13 Corruption in EU Funds?

Europe-wide evidence of the corruption effect of EU-funded public contracting

Mihály Fazekas and István János Tóth

Introduction

There is an intense public and policy debate over whether EU Structural and Cohesion Funds (henceforth EU Funds) contribute to lower levels of corruption and better governance or conversely fuel government favouritism and erode institutional quality. This debate is fed by striking negative examples: the Italian mafia hijacking highway projects, or the European Commission freezing Structural Funds payments in countries such as Romania, Bulgaria and Hungary. Some of these examples suggest the involvement of high-level politics and organised criminal groups, raising the possibility that the EU in fact extensively finances large-scale corruption in a number of countries. As EU Funds constitute a considerable proportion of GDP in many member states, especially in Central and Eastern Europe (CEE) where they amount to between 1.9 per cent and 4.4 per cent of annual member state GDPs (KPMG, 2012) and well above 50 per cent of public investment, this debate is crucial for the future of the EU and its territorial cohesion as well as the quality of institutions across Europe more broadly.

However, there has been little academic research on this topic, which deprives policymakers of crucial evidence underpinning future policy decisions. In order to address this gap in the evidence base, this chapter sets out to assess systematically the impact of EU Funds spending on institutionalised grand corruption risks across the whole EU. The chapter focuses on the 27 EU member states with sufficiently sizeable public procurement spending funded by the EU – that is, the EU28 countries except for Malta[1] – over the 2009–14 period. EU Funds are spent in various ways that make it impossible to arrive at a blanket assessment of their impact on corruption. We look specifically at public procurement spending by public or semi-public organisations (i.e. state-owned enterprises) financed from EU Funds, which predominantly means the use of Cohesion and Structural Funds. This approach has the advantage that we can compare projects that are similar in most respects except for the source of financing: predominantly EU or predominantly national. Moreover, there is exceptionally good comparative data available on large public procurement tenders in all countries at the level of individual contracts. Our approach is a major departure from prior studies

in this area, as it utilises a large-scale micro-level quantitative database, which allows us to paint a detailed picture of mechanisms at the analytical level where corruption takes place, while also being broad enough to evaluate whole systems of governance.

Theory

In spite of the considerable public and policy interest in corruption risks in EU Funds spending, there has been remarkably little scientific research conducted into the question to date (Dimulescu *et al*., 2013; Beblavy and Sičáková-Beblavá, 2014; Fazekas *et al*., 2014). There are, however, two bodies of literature that speak to this issue: the political science literature on aid dependence and the Europeanisation literature in political science.

The literature looking at the effect of development aid on quality of institutions, and corruption is extensive. It can only suggest the main mechanisms at play, as EU Funds are spent in Europe in very different institutional contexts and funding volumes than development aid is spent in developing countries. Nevertheless, according to this literature, foreign aid can have a positive effect on governance by providing clear policy goals such as improving the civil service and helping countries to overcome the lack of resources for state-building (Knack, 2001). However, development aid can also destroy institutions and impede state-building in much the same way that natural resources can (Djankov *et al*., 2008). It can weaken accountability and the development of civil society by breaking the link between domestic revenues (i.e. taxation) and government services. It can also damage administrative capacity in three ways:

1 reallocating talented bureaucrats from domestic institutions to aid organisations;
2 providing additional organisational goals that undermine institutional cohesion; and
3 increasing the pool of public resources available for rent-seeking, which easily translates into additional corruption in contexts with weak administrative capacity (Bräutigam, 2000).

Meanwhile, the Europeanisation literature presents three good reasons for believing that EU Funds support good government:

1 One of the most important remaining post-accession levers that Brussels has at its disposal for disciplining new member states is EU Funds and the threat of withdrawing them (Epstein and Sedelmeier, 2009). This should motivate recipient countries to manage funds to a high EU standard, if needed, even better than national funds.
2 The disbursement of EU Funds is more heavily regulated, making corruption more costly and motivating recipient organisations to invest in administrative capacity.

3 Extensive monitoring of and controls on EU Funds in addition to the national audit frameworks (for example, OLAF or the European Court of Justice) make the detection and punishment of corruption more likely than in projects funded with domestic funds (European Commission, 2003; European Court of Auditors, 2012, 2013).

However, there are also three arguments in the Europeanisation literature that external funding such as EU Funds damages the quality of government and increases corruption:

1 EU Cohesion and Structural Funds are spent on investment projects where public officials have wide discretion (for example, project design and budgeting). From the wider literature, it is clear that discretionary spending is more likely to involve corruption than non-discretionary spending such as pensions (Mauro, 1998; Tanzi and Davoodi, 2001).
2 EU funding provides a large additional pool of public resources for rent extraction, which is in effect unlimited as most recipient countries struggle to draw 100 per cent of allocated funds (Mungiu-Pippidi, 2013).
3 EU Funds, like any external funding, weaken the link between domestic civil society, taxation and policy performance.

In the context of public procurement, 'institutionalised grand corruption' refers to the allocation and performance of public procurement contracts by bending prior explicit rules and principles of good public procurement in order to benefit a closed network while denying access to all others (World Bank, 2009; Fazekas *et al*., 2014).

From the above discussion, the following null hypothesis results:

H_0: EU Funds decrease institutionalised grand corruption across the EU.

The above discussion also suggests that in countries and regions with diverse institutional quality, the effect may also differ due to the relative strength of each causal mechanism linking EU Funds to public procurement corruption. While no systematic analysis of determinants is presented due to lack of space, it is suggested that more corrupt countries and regions are less willing to cooperate with EU authorities and more prone to rent-seeking, which tips the balance towards more corruption in EU Funds.

Data and variables

Data used

The database we used, Tenders Electronic Daily (henceforth TED), derives from public procurement announcements of the 2009–14 period in the EU27 countries (i.e. the EU28 countries minus Malta) and is the online version of the Supplement

to the *Official Journal of the European Union*, dedicated to EU public procurement (DG GROWTH, 2015). TED is a comprehensive database containing details of all public procurement procedures conducted under the EU Public Procurement Directive – that is, all contracts exceeding set contract value thresholds (for example, €135,000 for services and goods contracts). The database was released by the European Commission, which has also conducted a series of data quality checks and enhancements. TED contains variables appearing in both calls for tenders and contract award notices, which provide a rich picture of the procurement process up until contract award by disclosing contract values, the number of bidders, the names of the winning firm and the deadline for submission, to name only a few key variables available.[2] Each country's public procurement legislation operates within the framework of the EU Public Procurement Directive and so the legislation of different countries is therefore, by and large, comparable. TED contains the details of over 2.8 million contracts for the 27 EU member states considered.

Variables used in the analysis

Use of EU Funds

The spending of EU Funds in public procurement can be directly identified in each contract award announcement, which records the use or non-use of EU Funds along with reference to the corresponding EU programme. However, no information is published as to the proportion of EU funding within the total contract value. Hence, we had to employ a yes/no categorisation of each contract awarded. Public procurement from EU Funds falls under the same procurement rules and thresholds as other funding sources. Common national and EU legal frameworks for public procurement warrant a meaningful comparison between EU-funded and non-EU-funded public procurement procedures. The crucial difference between contracts funded from EU Funds and those funded by national governments lies in the additional monitoring and controls and different motivation structures associated with spending EU Funds. While the use of EU Funds differs greatly between countries, there are a large number of observations for matching contracts in each case (see Table 13.A1 in the Appendix). The full database used for this analysis can be downloaded at digiwhist.eu/resources/data.

Indicators of institutionalised grand corruption

Developing comparative indicators of institutionalised grand corruption in public procurement for all EU27 countries represents the primary methodological innovation of this chapter. The approach follows closely the corruption risk measurement methodology developed by the authors in that it makes use of a wide range of public procurement 'red flags' (Fazekas *et al*., 2014, forthcoming; Charron *et al*., 2015).

The measurement approach exploits the fact that for institutionalised grand corruption to work, procurement contracts have to be awarded recurrently to

companies belonging to the corrupt network. This can only be achieved if legally prescribed rules of competition and openness are circumvented. By implication, it is possible to identify both the input side of the corruption process (i.e. fixing the procedural rules for limiting competition) and also the output side (i.e. signs of limited competition). By measuring the degree of unfair restriction of competition in public procurement, a proxy indicator of corruption can be obtained.

First, the simplest indication of restricted competition in line with our theoretical definition is when only one bid is submitted for a tender in an otherwise competitive market, which typically allows for awarding contracts above market prices and extracting corrupt rents (output side). Hence, single-bidder contracts as a percentage of all of the awarded contracts is the most straightforward measure we used.

Second, a more complex indication of high-level corruption also incorporates characteristics of the tendering procedure that are in the hands of public officials who conduct the tender and suggests deliberate competition restriction (input side) (Fazekas *et al*., 2013). This composite indicator, which we call the corruption risk index (CRI), represents the probability of corrupt contract award in public procurement, defined as follows:

$$CRI^i = \Sigma_j \, w_j * CI_j^{\,i} \tag{13.1}$$

$$\Sigma_j \, w_j = 1 \tag{13.2}$$

$$0 \leq CRI^i \leq 1 \tag{13.3}$$

$$0 \leq CI_j^i \leq 1 \tag{13.4}$$

where CRI^i stands for the corruption risk index of contract *i*, CI_j^i represents the *j*th elementary corruption indicator observed in the tender of contract *i* and w_j represents the weight of elementary corruption indicator *j*. Elementary corruption indicators can be either corruption inputs or outputs. CRI = 0 indicates minimum corruption risk, while CRI = 1 denotes maximum corruption risk observed. Based on qualitative interviews about corruption in the public procurement process, a review of the literature (OECD, 2007; World Bank, 2009; PricewaterhouseCoopers, 2013) and regression analysis, we identified the following five components of the CRI in addition to single bidding (Table 13.1):

1 A simple way to fix tenders is to avoid the publication of the call for tenders in the official public procurement journal, as this makes it harder for competitors to prepare a bid. This is only considered in non-open procedures, as in open procedures publication is mandatory.
2 While open competition is relatively hard to avoid in some tendering procedure types such as open tender, others such as invitation tenders are by default much less competitive; hence using less open and transparent procedure types can indicate the deliberate limitation of competition, hence corruption risks.

Table 13.1 Summary of elementary corruption risk indicators.

Procedural phase	*Indicator name*	*Indicator values*
Submission	Call for tenders publication	0 = call for tender published in official journal 1 = NO call for tender published in official journal
	Procedure type	0 = open procedure types 1 = non-open procedure types (e.g. accelerated restricted procedure)
	Length of submission period	Number of days between publication of call for tenders and submission deadline (for short submission periods, weekends are deducted)
Assessment	Weight of non-price evaluation criteria	Sum of weights for evaluation criteria that are NOT related to prices
	Length of decision period	Number of days between submission deadline and contract award announcement
Outcome	Single bidder contract (valid/received)	0 = more than 1 bid received 1 = only 1 bid received

3 If the advertisement period (i.e. the number of days between publishing the call for tenders and the submission deadline) is too short to allow for the preparation of an adequate bid, it can serve corrupt purposes, whereby the issuer informally tells the well-connected company about the opportunity well in advance.
4 Different types of evaluation criteria are prone to manipulation to different degrees; subjective, hard-to-quantify criteria often accompany rigged assessment procedures as they create room for discretion and limit accountability mechanisms.
5 If the time taken to decide on the submitted bids is excessively short or lengthened by legal challenge, it can also signal corruption risks. Snap decisions may reflect premediated assessment, while legal challenge and the correspondingly lengthy decision period suggests outright violation of laws.

For continuous variables above such as the length of the advertisement period, thresholds had to be identified in order to reflect the non-linear character of corruption. This is because most values of continuous variables can be considered as reflections of diverse market practices, while some sets of outlier values are more likely associated with corruption. Thresholds were identified using regression analysis, in particular analysing residual distributions (for more on this, see Fazekas *et al*., forthcoming).

We restricted the sample in two ways:

1 *Competitive markets*: We only examined tenders in markets with at least ten contracts awarded during the 2009–14 period, where markets are defined by product type (CPV[3] level 3) and location (NUTS[4] level 1) within each country.
2 *Regulated tenders*: We only used those tenders that are above EU thresholds in order to avoid the noise of contracts that are too small and voluntary reporting, which follows erratic patterns across countries and over time.

These together removed 17 per cent of the observations.

In addition to the identification of thresholds in continuous variables, regression analysis was also used to identify 'red flags' which are most likely to signal corruption rather than any other phenomena such as low administrative capacity. Ultimately, those variables and variable categories that were selected are large and significant predictors of single-bidder contracts. The regression set-up controlled for four likely confounders of bidder numbers:

1 institutional endowments measured by type of issuer (for example, municipal or national);
2 product market and technological specificities measured by CPV division of products procured;
3 contract size (log contract value in euros);
4 regulatory changes as proxied by year of contract award.

The logic of regression analysis is as follows. If, in a certain country, not publishing the call for tenders in the official journal for open procedures is associated with a higher probability of a single-bidder contract award, it is likely that avoiding the transparent and easily accessible publication of a new tender is typically used for limiting competition. This would imply that a call for tenders not published in the official journal becomes part of the analysed country's CRI. Taking another example, if we found that leaving only 5 or fewer days for bidders to submit their bids is associated with a higher probability of a single-bidder contract award compared to periods longer than 20 calendar days (a more or less arbitrary benchmark category), this would indicate that extremely short advertisement periods are often used for limiting competition. This would then provide sufficient grounds to include the 'Five or fewer days' category of the decision period variable in the CRI of the country in question. Following this logic, in addition to the outcome variable in these regressions (single-bidder), only those variables and variable categories that are in line with a rent extraction logic and proven to be significant and powerful predictors were included in the CRI.

Once the list of elementary corruption risk indicators was determined with the help of the above regressions, each of the variables and variable categories received a component weight. As we lacked the detailed knowledge of which elementary corruption technique is a necessary or sufficient condition for corruption to occur, we assigned equal weight to each variable and the sizes of regression coefficients were only used to determine the weights of categories within variables.

For example, if there were four significant categories of a variable, then they would get weights 1, 0.75, 0.5 and 0.25, reflecting category ranking according to coefficient size. The component weights were normed so that the observed CRI fell between 0 and 1.

Each of the two corruption risk indicators has its pros and cons. The strength of the single-bidder indicator is that it is very simple and straightforward to interpret. However, it is also more prone to gaming by corrupt actors due to its simplicity. The strength of the CRI is that while individual strategies of corruption may change as the environment changes, they are likely to be replaced by other techniques. Therefore, the composite indicator is a more robust proxy of corruption over time than a single-variable approach. In an international comparative perspective, a further strength of the CRI is that it balances national specificities with international comparability by allowing for the exact formulation of the components to vary, thereby reflecting differences in local market conditions. The main weakness of the CRI is that it can only capture a subset of corruption strategies in public procurement, arguably the simplest ones; hence it misses out on sophisticated types of corruption such as corruption combined with inter-bidder collusion.

Validity of corruption risk indicators

While the validity of both corruption risk measures predominantly stems from their direct fit with the definition of high-level corruption in public procurement, it is also underpinned by their association with widely used survey-based macro-level corruption indicators as well as with further micro-level objective indicators of corruption risks.

Both corruption risk indicators (2009–14 averages per NUTS region using the number of nationally funded contracts) correlated as expected with the regional European Quality of Institutions index, population corruption perceptions and self-reported bribery of the same regional representative survey of 2013 (Charron *et al*., 2010) (Table 13.2).

Table 13.2 Bivariate Pearson correlation between 'objective' measures of regional corruption and survey-based indicators for NUTS2 regions that awarded at least five contracts in the 2009–14 period.

Variable	*% single-bidder contracts*	*Regional CRI*	*N*
% single-bidder contracts		0.51*	178
Regional CRI	0.51*		178
EQI (2013)	–0.41*	–0.11	171
Corruption perception	0.34*	0.12	172
Reported bribery	0.34*	0.20*	172

Source: TED and Charron *et al.* (2015).

Note: * = significant at the 5% level.

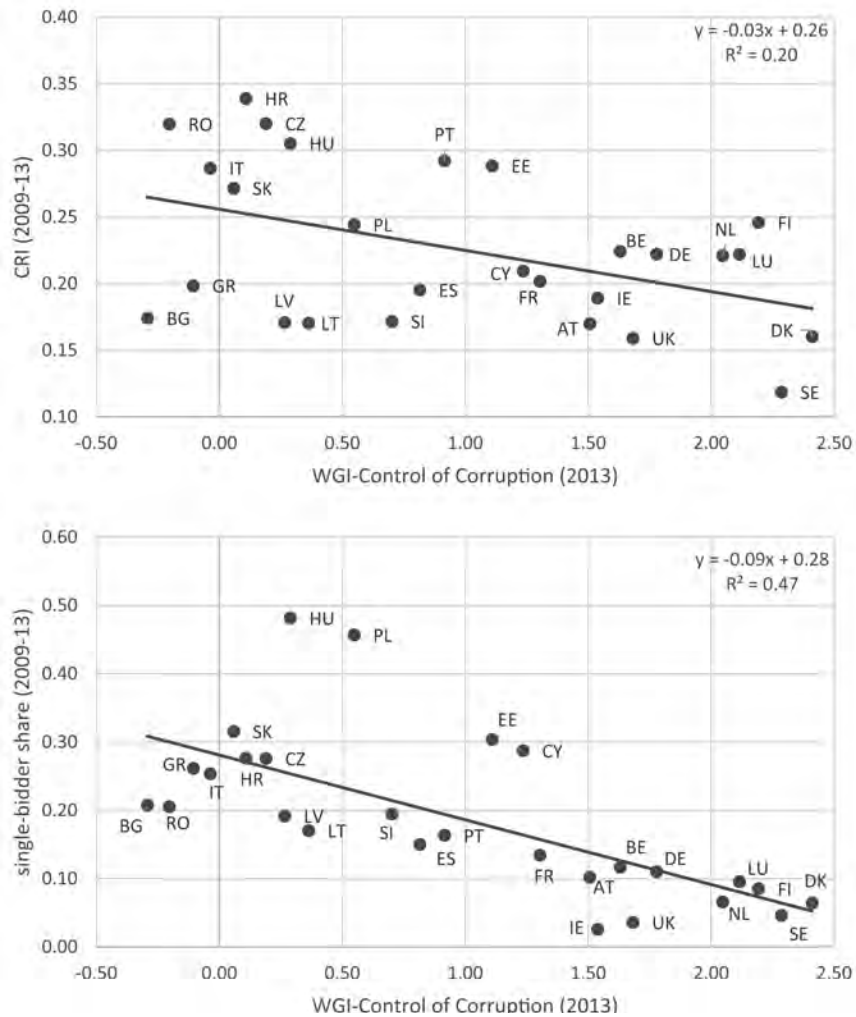

Figure 13.1 Bivariate relationship between WGI-Control of Corruption (2013 point estimate) and the CRI and the share of single-bidder contracts (2009–13 period averages).

Source: TED and Kaufmann *et al.* (2010).

At the national level, one simple indication that the corruption indices were valid was their association with widely acknowledged and used corruption indices such as the World Bank's Control of Corruption indicator (Figure 13.1: top panel for the CRI, bottom panel for the share of single-bidder contracts). While validity tests were confirmatory in both cases, the association was much stronger for the single-bidder indicator than for the CRI.

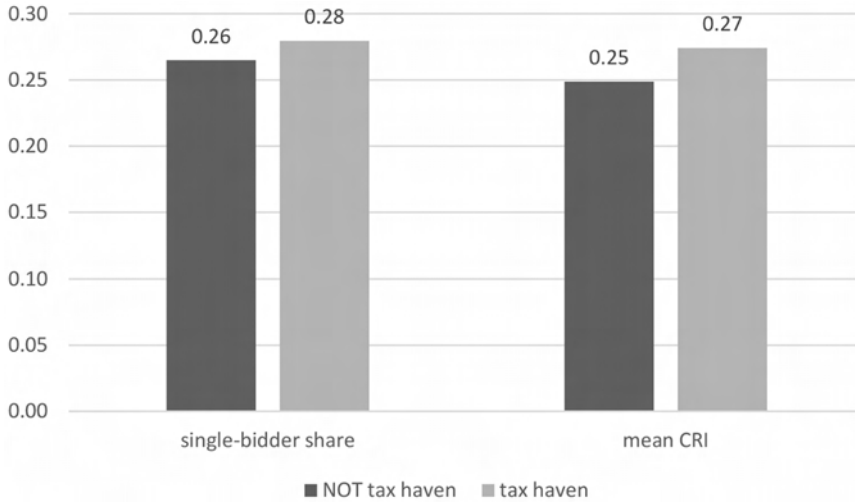

Figure 13.2 Average corruption risks of public procurement suppliers registered abroad, EU26, 2009–14 ($N_{contract}$ = 27,888).

Source: TED

Note: We excluded Croatia and Malta due to the small number of observations.

In addition to macro-level evidence of validity, two micro-level 'objective' risk indicators were inspected for further testing validity: procurement suppliers' country of origin and contract prices. It was expected that contracts that carry a higher corruption risk are won by companies registered in tax havens as their secrecy allows for hiding illicit money flows (Shaxson and Christensen, 2014). In line with our expectations, there was a marked and significant difference with regards to both indicators (Figure 13.2).

We also expected corruption to drive prices up. A simplistic, albeit widely used, indicator of price in the absence of reliable unit prices is the ratio of actual contract value to initially estimated contract value (Coviello and Mariniello, 2014). As expected, both the single-bidder indicator and the CRI were associated with a higher price ratio. Single-bidder contracts were associated with a 9 per cent higher contract value, while contracts with one unit higher CRI were associated with a 17 per cent higher contract value (Table 13.3).

Results

In the absence of random assignment of EU funding, the causal effect of EU Funds on corruption risks was estimated by matching tenders without EU funding (control group) with tenders funded by EU Funds (treatment group) and comparing the two groups in terms of corruption risks, measured by the CRI

Table 13.3 Linear regression explaining relative contract value, EU27, 2009–14.

Dependent variable	*Relative contract value (contract price/estimated price)*	
Independent variables		
Single-bidder contract	0.092	
CRI		0.173
Sign.	0.000	0.000
Each regression contains constant		
Controls: sector of contracting entity, type of contracting entity, year of contract award, country of contract award, main product market of procured goods and services, contract value		
N	543,355	543,355
R^2	0.143	0.115

Source: TED.

and the single-bidder share. Comparing tenders that were as similar as possible in every relevant respect except funding source allowed for the identification of a causal impact of EU Funds on corruption risks. The obvious limitation of this approach was that we could not measure all of the confounding factors; hence we could not fully account for all of the systematic differences between EU-funded and nationally funded contracts that contribute to corruption risks. We used state-of-the-art matching methods that are widely employed in the programme evaluation literature (Imbens and Wooldridge, 2009).

Matching is superior to the simple, unmatched comparison of group means as long as the selection of EU-funded projects is itself not driven by corrupt considerations such as deliberately channelling EU Funds to markets where hiding corruption is easier. If the selection is predominantly strategic, driven by corruption, the simple comparison is more appropriate than matching. As it is unclear to what degree EU Funds selection is driven by corrupt considerations, we considered the matched results as a lower-bound estimate and the simple comparison as an upper-bound estimate of the causal impact.

A simple, unmatched comparison of the average single-bidder share and the CRI suggested that EU-funded procurement carries higher corruption risks than nationally funded procurement across the whole of the EU (Tables 13.4 and 13.5). These effects are substantial: increases of 38 per cent and 16 per cent for the single bidder share and the CRI respectively compared to nationally funded contracts.

In order to balance the different composition of EU-funded and nationally funded contracts, we employed a propensity score-matching algorithm[7] that matched contracts on control variables.[8] The corruption risks of any contract are determined on the one hand by the characteristics of the contract itself (for example, the type of service or goods procured, such as a consultancy report) and on the other, by the institutional environment in which it is awarded (for example, weaker control institutions in a country). Both of these had to be

Table 13.4 Unmatched and matched comparisons of EU-funded and non-EU-funded contracts' single-bidder share, EU27[5] totals, 2009–14.

	Unmatched comparison	*Propensity score-matching (cross-country)*	*Propensity score-matching (within-country)*
Non-EU-funded	0.247	0.242	0.281
EU-funded	0.340	0.340	0.338
Diff. (EU-funded − non-EU-funded)	**0.093**	**0.098**	**0.057**
95% conf. interval – lower bound	0.091	0.094	0.054
95% conf. interval – upper bound	0.096	0.101	0.061
N non-EU-funded	1,407,301	123,678	121,338
N EU-funded	123,696	123,696	121,338

Source: TED.

Table 13.5 Unmatched and matched comparisons of EU-funded and non-EU-funded contracts' CRI, EU27[6] totals, 2009–14.

	Unmatched comparison	*Propensity score-matching (cross-country)*	*Propensity score-matching (within-country)*
Non-EU-funded	0.225	0.260	0.254
EU-funded	0.262	0.262	0.261
Diff. (EU-funded − non-EU-funded)	**0.037**	**0.003**	**0.008**
95% conf. interval – lower bound	0.036	0.001	0.006
95% conf. interval – upper bound	0.038	0.004	0.009
N non-EU-funded	1,407,300	123,678	121,338
N EU-funded	123,696	123,696	121,338

Source: TED.

controlled for in the matching process to arrive at a balanced comparison. In terms of characteristics of contracts matched, the following five variables were used:

- the main market of procured goods and services (using CPV two-digit categorisation once again);
- the log value of the contract;
- the year of contract award;
- the type of procuring organisation (for example, local body or public utility);
- the main sector in which the procuring organisation operates (e.g. education, healthcare).

In terms of institutional characteristics, we controlled for the country in which the contracting authority resides, which captures the macro-institutional factors determining corruption risks. This was done in two alternative ways:

1 We allowed for a degree of flexibility where some contracts could be matched to a contract in another country as long as it improved matching on contract-level characteristics (cross-country matching).
2 We restricted matching only to contracts in the same country at the expense of poorer matching on contract-level characteristics and in fact removing some EU-funded contracts due to a lack of sufficient matches (within-country matching).

While these two variants did not deliver substantially different results, the more restrictive approach is preferable as national-level effects are likely to override contract-level effects. Tables and Figures demonstrating the quality of matching procedures can be found in the Appendix.

The propensity score-matching procedures, taking into account confounding factors, revealed a similar picture to the unmatched comparison, although effect magnitudes change somewhat, in particular for CRI comparisons. For the single-bidder indicator, the cross-country propensity score-matching resulted in a similarly strong effect (0.1), while the within-country propensity score-matching delivered a slightly smaller effect (0.06) (Table 13.4). Both of these effects are substantial in relative terms: they indicate that corruption risks would have been 20–40 per cent lower had the same contracts been financed from national funds rather than EU Funds.

For the CRI, both propensity score-matching algorithms delivered a substantially smaller effect size than the simple comparison: the cross-country matching showed an increase of corruption risks due to EU Funds of 0.003, while the within-country matching resulted in a somewhat larger effect (0.01) (Table 13.5). Both of these effects are small in relative terms: they indicate that corruption risks would have been 1–3 per cent lower had the same contracts been financed from national funds rather than EU Funds.

In sum, for all of the specifications, the negative effect of EU funding on corruption risks (i.e. worsening corruption) stayed by and large the same. The stronger negative effect when measuring corruption risks by the single-bidder share rather than by the CRI is in line with prior research looking at CEE national datasets (Fazekas *et al*., 2014). This suggests that it is market outcomes that are particularly negatively influenced by EU funding, whereas formal requirements such as the use of open procedure or publishing the call for tenders are more positively influenced.

It must be noted that a large portion of the control group was discarded in order to achieve a tight comparison between treatment and control groups, while even some EU-funded contracts were excluded by the within-country propensity score-matching algorithm, as no sufficiently close match was found. Missing values of control variables were included as separate values in each matching algorithm; however, due to their large numbers in some countries, they may have influenced the reliability of the results in ways that are not clear. As data quality is best for the biggest beneficiaries of EU funding, such bias is expected to be minor. For the EU-wide average effect, we did not apply any country weights; hence each

country contributed to the overall mean in proportion to the number of EU-funded contracts it has been awarded. This made the performance of the Polish EU funding system the single most important factor in determining the overall EU mean as Polish EU-funded contracts make up roughly one-third of all EU-funded contracts in the database.

Based on these results, we can reject H_0 – that is, the moderating effect of EU Funds on grand corruption in public procurement across the whole EU. EU-funded public procurement contracts carry a greater risk of corruption than domestically funded ones whether or not tenders' characteristics are matched. The different effect magnitudes given by using the single-bidder share and the CRI indicate the different effect of EU Funds on the outcomes of competition and the characteristics of the contracting process. This is hardly a surprise given the predominant focus of EU monitoring on bureaucratic inputs rather than competitive outcomes.

The change in effect magnitude when controlling for confounding factors highlights that the contexts in which EU Funds are spent exercise a considerable impact on corruption risks. In order to directly explore this variability at the national level, EU-funded and nationally funded contracts' shares of single bidders were plotted by country (Figure 13.3). It is apparent that most countries cluster around the line representing parity between corruption risks in EU-funded and nationally funded public procurement, though there are some

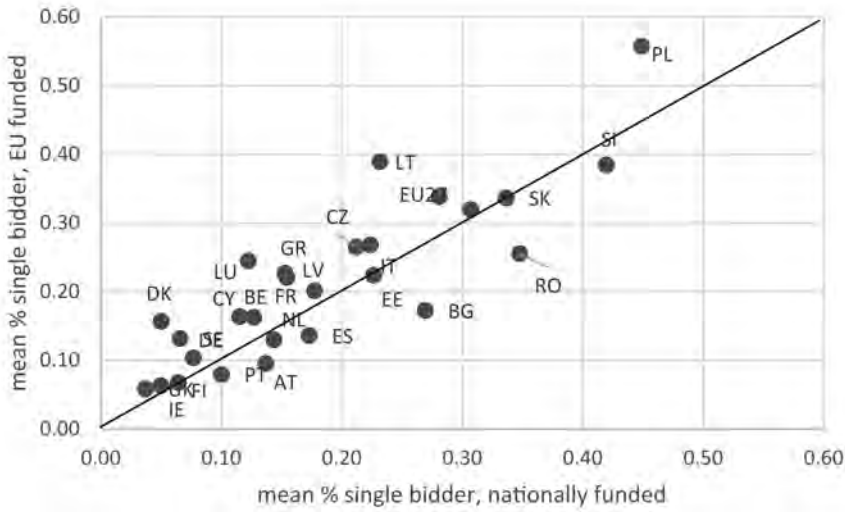

Figure 13.3 Single-bidder shares of EU-funded and nationally funded public procurement contracts by country, EU26,[9] 2009–14 (applying within-country matching).

Source: TED.

Note: The dashed line indicates where the single-bidder shares are equal in EU-funded and national funded contracts. We excluded Croatia and Malta due to the small number of observations.

notable exceptions representing wide deviations between EU funding and national funding such as Poland or Bulgaria.

While no comprehensive explanation of such heterogeneous effect can be offered here due to lack of space, it is suggested that regions with higher levels of corruption risks in general are also less able to control the additional corruption risks attached to EU Funds (for example, additional discretionary spending). Plotting the CRI difference between EU-funded and nationally funded contracts on matched samples and the unmatched mean total CRI at the regional level (Figure 13.4) suggests that the increase of the general level of corruption in a region increases the relative underperformance of EU Funds; that is, corruption risks in EU Funds increase further compared to national funds.

Conclusions

While much additional work is needed, this chapter has already demonstrated that it is feasible and fruitful to use detailed, contract-level data for tracking corruption risks over time across EU countries. Such monitoring can be done in real time if the necessary investment into database development is made. Findings indicate that EU funding increases corruption risks in some EU member states albeit not in others, while on average having a negative effect across the EU. This effect is particularly large where general corruption risks in the region are

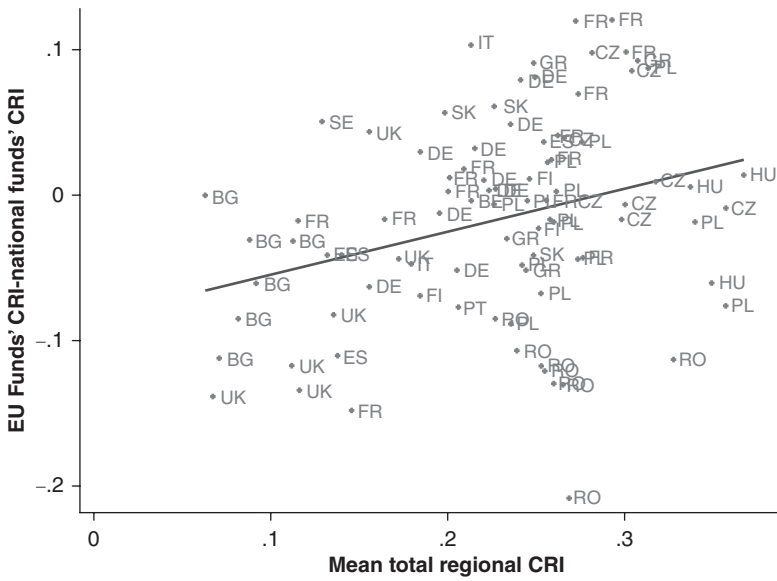

Figure 13.4 Scatter plot of the CRI difference between EU-funded and nationally funded contracts and the mean total regional CRI, by NUTS2 regions that awarded at least 200 EU-funded contracts in the 2009–14 period.

Source: TED.

high. Relative prices in EU-funded contract awards (the ratio of actual contract value to initially estimated contract value) (Coviello and Mariniello, 2014) are also higher than nationally funded ones on the matched samples (price increase of 0.4 per cent), which implies that approximately €9.9 billion of EU taxpayers' money is lost per annum. When interpreting the results, it is worth keeping in mind that corruption is a diverse phenomenon that could only partially be captured with the selected 'red flags'. Further work should use more precise measurement based on richer data.

Appendix

Table 13.A1 Use of EU Funds in the EU27, for markets that awarded at least ten contracts worth above €125,000 in the 2009–14 period.

Country	*N of contracts awarded*	*% of contracts funded by the EU*	*% of spending through EU-funded public procurement*
AT	13,147	1.4%	1.6%
BE	24,901	7.8%	18.2%
BG	33,023	6.8%	33.9%
CY	4,465	4.7%	8.3%
CZ	27,432	38.8%	18.5%
DE	138,477	5.0%	7.6%
DK	22,553	0.8%	1.4%
EE	7,308	21.9%	14.6%
ES	69,022	13.8%	16.3%
FI	8,729	8.8%	11.0%
FR	391,673	4.9%	9.4%
GR	12,963	29.8%	64.5%
HR	4,056	0.6%	0.3%
HU	28,111	21.8%	62.8%
IE	4,338	8.0%	15.7%
IT	74,579	2.8%	4.6%
LT	32,902	11.7%	5.7%
LU	2,264	9.4%	91.0%
LV	56,036	20.1%	38.8%
NL	22,146	3.5%	1.8%
PL	523,797	8.8%	28.1%
PT	6,145	28.4%	54.7%
RO	86,602	3.8%	29.2%
SE	27,235	1.2%	3.1%
SI	29,707	3.9%	35.3%
SK	12,902	13.1%	38.5%
UK	105,389	5.0%	2.0%
Total	**1,769,902**	**8.0%**	**14.0%**

Source: TED.

Table 13.A2 Summary of balance in the unmatched and the two matched samples (using Stata 12.0 ps test command).

Sample	*Ps R^2*	*LR chi^2*	*p > chi^2*	*MeanBias*	*MedBias*	*B*	*R*	*%Var*
Unmatched	0.396	391175	0.000	11.0	7.6	186.5*	1.59	99
Propensity score-matching (cross-country)	0.070	25682	0.000	5.3	3.3	64.1*	1.83	95
Propensity score-matching (within-country)	0.110	40114	0.000	5.6	3.0	82.0*	1.38	98

Source: TED.

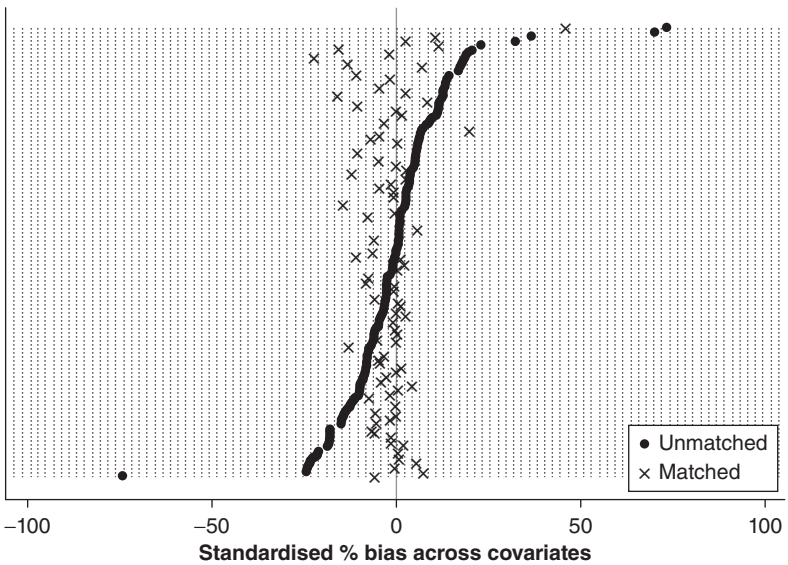

Figure 13.A1 Overview of bias remaining after matching per variable, propensity score-matching (cross-country).

Source: TED.

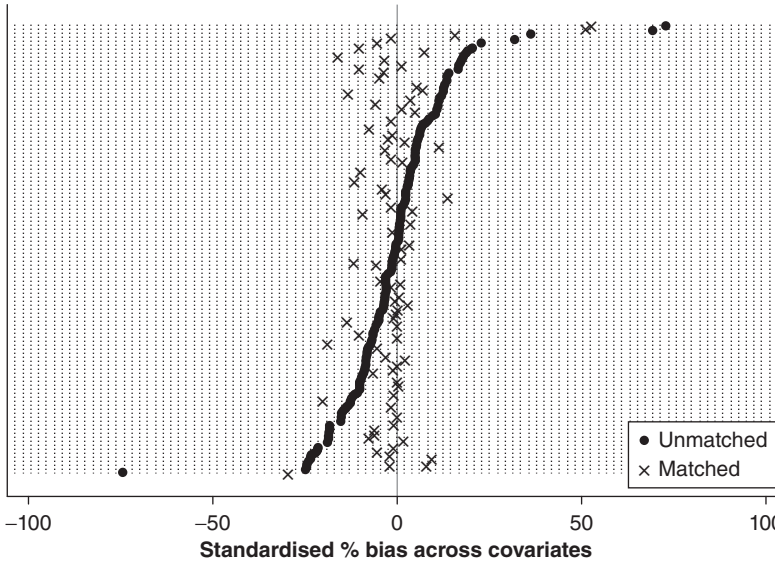

Figure 13.A2 Overview of bias remaining after matching per variable, propensity score-matching (within-country).

Source: TED.

Notes

1 Malta is too small a country with small public procurement markets, making it unsuitable for the corruption risk measurement methodology.
2 For full list of variables available see: http://digiwhist.eu/publications/towards-a-comprehensive-mapping-of-information-on-public-procurement-tendering-and-its-actors-across-europe/.
3 CPV = Common Procurement Vocabulary. For more information, see http://simap.ted.europa.eu/en/web/simap/cpv.
4 NUTS = nomenclature of territorial units for statistics. For more information, see http://ec.europa.eu/eurostat/web/nuts/overview.
5 Croatia is excluded from the matched comparisons as it didn't have a sufficient pool of non-EU-funded project to generate a sufficient quality matching.
6 Croatia is excluded from the matched comparisons as it didn't have a sufficient pool of non-EU-funded project to generate a sufficient quality matching.
7 We used the Stata 12.0 psmatch2 algorithm.
8 Coarsened exact matching was also conducted, leading to a much tighter matching at the expense of discarding most of the EU-funded contracts due to lack of sufficient matches. By implication, the resulting sample was not reliable enough to characterise the whole of the EU anymore. Detailed results can be obtained from the authors.
9 The EU28 minus Malta and Croatia.

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