Corruption Risk of EU-Funded Contracts in the EU 2007-2023

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Abstract

The study examines two questions based on public procurement data from EU member states between 2007 and 2023: (i) whether the corruption risk in public procurements financed by EU funds differs from those financed by national sources; (ii) and whether the downward trend in the risk of corruption in public procurement in the new member states, as shown by previous research, will continue after 2020. For the analysis, we use data from the contract-level database published by the EU TED (Tender Electronic Daily) for 2007-2023, which contains data on more than 10.4 million public contracts.

The results show that considering various characteristics of public procurement contracts, EU-funded contracts increase the corruption risk. This conclusion holds whether we use the traditional indicator of corruption risk (the proportion of contracts awarded without competition) or a more suitable indicator for the institutional corruption environment (the proportion of contracts awarded with at no more than three bidders). Analyzing the proportion of the net value of contracts awarded without competition within the total net value of contracts also leads to the same result. The findings support the view that Western European countries exhibit the strongest positive correlation between EU funding and increased corruption risk. Therefore, the European Commission and EU organizations (OLAF, European Public Prosecutor's Office) should closely and regularly monitor public procurement contracts financed by EU funds across all member states, including the Western European countries.

Furthermore, our findings on the decreasing trend in corruption risk in public procurement contracts across new member states (NMS) align with our previous research. Between 2007 and 2023, corruption risk in NMS has steadily approached the lower levels observed in Western European countries, which serve as a benchmark. All corruption risk indicators used in this study support this trend. We interpret this as a sign of institutional convergence, indicating that EU and national institutions in the new member states are increasingly capable of controlling and mitigating corruption risk in public procurement.

Introduction

The study examines two questions based on public procurement data from EU member states between 2007 and 2023: (i) whether the corruption risk in public procurements financed by EU funds differs from those financed by national sources; (ii) and whether the downward trend in the risk of corruption in public procurement in the new member states, as shown by previous research, will continue after 2020.

This study is related to our previous works[1].

A crucial empirical question is whether EU structural and cohesion funds contribute to reducing corruption and improving governance or exacerbate corruption and deteriorate governance quality.

In a previous study (Fazekas et al., 2013), we examined the impact of EU funds on corruption risk in public procurement in the Czech Republic, Hungary, and Slovakia (2009–2013). The results indicated that EU funds increased corruption risk in Hungary and Czechia. In another study (Fazekas & Tóth, 2016), we analyzed public procurement across 27 EU Member States (2009–2014) from this perspective. Findings showed that EU funding heightens corruption risk overall, with significant variations across countries and regions. This effect was most pronounced in countries where corruption risk was already high. Moreover, EU-funded contracts had higher relative prices (contract price vs. estimated price), leading to a 0.4% price increase across the EU—translating to an estimated €9.9 billion annual loss for European taxpayers.

Tóth and Palócz (2022) examined corruption risk differences based on funding type (EU vs. national) in public procurement contracts across Europe (2006–2019). Descriptive statistics revealed that EU-funded contracts exhibited higher corruption risk—especially in the earlier years—across Eastern and Western/Southern European countries.

Tóth and Hajdu (2020) analyzed European public procurement contracts (2006–2018), interpreting corruption risk discrepancies between new Member States and Western European countries as indicators of institutional quality differences.

[1] See: Fazekas, M., Chvalkovska, J., Skuhrovec, J., Tóth, I. J. & King, L. P. (2013). Are EU Funds a Corruption Risk? The Impact of EU Funds on Grand Corruption in Central and Eastern Europe. In A. Mungiu-Pippidi (Eds.) The Anticorruption Frontline. The ANTICORRP Project, vol. 2. (pp. 68-89). Barbara Budrich Publishers. https://doi.org/10.2139/ssrn.2363545; Fazekas, M. & Tóth, I.J. (2016). Corruption in EU Funds? Europe-wide evidence of the corruption effect of EU-funded public contracting. In J. Bachtler et al. (Eds.) EU Cohesion Policy: Reassessing Performance and Direction. (pp. 186-205). Routledge. https://doi.org/10.4324/9781315401867; Tóth, I. J. & Hajdu, M. (2021). Corruption, Institutions and Convergence. In M. Landesmann & I. P. Székely (Eds.) Does EU Membership Facilitate Convergence? The Experience of the EU's Eastern Enlargement - Volume II, (pp. 195-248). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-57702-5_9; Tóth, I.J. & Palócz, É. (2022). Firm Size, Productivity, EU Funds, and Corruption. In L. Mátyás (Eds.) Emerging European Economies after the Pandemic. Contributions to Economics. (pp. 113-153). Springer. https://doi.org/10.1007/978-3-030-93963-2_3

Trends in corruption risk differences were seen as measures of institutional convergence. Their results confirmed the poor performance of Southern European EU countries while highlighting significant divergence among new Member States: (a) strong institutional convergence: Slovakia, Estonia, Lithuania; (b) weak or no convergence: Italy, Greece, Bulgaria, Slovenia; (c) and slow and mild convergence with persistently low institutional quality: Czech Republic, Hungary, Latvia, Poland, Romania.

In this analysis, we build upon and expand previous studies by incorporating new data and indicators to examine the correlation between EU funding and corruption risk, using public procurement contract data from all EU Member States.

1. Data and variables

For the analysis, we use data from the contract-level database published by the EU TED (Tender Electronic Daily)[2] for 2007-2023, which contains data on more than 10.4 million public contracts.

For contract-level data, we estimate whether the corruption risk of EU-funded contracts significantly differs from that of nationally funded contracts after controlling for the type of procedure (open or non-open), the size of the contract value, the economic sector of the product/service purchased during the contract, and the corruption level characteristic of the countries. The corruption risk (CR) is measured with a binary variable, which takes the value of 0 if more than one bidder competed for the contract and one if there was no competition and only one bidder (the eventual winner) submitted a bid. In addition, we also examine another corruption risk indicator (*CRX*), which measures how well corruption risks have been controlled. The *CRX* takes a value of 0 if the number of bids during the procurement tender exceeds three and a value of 1 if there are no more than three bids. The two variables (*CR* and *CRX*) are therefore constructed as follows:

CR [0,1]: 0, if there was more than one bid in the tender;

1, if there was only one bid in the tender;

and

CRX [0,1]: 0, if there were more than three bids in the tender;

1, if there were no more than three bids in the tender.

The use of the *CRX* is justified because corruption is still possible in countries where systemic corruption is prevalent, even with two or three seemingly independent bids due to collusion between the contracting authority and the bidders. In such cases, the corrupt official of the contracting authority tells the

[2] See: https://data.europa.eu/data/datasets/ted-csv?locale=en

corrupt company executive, *'You will win, but to comply with formal rules, bring two losing bids as well.'* This is the logic behind such collusion. Such situations rarely occur with four or more bids, as organizing three or more losing (corrupt) bids would be costly and not easy to achieve for the corrupt winning company.

The presence of EU funds (*EU*) and the type of procedure (*LTI*), the type of the contract (whether the contract is part of a government agreement, *GPA*), the use of the electronic auction (*EAUCTION*), and in which country the contract was concluded (*NMS*) are also measured with binary variables as follows:

EU [0,1]: 0, if the procurement contract was financed from national sources;

1, if the contract was financed by EU funds.

LTI [0,1]: 0, if the procurement procedure was open;

1, if the procurement procedure was not open.

GPA [0,1]: 0, if the contract was not covered by the Government Procurement Agreement;

1, if the contract was covered by the Government Procurement Agreement.

EAUCTION [0,1]: 0, if electronic auctions were not used;

1, if electronic auctions were used.

NMS [0,1]: 0, if the contract was in a Western European country;

1, if the contract was in a New Member State.

SEC [0,1]: 0, if the contract was in a Western European country;

1, if the contract was in a Southern European country.

Additionally, we determined the economic sector of the product or service based on the CPV codes of the purchased product or service (distinguishing 35 economic sectors), and we also considered the natural logarithm of the net contract value (ln*NCV*) in the estimates. We ran logit estimations on contract-level data for 2007-2023, with separate estimations for each year. The estimation equations were as follows: (1) and (2) for every *j* contract and *t* year.

In addition to the contract-level analysis, we also examined the correlation between corruption risk and EU aid based on annual aggregate data from EU Member States, i.e., at the country level. This method can be used to investigate how the proportion of contracts awarded with a high risk of corruption is related to the proportion of contracts with EU support. In addition, we can analyze a new corruption risk indicator (*NCV_CRR*) that measures by year the share of the total amount of contracts awarded in a country with a high risk of corruption (contracts where was only one bid) in the total annual net value of contracts in this country. The higher the ratio, the higher the weight of contract value with high corruption risk in the country in a given year.

The following variables were used for the analysis based on country level data:

$$CRR_{i,t} = \frac{\sum_{j=1}^{k} cr_{j,i,t}}{N_{i,t}},$$

$$CRXR_{i,t} = \frac{\sum_{j=1}^{k} crx_{j,i,t}}{N_{i,t}},$$

$$NCV\_CRR_{i,t} = \frac{\sum_{j=1}^{k} ncv\_cr_{j,i,t}}{NCV_{i,t}},$$

$$EUR_{i,t} = \frac{\sum_{j=1}^{k} eu_{j,i,t}}{N_{i,t}},$$

$$LTIR_{i,t} = \frac{\sum_{j=1}^{k} lti_{j,i,t}}{N_{i,t}},$$

$$EAUCTIONR_{i,t} = \frac{\sum_{j=1}^{k} eauction_{j,i,t}}{N_{i,t}} \text{ and}$$

$$\ln NCV_{i,t} = \ln of\ total\ net\ contract\ value\ in\ country\ i\ and\ year\ t.$$

where $cr_{j,i,t}$ takes a value of one if only one bid was received before the contract *j* was awarded in country *i* and year *t*; $crx_{j,i,t}$ takes a value of one if there were no more than three bids before the contract *j* was awarded in country *i* and year *t*; $ncv\_cr_{j,i,t}$ is the net contract value of contract *j* for which there was only one bid in country *i* and year *t*; the $NCV_{i,t}$ is the total net contract value in country *i* and year *t;* $eu_{j,i,t}$ takes a value of one if contract *j* was financed by EU funds in country *i* and year *t*; $eauction_{j,i,t}$ takes a value of one if in the tender electronic auctions was used before the contract *j* was awarded in country *i* and year *t;* and $N_{i,t}$ is the total number of contracts in country *i* and year *t*.

During the analysis, EU member states were categorized into three groups: Western European countries (*WEC*), Southern European countries (*SEC*), and New Member States (*NMS*). See the Annex 1 for a list of countries in each group.

2. Models

The equations for estimating the corruption risk in the contract level for each contract *j* and year *t* are as follows (1.1-1.2):

$$P(CR_{it} = 1) = \frac{1}{1 + e^{-z_{it}}}$$

$$z_{it} = \alpha_t + \beta_{1t} EU_{it} + \sum_{k=1}^{n} \gamma_{kij} X_{kit} + \varepsilon_{it} \quad (1.1) \text{ and}$$

$$P(CRX_{it} = 1) = \frac{1}{1+e^{-z_{it}}}$$

$$z_i = \alpha_t + \beta_{1t} EU_{it} + \sum_{k=1}^{n} \gamma_{kij} X_{kit} + \varepsilon_{it} \quad (1.2)$$

where *X* is the vector of other independent variables that describe the characteristics of each contract. We ran logit estimations for (1.1) and (1.2).

Among the other independent variables, the type of procedure, open or non-open (*LTI*), the logarithm of the net contract value(*lnNCV*), whether the contract was covered by the Government Procurement Agreement (*GPA*), whether an electronic auction was used, the economic sector of the product or service purchased, and country dummies were included.

In addition to contract-level analysis, we examine relationships between variables at the country level. Specifically, we analyze correlations among country-level variables and compare the averages of contract-level variables across countries. The corruption risk variables at the country level include *CRR*, *CRXR*, and *NCV_CRR*. Other country-level variables include the rate of non-open procedures (*LTIR*), the rate of electronic auctions (*EAUCTIONR*), the logarithm of net contract value (*lnNCV*), and the contract year (*YEAR*).

3. Results

3.1. Descriptive statistics

Between 2007 and 2023, the risk of corruption was significantly lower in Western European countries (0.17) than in the new accession countries (Table 3.1.1). Western European countries also had public procurements financed by EU funds, but their proportion was much lower (3.2 percent) than in the new accession countries (9.3 percent).

The proportion of public procurement contracts awarded through non-open procedures, which are less transparent than open procedures, was more than twice as high in Western European countries (21.7 percent) compared to the new accession countries (9.0 percent). Electronic auctions were used more in EU countries: only 2.3 percent of tenders were conducted this way. Electronic auctions were held nearly three times more frequently in the new accession countries (3.1 percent) than in Western European countries (1.2 percent).

Table 3.1.1.: Descriptive statistics of main variables at contract level data from 2007 to 2023

	CR	*CCX*	*EU*	*LTI*	*lnNCV*	*GPA*	*EAUCTION*
New Member States							
Mean	0.417	0.740	0.093	0.090	10.001	0.241	0.031
Standard Deviation	0.493	0.438	0.290	0.286	2.176	0.428	0.173
N	3632021	3632021	3,703,072	3,694,689	3,166,068	3,703,072	3,703,072
Western European Countries							
Mean	0.169	0.491	0.032	0.217	11.791	0.602	0.012
Standard Deviation	0.375	0.500	0.177	0.412	2.050	0.490	0.111
N	2,281,223	2,281,223	2,885,435	2,865,799	1,876,790	2,885,435	2,885,435
Southern European Countries							
Mean	0.281	0.569	0.090	0.157	11.773	0.322	0.015
Standard Deviation	0.449	0.495	0.286	0.363	2.175	0.468	0.123
N	802,781	802,781	969,726	966,179	853,108	969,726	969,726
EU Countries							
Mean	0.316	0.635	0.069	0.147	10.827	0.389	0.021
Standard Deviation	0.465	0.481	0.254	0.354	2.314	0.488	0.146
N	6,716,025	6,716,025	7,558,233	7,526,667	5,895,966	7,558,233	7,558,233

Note: lnNCV is the ln of net contract value (EUR); without framework agreements.

The average net value of contracts was slightly higher in Western European countries than in the new accession countries (see the ln*NCV* column in Table 3.1.1).

We see the same differences examining country-level data (Table 3.1.2 and Fig. 3.1.1a-f). In Figures 3.1.1a-f, the circles represent the data of a single country

for a single year. In the left-side figures, we grouped the countries into three categories: Western European, Southern European, and new accession countries. In the right-side figures, each country's annual data appears twice: the figure represents separately the contracts financed by EU funds (blue circles) and national sources (purple circles).

From the figures, it is clear that the corruption risk indicators used in our analysis (*CRR, CRXR*, and *NCV_CRR*) distinctly separate Western European and new accession countries (Fig. 3.1.1a, Fig. 3.1.1c, and Fig. 3.1.1e). The 3.1.1b figure shows that in the case of EU-funded contracts, the relationship between corruption risk (*CRR*) and corruption risk control (*CRXR*) is less tight than in the case of nationally funded contracts (Fig. 3.1.1b and Table A2.1.) The traditional corruption risk indicator (*CRR*), which is the proportion of single-bidder contracts in all contracts, presents a more favorable picture in the case of EU-funded contracts than in reality: the low value of this indicator often merely indicates that only two or three companies competed for the public procurement contract, rather than four or more companies (See Fig. 3.1.1.b).

It is also evident that the high risk of corruption seen in EU-funded tenders occurs mainly in small tenders (Fig. 3.1.1d. and Fig. 3.1.1f.) The circles represent the EU-funded (blue circles) and nationally funded (purple circles) contracts for each year and each country. In the figure 3.1.1d. the horizontal axis shows the share of the value of non-competitive contracts within the total contract value; the vertical axis represents the traditional indicator of corruption risk, the proportion of non-competitive contracts. The figure 3.1.1.d shows that the blue circles representing EU-funded contracts are often higher and to the left than the purple circles representing nationally funded contracts. We can see the same relationship in Fig. 3.1.1f. In the case of EU-funded contracts, countries are more characterized by higher corruption risk and a lower proportion of contract value awarded under high corruption risk.

Table 3.1.2.: Descriptive statistics of main variables at country level data from 2007 to 2023

	CRR	*CRXR*	*EUR*	*LTIR*	*lnNCV*	*EAUCTIONR*
New Member States						
Mean	0.344	0.669	0.152	0.172	7.907	0.051
Median	0.320	0.681	0.123	0.155	7.769	0.004
Standard Deviation	0.118	0.137	0.112	0.114	1.007	0.119
N	189	189	189	189	189	189
Western European Countries						
Mean	0.146	0.453	0.035	0.267	8.360	0.009
Median	0.127	0.454	0.025	0.223	8.309	0.003
Standard Deviation	0.080	0.131	0.034	0.140	1.291	0.027
N	198	198	198	198	198	198
Southern European Countries						
Mean	0.254	0.538	0.143	0.127	7.720	0.011
Median	0.258	0.544	0.088	0.120	7.677	0.003
Standard Deviation	0.103	0.132	0.135	0.109	1.856	0.019
N	108	108	108	108	108	108
EU Countries						
Mean	0.245	0.554	0.103	0.200	8.047	0.025
Median	0.236	0.548	0.065	0.181	7.902	0.003
Standard Deviation	0.134	0.164	0.111	0.137	1.366	0.079
N	495	495	495	495	495	495

Note: lnNCV is the ln of net contract value (EUR million); without framework agreements.

Fig. 3.1.1a-f. Scatterplots of *CRR*, *CRXR* and *NCV_CRR*, 2007-2023

Fig. 3.1.1a.

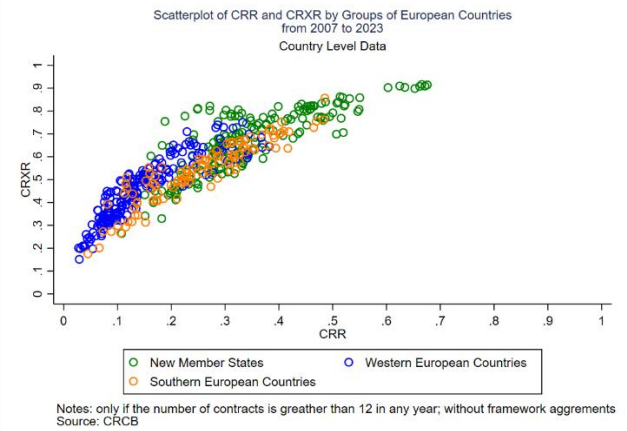


Fig. 3.1.1b.

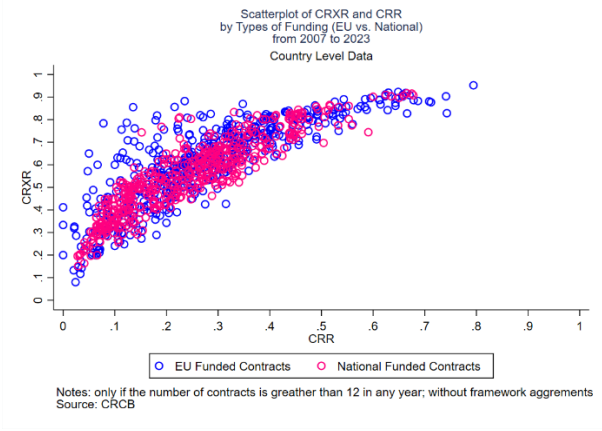


Fig. 3.1.1c.

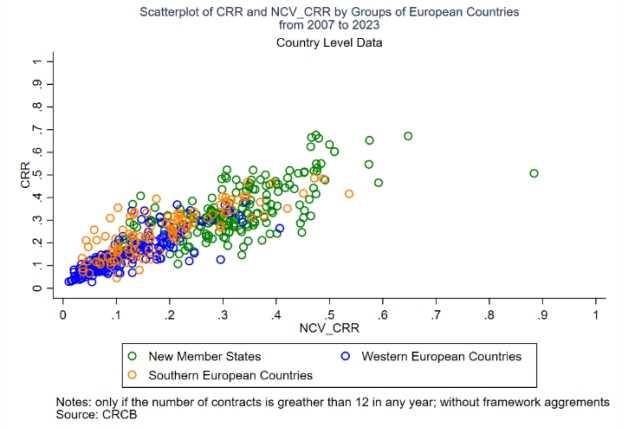


Fig. 3.1.1d.

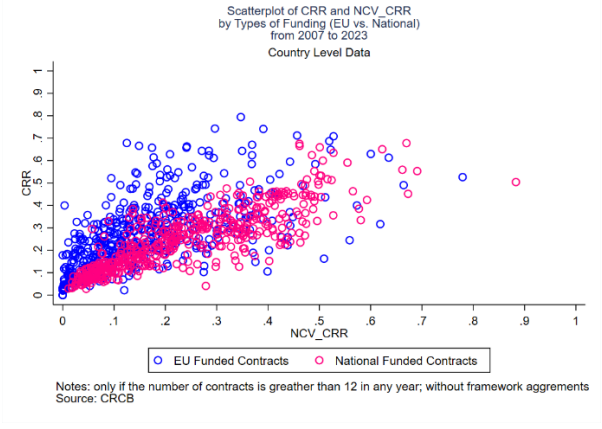


Fig. 3.1.1e.

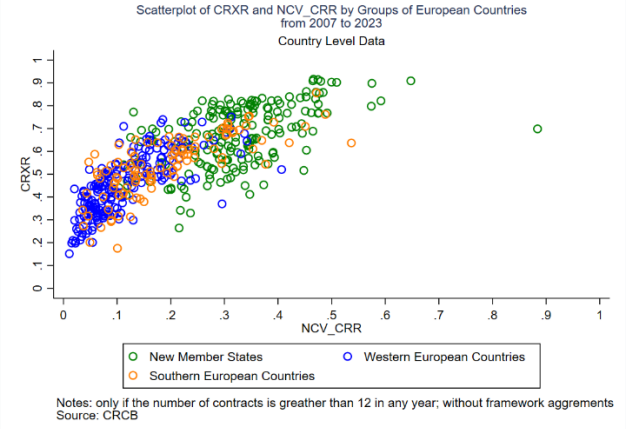
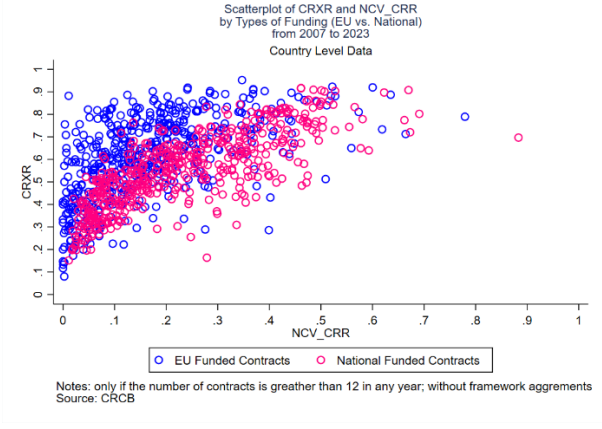


Fig. 3.1.1f.



Notes: CRR: share of contracts awarded without competition (single bid) in total number of contracts; CRXR: share of contracts with no more than three bids in total number of contracts; without framework agreements. NCV_CRR: share of net contract value of high corruption risk contracts in total net contract value.

3.2. Estimations

The analysis of approximately 5 million public procurement records from EU Member States (2007–2023) indicates that EU-funded procurement carries a significantly higher corruption risk than nationally funded procurement. In our estimations, we controlled for factors such as procedure type (*LTI*), contract value (*lnNCV*), government procurement agreements (GPA), electronic auctioning (EAUCTION), sector of activity (SECTOR), Member State (COUNTRY), and year (YEAR).

EU funding increases the likelihood of high-corruption-risk contracts by approximately 20–21% compared to national funding. This relationship holds regardless of whether corruption risk is measured by the incidence of single-bidder contracts (CR) or contracts awarded with up to three bidders (CRX).

Notably, the elevated corruption risk associated with EU funding is consistent across all three country groups: new Member States (NMS), Southern and Eastern European countries (SEC), and Western European countries (WEC). Specifically, EU funding increases the likelihood of high-corruption-risk contracts by 23% in NMS, 8–15% in SEC, and 34–44% in WEC compared to national funding. Although EU-funded contracts account for only 3.5% of total contracts in WEC, it is in these countries that EU funding is linked to the largest increase in corruption risk (34–44%) (Figure 3.2.1d, Table 3.2.1b).

These findings underscore the need to mitigate corruption risks in EU-financed procurement not only in new member states (NMS) but also in Western European Countries (WEC).

Except for Southern European countries, the effect of EU-funding to rise the corruption risk was significantly more substantial at the beginning of the period (Table 3.2.1a, Table 3.1.2b, Table A1.1a-b, and Figures 3.2.1a-d). It weakened between 2016 and 2018 but re-emerged later. In Southern European countries, EU financing either resulted in lower corruption risk or did not affect the corruption risk of contracts (Figure 3.2.1c).

The study next examines whether the corruption risk levels in new EU member states have decreased over time, converging with the lower corruption levels of Western European countries. Such a decline would indicate institutional convergence, suggesting that contracting authorities in these countries are increasingly capable of conducting procurements with lower corruption risk, aligning their practices with those of Western European authorities. This question is also relevant for Southern European countries.

Our previous findings showed a clear trend of institutional convergence in several newly acceded countries, including Estonia, Latvia, Lithuania, and Slovakia. In Southern European countries, corruption risk levels significantly declined relative to Western European levels from the initially high levels

observed at the beginning of the study period[3]. The present study incorporates data from 2020–2023, and our current results support the continuation of this institutional convergence trend in both new member states and Southern European countries (see Figures 3.2.3a-b). The downward trend has persisted beyond 2019.

Since the start of the period, corruption risk levels in new member states relative to Western Europe have declined significantly. At the beginning, the odds ratio of high-corruption-risk contracts in new member states was 6.08 times higher than in Western European countries (after accounting for other contract characteristics). By the end of the period, this ratio had fallen to 40% of its initial value. However, despite this progress, high-corruption-risk contracts in new member states remain 2.3 times more likely than in Western Europe.

As a result, new member states are gradually approaching the corruption risk levels of Southern European countries. The second corruption risk indicator (CRX) for 2007–2022 reflects the same trend, with new member states slowly converging toward Western European levels and nearing Southern European levels by the end of the period. However, this improving trend appears to have stalled in 2023.

One promising finding from our research is the impact of electronic auctions (EAUCTIONS) to mitigate corruption risk. Our data shows that electronic auctions are consistently associated with lower levels of corruption risk (Fig. 3.2.4.)[4] This procurement method effectively halves the odds of high corruption risk. Despite its limited use in only 2 percent of contracts between 2007 and 2023 in EU member states, our results suggest that a wider application of this method could be a powerful tool in limiting corruption risk in EU procurements.

The results also highlight that less transparent (not open) procurement methods increase the corruption risk (See the A3.1a-b Tables in Annex). Therefore, the EU Commission's efforts to encourage member states to increase the share of open procedures are commendable.

[3] See: Tóth, I. J. & Hajdu, M. (2021). Corruption, Institutions and Convergence. In M. Landesmann & I. P. Székely (Eds.) Does EU Membership Facilitate Convergence? The Experience of the EU's Eastern Enlargement - Volume II, (pp. 195-248). Palgrave Macmillan. https://doi.org/10.1007/978-3-030-57702-5_9;

[4] Due to the low number of e-auctions, the years 2007 and 2008 were omitted, as the number of e-auctions in each of these years was below 2,000.

Fig. 3.2.1a-d. Impact of EU Funding on Corruption Risk (CR) in the EU, 2007-2023

Fig. 3.2.1a.

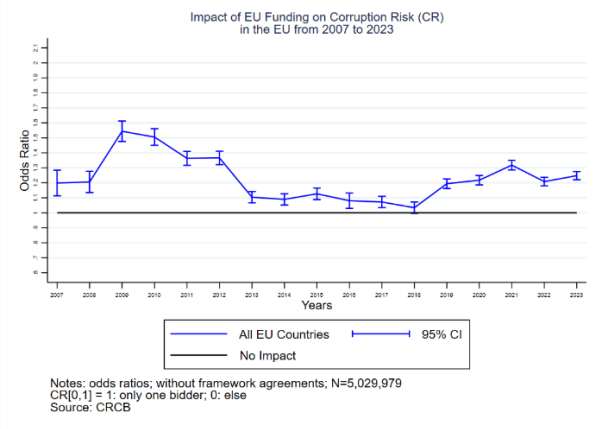


Fig. 3.2.1b.

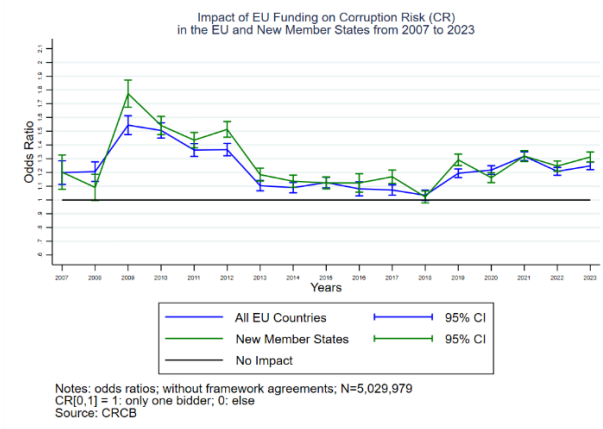


Fig. 3.2.1c.

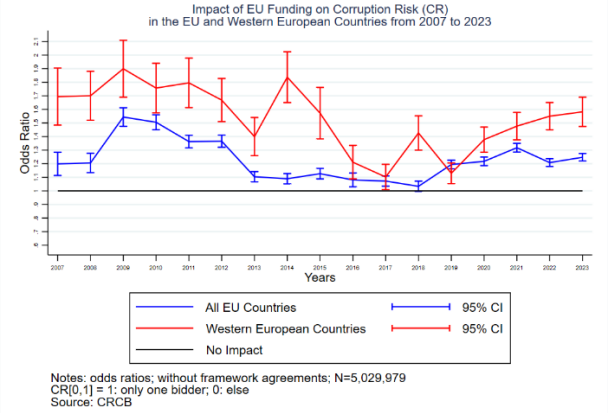
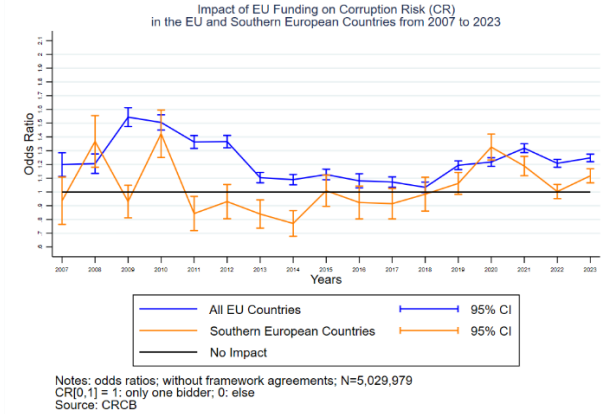


Fig. 3.2.1d.



Notes: CR (corruption risk): contract awarded without competition (single bid); without framework agreements; N =5,029,979.

Fig. 3.2.2a-d. Impact of EU Funding on Corruption Risk (CRX) in the EU, 2007-2023

Fig. 3.2.2a.

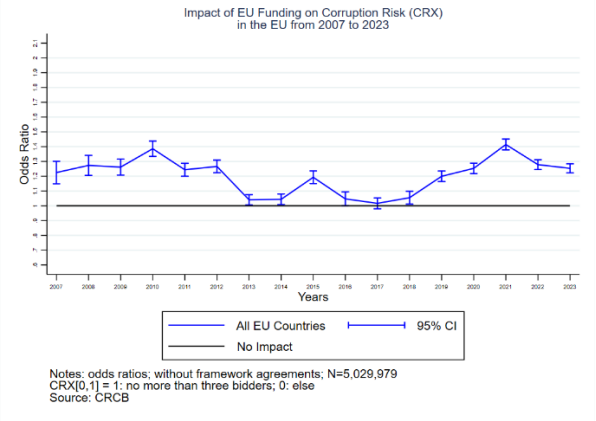


Fig. 3.2.2b.

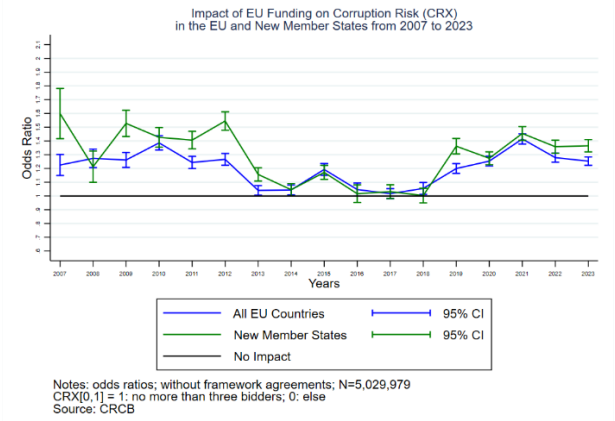


Fig. 3.2.2c.

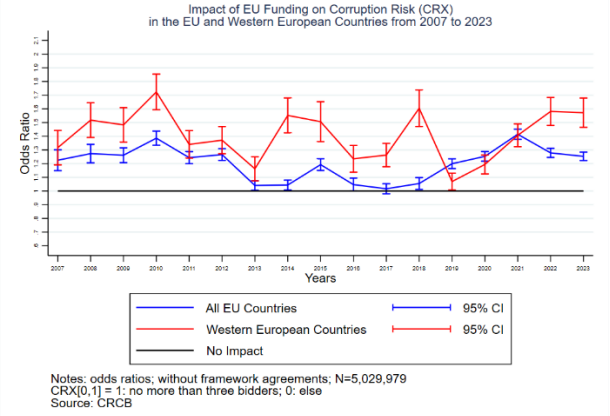
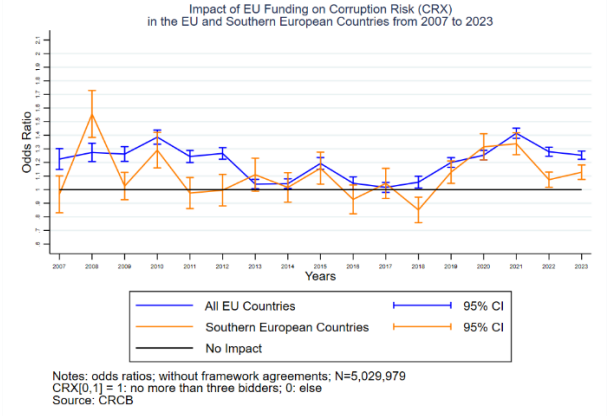


Fig. 3.2.2d.



Notes: CRX (corruption risk): contract awarded with no more than three bids; without framework agreements; N =5,029,979.

Fig. 3.2.3a-b. Trends of Institutional Convergence. Trend of Corruption Risk Indicators in New Accession Countries and Southern European Countries relative to West European Countries, 2007-2023

Fig. 3.2.3a.

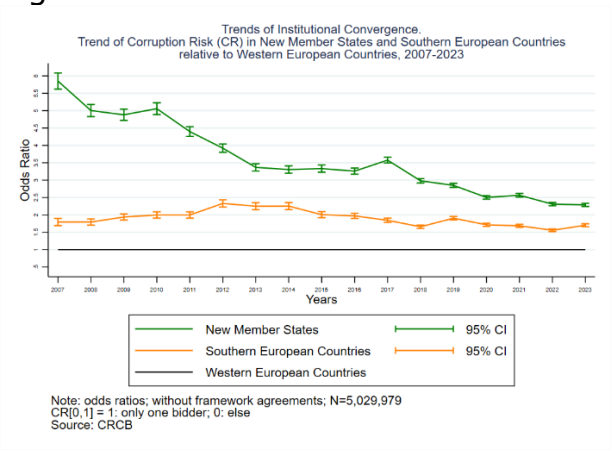


Fig. 3.2.3b.

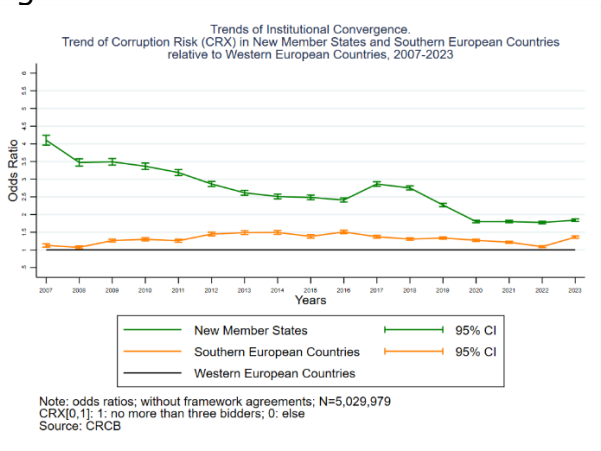


Fig. 3.2.4. Impact of E-auction on Corruption Risk (CR) in the EU, 2009-2023

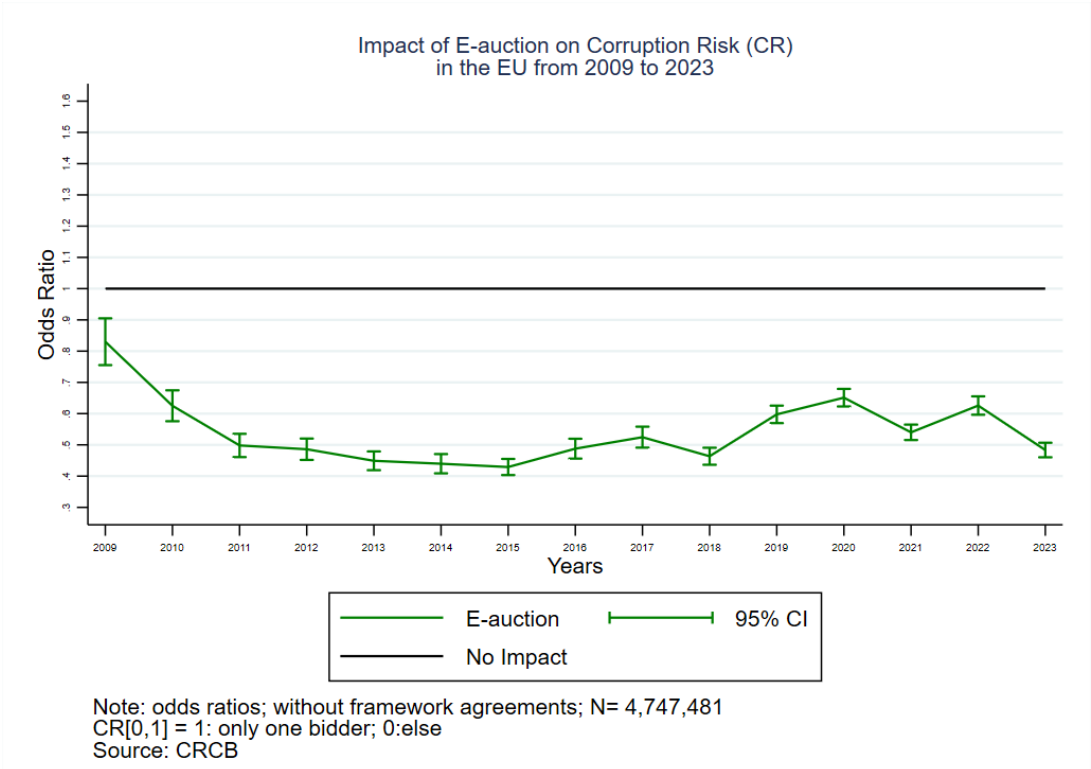


Table 3.2.1a. Results of Logit Estimations, 2007-2023

	Impact of EU Funds on[1]		Impact of NMS on[2]		Impact of SEC on[3]	
Years	CR	CRX	CR	CRX	CR	CRX
2007	1.20***	1.22***	5.85***	4.10***	1.79***	1.13***
	(0.04)	(0.04)	(0.12)	(0.07)	(0.05)	(0.02)
2008	1.21***	1.27***	5.00***	3.47***	1.79***	1.07***
	(0.04)	(0.03)	(0.09)	(0.05)	(0.05)	(0.02)
2009	1.54***	1.26***	4.88***	3.49***	1.94***	1.26
	(0.03)	(0.03)	(0.08)	(0.05)	(0.04)	(0.02)
2010	1.51***	1.39***	5.06***	3.37***	2.00***	1.30***
	(0.03)	(0.03)	(0.09)	(0.05)	(0.05)	(0.02)
2011	1.36***	1.24***	4.40***	3.19***	2.00***	1.26***
	(0.02)	(0.02)	(0.07)	(0.04)	(0.05)	(0.02)
2012	1.37***	1.27***	3.92***	2.87***	2.33***	1.45***
	(0.02)	(0.02)	(0.06)	(0.04)	(0.05)	(0.03)
2013	1.10***	1.04***	3.37***	2.61***	2.25***	1.49***
	(0.02)	(0.02)	(0.05)	(0.03)	(0.05)	(0.03)
2014	1.09***	1.04***	3.30***	2.51***	2.25***	1.49***
	(0.02)	(0.02)	(0.05)	(0.03)	(0.05)	(0.03)
2015	1.13***	1.19***	3.33***	2.48***	2.01***	1.38***
	(0.02)	(0.02)	(0.05)	(0.03)	(0.04)	(0.03)
2016	1.08***	1.04**	3.26***	2.41***	1.97***	1.51***
	(0.03)	(0.02)	(0.05)	(0.03)	(0.04)	(0.02)
2017	1.07***	1.02	3.58***	2.86***	1.84***	1.37***
	(0.02)	(0.02)	(0.04)	(0.03)	(0.03)	(0.02)
2018	1.03***	1.05**	2.98***	2.75***	1.66***	1.31***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)
2019	1.19***	1.20***	2.85***	2.27***	1.90***	1.34***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
2020	1.22***	1.25***	2.50***	1.80***	1.71***	1.27***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)
2021	1.32***	1.41***	2.57***	1.80***	1.69***	1.22***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.01)
2022	1.21***	1.28***	2.31***	1.78***	1.56***	1.09***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
2023	1.25***	1.25***	2.29***	1.84***	1.70***	1.36***
	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2007-2023[4]	1.20***	1.21***	3.14***	2.43***	1.79***	1.30***
	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)
N	5,029,979	5,029,979	4,338,386	4,338,386	2,203,903	2,203,903

Notes: contract level data; odds ratios are in the cells, standard errors are in the brackets; without framework agreements;
(1) the EU, LTI, lnNCV, GPA, EAUCTION, sector dummies and country dummies are included into the analysis;
(2) the EU, LTI, lnNCV, GPA, EAUCTION and sector dummies are included into the analysis; the impact of NMS compared to the level of WEC countries;
(3) the EU, LTI, lnNCV, GPA, EAUCTION and sector dummies are included into the analysis; the impact of SEC compared to the level of WEC countries;
(4): year dummies are also included into the analysis;
****: p<0.01 **: p<0.05; *: p<0.1*

Table 3.2.1b. Results of Logit Estimations, 2007-2023

Years	Impact of EU Funding on CR[(1)] if NMS=1	Impact of EU Funding on CR[(1)] if WEC=1	Impact of EU Funding on CR[(1)] if SEC=1	Impact of EU Funding on CRX[(1)] if NMS=1	Impact of EU Funding on CRX[(1)] if WEC=1	Impact of EU Funding on CRX[(1)] if SEC=1
2007	1.20***	1.69***	0.94	1.60***	1.32***	0.97
	(0.06)	(0.11)	(0.09)	(0.09)	(0.06)	(0.07)
2008	1.09**	1.70***	1.37***	1.21***	1.52***	1.56***
	(0.05)	(0.09)	(0.10)	(0.06)	(0.06)	(0.09)
2009	1.77***	1.90***	0.93	1.53***	1.48***	1.03
	(0.05)	(0.11)	(0.06)	(0.05)	(0.06)	(0.05)
2010	1.54***	1.76***	1.42***	1.43***	1.72***	1.29***
	(0.03)	(0.09)	(0.09)	(0.04)	(0.07)	(0.07)
2011	1.43***	1.80***	0.84**	1.41***	1.34***	0.97
	(0.03)	(0.09)	(0.06)	(0.03)	(0.05)	(0.06)
2012	1.51***	1.67***	0.93	1.54***	1.37***	1.00
	(0.03)	(0.08)	(0.06)	(0.03)	(0.05)	(0.06)
2013	1.18***	1.40***	0.84***	1.16***	1.16***	1.01*
	(0.02)	(0.07)	(0.05)	(0.02)	(0.04)	(0.06)
2014	1.14***	1.84***	0.77***	1.05**	1.55***	1.02
	(0.02)	(0.10)	(0.05)	(0.02)	(0.06)	(0.06)
2015	1.12***	1.57***	1.01	1.17***	1.51***	1.16***
	(0.02)	(0.10)	(0.06)	(0.03)	(0.07)	(0.06)
2016	1.12***	1.21***	0.92	1.01	1.24***	0.93
	(0.03)	(0.06)	(0.06)	(0.03)	(0.05)	(0.05)
2017	1.17***	1.10**	0.92	1.03	1.26***	1.05
	(0.02)	(0.05)	(0.06)	(0.03)	(0.04)	(0.06)
2018	1.02***	1.43***	0.98	1.00	1.60***	0.85***
	(0.02)	(0.06)	(0.06)	(0.03)	(0.07)	(0.05)
2019	1.29***	1.13***	1.06	1.36***	1.07**	1.13***
	(0.02)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)
2020	1.16***	1.38***	1.32***	1.27***	1.19***	1.31***
	(0.02)	(0.05)	(0.05)	(0.02)	(0.04)	(0.05)
2021	1.32***	1.48***	1.19***	1.45***	1.41***	1.34***
	(0.02)	(0.05)	(0.04)	(0.03)	(0.04)	(0.04)
2022	1.25***	1.55***	1.00	1.36***	1.58***	1-07***
	(0.02)	(0.05)	(0.03)	(0.02)	(0.05)	(0.03)
2023	1.31***	1.58***	1.12***	1.37***	1.57***	1.13***
	(0.02)	(0.06)	(0.03)	(0.02)	(0.05)	(0.03)
2007-2023[(2)]	1.23***	1.44***	1.08***	1.26***	1.34***	1.15***
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
N	2,826,076	1,512,310	691,593	2,826,076	1,512,310	691,593

Notes: contract level data; odds ratios are in the cells, standard errors are in the brackets; without framework agreements.
(1) the EU, LTI, lnNCV, GPA, EAUCTION, sector dummies and country dummies are included into the analysis;
(2): year dummies are also included into the analysis;
****: p<0.01 **: p<0.05; *: p<0.1*

4. Conclusions

The study examined two questions based on the data of 10.4 million public procurement contracts of EU member states between 2007 and 2023: (i) whether the corruption risk in public contracts funded by the EU significantly differs from those funded by national sources; and (ii) whether the decreasing trend in corruption risk in public procurement contracts in new member states, identified in previous research, continued after 2020. Both questions were analyzed using contract level data.

The results provided a clear answer to the first question. Considering various characteristics of public procurement contracts, EU-funded contracts increase the corruption risk. This conclusion holds whether we use the traditional indicator of corruption risk (the proportion of contracts awarded without competition) or a more suitable indicator for the institutional corruption environment (the proportion of contracts awarded with at no more than three bidders). Analyzing the proportion of the net value of contracts awarded without competition within the total net value of contracts also leads to the same result. Therefore, the European Commission and EU organizations (OLAF, European Public Prosecutor's Office) should pay particular attention to public procurement contracts financed by EU funds.

Another important finding of the research is that the impact of EU funding on increased corruption risk is not limited to newly acceded countries. Our results indicate that this issue is relevant across all EU countries. The findings support the view that Western European countries exhibit the strongest positive correlation between EU funding and increased corruption risk. Identifying the causes and mechanisms that lead to higher corruption risk in projects financed by EU funds across all Member States is crucial. This understanding will enable the EU to develop new indicators and control mechanisms to mitigate corruption risk, ensuring a more transparent and accountable public procurement process.

Our analysis also pointed out that there are modern solutions, such as e-auctions, whose more widespread use could limit public procurement corruption in the EU countries. E-auctions strengthen competition and, according to some estimations, result in 10-50 percent savings compared to the initial bid price[5]. In 2023, the contracting authorities in the EU used e-auctions in only 2.1 percent of contracts. In e-auctions, the CR (corruption risk) value was 0.23. In other methods that do not use e-auctions, this value was much higher, 0.38. If the proportion of e-auctions had been 10 percent in 2023, the corruption risk level at the EU level could have been reduced by 1.2 percentage points, ceteris paribus. Therefore, it is worth exploring methods that leverage modern online

[5] Estimation of the Office of Government Commerce, see: OGC. 2010. The Forward Plan for e-auctions. https://joinup.ec.europa.eu/sites/default/files/document/2014-12/The%20Forward%20Plan%20for%20e-auctions.pdf

IT systems to simultaneously enhance the transparency of public procurements, strengthen competition, and ultimately reduce corruption risks.

Furthermore, our findings on the decreasing trend in corruption risk in public procurement contracts across new member states (NMS) align with our previous research. Between 2007 and 2023, corruption risk in NMS has steadily approached the lower levels observed in Western European countries, which serve as a benchmark. All corruption risk indicators used in this study support this trend. We interpret this as a sign of institutional convergence, indicating that EU and national institutions in the new member states are increasingly capable of controlling and mitigating corruption risk in public procurement.

Annex

A1. The Groups of EU Member States

Western European Countries (WEC)
- Austria
- Belgium
- Denmark
- Finland
- France
- Germany
- Ireland
- Luxemburg
- Netherland
- Sweden
- United Kingdom

Southern European Countries (SEC)
- Cyprus
- Greece
- Italy
- Malta
- Portugal
- Spain

New Member States (NMS)
- Bulgaria
- Croatia
- Czech Republic
- Estonia
- Hungary
- Lithuania
- Latvia
- Poland
- Romania
- Slovakia
- Slovenia

A2. Descriptive Statistics of the Variables Analyzed at Country Level

Fig. A2.1a-f. Histograms of Variables Analyzed

Fig. A2.1a.

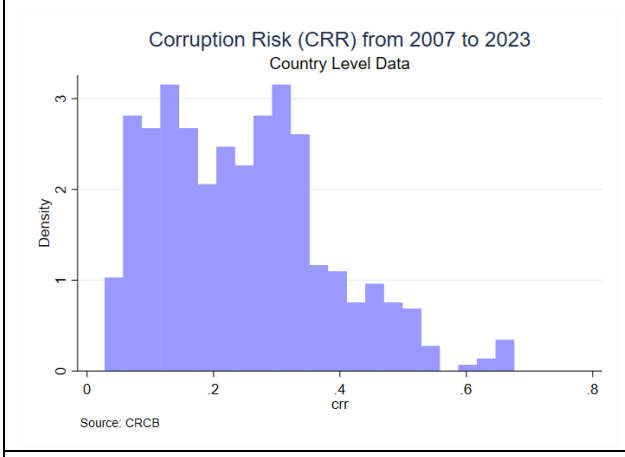


Fig. A2.1b.

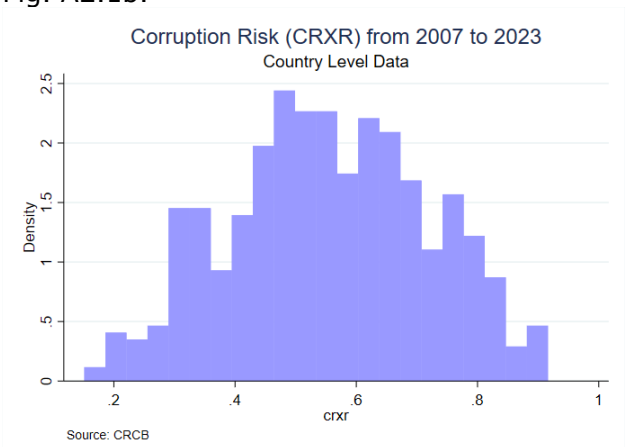


Fig. A2.1c.

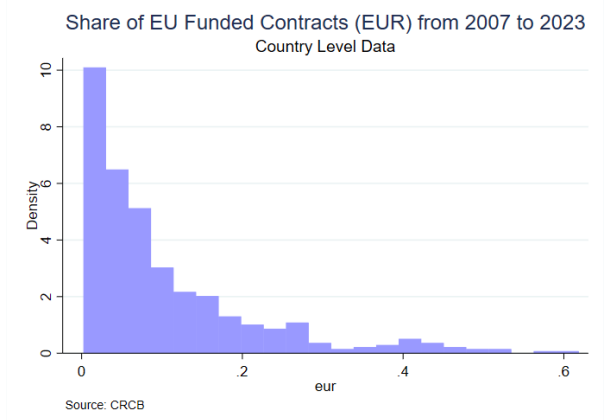


Fig. A2.1d.

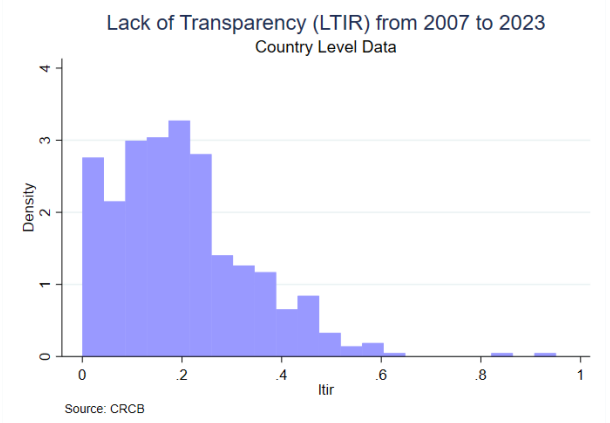


Fig. A2.1e.

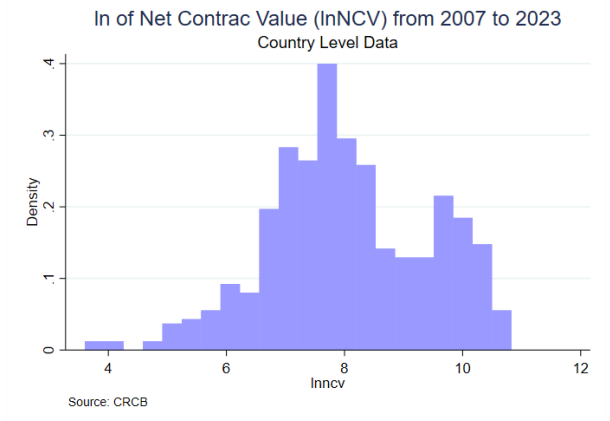
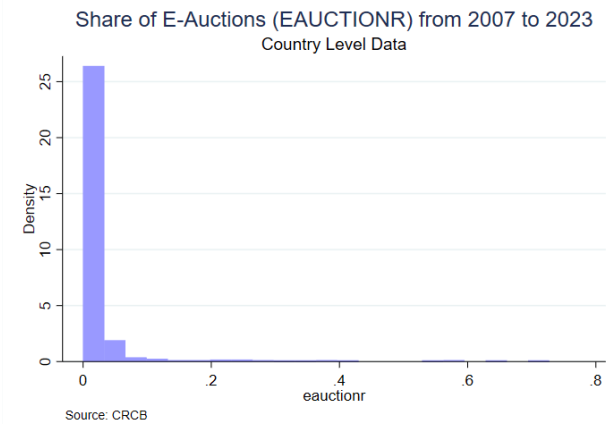
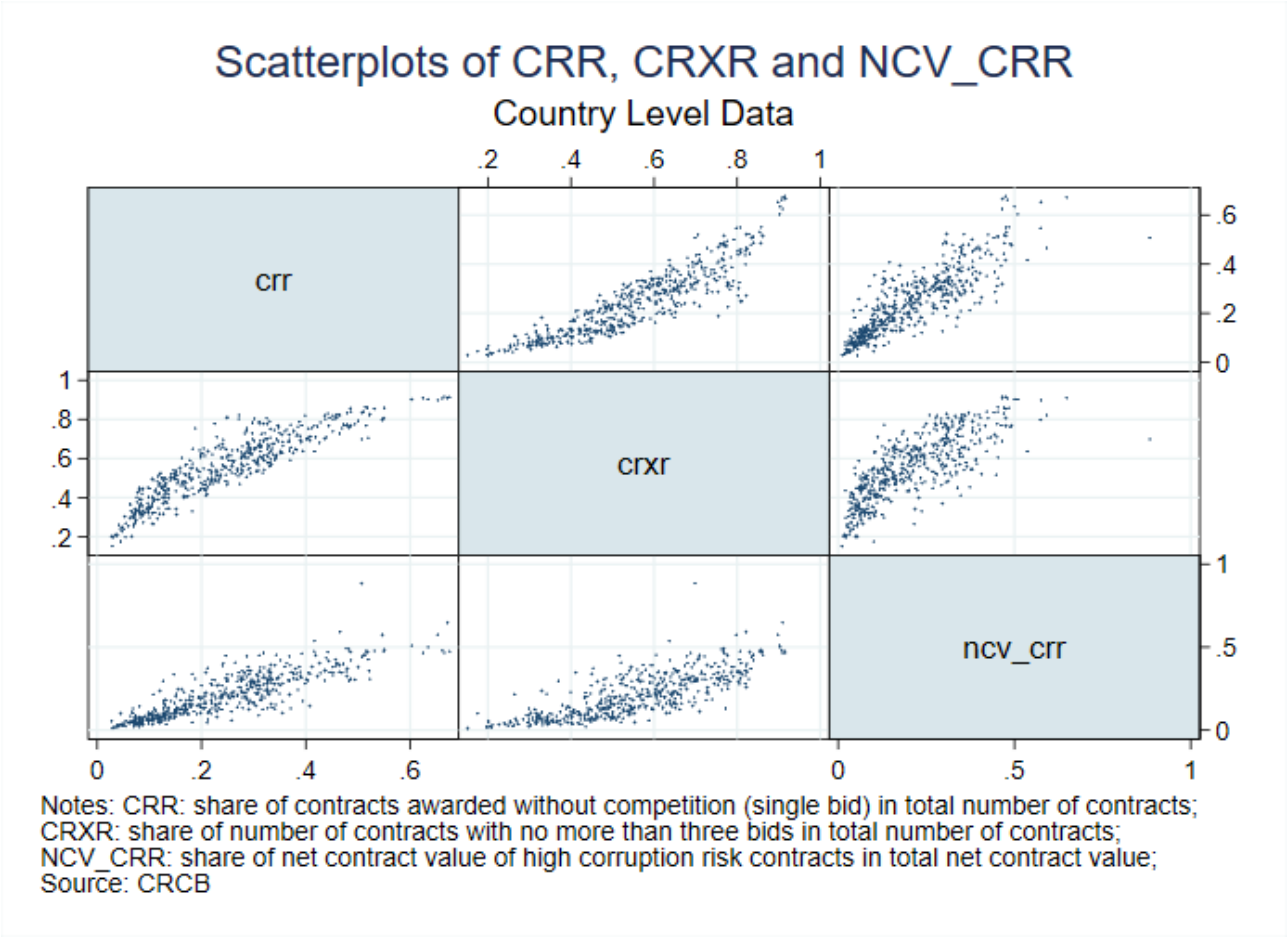


Fig. A2.1f.



Notes: CRR: share of contracts awarded without competition (single bid) in total number of contracts; CRX: share of contracts with no more than three bids in total number of contracts; NCV_CRR: share of net contract value of high corruption risk contracts in total net contract value.

Fig. A2.2. Scatterplots of CRR, CRXR and NCV_CRR



Notes: CRR: share of contracts awarded without competition (single bid) in total number of contracts;
CRXR: share of number of contracts with no more than three bids in total number of contracts;
NCV_CRR: share of net contract value of high corruption risk contracts in total net contract value;
Source: CRCB

Table A2.1. Correlation Matrix of *CRR*, *CRXR* and *NCV_CRR* by Type of Funding

	All Contracts		
	CRR	*CRXR*	*NCV_CRR*
CRR	1.000 498		
CRXR	0.893*** 498	1.000 498	
NCV_CRR	0.864*** 498	0.782*** 498	1.000 498

	Nationally Funded Contracts			EU Funded Contracts		
	CRR	*CRXR*	*NCV_CRR*	*CRR*	*CRXR*	*NCV_CRR*
CRR	1.000 498			1.000 495		
CRXR	0.892*** 498	1.000 498		0.823*** 495	1.000 495	
NCV_CRR	0.852*** 498	0.772*** 498	1.000 498	0.602*** 495	0.531*** 495	1.000 495

*Note: ***: p<0.01; **: p<0.05; *: p<0.1*

A3. Impact of EU Funding on Corruption Risk

Table A3.1.: Impact of EU Funding on Corruption Risk (CR) 2007-2023

	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU	**1.20**	**1.21**	**1.54**	**1.51**	**1.36**	**1.37**	**1.10**	**1.09**	**1.13**
	0.04	*0.04*	*0.03*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*
LTI	**2.30**	**2.56**	**3.16**	**2.85**	**2.45**	**2.49**	**2.96**	**2.69**	**2.56**
	0.05	*0.05*	*0.05*	*0.05*	*0.04*	*0.04*	*0.05*	*0.04*	*0.04*
LNNCV	**1.04**	**1.04**	**1.01**	**1.04**	**1.04**	**1.03**	**1.05**	**1.04**	**1.05**
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	0.99	**0.92**	**0.89**	**0.92**	**0.88**	0.98	**0.95**	**0.96**	0.99
	0.02	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
EAUCTION	**0.70**	**1.48**	**0.83**	**0.63**	**0.50**	**0.49**	**0.45**	**0.44**	**0.43**
	0.07	*0.09*	*0.04*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
COUNTRY	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**0.06**	**0.02**	**0.10**	**0.06**	**0.08**	**0.07**	**0.07**	**0.04**	**0.06**
	0.01	*0.00*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
Pseudo R^2	0.17	0.16	0.17	0.16	0.14	0.13	0.12	0.11	0.11
N	123,619	158,877	194,119	204,867	215,440	218,041	217,026	215,217	221,539

	2016	2017	2018	2019	2020	2021	2022	2023	2007-2023
EU	**1.08**	**1.07**	1.03	**1.19**	**1.22**	**1.32**	**1.21**	**1.25**	**1.17**
	0.03	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*	*0.01*	*0.00*
LTI	**2.47**	**2.47**	**2.02**	**2.20**	**2.74**	**2.59**	**2.64**	**2.42**	**2.45**
	0.04	*0.03*	*0.02*	*0.02*	*0.03*	*0.03*	*0.03*	*0.02*	*0.01*
LNNCV	**1.03**	1.00	**1.00**	**0.99**	**1.02**	**1.02**	**1.04**	**1.05**	**1.02**
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	**0.97**	**0.97**	0.99	**0.98**	0.99	**0.94**	**0.92**	**0.90**	**0.99**
	0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*
EAUCTION	**0.49**	**0.52**	**0.46**	**0.60**	**0.65**	**0.54**	**0.63**	**0.48**	**0.54**
	0.02	*0.02*	*0.01*	*0.01*	*0.01*	*0.01*	*0.02*	*0.01*	*0.00*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
COUNTRY	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**0.11**	**0.16**	**0.19**	**0.25**	**0.20**	**0.23**	**0.26**	**0.20**	**0.16**
	0.01	*0.01*	*0.01*	*0.02*	*0.01*	*0.02*	*0.02*	*0.01*	*0.01*
Pseudo R^2	0.12	0.13	0.11	0.10	0.10	0.11	0.10	0.10	0.10
N	236,238	312,523	356,998	425,600	446,430	482,502	493,058	507,883	5,029,979

Notes: logit estimations on contract level data without framework agreements; odds ratios are in the cells, standard errors in italics; odds ratios at least p<0.05 significance level are in bold. N = 5,029,979.

Table A3.2.: Impact of EU Funding on Corruption Risk (CRX) 2007-2023

	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU	**1.22**	**1.27**	**1.26**	**1.39**	**1.24**	**1.27**	**1.04**	**1.04**	**1.19**
	0.04	*0.03*	*0.03*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*
LTI	**1.59**	**1.91**	**2.17**	**1.98**	**1.65**	**1.62**	**1.73**	**1.72**	**1.67**
	0.03	*0.03*	*0.03*	*0.03*	*0.02*	*0.02*	*0.03*	*0.03*	*0.03*
LNNCV	**1.05**	**1.03**	**0.99**	1.00	**0.99**	**0.98**	**0.98**	1.00	1.00
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	**1.06**	1.00	**0.94**	**0.96**	**0.94**	**1.06**	**0.93**	0.99	**0.96**
	0.02	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
EAUCTION	0.98	**2.00**	0.94	**0.71**	**0.63**	**0.60**	**0.49**	**0.50**	**0.49**
	0.08	*0.13*	*0.04*	*0.03*	*0.02*	*0.02*	*0.01*	*0.02*	*0.01*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
COUNTRY	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**0.72**	**0.32**	**0.63**	**0.58**	**0.96**	1.03	**0.79**	**0.55**	**0.63**
	0.09	*0.05*	*0.07*	*0.06*	*0.09*	*0.11*	*0.08*	*0.06*	*0.07*
Pseudo R^2	0.14	0.15	0.16	0.16	0.14	0.13	0.11	0.11	0.11
N	123,589	158,877	194,119	204,867	215,440	218,041	217,026	215,217	221,539

	2016	2017	2018	2019	2020	2021	2022	2023	2007-2023
EU	**1.05**	1.02	**1.05**	**1.20**	**1.25**	**1.41**	**1.28**	**1.25**	**1.17**
	0.02	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.00*
LTI	**1.53**	**1.76**	**1.56**	**1.69**	**1.96**	**2.02**	**2.03**	**1.79**	**1.76**
	0.02	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*
LNNCV	**0.97**	**0.95**	**0.96**	**0.95**	**0.97**	**0.97**	**0.99**	**0.99**	**0.98**
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	1.01	**1.06**	**1.03**	0.99	**0.97**	**0.95**	**0.95**	**0.94**	**1.03**
	0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*
EAUCTION	**0.55**	**0.52**	**0.52**	**0.66**	**0.75**	**0.67**	**0.88**	**0.78**	**0.67**
	0.02	*0.02*	*0.01*	*0.02*	*0.02*	*0.01*	*0.02*	*0.02*	*0.00*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
COUNTRY	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**2.09**	**1.85**	**2.38**	**2.13**	**2.39**	**2.49**	**2.61**	**3.18**	**1.50**
	0.20	*0.13*	*0.18*	*0.14*	*0.16*	*0.16*	*0.17*	*0.21*	*0.03*
Pseudo R^2	0.10	0.12	0.12	0.10	0.10	0.10	0.10	0.09	0.10
N	236,238	312,523	356,998	425,600	446,430	482,502	493,058	507,883	5,029,979

Notes: logit estimations on contract level data without framework agreements; odds ratios are in the cells, standard errors in italics; odds ratios at least p<0.05 significance level are in bold. N = 5,029,979.

A4. Impact of the New Member States on Corruption Risk

Table A4.1.: Impact of the New Member States on Corruption Risk (CR) 2007-2023

	2007	2008	2009	2010	2011	2012	2013	2014	2015	
NMS	**5.85**	**5.00**	**4.88**	**5.06**	**4.40**	**3.92**	**3.37**	**3.30**	**3.33**	
	0.12	*0.09*	*0.08*	*0.09*	*0.07*	*0.06*	*0.05*	*0.05*	*0.05*	
EU	**1.19**	**1.07**	**1.53**	**1.42**	**1.28**	**1.27**	1.00	1.03	**1.11**	
	0.05	*0.03*	*0.04*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	
LTI	**2.02**	**2.02**	**2.67**	**2.34**	**1.92**	**1.86**	**2.20**	**2.14**	**2.08**	
	0.04	*0.04*	*0.05*	*0.04*	*0.03*	*0.03*	*0.04*	*0.04*	*0.04*	
LNNCV	1.00	**1.01**	1.00	**1.03**	**1.02**	**1.01**	**1.03**	**1.03**	**1.05**	
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	
GPA	**0.91**	**0.85**	**0.76**	**0.80**	**0.75**	**0.75**	**0.79**	**0.83**	**0.86**	
	0.02	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	
EAUCTION	**0.73**	1.07	**0.60**	**0.55**	**0.45**	**0.58**	**0.52**	**0.43**	**0.41**	
	0.08	*0.07*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*	
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Constant	**0.11**	**0.05**	**0.13**	**0.08**	**0.13**	**0.10**	**0.10**	**0.06**	**0.08**	
	0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	
Pseudo R^2	0.14	0.12	0.15	0.14	0.12	0.12	0.10	0.10	0.11	
N	106,391	136,218	163,974	175,083	187,207	193,265	192,946	190,571	195,027	
	2016	2017	2018	2019	2020	2021	2022	2023	2007-2023	
NMS	**3.26**	**3.58**	**2.98**	**2.85**	**2.50**	**2.57**	**2.31**	**2.29**	**3.13**	
	0.05	*0.04*	*0.03*	*0.03*	*0.03*	*0.03*	*0.02*	*0.02*	*0.01*	
EU	**1.09**	1.02	1.04	**1.20**	**1.14**	**1.22**	**1.18**	**1.22**	**1.13**	
	0.03	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.00*	
LTI	**2.00**	**2.14**	**1.82**	**1.88**	**2.26**	**2.06**	**2.09**	**1.87**	**2.03**	
	0.03	*0.03*	*0.02*	*0.02*	*0.03*	*0.02*	*0.02*	*0.02*	*0.01*	
LNNCV	**1.03**	0.98	**0.98**	**0.98**	**1.00**	**1.02**	**1.05**	**1.08**	**1.02**	
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	
GPA	**0.86**	**0.79**	**0.81**	**0.83**	**0.80**	**0.88**	**0.96**	**0.84**	**0.85**	
	0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*	
EAUCTION	**0.46**	**0.53**	**0.45**	**0.55**	**0.58**	**0.45**	**0.48**	**0.42**	**0.48**	
	0.02	*0.02*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*	
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Constant	**0.10**	**0.20**	**0.32**	**0.22**	**0.17**	**0.14**	**0.11**	**0.10**	**0.13**	
	0.01	*0.01*	*0.02*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*	
Pseudo R^2	0.12	0.12	0.09	0.07	0.07	0.07	0.06	0.07	0.09	
N	208,209	279,178	313,638	362,928	387,725	407,650	412,357	426,018	4,338,386	

Notes: NMS: New Member States; logit estimations on contract level data without framework agreements; odds ratios are in the cells; the odds ratios of NMS express the ratio of odds of high corruption risk contracts (CR) in NMS compared to WEC; standard errors in italics; odds ratios at least p<0.05 significance level are in bold. N = 4,338,386.

Table A4.2.: Impact of the New Member States on Corruption Risk (CRX) 2007-2023

	2007	2008	2009	2010	2011	2012	2013	2014	2015
NMS	**4.10**	**3.47**	**3.49**	**3.37**	**3.19**	**2.87**	**2.61**	**2.51**	**2.48**
	0.07	*0.05*	*0.05*	*0.05*	*0.04*	*0.04*	*0.03*	*0.03*	*0.03*
EU	**1.17**	1.06	**1.17**	**1.26**	**1.11**	**1.16**	**0.96**	1.01	**1.22**
	0.04	*0.03*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*
LTI	**1.33**	**1.47**	**1.79**	**1.53**	**1.26**	**1.26**	**1.37**	**1.39**	**1.41**
	0.03	*0.03*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*
LNNCV	0.99	**0.98**	**0.96**	**0.98**	**0.96**	**0.95**	**0.96**	**0.98**	0.99
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	**1.08**	**0.96**	**0.85**	**0.88**	**0.81**	**0.82**	**0.80**	**0.86**	**0.83**
	0.02	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
EAUCTION	0.96	**1.31**	**0.60**	**0.56**	**0.54**	**0.63**	**0.58**	**0.58**	**0.55**
	0.08	*0.08*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**1.34**	**0.66**	1.06	0.95	**1.84**	**2.21**	**1.39**	**0.88**	**0.81**
	0.15	*0.10*	*0.10*	*0.08*	*0.15*	*0.20*	*0.11*	*0.08*	*0.07*
Pseudo R^2	0.08	0.08	0.11	0.12	0.10	0.10	0.09	0.08	0.09
N	106,359	136,218	163,974	175,083	187,207	193,265	192,946	190,571	195,027

	2016	2017	2018	2019	2020	2021	2022	2023	2007-2023
NMS	**2.41**	**2.86**	**2.75**	**2.27**	**1.80**	**1.80**	**1.78**	**1.84**	**2.44**
	0.03	*0.03*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*
EU	1.03	**0.95**	**1.18**	**1.30**	**1.30**	**1.38**	**1.34**	**1.34**	**1.16**
	0.03	*0.02*	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*
LTI	**1.24**	**1.51**	**1.41**	**1.41**	**1.67**	**1.67**	**1.57**	**1.40**	**1.45**
	0.02	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*	*0.00*
LNNCV	0.96	**0.93**	**0.95**	**0.94**	**0.97**	**0.98**	**1.01**	**1.02**	**0.98**
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	**0.88**	**0.87**	**0.84**	**0.82**	**0.78**	**0.86**	**0.98**	**0.85**	**0.88**
	0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*
EAUCTION	**0.60**	**0.60**	**0.58**	**0.67**	**0.68**	**0.56**	**0.67**	**0.66**	**0.61**
	0.02	*0.02*	*0.02*	*0.02*	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**1.90**	**1.92**	**2.39**	**2.02**	**1.92**	**1.67**	**1.14**	**1.30**	**1.38**
	0.15	*0.11*	*0.16*	*0.12*	*0.11*	*0.09*	*0.06*	*0.07*	*0.02*
Pseudo R^2	0.08	0.09	0.07	0.05	0.05	0.05	0.04	0.05	0.06
N	208,209	279,178	313,638	362,928	387,725	407,650	412,268	426,018	4,338,386

Notes: NMS: New Member States; logit estimations on contract level data without framework agreements; odds ratios are in the cells; the odds ratios of NMS express the ratio of odds of high corruption risk contracts (CRX) in NMS compared to WEC; standard errors in italics; odds ratios at least p<0.05 significance level are in bold. N = 4,338,386.

A5. Impact of the Southern European Countries on Corruption Risk

Table A5.1.: Impact of the Southern European Countries on Corruption Risk (CR) 2007-2023

	2007	2008	2009	2010	2011	2012	2013	2014	2015
SEC	**1.79**	**1.79**	**1.94**	**2.00**	**2.00**	**2.33**	**2.25**	**2.25**	**2.01**
	0.05	*0.05*	*0.04*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.04*
EU	**1.30**	**1.42**	**1.24**	**1.46**	**1.20**	**1.27**	**1.12**	**1.18**	**1.12**
	0.06	*0.06*	*0.05*	*0.06*	*0.05*	*0.05*	*0.04*	*0.05*	*0.04*
LTI	**1.70**	**1.89**	**2.25**	**2.35**	**2.13**	**2.14**	**2.19**	**2.56**	**2.70**
	0.05	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.05*	*0.06*	*0.06*
LNNCV	**0.96**	**0.97**	**0.95**	**0.95**	**0.94**	**0.93**	**0.91**	**0.91**	**0.92**
	0.01	*0.01*	*0.01*	*0.01*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	**1.34**	**1.31**	**1.18**	**1.07**	0.96	**1.19**	0.99	**1.05**	1.00
	0.03	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*
EAUCTION	**0.40**	**2.67**	**2.80**	**1.28**	0.89	**0.74**	**0.66**	**0.64**	0.98
	0.10	*0.27*	*0.23*	*0.12*	*0.10*	*0.07*	*0.07*	*0.06*	*0.08*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**0.31**	**0.07**	**0.26**	**0.13**	**0.19**	**0.18**	**0.28**	**0.42**	**0.40**
	0.05	*0.04*	*0.05*	*0.02*	*0.03*	*0.03*	*0.05*	*0.07*	*0.07*
Pseudo R^2	0.04	0.04	0.06	0.06	0.06	0.06	0.07	0.08	0.09
N	65,028	78,629	99,483	97,280	96,174	94,410	86,884	83,306	84,116

	2016	2017	2018	2019	2020	2021	2022	2023	2007-2023
SEC	**1.97**	**1.84**	**1.66**	**1.90**	**1.71**	**1.69**	**1.56**	**1.70**	**1.90**
	0.04	*0.03*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*
EU	1.05	1.01	**1.22**	**1.11**	**1.41**	**1.36**	**1.22**	**1.23**	**1.24**
	0.04	*0.04*	*0.04*	*0.03*	*0.03*	*0.03*	*0.02*	*0.02*	*0.00*
LTI	**2.51**	**2.80**	**2.33**	**2.28**	**3.30**	**3.03**	**2.70**	**2.35**	**2.45**
	0.05	*0.05*	*0.04*	*0.03*	*0.05*	*0.04*	*0.04*	*0.03*	*0.01*
LNNCV	**0.95**	**0.93**	**0.91**	**0.91**	**0.96**	**0.96**	**0.98**	**0.98**	**0.95**
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	1.02	**1.06**	1.01	0.99	1.01	**0.95**	**0.97**	0.99	**1.07**
	0.02	*0.02*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*
EAUCTION	0.94	0.94	**0.79**	0.95	**0.66**	**0.54**	1.04	**0.75**	**0.86**
	0.06	*0.06*	*0.04*	*0.05*	*0.04*	*0.03*	*0.06*	*0.05*	*0.00*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**0.38**	**0.21**	**0.45**	**0.50**	**0.32**	**0.36**	**0.30**	**0.31**	**0.26**
	0.05	*0.02*	*0.04*	*0.04*	*0.03*	*0.04*	*0.03*	*0.03*	*0.01*
Pseudo R^2	0.07	0.06	0.05	0.06	0.10	0.09	0.07	0.07	0.07
N	115,567	147,728	170,187	200,227	186,155	199,661	197,937	201,083	2,203,903

Notes: SEC: Southern European Countries; logit estimations on contract level data without framework agreements; odds ratios are in the cells; the odds ratios of SEC express the ratio of odds of high corruption risk contracts (CR) in SEC compared to WEC; standard errors in italics; odds ratios at least p<0.05 significance level are in bold. N = 2,203,903.

Table A5.2.: Impact of the Southern European Countries on Corruption Risk (CRX) 2007-2023

	2007	2008	2009	2010	2011	2012	2013	2014	2015
SEC	**1.13**	**1.07**	**1.26**	**1.30**	**1.26**	**1.45**	**1.49**	**1.49**	**1.38**
	0.02	*0.02*	*0.02*	*0.02*	*0.02*	*0.03*	*0.03*	*0.03*	*0.03*
EU	1.04	**1.30**	1.05	**1.29**	1.00	**1.09**	1.01	**1.18**	**1.17**
	0.04	*0.04*	*0.03*	*0.04*	*0.03*	*0.03*	*0.03*	*0.04*	*0.04*
LTI	**1.43**	**1.45**	**1.62**	**1.71**	**1.57**	**1.58**	**1.52**	**1.78**	**1.73**
	0.03	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*
LNNCV	1.00	1.00	**0.97**	**0.95**	**0.95**	**0.95**	**0.92**	**0.93**	**0.95**
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	**1.29**	**1.30**	**1.22**	**1.11**	**1.03**	**1.17**	**0.96**	**1.03**	0.98
	0.02	*0.02*	*0.02*	*0.02*	*0.01*	*0.02*	*0.01*	*0.02*	*0.01*
EAUCTION	**0.68**	**2.12**	**3.13**	**1.19**	**0.74**	**0.68**	**0.53**	**0.64**	**0.75**
	0.08	*0.21*	*0.26*	*0.09*	*0.06*	*0.05*	*0.04*	*0.04*	*0.05*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**1.36**	**0.45**	0.88	**1.31**	1.18	1.19	**1.38**	**2.12**	**1.69**
	0.17	*0.12*	*0.12*	*0.14*	*0.12*	*0.14*	*0.15*	*0.28*	*0.21*
Pseudo R^2	0.04	0.03	0.04	0.04	0.03	0.03	0.04	0.05	0.06
N	65,030	78,629	99,483	97,325	96,174	94,410	86,884	83,306	84,116
	2016	2017	2018	2019	2020	2021	2022	2023	2007-2023
SEC	**1.51**	**1.37**	**1.31**	**1.34**	**1.27**	**1.22**	**1.09**	**1.36**	**1.37**
	0.02	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*	*0.01*	*0.02*	*0.00*
EU	**1.10**	**1.15**	**1.25**	**1.11**	**1.26**	**1.38**	**1.21**	**1.19**	**1.17**
	0.04	*0.03*	*0.04*	*0.02*	*0.03*	*0.03*	*0.02*	*0.02*	*0.01*
LTI	**1.53**	**1.85**	**1.68**	**1.70**	**2.19**	**2.24**	**2.11**	**1.70**	**1.75**
	0.03	*0.03*	*0.02*	*0.02*	*0.03*	*0.03*	*0.03*	*0.02*	*0.01*
LNNCV	**0.94**	**0.93**	**0.93**	**0.92**	**0.95**	**0.94**	**0.96**	**0.96**	**0.95**
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	**1.10**	**1.17**	**1.04**	0.98	0.98	**0.97**	**1.02**	1.01	**1.10**
	0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.00*
EAUCTION	**0.87**	**0.75**	**0.72**	**0.84**	**0.74**	**0.68**	**1.15**	**0.83**	**0.83**
	0.05	*0.04*	*0.03*	*0.03*	*0.03*	*0.03*	*0.06*	*0.04*	*0.01*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**2.94**	**1.58**	**2.51**	**2.15**	**3.53**	**3.14**	**1.97**	**2.75**	**1.67**
	0.29	*0.11*	*0.18*	*0.14*	*0.29*	*0.26*	*0.17*	*0.23*	*0.04*
Pseudo R^2	0.04	0.03	0.03	0.03	0.05	0.05	0.04	0.04	0.03
N	115,567	147,728	170,187	200,227	186,155	199,661	197,937	201,083	2,203,903

Notes: SEC: Southern European Countries; logit estimations on contract level data without framework agreements; odds ratios are in the cells; the odds ratios of SEC express the ratio of odds of high corruption risk contracts (CRX) in SEC compared to WEC; standard errors in italics; odds ratios at least p<0.05 significance level are in bold. N = 2,203,903.

A6. Impact of EU funding on Corruption Risk in the Western European Countries

Table A6.1.: Impact of EU funding on Corruption Risk (CR) in the Western European Countries 2007-2023

	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU	**1.69**	**1.70**	**1.90**	**1.76**	**1.80**	**1.67**	**1.40**	**1.84**	**1.57**
	0.11	*0.09*	*0.11*	*0.09*	*0.09*	*0.08*	*0.07*	*0.10*	*0.10*
LTI	**1.87**	**2.13**	**2.59**	**2.79**	**2.31**	**2.02**	**2.09**	**2.32**	**2.43**
	0.07	*0.07*	*0.08*	*0.09*	*0.07*	*0.06*	*0.06*	*0.07*	*0.07*
LNNCV	**0.98**	1.00	**0.95**	**0.95**	**0.94**	**0.94**	**0.91**	**0.92**	**0.92**
	0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
GPA	**1.09**	**1.11**	**1.12**	0.99	1.00	**1.09**	**0.93**	1.01	1.01
	0.04	*0.03*	*0.03*	*0.03*	*0.03*	*0.03*	*0.02*	*0.03*	*0.03*
EAUCTION	0.63	**1.61**	0.56	**0.59**	**0.40**	0.80	0.78	**0.44**	**0.62**
	0.22	*0.24*	*0.21*	*0.12*	*0.08*	*0.09*	*0.10*	*0.08*	*0.09*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Country dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**0.14**	**0.05**	**0.15**	**0.10**	**0.17**	**1.55**	**0.20**	**0.26**	**0.34**
	0.03	*0.03*	*0.04*	*0.02*	*0.04*	*0.30*	*0.04*	*0.06*	*0.08*
Pseudo R^2	0.06	0.06	0.08	0.09	0.07	0.06	0.06	0.07	0.08
N	47,800	55,970	69,338	67,513	67,941	69,634	62,797	58,660	57,604

	2016	2017	2018	2019	2020	2021	2022	2023	2007-2023
EU	**1.21**	**1.10**	**1.43**	**1.13**	**1.38**	**1.48**	**1.55**	**1.58**	**1.39**
	0.06	*0.05*	*0.06*	*0.04*	*0.05*	*0.05*	*0.05*	*0.06*	*0.01*
LTI	**2.30**	**2.43**	**1.85**	**1.86**	**2.67**	**2.32**	**2.39**	**2.20**	**2.22**
	0.06	*0.05*	*0.04*	*0.03*	*0.05*	*0.04*	*0.04*	*0.04*	*0.01*
LNNCV	**0.94**	**0.91**	**0.90**	**0.90**	**0.95**	**0.95**	**0.96**	**0.98**	**0.95**
	0.01	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	0.96	**1.04**	0.99	**1.05**	**1.08**	**0.94**	**0.95**	0.99	**1.08**
	0.02	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.01*
EAUCTION	**0.53**	**0.70**	**0.55**	**0.88**	**0.71**	**0.74**	0.94	**0.83**	**0.74**
	0.06	*0.05*	*0.04*	*0.05*	*0.06*	*0.06*	*0.07*	*0.07*	*0.02*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Country dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**0.50**	**0.33**	**0.67**	**0.80**	**0.56**	1.05	**0.65**	**0.45**	**0.40**
	0.08	*0.05*	*0.08*	*0.09*	*0.07*	*0.13*	*0.09*	*0.06*	*0.02*
Pseudo R^2	0.06	0.06	0.06	0.06	0.10	0.08	0.08	0.09	0.06
N	87,538	114,383	126,827	137,555	127,432	124,809	117,236	119,218	1,512,310

Notes: logit estimations on contract level data without framework agreements; odds ratios are in the cells; standard errors in italics; odds ratios at least p<0.05 significance level are in bold. N = 1,512,310.

Table A6.2.: Impact of EU funding on Corruption Risk (CRX) in the Western European Countries 2007-2023

	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU	**1.32**	**1.52**	**1.48**	**1.72**	**1.34**	**1.37**	**1.16**	**1.55**	**1.51**
	0.06	*0.06*	*0.06*	*0.07*	*0.05*	*0.05*	*0.04*	*0.06*	*0.07*
LTI	**1.54**	**1.61**	**2.03**	**1.99**	**1.65**	**1.59**	**1.55**	**1.62**	**1.67**
	0.04	*0.04*	*0.05*	*0.04*	*0.04*	*0.03*	*0.03*	*0.04*	*0.04*
LNNCV	**1.04**	**1.05**	1.00	**0.97**	**0.96**	**0.97**	**0.94**	**0.95**	**0.97**
	0.01	*0.01*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	1.01	1.02	**1.07**	1.03	1.02	**1.12**	**0.95**	**1.04**	**0.95**
	0.02	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*	*0.02*
EAUCTION	1.06	**1.39**	1.16	**0.79**	**0.58**	**0.67**	**0.62**	**0.60**	**0.58**
	0.18	*0.18*	*0.21*	*0.09*	*0.06*	*0.05*	*0.05*	*0.06*	*0.05*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Country dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**0.64**	**0.34**	**0.47**	**0.62**	**0.89**	**0.62**	**0.73**	0.92	0.81
	0.10	*0.10*	*0.08*	*0.09*	*0.12*	*0.09*	*0.10*	*0.14*	*0.13*
Pseudo R^2	0.08	0.07	0.08	0.08	0.07	0.06	0.06	0.06	0.06
N	47,800	55,970	69,338	67,541	67,941	69,634	62,804	58,660	57,604

	2016	2017	2018	2019	2020	2021	2022	2023	2007-2023
EU	**1.24**	**1.26**	**1.60**	**1.07**	**1.19**	**1.41**	**1.58**	**1.57**	**1.30**
	0.05	*0.04*	*0.07*	*0.03*	*0.04*	*0.04*	*0.05*	*0.05*	*0.01*
LTI	**1.50**	**1.73**	**1.53**	**1.58**	**2.01**	**1.90**	**2.02**	**1.86**	**1.70**
	0.03	*0.03*	*0.03*	*0.02*	*0.03*	*0.03*	*0.03*	*0.03*	*0.01*
LNNCV	**0.95**	**0.94**	**0.95**	**0.93**	**0.95**	**0.96**	**0.97**	**0.98**	**0.97**
	0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
GPA	1.05	**1.13**	**1.07**	**1.03**	**1.03**	**0.95**	**1.04**	**1.05**	**1.11**
	0.02	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.02*	*0.02*	*0.00*
EAUCTION	**0.60**	**0.63**	**0.56**	**0.74**	**0.73**	**0.77**	0.95	**0.75**	**0.73**
	0.04	*0.03*	*0.03*	*0.03*	*0.04*	*0.05*	*0.06*	*0.05*	*0.01*
SECTOR	Y	Y	Y	Y	Y	Y	Y	Y	Y
Country dummies	Y	Y	Y	Y	Y	Y	Y	Y	Y
Constant	**2.87**	**1.91**	**1.91**	**2.22**	**4.00**	**3.42**	**2.51**	**2.61**	**1.35**
	0.35	*0.16*	*0.18*	*0.20*	*0.41*	*0.37*	*0.29*	*0.28*	*0.04*
Pseudo R^2	0.04	0.04	0.04	0.05	0.07	0.07	0.08	0.09	0.05
N	87,538	114,383	126,827	137,555	127,450	124,809	117,229	119,218	1,512,310

Notes: logit estimations on contract level data without framework agreements; odds ratios are in the cells; standard errors in italics; odds ratios at least p<0.05 significance level are in bold. N = 1,512,310.