertia in composition of evaluation team	0.884*	(0.514)
2	Conflict of interest members of evaluation team	Too related to the dependent variable	
3	Multiple contact points	0.450	(0.390)
4	Contact office not subordinated to tender provider	0.281	(0.459)
5	Contact person not employed by tender provider	0.850**	(0.434)
6	Preferred supplier indications	Too related to the dependent variable	
7	Shortened time span for bidding process	0.449	(0.624)
8	Accelerated tender	0.565	(0.772)
9	Tender exceptionally large	1.045***	(0.347)
10	Time-to-bid conform the law	Not enough variation in the answers	
11	Bids after the deadline accepted	Not enough variation in the answers	
12	Number of offers	Too many missing values	
13	Artificial bids	Not enough variation in the answers	
14	Complaints from non-winning bidders	0.743**	(0.325)
15	Award contract has new bid specifications	0.505	(0.582)
16	Substantial changes in project scope/costs after award	1.084***	(0.413)
17	Connections between bidders undermines competition	0.588	(0.464)
18	All bids higher than projected overall costs	1.134**	(0.499)
19	All bidders informed of the award and its reasons	Not enough variation in the answers	
20	Award contract and selection documents not public	0.235	(0.295)
21	Inconsistencies in reported turnover/number of staff	Not enough variation in the answers	
22	Winning company listed in Chamber of Commerce	Not enough variation in the answers	
23	% of EU funding	Too much missing values	
24	% of public funding from MS	Too much missing values	
25	Awarding authority not filled in all fields in TED/CAN	1.013***	(0.366)
26	Audit certificates by auditor without credentials	Not enough variation in the answers	
27	Negative media coverage	Too related to the dependent variable	
	Amount of information missing	0.298***	(0.032)
	Observations	192	
	Explanatory power (Pseudo R^2)	0.43	

Source: calculations based on collected dataset. Stars indicate that a coefficient is significantly different from zero with the following p-values: *** p<0.01, ** p<0.05, * p<0.1. The results are interpreted in the main text with a 95% confidence interval. Note that probit-regressions are non-linear and that therefore the estimated coefficient cannot be interpreted directly. To increase readability all red flags are now positively formulated (meaning that the expected sign is positive) and the context variables are not shown.

In the second step, we estimate the probability of corruption for the representative sample by entering the data from the representative sample in the formula resulting from the adjusted model. In this step we apply the same presumption of innocence as in Stage I with respect to missing information. That is, when the information on a red flag is missing in our representative sample, we assume that the red flag is not raised. However, the fact that information is missing is not ignored. We included it in our model as "Amount of information missing" which captures the number of red flags for which there is no information. The result of the process of entering data from the representative sample into the model is a probability of corruption for each individual procurement procedure.

By averaging the probability for corruption over countries and sectors, we can obtain an estimation for the amount of corruption in those countries (in the selected product groups) and product groups (for the selected countries).

Thirdly, we estimate the confidence interval for our results. There are two sources for inaccuracy related to the average probability for corruption. The first source of inaccuracy is the spread in the probabilities for the individual procurement procedures. The estimated values are not normally distributed. In order to indicate the size of the spread, we include the standard deviation of the calculated probability of corruption per case. The larger the standard deviation, the less accurate the average value is for the individual procurement procedures. The second source for inaccuracy is related to the level of representativeness of the representative sample. Here, we compare the size of the representative sample to the total size of the cases in the product group. The larger this inaccuracy, the less sure we are that the average from the sample is similar to the average in the population.

Stage IV: Test on procurement database

In Stage IV we apply the model defined in Stage I to the TED dataset. In this dataset, awarding authorities publish all above threshold value public procurements in the European Union and EEA countries. However, we can only operationalize a few of the 27 red flags in the TED. Therefore, we have to modify the econometric model from Stage I.

First, we identified all the red flags that we can operationalize in the TED. This assumes a perfect match between the red flags in the TED and in the bottom up. Although presence of this perfect relation should be considered unlikely, it does offer the best possible basis to explore the probability of corruption on Member State or sector level. We only took into account those red flags in the TED that showed a similar pattern as in the bottom-up analyses and showed no strange country patterns.

Table G.4: Confrontation of significant red flags from the econometric estimation with the information available in the TED database

#	*Short name of the red flag*	*Possible to proxy in TED?*	*Relevant information in the TED database?**
1	Strong inertia in composition of evaluation team	No	n.a.
3	Multiple contact points	No	n.a.
4	Contact office not subordinated to tender provider	No	n.a.
5	Contact person not employed by tender provider	No	n.a.
7	Shortened time span for bidding process	Yes	Date of publication of the tender and date of deadline
8	Accelerated tender	Yes	Type of procedure
9	Tender exceptionally large	Yes	Contract value
12	Amount of offers is one	Yes	Number of offers
14	Complaints from non-winning bidders	No	n.a.
15	Award contract has new bid specifications	No	n.a.
16	Substantial changes in project scope/costs after award	No	n.a.
17	Connections between bidders undermines competition	No	n.a.
18	All bids higher than projected overall costs	Yes	Estimated contract value and final

			contract value of the winning
20	Award contract and selection documents not public	Yes	Missing data fields
23	No EU-funding involved	Yes	Community funds involved
25	Awarding authority not filled in all fields in TED/CAN	Yes	Missing data fields

* n.a. stands for "not applicable".

To implement the identified red flags in the Stage IV analysis we make some further assumptions.

- Red flag 8) Accelerated tender: This information can readily be retrieved from the TED. We include as accelerated tender (1) accelerated negotiated procedure and (2) accelerated restricted procedure.
- Red flag 12) Number of bids: We construct a red flag when there is only one bidder.
- Red flag 23) No EU funding involved: Information on the amount of EU funding at tender level is not available but we do have information on whether Community funding is involved or not. We construct a dummy variable taking a value of 1 if Community funding is involved and 0 otherwise.

These considerations resulted in the following equation on the data of the bottom-up approach in which the β's represent the relevant weights of the respective red flags. Please note we excluded the country and sector dummies from the model. This is causing the far lower Pseudo R^2 than in the original bottom-up econometric model. Reason for excluding these dummies is the non-random selection of the bottom-up dataset. Therefore, we have to interpret the meaning of these dummies as indicator for the relative division between corrupt/grey and clean cases. As this dataset is non-random, chances are high that in the TED dataset the division between corrupt/grey and clean cases is very much different, and hence, the dummy coefficients by definition not correct. Applying those dummies in the extrapolation to the TED will result in a distorted model that is methodologically not sound.

Pr(corruption) = β0 + β1 Red flag 8 + β2 Red flag 12 + β3 Red flag 18 + β4 Red flag 23

The table below shows the result of estimating such a Probit model for the four red flags that are used for the estimation of the probability of corruption. Please note, that we used the dataset from Stage I to estimate this model. We consequently extrapolate the relative weights of the red flags to the entire TED for the relevant sectors.

Table G.5: Red flags, coefficients and standard error

#	*Short name of the red flag*	*Coefficient*	*Standard error*
8	Accelerated tender	1.003**	(0.477)
12	Amount of offers is one	0.184	(0.369)
18	All bids higher than projected overall costs	0.896**	(0.416)
23	No EU-funding involved	-1.684**	(0.382)
	Constant	1.380***	(0.368)
	Observations	192	
	Pseudo R^2	0.14	

Source: calculations based on own dataset. Stars indicate that a coefficient is significantly different from zero with the following p-values: *** p<0.01, ** p<0.05, * p<0.1. We interpret the results in the main text with a 95% confidence interval. Note that Probit-regressions are non-linear and that therefore the estimated coefficient cannot be interpreted directly. The last column shows the marginal effect of each red flag and sector.

The weights that are found in the Probit model can be used to calculate a probability of corruption for all the cases in the TED-database, based on their characteristics, i.e. the red flags. This basically means that we estimate the following formula for all the public procurements in the TED-database:

$\widehat{Pr}$ (corruption) = β0 + β1 Red flag 8 + β2 Red flag 12 + β3 Red flag 18 + β4 Red flag 23

where β0-4 are the relevant weights found in the earlier calculated Probit model.

Since we acknowledge that the red flags that are used for this calculation are rather limited and do not represent all the characteristics of the public procurements, we recalculate the found probabilities to ensure that the probabilities range from zero to a hundred per cent. For this recalculation, we use the following formula:

$$Prob_{rescaled} = \frac{prob - prob_{min}}{prob_{max} - prob_{min}} \cdot 100\%$$

In this formula: we use the original unscaled probability (prob), and the minimum, respectively the maximum value of all probabilities ($prob_{min}$ and $prob_{max}$). This rescaling ensures that without any red flags there is no chance for corruption, and when all the red flags are present, the chance for corruption is 100%.

Source: CAMERON AND TRIVEDI (2005) *Micro-econometrics, Methods and Applications*, Cambridge University Press.

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