

Title: Prometheus unbound: Quality of government and institutionalised grand corruption in public procurement

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## Preface

This dissertation is the result of much joy as well as suffering. I owe my deepest thanks to all those who supported me in this endeavour, especially my wife Marie Licht and my close family back in Hungary. In addition, my colleagues and critical friends who closely followed the development of my research deserve my gratitude, first of all István János Tóth. My work greatly benefited from the rich scholarship of the field and the countless non-academics who expressed their opinion on corruption, state capacity, and good government.

I would also like to thank the funding bodies who contributed towards to goals of my research, especially the European Union and the Hungarian Government: TAMOP 4.2.2.B and ANTICORRP (Grant agreement no: 290529) for supporting database building.

This dissertation is the result of my own work and includes nothing which is the outcome of work done in collaboration with others except where specifically indicated in the text.

## **Statement of Length**

This PhD dissertation does not exceed the 80,000 words limit set by the Department of Sociology.

## Summary

This PhD thesis looks at one of the most crucial determinants of state formation, quality of institutions, and social equality: institutionalised grand corruption. Institutionalised grand corruption denotes the particularistic allocation of public resources, that is violating prior explicit rules in order to benefit a closed network while denying access to all others. Emphasizing access to power and public resources deviates from traditional definitions of corruption resting on individual wrongdoing and abuse of power.

The thesis makes use of large amounts of administrative data describing public procurement tenders on transaction level and links it to data on company ownership, financial accounts, and political office of company owners. By using data mining techniques it breaks away from standard, and arguably deficient, measures of quality of institutions and corruption. It proposes a complex 'blueprint' for measuring institutionalized grand corruption in the allocation of public resources and applies its key elements to three Central and Eastern European countries: Czech Republic, Hungary, and Slovakia. It is emphasized that these cases are only 'pilot' measurements, the blueprint is applicable to practically every high and middle income country, data is typically going back in time for 6-8 years.

Using such a novel indicator set allows for an unprecedented detail of analysis. Results highlight the role played by European Union Structural and Cohesion Funds in *increasing* the prevalence of institutionalised grand corruption. This is due to at least two factors, first, they provide additional public resources available for corrupt rent extraction; second, they change the motivations for and controls of corruption. In Czech Republic, Hungary, and Slovakia, the first effect increases the value of particularistic resource allocation by up to 1.21% of GDP, while the second effect decreases it by up to 0.03% of GDP. The latter effect is entirely driven by Slovakia; in Czech Republic and Hungary even this effect increases particularism.

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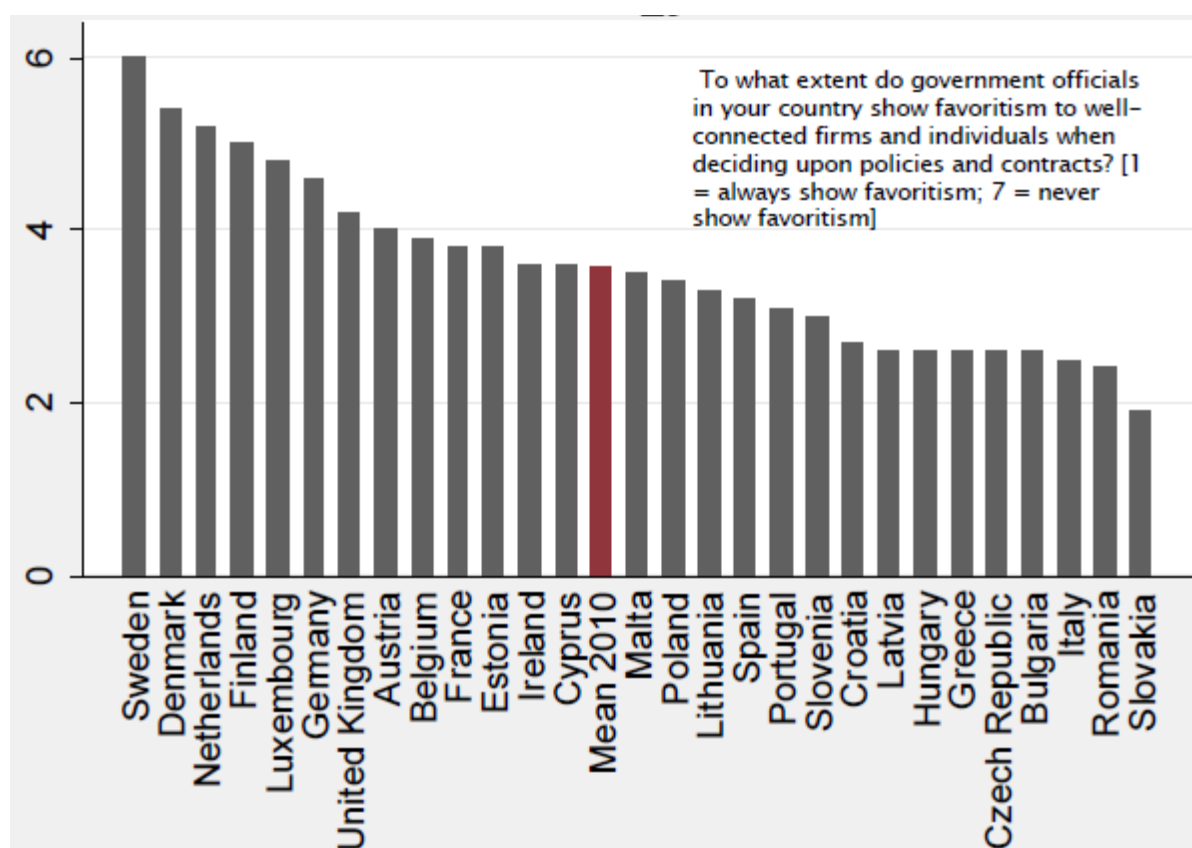
## Chapter 1 - Introduction

Good governance in most countries of Central and Eastern Europe (CEE) seems to be a long way off, especially given the lack of progress and numerous policy reversals in the last few years. For example, to the surprise of many, Hungary turned out to be a clear 'frontrunner' in terms of dismantling institutions of democratic governance and the system of checks and balances. Probably less surprisingly, Romania has made several attempts to weaken government accountability mechanisms. While it is too early to determine the exact nature of such changes throughout the region, it is already clear that the quality of government in CEE with its high levels of corruption, state capture, and weak state capacity is a likely contributing factor to low growth, high budget deficit, low quality of public services, and low levels of trust in government (Lambsdorff, 2006a). In addition and importantly for this analysis, systemic corruption is highly likely to distort the structure of public sector spending conducted through public contracting (Mauro, 1998).

One indication of low quality of government, albeit an imperfect one, is the perception that government favouritism is widespread in Europe, especially in CEE (Figure 1). This is also met by corruption, broadly defined, being one of the primary concerns of Europe's citizens and policy makers (European Commission, 2011a).



Figure 1. Extent of government favouritism in European countries, 2010



Source: (World Economic Forum, 2010)

Interestingly, almost every available indicator show little to no progress on the level of nation states in the fight against corruption and in improving the quality of government in CEE. This observation is in stark contrast with the turbulent changes happening on the micro-level in many countries such as economic crises, imprisoning high ranking politicians on charges of corruption (e.g. Slovenia) or whole governments resigning on similar grounds (e.g. Czech Republic). In addition, many of the most corrupt countries of Europe such as Romania and Bulgaria have received extensive assistance and have been subject to heavy pressure to modernise. Weak government performance, turbulent changes, and extensive external pressure for change make CEE a highly relevant region for analysing quality of government and corruption.

Our understanding of permanently low quality of government in CEE is clearly impaired by the lack of reliable data which would reveal trends over time, variation across countries and organisations, and would allow for rigorously testing theories.

First, there is a great deal of perception-based indicators of typically low quality both on corruption and quality of government (e.g. Kaufmann, Kraay, & Mastruzzi, 2007; Kaufmann, Mastruzzi, & Kraay, 2010; Kurtz & Schrank, 2007a, 2007b). What is common in perception-based indicators is that they are rather unreliable for gauging levels precisely and tracking changes of the actual phenomena as they suffer from perception biases and influences of the mass media. In addition, micro-level variation such as inter-institutional differences are invisible for such measures, a troubling shortcoming as many best practices arise at the micro level. Second, while there are some indicators based on actual experiences with public services and corruption either by public employees or citizens (Charron & Lapuente, 2011; e.g. Meyer-Sahling, 2011; Olken, 2007; Reinikka & Svensson, 2004), these measures are applicable only in selected fields and are costly to replicate across many countries and many years. In addition, surveys are unable to inform us about phenomena invisible for ordinary citizens (e.g. constructing highways with lower than contracted quality showing its results only after years of use). Third, there is also good qualitative evidence on corruption and state capture based on interviews and qualitative case studies (Jancsics & Jávora, 2012; Szántó, Tóth, Varga, & Cserpes, 2010; Szántó & Tóth, 2008; Torsello, 2012) which are excellent for revealing the micro-structure of the phenomena, but incapable of determining prevalence or trends over time. Hence, there is a clear lack of reliable indicators both for policy makers and researchers.

In order to advance our knowledge about quality of government and corruption, it is necessary to rely on a range of indicators and especially to develop 'objective' measures which do not suffer from the usual shortcomings of perception and experience surveys (Donchev & Ujhelyi, 2009; Morris, 2008). In addition, rigorous theory testing also requires going beyond national level-indices as mapping micro-mechanisms is the key to decipher higher level phenomena, especially in light of the surprising contrast between stable macro indices and apparently dynamic micro-level events. While there are a number of promising developments pointing at objective measures, there is a long way to go in this direction (Sampford, Shacklock, Connors, & Galtung, 2006). In order to arrive at a full and balanced repertoire of empirical evidence, lessons can be drawn from other areas of research facing similar challenges such as shadow economy research. Here, interview evidence and

perception- and experience-based population surveys are complemented by analyses performed on administrative data pointing at phenomena not experienced by most of the population or concealed by respondents (e.g. using electricity consumption to estimate hidden income).

As most top-down approaches to measuring the quality of government and corruption have by and large failed to deliver good enough indicators, the only feasible route appears to be to construct new indices bottom-up. Hence, understanding the technologies or strategies of corruption at the micro-level is the precondition for developing objective indicators circumventing the actors' efforts at hiding their actions. By implication, this paper joins a small, but growing literature using 'objective' indicators of the quality of government and corruption in general and corruption in public procurement in particular.

In addition to the dire state of measurement, theoretical controversy and conceptual confusion often contribute to the lack of sufficiently robust understanding of quality of government and corruption. For example, a widely used set of measures come from the World Bank's World Governance Indicators (Kaufmann et al., 2010) which doesn't make it clear whether the assessment refers to the content of policies or the process of making them (Kurtz & Schrank, 2007b). While it is possible to enact inclusive and open economic policies through a non-inclusive process (think about China for example) or the other way around, the two have widely different consequences for democracy and social inclusion. Hence, if a new measurement is to go beyond the state-of-the-art, it has to closely tie conceptual innovation to novel measurement.

In order to start filling the above gaps, this PhD dissertation delivers new theoretical and empirical insights on the issue of corruption which is arguably one of the key aspects of the quality of government. While the broader context of quality of institutions is also discussed, narrowing the focus only to corruption is necessary for keeping the analysis tractable. Nevertheless, suggestions are also offered on how this approach can be adapted to aspects of government quality other than corruption such as administrative capacity.

This PhD dissertation pursues the following goals in the context of CEE countries in 2009-2012:

1. *Developing* a novel set of corruption indicators based on clear conceptual foundations and using solely 'objective' data.
2. *Assessing* the validity of these novel indicators.
3. *Describing* the trajectory and structure of corruption across countries, organisations, and over time.
4. *Explaining* the impact of development funding (i.e. EU funds) in CEE on corruption.

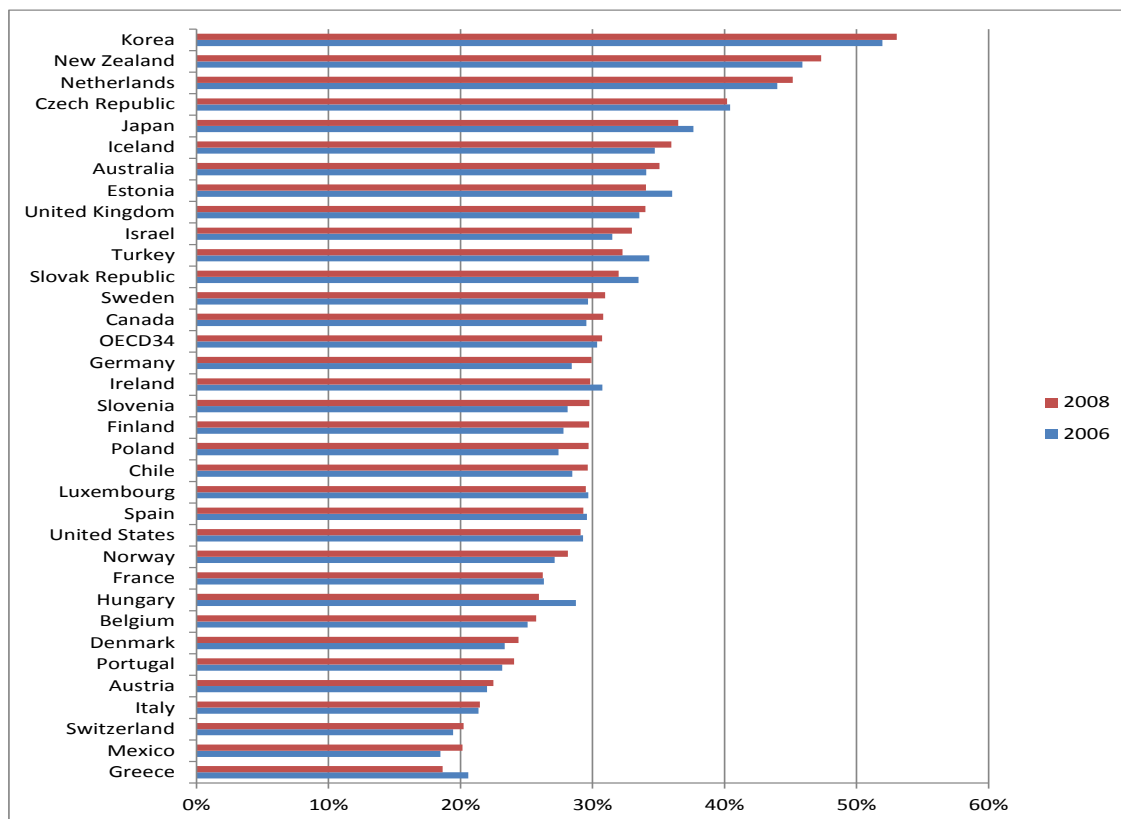
As I will argue below, corruption is a diverse phenomenon and it is hardly possible to arrive at a conceptually and empirically sound approach which would encompass all of its forms and aspects. Instead, what appears to be more fruitful, both theoretically and empirically, is to concentrate on one type of corruption affecting a distinct set of government activities. Throughout this dissertation, the primary emphasis falls on institutionalised grand corruption done in public in CEE. Looking specifically at public procurement is ideal for my purposes both for scientific and practical reasons, while it is emphasized that the approach is transferable to a range of other spending areas:

- 1) it represents a large portion of GDP as well as public spending: 19-53% of general government spending across OECD countries and about 30% or more in CEE in 2008 (Figure 2)<sup>1</sup>.

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<sup>1</sup> Although the methodology used for calculating the size of public procurement markets is an upper bound estimate of the actual value.

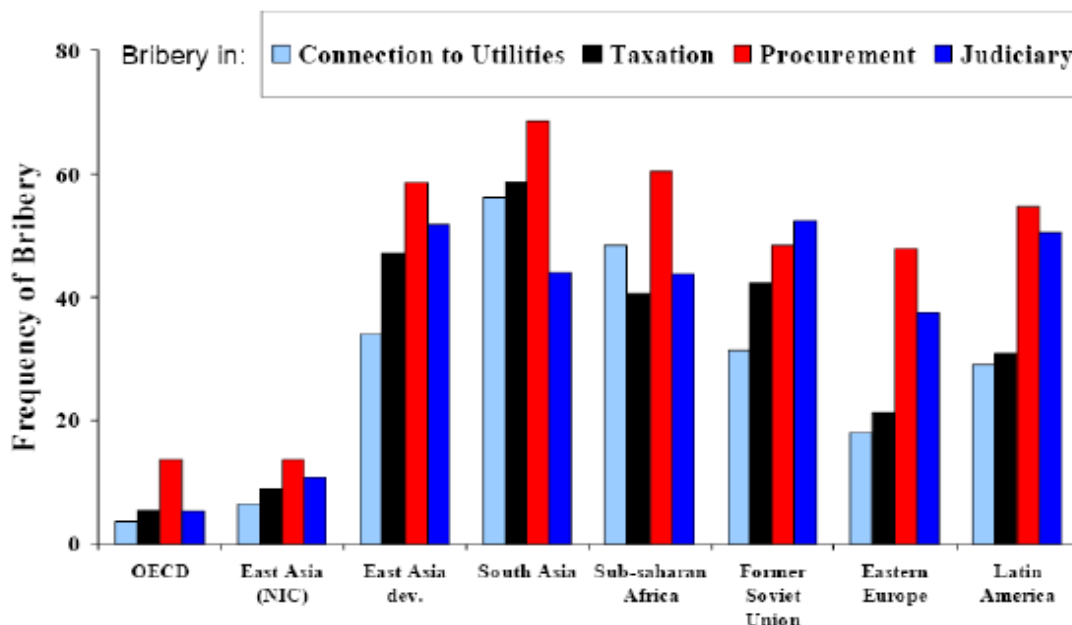
**Figure 2. General government procurement to total general government spending, 2006 and 2008, %**



Source: (OECD, 2011 table 40.2) and IMF World Economic Outlook database

- 2) Public procurement constitutes a crucial link between the public and private spheres, besides welfare transfers and public employment, creating diverse opportunities for corruption which coincides with high perceived prevalence of corruption even in relatively clean countries (Figure 3) (Piga, 2011).

**Figure 3. Frequency of bribery in connection with selected government functions**



Source: OECD, 2007, p. 9

- 3) Due to extensive transparency laws across CEE, and in fact every developed country, over the last decade or so, there is a lot of relevant, but unprocessed official information publicly available at the micro-level, that is on the level of individual transactions.

The period between 2009 and 2012 was chosen simply due to practical reasons as obtaining internationally comparable public procurement data was a challenge. Nevertheless, this period serves my goals well, as it has seen multiple government changes in the region and intense reforms both in public procurement and the wider machinery of government likely to impacting corruption.

This PhD dissertation is structured as the following: First, the conceptual framework is spelled out discussing both the underlying theoretical considerations and the measurement approach. Second, empirical findings are discussed in detail, most importantly key elements of the proposed corruption indicators and the relationship between EU funding and corruption. Each chapter is formulated so that it can stand as a unique piece which resulted in some degree of repetition. This, nevertheless, makes the whole dissertation more tractable as the reader can consult self-contained parts without having to see through the whole document at once.

# Part I – Towards a conceptual framework

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## Chapter 2 - Understanding quality of government and corruption

This chapter provides the definitions for quality of government and corruption which are the basis for measurement and analysis. No comprehensive review of the literature on these themes is offered simply because it would take up a full PhD dissertation on its own. Instead, what is offered is a brief critical review of the most relevant theories and a thorough discussion of the definitions adopted. Quality of government serves as a broad theme within which the issue of corruption is defined. Theoretical models of causal links are only covered by the respective theoretical sections in the later empirical chapters in order to keep empirical work self-containing.

### 1. What is quality of government?

Quality of government is a widely used and often hotly contested concept. Scientific disciplines such as (political) sociology, political science, or (institutional) economics have their unique view on it at least partially reflecting their main area of scientific interest (e.g. economists often see the quality of government in light of economic growth it contributes to). Debates around quality of government have spawned surprisingly many inadequate conceptualisations, two of which deserve some critical discussion as they are widely used: 1) functionalist definitions and 2) all-encompassing definitions.

Functionalist definitions hold the promise of being elegantly simple by defining quality of government as those institutions which serve a purpose. One of the most often quoted example of this is quality of government as institutions serving economic growth (Porta, Lopez-de-Silanes, Shleifer, & Vishny, 1999). The main problem with any such approach is that high quality or good government can result in a range of positive or negative outcomes while it is unclear why one or the other outcome shall be superior. In addition, it exactly the relationship between government quality and desired societal and economic outcomes which is of question for many researchers, hence, assuming away the problem leaves us with no tools to work with. Finally, functionalist definitions can often result in a circular chain of definitions such as 1) what is required for economic growth is good government; and 2) what is good government is what produces economic growth.



A prime example of all-encompassing definitions is the concept of (good) governance adopted by Kaufmann and colleagues at the World Bank:

*“the traditions and institutions by which authority in a country is exercised. This includes (a) the process by which governments are selected, monitored and replaced; (b) the capacity of the government to effectively formulate and implement sound policies; and (c) the respect of citizens and the state for the institutions that govern economic and social interactions among them.”*  
(Kaufmann et al., 2010 p. 4)

While the authors go a long way to break down this broad definition into smaller parts, at the end of the day, their concept of governance encompasses everything from the access to power to the exercise of power; from the content of policies to the process by which they are formulated. As Rothstein & Teorell (2008) (p. 168) put it *“The problem is that such a definition is just about as broad as any definition of “politics”.*” In addition, the measurement of this concept, however impressive in scope, suffers from a number of biases towards international business elites and generally lacks the hard elements which would allow for deriving causal inferences (Kurtz & Schrank, 2007a, 2007b).

In order to avoid the pitfalls of defining quality of government in functional or all-encompassing terms, focusing the definition on *how public authority is exercised* appears to be fruitful. It makes the distinction between the *access* to power and the *exercise* of power clear while it also steers clear from conflating the *content* of policies with the *process* of decision making and implementing policies. Hence, following Weber<sup>2</sup> and many contemporary scholars quality of modern governments can be defined as

*the degree to which the exercise of public authority follows the principle of universalism or impartiality.*

In this context, universalistic or impartial exercise of power is such that only rational-legal rules applying to a case are taken into account when making public decisions or implementing them. This definition departs from the similar definition adopted by

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<sup>2</sup> The concept of impartiality is clearly linked to Weber’s legal-rational ideal while being applied to the whole state rather than to state bureaucracy only (Dahlström et al., 2010).

Rothstein & Teorell (2008) in that it also refers to making public decisions not only implementing them. This is because it is hard to separate decision making from implementation when it comes to impartiality as, for example, a law enacted in a partial manner giving special favours to a particular individual (think about for example a law which stipulates that only the brother of the president can receive highway construction contracts) can be impartially implemented still rendering it partial. Hence, both decision making and implementation should follow the principle of universalism or impartiality in a high quality government.

In spite of efforts to establish impartiality or even-handedness as a generally applicable norm (Rothstein & Torsello, 2013), such a norm is far from warranted in every context. By implication, the above definition is only applicable in contexts where the norm of universalism is established at least in part. For example, even in a largely patrimonial society, development funding may be attached to a universalistic spending principle which can be respected in spite of generally divergent norms in the wider society.

Unsurprisingly, the quality of government is only applicable to the state, hence, its space of validity hinges upon the scope of the state, that is what kinds of products and services a given state provides or is expected to provide by the majority of the population.

This definition of quality of government implies that a high quality government is free of corruption, i.e. abuse of public office for private gain (Nye, 1967), as well as clientelistic and patronage practices (Mungiu-Pippidi, 2006); however quality of government can be low for other reasons too. On an abstract level, the principle of universalism in the exercise of public authority can be violated for two fundamental reasons: *1) lack of capacity to live up to such a norm (state capacity); and 2) deliberate violation in order to benefit a particular group or individual (corruption)*. The first kind of violation arises in a more or less random way implying no regular benefits to any particular group or individual. Here, intentionality is lacking. A prime example of this violation is when official records are accidentally lost by the state and the corresponding citizens get an inferior treatment compared to all others as a result. The second kind of violation arises in a non-random fashion, whereby the involved actors intentionally violate the principle of ethical universalism. In order

words, state capacity is about the means to deliver in an impartial manner, while corruption is about the balance between the motivations and controls for purposefully using public means for public goals.

While, these two types of violations are conceptually distinct, they need not neatly separate in reality. For example, when record keeping capacities are low, intentional bending of rules is more easy to carry out.

These two components of quality of government: state capacity and corruption are discussed separately below.

## 2. What is state capacity?

In the sociological and political science literature pluralist (Baumgartner, Berry, Hojnacki, Kimball, & Leech, 2008; Berry, 1999; Mahoney, 2008), class-domination (Domhoff, 1990, 1996, 2006), Foucauldian (Foucault, 1980, 1991), and state centrist (Evans, Rueschemeyer, & Skocpol, 1985; Evans, 1995; Finegold & Skocpol, 1995; Weiss, 1998) schools have formulated often opposing theories of the capacities of the state. Among many others they have long debated whether the state is autonomous, i.e. whether it is simply the reflection of societal interests and power relations or whether it is capable of acting independent of these. The proposed analysis clearly assumes that the state can be autonomous if it commands sufficient capacity. Below, relevant literature is critically reviewed first, then a simple conceptualisation is offered.

The proposed research's state capacity concept directly relates to the formulation of **state capacity** in the state centrist and institutionalist accounts (Evans, 1995; Jessop, 2006). State capacity in these works, by and large, refers to the capacity of the state to carry through its decisions, that is implementation capacity which can take the form of, for example, capacity to coordinate state intervention into the economy (e.g. Skocpol & Finegold, 1982) or capacity to extract resources from the society (Tilly, 1985). By now, 'state capacity' has become a frequently used term for a burgeoning literature with various meanings and measurements.<sup>3</sup> In the works within the diverse tradition of state centrist institutionalism, state capacity emerges as the prime explanatory factor behind policy success and failure in terms of, for

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<sup>3</sup> Google scholar returned more than 26 000 articles mentioning the term 'state capacity' on the 15<sup>th</sup> of March 2011.

example, war and international conflict, state coordination of the economy, or industrial development. One of the virtues of this school of thought is that it gives a detailed historical account of the development as well as the impacts of state capacity in developed as well as developing countries both in contemporaneous and historical perspectives. Nevertheless, our understanding of state capacity building and deconstructing efforts in the specific context of CEE countries is incomplete. It is suggested that much of the existing state capacity was purged in the transition process by reform minded governments mostly following neo-liberal advice (Hamm, Stuckler, & King, 2010; King & Hamm, 2005; King & Szelényi, 2005). The subsequent efforts to strengthen state capacity are subject to heated debates claiming dominance of external or internal forces and evoking the capturing tendencies of business. Furthermore, this school of thought places the state into an interaction with civil society and markets (e.g. constructing markets) (Polányi, 1957); it also opens up the black box of the state and considers the interaction among state institutions (Block & Evans, 2005; Lange, 2005).

Much of the state capacity and related scholarship is driven by the argument put forward by Weber (Weber, 1978 ch. 11) that bureaucracy is one of the institutional foundations of capitalist economies associated with a rational-legal order and capitalist growth (Albrow, 1970). This bureaucracy constitutes “a distinct organizational setting, the bureau or office: formalized, hierarchical, specialized with a clear functional division of labor and demarcation of jurisdiction, standardized, rule based, and impersonal. [...] bureaucracy refers to a professional, full-time administrative staff with lifelong employment, organized careers, salaries, and pensions, appointed to office and rewarded on the basis of formal education, merit, and tenure.” (Olsen, 2005, p. 2). Based on this clear theoretical model, two recent attempts were made to develop an empirical research program and further refine and test the ideas of Weber:

1. Evans and Rauch developed a ‘Weberianness’ score based on a narrower understanding of the Weberian model, i.e. meritocratic recruitment and predictable long-term career paths, which they found to be conducive to economic growth and bureaucratic quality in some low and middle income countries (Evans & Rauch, 1999; Rauch & Evans, 2000).

2. Scholars at the Quality of Government Institute, University of Gothenburg<sup>4</sup> have taken forward and further refined the ideas of Evans and Rauch. Their work concentrates on meritocratic versus political recruitment, career path of bureaucrats, and their salaries which have led to conceptualizing two principal aspects of bureaucracy: professionalism and closedness (Dahlström, Lapuente, & Teorell, 2010).

One of the greatest merits of these accounts is that they strictly differentiate between inputs to and internal processes of state bureaucracies (e.g. career progression) and the outcomes which are expected to derive from the existence of such state structures (e.g. economic growth). This approach allows for separating state and society in the policy process which in a second analytical step can be linked through mechanisms. However, both of these research strands focus on a narrow understanding of public administration, i.e. central government, and limited concepts of organisational structures. In addition, when considering the impacts of Weberian bureaucracy no or only one intervening factor is considered. Furthermore and more significantly, these applications of the Weberian perspective on bureaucracy is limited in contemporary developed societies where a host of state-society institutionalized relationships exist which contribute towards state capacity, but, strictly speaking, lie outside the domain of bureaucracy. These developments must be taken into account if one wants to develop an empirically accurate account of state capacity. This is not to say that bureaucracy is not crucial in state capacity as, for example it is central to managing state-society relationships; rather the analytical perspective must be broadened (Pierre & Peters, 2005).

Finally, these schools of thought acknowledge the role of bureaucratic expertise and knowledge in producing outcomes; nevertheless, they do not explicitly theorize or measure these, even though in Weber's original account they featured as key insights (Evans, 1995 ch. 2). Similarly, the previously reviewed state centric institutionalist authors make notice, but does not spell out in detail the role played by expertise and knowledge even though there is a substantive amount of scholarly work by now (Amsden, 2001; Gordon, 1977; P. A. Hall, 1993; Rueschemeyer, 1983).

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<sup>4</sup> See: <http://www.qog.pol.gu.se/>

Another strand of scholarly work connected to Weber's ideas is provided by scholars who assess the **administrative capacity** of the state, among others, in CEE (Dimitrova, 2002; Meyer-Sahling, 2011; World Bank, 2006). However, these authors go beyond the Weberian tradition in that they take into account the developments in public administration and management which yield additional insights in analysing contemporaneous public service reforms. In addition, this literature is more explicitly linked to prescriptions of intergovernmental and governmental institutions such as the EU or the OECD (OECD, 1998, 1999). The great value of this literature is that it unravels the internal structure of public administrations and seeks to understand the dynamics which drive public administration reform. Administrative capacity is understood as characteristic of the central state bureaucracy, in particular the presence of (1) the rule of law (i.e. legality, reliability and predictability); (2) openness and transparency; (3) legal accountability; and (4) efficiency and effectiveness in a number of domains such as recruitment and career progression (Meyer-Sahling, 2009). Based on this framework, an extensive survey of civil servants in CEE was conducted which revealed, among others, that much progress achieved until the EU accession has been reversed and there is a significant implementation gap in the region, that is apparent deviation between the legal framework and actual practice (Meyer-Sahling, 2011). In addition, CEE countries are characterized by a mixture of classical Weberian and New Public Management type bureaucracies where there is no clear pattern of sequencing these reforms or trajectories towards a common model (Meyer-Sahling, 2009). While this literature is highly relevant to the detailed analysis we aim at, its exclusive focus on the central bureaucracy apparently leaves a great number of critical questions unanswered.

Michael Mann's analysis of **state despotic and infrastructural powers** derives from a long standing interest of sociologists regarding the question who controls whom in the society (Weiss, 2005). The despotic power of the state denotes the "the range of actions which the elite is empowered to undertake without routine, institutionalized negotiation with civil society groups" while the state's infrastructural power refers to the "institutional capacity of a central state [...] to penetrate its territories and logistically implement decisions" (Mann, 1984, p. 113). His work has generated a rich theoretical and empirical scholarship (J. A. Hall & Schroeder, 2005; Soifer & vom Hau, 2008). This framework differentiates among the central state, its

radiating institutions, and civil society which lends it strong analytical tools (Soifer, 2008). Moreover, it places the emphasis on the relationship between state and society, i.e. negotiated interdependence (Weiss, 2005), as well as among different state institutions which highlights to what degree and in what ways the state is dependent on civil society in implementing its decisions (Soifer & vom Hau, 2008).

Nevertheless, some authors call for clearly delineating the concept of state infrastructural power from state capacity understood as bureaucratic professionalism (Soifer & vom Hau, 2008; Ziblatt, 2008) where the former is more related to the 'street-level bureaucrats' whose abilities define the overall implementation capacity of the state; whereas the latter concerns the professionalism of the higher ranking bureaucrats. Clearly, there is a potential conceptual confusion here as, for example, it is unclear where the boundary between high and low ranking bureaucrats lies or why the professionalism of higher ranking bureaucrats doesn't count towards the state's overall implementation capacity. This potentially perplexing distinction can be resolved by focusing on the different resources the state commands when implementing its decisions. As the later discussion will show, there is a great merit in differentiating between the state resources which are directly in the hands of the state (e.g. professionalism of the bureaucrats, financial resources) and those resources which it can use, but lie outside its direct control, i.e. relational resources such as legitimacy and popular support.

In contrast to the above discussed concepts of state capacity, the **proposed approach to state capacity** focuses on resource endowments of the state while avoiding issues such as in what ways and to what ends these are actually exercised. These are much more the domain of corruption, discussed in section 1.3. Such focus strictly detaches state capacity from outcomes of public action such as effective policy implementation. The below formulation of state capacity is proposed:

***State capacity** refers to the state's – i.e. political leaders, state bureaucracy and other governmental organisations - capacity to make decisions and implement them in line with the principle of ethical universalism.*

This definition directly follows from the concept of the quality of government. In order to avoid using a state capacity definition which is too broad for operationalization,

further break-up of the concept is offered. The point of departure is that in order to solve any collective action problem a state apparatus has to make decisions, implement them, and reach consent from the governed (even if it is forced consent) (Jann & Wegrich, 2007). Thus, state capacity can relate to each of these three core functions: (1) policy capacity, (2) administrative capacity, and (3) mobilization capacity (cf. Painter & Pierre, 2005; Polidano, 2000). Loosely following the guidance of Painter & Pierre (2005) and Polidano (2000), these three concepts are defined and briefly explained below.

***Policy capacity** is the state's ability to marshal the necessary resources to structure the collective decision making process, coordinate it, and feed informed analysis into it.*

Policy capacity in this framework refers to the domain of politics where decisions are made in a democratic or otherwise fashion. While the definition does not imply any normatively desirable or superior mode of decision making it does draw the attention to the simple fact that any intelligible collective decision making process requires adequate processes and structures in place which determine which actors at what point can provide input and which of them have a bigger say in the final decision. In addition, it also highlights the crucial role of knowledge in the collective decision making process and the importance of knowledge management (Fazekas & Burns, 2012; Howlett, 2009).

***Administrative capacity** refers to public and semi-public organisations' ability to manage effectively their human, ideational, and physical resources required for implementing collective decisions.*

The concept of administrative capacity comes closest to the above enumerated concepts of 'Weberianness', bureaucratic effectiveness, and implementation capacity. It is important to highlight that effective implementation crucially hinges upon (1) human resources such as the availability of well-trained bureaucrats who adhere to the organisation's goals, the presence of resources for motivation, and organisational procedures regulating the division of labour; (2) ideational resources such as reliable and timely statistics and causal theories to support state intervention; and (3) physical resources such as IT infrastructure and buildings. The implementation of collective decisions produces the outputs of government activity



ranging from regular provision of public goods, such as schooling and issuing permissions, to unique projects such as joining the European Union (EU). It is important to highlight that administrative capacity does involve policy decisions; however, these decisions are of more practical nature in comparison to the decisions made through using policy capacity.

***Mobilization capacity** encompasses the state's ability to mobilize critical resources outside the state such as popular support, cooperation, and knowledge in furtherance of public goals.*

Mobilization capacity is explicitly focused on state-society relations among the three capacity concepts proposed here. While mobilization capacity concerns implementation of collective decisions just like administrative capacity, it constitutes the crucial link between state outputs and outcomes by explicitly reflecting on the role played by society in producing these outcomes and impacts. This role is most explicit in cases where the state and the society co-produce public goods (Ostrom, 1996). Examples cover a wide range of phenomena from contractual public-private partnerships to informal cooperation between police and civil society (Joshi & Moore, 2004). The decisive role played by society in producing outcomes is also present in more traditional areas of public service delivery such as health care or public procurement. Take for example a public tendering procedure where the state employing its high administrative capacity announces a highly professional and adequate tender; however, if the applicant companies decide to collude the received bids will be excessively expensive and potentially low quality. The crucial resources which the state needs in order to produce the outcomes in line with collective decisions lie outside the public domain. These resources are, for example, legitimacy, popular support, and willingness to cooperate and share knowledge possessed by societal actors. Clearly, the state has some influence over these resources, but no direct control.

The three concepts introduced above, i.e. policy capacity, administrative capacity, and mobilization capacity, are analytically distinct concepts; nevertheless, they mutually impact each other. Policy capacity and the high level, strategic decisions made through it define and can redefine the level of administrative and mobilization capacities. For example, low level of policy capacity may imply that decisions don't

reflect adequately collective preferences which can directly result in loss of legitimacy decreasing mobilization capacity. Similarly, administrative capacity impacts on policy as well as mobilization capacities. An inefficient bureaucracy is unlikely to support the decision making process with reliable knowledge and is likely to erode legitimacy of the state. Finally, mobilization capacity feeds back into policy and administrative capacities. The public's unwillingness to share information with the state often constrains the quality of collective decisions and the implementation ability of the state.

The proposed framework does not offer an easy and straightforward answer to the question of the level of state capacity or its constitutive elements. The key problem highlighted by the framework is that the three different capacity concepts interact with each other hence the framework allows for assigning different levels to each of the elements depending on the others. This is not surprising as, for example, low quality laws produced by low level of policy capacity are difficult to implement both because the administration faces insurmountable interpretation issues and because implementation has to face with the resistance of the population. It is noted by a number of authors that low quality regulation often leads to corruption and regulatory capture as vague rules open the way for discretion and abuse (Hellman, Jones, & Kaufmann, 2003; Hellman, Jones, Kaufmann, & Schankerman, 2000; Slinko, Yakovlev, & Zhuravskaya, 2004). On the other hand, increasing policy capacity may reverse the situation implying that the same amount of administrative resources can produce different outcomes. Nevertheless, the way forward appears to be more adequate conceptualization and measurement of each of the three elements in themselves and as a second step exploring the interactions among them in producing collective outcomes (Keefer, 2004).

It is recognized that state capacity is at least partially goal-dependent, that is the level of state capacity depends on the nature of goals and tasks allocated to the state organisations in question. This also means that there is no such thing as generally capable state; states are capable in some things while incapable in others (Oszlak, 2005). To give an example, a classic Weberian bureaucracy may well be excellent in traditional command and control governance; however, it is most likely to be inapt for the tasks associated with a transparent, open, and participatory governance mode where hierarchical relationships, insulation of bureaucracy from

society are disadvantages. This also leads to a genuine problem of cross country research on state capacity. Because countries define different goals and intervene into the economy and civil society in different ways the same resources and structures of different countries are very likely to imply different levels of state capacity. This problem permeates objective measures of state capacity, but even more perception based indicators where it appears to be a crucial problem as to which 'ideal state' do respondents compare the actual observed state behaviour (Kurtz & Schrank, 2007a).

### 3. What is corruption?

Corruption or the lack of it forms the other crucial component of quality of government. Recall that corruption implies the violation of the impartiality principle for a reason, that is benefiting a particular group or individual over others. As corruption is a contested and often ambiguous concept, a brief review of literature is offered before this thesis' definition is introduced.

The term corruption is used to cover diverse phenomena in many contexts which differ in the prevailing norms of good conduct. Hence, many characterisations of corruption are normatively charged and context-dependent (Johnston, 1996). A common definition of corruption is "*the misuse of public office for private gain*" (Rose-Ackerman, 1978). This definition clearly sets out that corruption is an activity undertaken by those holding public office and implicitly implies that codes of conduct for public officials are well-defined along with an established separation between the public and private spheres. Furthermore, the scholarship based on this definition predominantly understood corruption within a bureaucratic context and equated corruption with bribery of public officials. The problem is that Weberian-type bureaucracy and the underlying rational-legal order may not be present to start with rendering the definition useless. In addition, it is similarly inadequate to capture corruption in public positions with high degrees of discretion such as members of parliament (Warren, 2003).

Nevertheless, the other components of the definition are similarly problematic: misuse and private gain. "Misuse" attempts to steer scholars away from excessive legalism, to consider technically legal but otherwise questionable practices. The obvious question, then, is how to characterise the border between use and misuse,

the answer inevitably depending on the context. “Private gain” works well in the canonical case of a citizen or firm bribing a petty official to obtain some advantage, as the bribe money goes in the official’s pocket, but for many other types of potentially corrupt exchanges, gains may benefit groups spanning through the public-private boundary rather than a single individual.

A commonly-employed conceptualisation of corruption is the *principal-agent framework* which explains the incidence and organisation of corruption (Klitgaard, 1991; Lambsdorff, 2007; Szántó, Tóth, & Varga, 2012). While this framework informs us of the difficulties faced by a ‘clean’ principal in monitoring her agents in an effort to prevent their deviation to corruption, there are very few such principals in systematically corrupt countries such as CEE countries. In fact, obtaining public office is often the primary means of extracting rents and conducting corruption (Hellman et al., 2003; Mungiu-Pippidi, 2006). Hence, focusing only on this relationship, to the neglect of the networks that support a corrupt principal in her position, misses the key contextual feature sustaining corruption (Rothstein, 2011).

Reflecting on the contested nature of the term corruption and the limited space available for a theoretical discussion, no generally applicable definition is offered which would cover all forms of corruption and satisfy all the criticism made against corruption concepts. Rather, a more feasible and practical route is followed which clearly identifies the set of actions which are considered to be corrupt or not and the set of rules which define these, following from the concept of quality of government already outlined above. Hence,

*corruption is understood as a deliberate deviation from the norm of ethical universalism in order to benefit a particular group or individual in the exercise of public authority.*

Like in the case of our quality of government definition, this formulation of corruption can only be applied to contexts where universalism as a guiding principle is established throughout the whole society or at least in a given area of public action. Once again the potential scope of corruption depends on the scope of the state. This definition of corruption is also closely related to the idea of social orders where open versus closed access to public resources plays a central role (North, Wallis, & Weingast, 2009). This also implies that corruption is crucially about power and

access to the spoils of collective institutions; in other words, one can only talk about corruption if access should be, at least in principle, open to a wider group of actors, but it is limited to a few by breaking some established written or unwritten rules.

As in systematically corrupt environments many specific rules may be biased and constrain open access in spite of a general promise of open access, conflicting rules represent a major challenge to this understanding of corruption. The simple solution is that what matters is whether the general principles of universalism and open access are established irrespective of some lower-order, specific regulations. For example, if a public procurement law backed by an international treaty stipulates competition and open access to tenders for all bidders, which is the case for every EU member state, then using administrative regulations or courts for closing access to otherwise eligible bidders is considered to be corruption. In this respect, we can talk about legal corruption. In a similar vein, if the norm of ethical universalism is not established in a country in general, for example in most developing country contexts, but development funding is expected to be spent in an open and transparent way, then corruption can be established with regards to conditions attached to spending the money rather than the given country's particularistic traditions at large. However, if no violation of access occurs, as for example in many health care systems of Central and Eastern Europe where gratuity payments are pretty much automatic and expected by both parties, the above definition doesn't confer the label of corruption.

As corruption is a highly diverse phenomenon, its adequate understanding and measurement requires it to be broken down into types or kinds with distinct logics and actor constellations. For the subsequent empirical analysis three characteristics are key: 1) government function affected (e.g. rule-making or implementation); 2) level of government engaging in corruption (e.g. low or high); and 3) degree of institutionalisation (e.g. irregular and occasional or recurrent and institutionalised).

As already noted in section 1.2, the exercise of public authority requires to fulfil three functions at a most basic level: make decisions, implement them, and reach consent from the governed (even if it is forced consent) (Jann & Wegrich, 2007). By implication, three government functions can be corrupted: particularistic collective decisions (e.g. selling laws); particularistic policy implementation (e.g. unfairly favouring a friend's company over others in public procurement); and particularistic

consent to public action (e.g. selling one's vote in a local construction permit application procedure) (Karklins, 2005). As public action, controls, and forms of corrupt rents differ in each of these cases, it is expected that these three types of corruption would follow divergent logics, hence would need to be analysed with different tools.

In terms of level of government affected, typically low-level and high-level corruption are differentiated, where the former refers to the actions of street-level bureaucrats who deliver public services such as issuing work permits, while the latter refers to decision making and managerial roles with wider ramifications such as awarding public procurement contracts (Pardo, 2004). While the distinction between these two may not always be clear, they display largely different logics primarily driven by the potential size of rents and different kinds of monitoring mechanisms. High-level or grand corruption usually involves fewer people and larger sums offering greater potential for corrupt organisations to evolve.

In terms of the degree of institutionalisation, there are two extremes along this imaginary scale, one where corrupt transactions occur sporadically between isolated individuals without any expectation of a repeated transaction, and the other one where corrupt transactions are recurrent and highly institutionalised with the expectation of continuation. The point here is not only the number of transactions between actors, but also the nature of those transactions with their established rules, roles, and mutually shared expectations. Highly institutionalised corruption borders with organised crime (von Lampe, 2008), may partially appropriate the state (state capture), blur the public-private boundary, and create powerful informal institutions (Grzymala-Busse, 2008; Hellman et al., 2003; Wedel, 2003) often by manipulating policy implementation such as public procurement (Piga, 2011) and making corruption look legal (Kaufmann & Vicente, 2005).

## Chapter 3 - Framework for measuring institutionalised grand corruption

Measuring corruption in general and institutionalised grand corruption in particular has been on the agenda for many years by now. Even though there are many indicators around and quite a few promising developments have arisen, no real breakthrough has happened yet (Sequeira, 2012). The lack of adequate indicators is a serious problem both for policy and academic research. As the field is vast, no review is offered here, instead our novel approach is discussed in detail (for a detailed discussion of corruption measurement problems see section 4.2).

### 1. What is measured exactly?

In order to harness the large amounts of previously unexploited data and to reflect the large monetary value and its crucial importance in the functioning of governments, corruption is measured in the domain of public procurement. As corrupt rents can be extracted from a range of government activities other than public procurement such as wages for public employees, sale or renting of public assets, or regulation, this choice represents a considerable narrowing of the field of interest. While there may be considerable overlaps and interactions between these different fields, it nevertheless lends crisp analytical focus to the subsequent measurement and analytical exercises.

While public procurement corruption can manifest in a diversity of forms, the subsequent empirical analysis only concentrates on one form in order to focus attention on corruption which most likely have the widest ramification for democracy, public goods, and development: institutionalised grand corruption. Hence, the working definition of corruption adopted is the following:

*institutionalised grand corruption in public procurement refers to the particularistic allocation and performance of public procurement contracts by bending universalistic rules and principles of good public procurement in order to benefit a group of individuals while denying access to all others (for a similar understanding of corruption see: Mungiu-Pippidi, 2006; North et al., 2009; Rothstein & Teorell, 2008).*

## 2. Core elements of a unique measurement approach

The starting point is that neither surveys of corruption nor detailed case studies are adequate enough for measuring corruption for policy purposes and testing scientific theories. While these can be part of a wider measurement strategy, harnessing Big Data, the immensely increasing speed and amount of data created covering virtually the full spectrum of social life, holds the promise of providing the sought after new indicators.

By implication, the measurement approach seeks to provide indicators which

- solely derive from objective data describing actor behaviour,
- are defined on the micro level such as individual transactions,
- allow for consistent comparisons across countries, organisations, and time, and
- rest on a thorough understanding of the corrupt rent extraction process.

This approach requires a combination of qualitative and quantitative methods where the two works closely together.

While corruption is clandestine, it must leave traces in official records of public procurement, company ownership, and financial information. As open access, fair competition, and transparency are prescribed by legal frameworks across every developed and in many less developed countries, corruption, that is particularistic limitations on open access, has to pretend that it is fully legal. This characteristic of institutionalised grand corruption in public procurement creates the opportunity for an indirect measurement approach following from anomalies of open market competition. In addition, the competition between corrupt groups and especially the change of power between them (e.g. which predatory elite group forms government) create a unique opportunity to identify what is open competition and what is only a pretence of it.

The proposed measurement approach is general as long as the underlying data is available and sufficient understanding of each country's context is warranted. The data in this thesis only comes from Hungary, Czech Republic and Slovakia which could be treated as pilot countries for a wider measurement exercise with more ambitious comparative goals.



While the discussion concentrates on public procurement, the same logic can be applied to other areas of public spending as long as they are also bidding markets for distributing public resources. Further examples cover:

- EU subsidies for enterprises,
- Sale of public property,
- Renting out public property, or
- Bidding for public licenses.

### 3. Overview of the proposed indicators

At an abstract level, successful and recurrent rent extraction requires

1. the generation and allocation of rents,
2. vehicle(s) for extracting and transferring rents to the ‘final’ beneficiaries, and
3. controlling the process of rent extraction.

As each of these three functions is necessary for successfully maintaining institutionalised grand corruption and each of them is likely to leave marks in official records, it is possible to develop three separate indicators (with two variants for process control). As indirect indicators of corruption are only approximate and contain a degree of error, using multiple indicators to characterise the same country, organisation, or transaction is likely to increase precision. This thesis sets out in detail only the first indicator, while pointing at the details of the others.

#### 1. **Corruption Risk Index (CRI)** – generation and allocation of rents

CRI measures the probability that the principle of open access is violated in the process of awarding and performing public procurement contracts in order to serve corrupt rent extraction by a select few. In other words, it expresses the probability of tender issuers pretending that tenders are competitive as prescribed by law while restricting competition to award contract to a well-connected bidder recurrently.

CRI is a composite indicator of elementary corruption risk indicators capturing ‘corruption techniques’ such as tailoring eligibility criteria to fit a single company or using exceptional procedure types to limit openness of competition. It reflects a corrupt rent extraction logic whereby elementary

corruption techniques are systematically used for restricting access and recurrently benefiting the same winner.

CRI is constructed in three steps: 1) A long list of elementary corruption indicators is identified (30+ indicators) which are proven to indicate corruption in *some* cases using qualitative methods (see chapter 3). 2) Those indicators are selected from the long list which prove to be systematically linked to restricted access as captured by a single bidder contract *as well as* to recurrent contract award to the same company as captured by winner contract share over 12 months. Regression analysis controlling for alternative explanations such as market specificities and low state capacity are used for identifying such indicators (see chapter 4). 3) Selected elementary corruption risk indicators are weighted by reflecting their strength in predicting lack of competition and recurrent contract award (see chapter 4).

While CRI is defined on the level of individual public procurement tenders it can also be aggregated to characterise organisations, markets, or countries over time.

## 2. **Winner Company Risk Index (WRI)** - vehicle for extracting and transferring rents

WRI measures the probability that a company is predominantly used for extracting and transferring corrupt rents earned in public procurement. While any company winning a public procurement contract can be used for extracting rents, even the most established and well-regarded companies, those companies whose primary purpose is rent extraction will differ from other companies in their industry. Such differences can be the short period between company incorporation and winning in public procurement or unusually intransparent ownership structure. Hence, WRI is a composite indicator of elementary company risk indices.

WRI is constructed in three steps similar to CRI: 1) A long list of elementary company risk indicators<sup>5</sup> is identified which are proven to indicate corruption

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<sup>5</sup> While this indicator is the least well developed in the thesis, an initial list is offered which will form the basis of creating a more complete list: 1) time between incorporation and winning public procurement contract, 2) time between winning public procurement contract and bankruptcy, 3) total annual public procurement contract value per total annual turnover, 4) total annual public procurement contract value per employee, 5) ownership transparency (i.e. country company registration risk score and amount of missing information), 6) company seat risk (i.e. large number of companies on the

for *some* companies using qualitative methods. 2) Those indicators are selected from the long list which prove to be systematically linked to high corruption risks using CRI, PII, and PCI (for the definition of the two latter indicators see below). Regression analysis controlling for alternative explanations such as market specificities and low state capacity are used for identifying such indicators. 3) Selected elementary corruption risk indicators are weighted by reflecting their strength in predicting corruption.

While WRI is defined for individual companies, it can be aggregated to the level of markets, public organisations, or countries, for example by taking the average WRI of companies winning contracts on a market, from a public organisation, or in a country.

### 3.1 Indicator of political interference on public procurement markets (PII) – controlling the process of rent extraction

PII indicates whether a company's success on the public procurement market depends on the political group in power at the national or local level. Such companies are identified by the change in total company contract volume from before to after government change. Those companies are designated as politically connected companies whose change in market share cannot be explained by standard economic explanations of market success such as main market or prior investment *and* whose deviation from the standard economic explanatory model is very large<sup>6</sup>.

Political connections identified in such an indirect way signal that a company is tied to hence, at least partially, controlled by political groups prone to corruption. In this sense, does PII indicate the political control of rent extraction. However, it does not indicate whether it is politics which captures business or the other way around.

While PII indicates companies' indirect political connections, it can also be used for characterising markets, organisations, or whole countries. The simplest way to do so is to divide the total contract value earned by politically

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same address and risk score of the other companies on the same address), and 7) failing to file annual balance sheet.

<sup>6</sup> The meaning of very large gets concrete quantitative meaning when 'normal' years, that is periods without change of government are compared with the period of government change; or when municipalities where there was no change of local government are compared with municipalities where there was.

connected companies by the total contract value of the market, organisation, or country.

### 3.2 Indicator of political control of public procurement contractors (PCI) - controlling the process of rent extraction

PCI measures whether a public procurement winning company has direct political connections. Political connections are identified by checking whether each winning firm's owners and managers held or still hold a political office where political office is broadly defined as elected national and local representatives and high-level appointed public officials such as supreme court judges or heads of national police force.

Political connections identified in such a direct way signal that a company is tied to hence, at least partially, controlled by political groups prone to corruption. In this sense, does PCI indicate the political control of rent extraction. However, it does not indicate whether it is politics which captures business or the other way around.

While PCI indicates companies' direct political connections, it can also be used for characterising markets, organisations, or whole countries. The simplest way to do so is to divide the total contract value earned by politically connected companies by the total contract value of the market, organisation, or country.

## 4. The issue of validity

Clearly, none of the four proposed indicators indicate institutionalised grand corruption directly. However, they are designed so that they signal the likelihood of institutionalised grand corruption to occur. Unfortunately, in systematically corrupt environments, we cannot rely on courts to validate our indicators: first, because they are highly likely to fail to uncover and prosecute most of the corruption cases (i.e. problem of false negatives); second, because they are also likely to hand out biased judgements serving political purposes (i.e. problem of false positives). By implication, the validation of indicators has to rely on alternative methods. We propose four procedures of validation:

- 1) Internal validity confirmed by the set-up of indicators themselves such as the clarity of indicator building logic, the richness of qualitative evidence supporting components of each indicator, and the quality of regression

models used for singling out corruption from other phenomena such as state capacity or market specificities.

- 2) External validity established by the co-variation between the four lead indicators which is expected to be only moderately strong as they indeed capture different aspects of the corrupt rent extraction process in public procurement with their divergent flaws. Nevertheless, no co-variation would be a strong argument against validity. It must be noted that WRI is devised exactly through exploiting the correlation between its elementary indicators and the three other lead indicators. Hence, constructing WRI satisfies this condition by definition.
- 3) External validity indicated by further indicators such as company productivity (Cole & Tran, 2011) or institutional integrity measures (Szente, 2011). While it is possible to check the proposed 'objective' indicators of institutionalised grand corruption against widely used survey measures such as government favouritism (World Economic Forum, 2010), it is expected that the difference in indicator scope and quality may lead to little to no correlation.
- 4) External validity demonstrated by well-documented cases is a tempting route to validation; however, due to weaknesses of courts in systematically corrupt environments, case selection may render such an exercise very difficult or impossible. However, contrasting organisations of very high corruption risks with those of very low risks using a thick qualitative account may deliver a valuable validity test.

The below thesis discusses validity tests 1-3, but it remains for further research to carry out validity test nr. 4.

The proposed validity tests must be understood only as indications of retrospective validity because the problem of reflexivity is particularly troubling in corruption research. This means that validity can be established in retrospect, but corrupt groups are likely to respond to changes in monitoring technology and detection probabilities. Hence, as soon as any of these indicators is used for monitoring corruption at large, indicator validity is expected to deteriorate due to efforts of corrupt actors to better hide their actions. This means that further refinements, also including the incorporation of further variables (role of regulator to constantly increase transparency!), are necessary for the indicators to remain valid.

## Part II – Empirical results

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## Chapter 4 - Corruption manual for beginners: “Corruption techniques” in public procurement with examples from Hungary<sup>7</sup>

### 1. Introduction

While there have been recent advances in measuring and understanding petty or low-level corruption (e.g. Charron, Lapuente, & Rothstein, 2013; Rose & Peiffer, 2012), research into grand or high-level corruption<sup>8</sup> has remained underdeveloped in the last decades. This is in large part due to the lack of data. In order to advance research as well as evidence based policy, reliable indicators are needed to gauge the structure and the magnitude of grand corruption. Data based on perceptions and formal institutional structures are plentiful, but these have not proven particularly useful in unearthing the mechanisms creating and sustaining grand corruption. The only way forward is to understand the micro-level context of grand corruption in particular fields of government activity such as public investment, law-making, or issuing permits and licenses and to develop qualitative and quantitative indicators based on a thorough understanding of the corruption process.

*Below, technologies of grand corruption in public procurement are described and corresponding quantitative indicators are developed which directly or indirectly signal their use.* What we call corruption techniques are techniques used by corrupt actors to make their corrupt, often illegal, acts look legal and to hide their actions from the eyes of the public. For example, making competition for a public contract look fair and open whereas the winner and the contract value were already agreed before the launch of the tendering process. Each corruption technique is described in abstract terms by outlining its characteristic elements, the actors’ reasons for resorting to it, the constraints on application, and some real-life examples as reported by the media, the courts, or our interviewees. The list of these techniques which is far from complete, can nevertheless be considered as novel scientific result in itself. However, the main rationale for their structured discussion is to provide solid theoretical and methodological ground for quantitative indicators of grand corruption.

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<sup>7</sup> Some of the research underlying this chapter has been conducted in collaboration with István János Tóth from the Corruption Research Center Budapest.

<sup>8</sup> Grand corruption (or state capture) refers to societal actors’ institutionalized and particularistic influence over public rule formation or policy implementation through private payments or favours.

These techniques can be considered as the input side of the public procurement corruption process where the output side is the collection of rents by the 'right'<sup>9</sup> organisations and individuals. We intend to define the list of indicators as comprehensively as possible because techniques can be used interchangeably and in combination making the measurement quality of overall corrupt activities ultimately dependent on the adequacy of this list.

Corruption techniques are grouped by referring to the different stages of the public procurement process (see section 2.2) in order to highlight the interdependencies between them and to emphasize the process, flow character of such corruption instead of a static understanding. It is important to keep in mind that grand corruption is institutionalized, recurrent, and mobilizes considerable collective resources so *elementary techniques must be seen as parts of a larger corrupt process*. Each corruption technique involves violation of principles of good public procurement in order to achieve corrupt benefits even if narrowly defined laws and regulations are not infringed upon. While there are many possible errors and deviations from good public procurement principles (European Court of Auditors, 2012), what makes the below corruption techniques intertwined with grand corruption is that they are *typically* used by corrupt *groups* to hide and legalize their actions. That is, the below list only contains those techniques which are *reportedly* employed by such groups as described by the media, courts, academic literature, and interviewees in Hungary. Hence, techniques and actions which may simply result from administrative error and incompetence are not discussed in this section as they cannot be reliably linked to grand corruption.

When defining individual techniques we followed the simple rule that each of them should be able to lead to corrupt rent extraction on its own if applied skilfully. This enabled us to identify the elementary building blocks of more complex corrupt strategies whose exact composition changes over time as regulation changes. Moreover, in practice, elementary techniques are typically combined with each other and various degrees of complementarities and substitutions exist among them (e.g.

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<sup>9</sup> Throughout this paper, the terms 'right', 'desired', or 'wanted' organisation refers to those organisations who form part of corrupt networks and are deliberately benefiting from corrupt rent allocation. A prime example is a company owned by the cousin of the mayor winning procurement contracts from the municipality in question.



once all the 'unwanted' bidders are excluded on administrative grounds there is no need for subjectively applying award criteria to 'unwanted' bidders).

The below listed techniques are explained from the viewpoint of tender issuers which, nevertheless, does not indicate that it has to be the issuer who initiates the corrupt transaction or that the issuer possesses all or most of the knowledge necessary for managing the corrupt transaction. Taking the perspective of the issuer simply acknowledges the fact that it is the issuer who, at the end of the day, has to formally manage the process of public procurement. Interviews indicated that the initiation of the corrupt exchange or de facto management may very well be done by a powerful and well-connected company or a politically supported public procurement adviser. For example, the head of public procurement department of a major construction company reported: "I wrote the full tender documentation myself which was subsequently sent out to all bidders."

As we look at grand corruption and state capture primarily as resulting from collusion between some public and private actors, only those techniques of corruption are discussed below which involve or require the deliberate collaboration of the issuer, even though it may well be that multiple bidders take part in the corrupt transaction (e.g. the politically connected winning bidder pays off 2-3 other companies to mimic competition). By implication, cartels and likes involving bidders only are not part of the discussion.

In order to identify as complete and reliable list of corruption techniques as possible a number of data collection methods were used in Hungary:

- the small body of academic literature was screened, including secondary analysis of interviews done by other researchers,
- a review of media reports of concrete corruption cases was conducted,
- original interviews were carried out with public procurement practitioners who have seen corrupt transactions close up, and
- some court cases relating to public procurement corruption were reviewed.

First, we reviewed the small body of directly relevant academic literature of the last 10 years looking at corruption involving public procurement in Hungary and international research papers specifically looking at public procurement corruption.

This literature collected data by interviews, surveys and media reviews; in addition, a few papers made use of administrative data and court cases. As the literature is small, standard keyword searches yielded very few documents, hence our search strategy largely relied on exploring the bibliographic network of key publications. The literature review combined with our own ideas spawned the initial list and definitions of corruption techniques further refined by additional data collection.

Second, the review of media reports covered all major online newspapers of Hungary such as [www.index.hu](http://www.index.hu), [www.origo.hu](http://www.origo.hu), [www.fn.hu](http://www.fn.hu), [www.mno.hu](http://www.mno.hu), <http://vg.hu>, <http://hetivalasz.hu>, [www.nol.hu](http://www.nol.hu), <http://hvg.hu>, and [www.hir24.hu](http://www.hir24.hu) which together cover the whole political spectrum from the left to the right. Many of these have a print edition too, but our review was constrained to the online material which is mostly equivalent or even more extensive than the print version. The time period of systematic analysis was between 1/1/2008 and 1/8/2012<sup>10</sup>, but further articles are also included from later dates if they were brought to our attention. Due to technical issues with newspaper archives there was some random variation in the completeness of our sample, that is some months are missing from the sample. However, this doesn't weaken the analysis as the goal is to find examples rather than establish the prevalence of certain techniques in the press. Among all the articles of these online newspapers, we initially selected those that contained any keywords associated with corruption (concrete list of keywords can be found in Appendix 4A). In a second step, from this large sample of articles, we identified those which discussed a corruption case in public procurement in detail (i.e. simply stating that this and this contract award was corrupt and benefited this and this individuals was not good enough for selection). In the final step, this short list of articles was checked again by the authors and were categorised according to a pre-defined initial list of corruption techniques. Based on articles describing techniques beyond our initial list, new corruption techniques were defined leading to a list covering all the articles in the sample. The results of the media review can be found in Appendix 4A.

Third, interviews with public procurement practitioners 'close' to corrupt transactions were carried out to explore the underlying rationale of each corruption technique,

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<sup>10</sup> In the case of <http://hvg.hu> and <http://vg.hu> we only had the online content starting from 1/11/2010.

gather specific examples (without concrete names), verify whether the techniques are typically used in corrupt transactions, and to identify additional corruption techniques. We conducted semi-structured interviews lasting for about 1-1.5 hours with 14 individuals covering all three major actor categories of public procurement (issuers, bidders, and advisors). They work in construction, healthcare, and IT services sectors taking part in projects ranging from large infrastructure projects of millions of EUR to small services contracts of few thousand EUR. In all but one case, the interviewees either referred to concrete cases they saw from 'close' or described the suitability of a corruption technique in general to reach corrupt goals based on their experience. Given the sensitive nature of the topic, interviewees avoided explicitly mentioning names of individuals or companies. The interview evidence formed the basis on which the final list of corruption techniques was further refined.

Finally, there have been about 600-700 convictions per year by Hungarian courts on the basis of corruption charges between 1990 and 2009<sup>11</sup> and more than 1500 Hungarian court decisions mentioning "public procurement" since 2005<sup>12</sup>. While we could already obtain the text of court decisions, it requires additional work to systematically categorize and check these cases against the below list of corruption techniques. In addition, decisions of the European Court of Justice should also be screened and analysed to cover the full spectrum of judicial review of public procurement in Hungary. We only look at the documents referring to high profile court cases that were reported by the press.

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<sup>11</sup> For annual figures and details of case identification see: [http://www.crc.uni-corvinus.hu/download/korrupcios\\_buncselekmenyek\\_1972\\_2009\\_100428.xls](http://www.crc.uni-corvinus.hu/download/korrupcios_buncselekmenyek_1972_2009_100428.xls)

<sup>12</sup> <http://www.birosag.hu/engine.aspx?page=anonim>

## 2. Principles and models of good public procurement

At the heart of grand corruption in public procurement lies the simple fact that public procurement legislation in the EU and Hungary in particular prescribes basic universalistic principles which must be violated in order to collect the corruption rents. As grand corruption may very well succeed in appearing legal according to the detailed regulations covering public contract award, it is the underlying general principles which define clearly what is corrupt and what is not.

Thus, below we outline the underlying principles of good public procurement and define a simple abstract model of procurement activities allowing for grouping of corruption techniques. Each of the corruption techniques and the corresponding indicator relates to a specific public procurement activity and an underlying principle whose breach implies corruption.

### 2.1 Principles of good public procurement

While there is a multitude of principles of good public procurement in the academic and policy literatures as well as in EU and national laws, there are considerable overlaps among them paving the way for a synthesis valid for the last 10 years (i.e. about 2002-2012) (Arrowsmith, 2009, 2010 ch. 1. OECD, 2007; Transparency International, 2006). While many of the principles in the literature relate to actual outcomes of public procurement such as efficiency of spending, our focus exclusively lies in the process of public procurement in order to aid later discussions of corruption techniques employed during procurement procedures.

The principles relating to the process of public procurement directly derive from the ideas of public sector integrity and impartial government creating the link between the general discussions of corruption and state capacity and the domain of public procurement. Hence, good public procurement rests on three principles which mutually support each other:

- Transparency,
- Fair competition<sup>13</sup>, and
- Accountability.

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<sup>13</sup> Even though fair competition also applies to the absence of collusion among bidders, this aspect is deliberately left aside in order to concentrate attention to corruption and the private-public nexus. There is evidence that corruption and collusion tend to go together, even though they are distinct phenomena (OECD, 2010b).

The principle of transparency means that information about public procurement should be readily available in a precise, reliable, and structured form for the public as a whole or its representatives (Kovacic, Marshall, Marx, & Raiff, 2006; OECD, 2007; Soreide, 2002). Transparency should concern all the information pertaining to the public procurement process and outcomes such as general laws, regulations, judicial decisions, administrative rulings, procedures and policies on public procurement, statistics on procurement activities, and individual procedures and award decisions. While excess transparency may harm competition (e.g. disclosure of commercially sensitive information), transparency in Hungary is generally considered to be too restricted rather than too extensive (Freedom House, 2012; Tóth & Márkus, 2010).

The principle of fair competition means that potential bidders should have equal opportunities for participation, contract award decisions should be impartial, and that public procurement rules should be applied equally to all contractors (Arrowsmith, 2009). That is, fair competition implies a level playing field for every potential and actual competitor. In general, decision making procedures should be rule-bound whereby every rule is transparently accessible to potential and actual bidders. Naturally, bidders may be treated differently if reasonable justification for such treatment is specified prior to the procedure. However, this discretion should also be exercised in an accountable manner.

The principle of accountability means that issuing authorities and their officers, public procurement advisors, and bidder companies and their employees should be held accountable for their actions according to their pre-defined duties and tasks (European Bank for Reconstruction and Development, 2011; Transparency International, 2006). Accountability primarily refers to 1) effective mechanisms and capacity for internal control and audit; and 2) effective mechanisms for filing complaints and challenging public procurement decisions. Accountability is also essential for ensuring fair competition. As accountability mechanisms are typically very costly both for the state and the bidding companies, balance between costs and benefits of accountability systems must be struck.

*Institutionalised grand corruption in public procurement, therefore, implies that some or all of these principles are systematically and recurrently breached in the conduct*

*of procurement by some actors in order to obtain unfair benefits in competition and contracting* (e.g. higher than market price).

The above should make it clear that the definition of grand corruption employed here may or may not imply breaking any laws as defined by Hungarian courts and law-makers. While at the level of principles our definition and the legal definition perfectly matches, actions deemed corrupt according to our definition may seem completely lawful in light of the detailed prescriptions of public procurement and related laws. For a transaction to be deemed corrupt here, neither bribery nor coercion is a necessary condition (Jancsics & Jávör, 2012; Szántó & Tóth, 2008).

## **2.2 Standard model of public procurement**

The standard model of public procurement enumerates the major actors and defines the key phases of the process in order to allow for a structured discussion of corruption techniques.

Public procurement requires interaction among three major actors while there is a range of external actors intervening under some circumstances (Transparency International, 2006). The three actors internal to the public procurement process are 1) issuers of tender, 2) public procurement advisors or brokers, and 3) bidder companies. There are external actors within the state such as 4) politicians who can also take on senior civil service positions; and 5) review bodies such as courts, state audit institutions, and competition agencies. The external actors outside the state are the 6) media and 7) the civil society.

The academic and policy literature identifies four major phases of the public procurement process spanning from the identification of organisational need up until the implementation and conclusion of the contract (Byatt, 2001; Piga, 2011; Thai, 2009; Transparency International, 2006; Várdy, 2005).

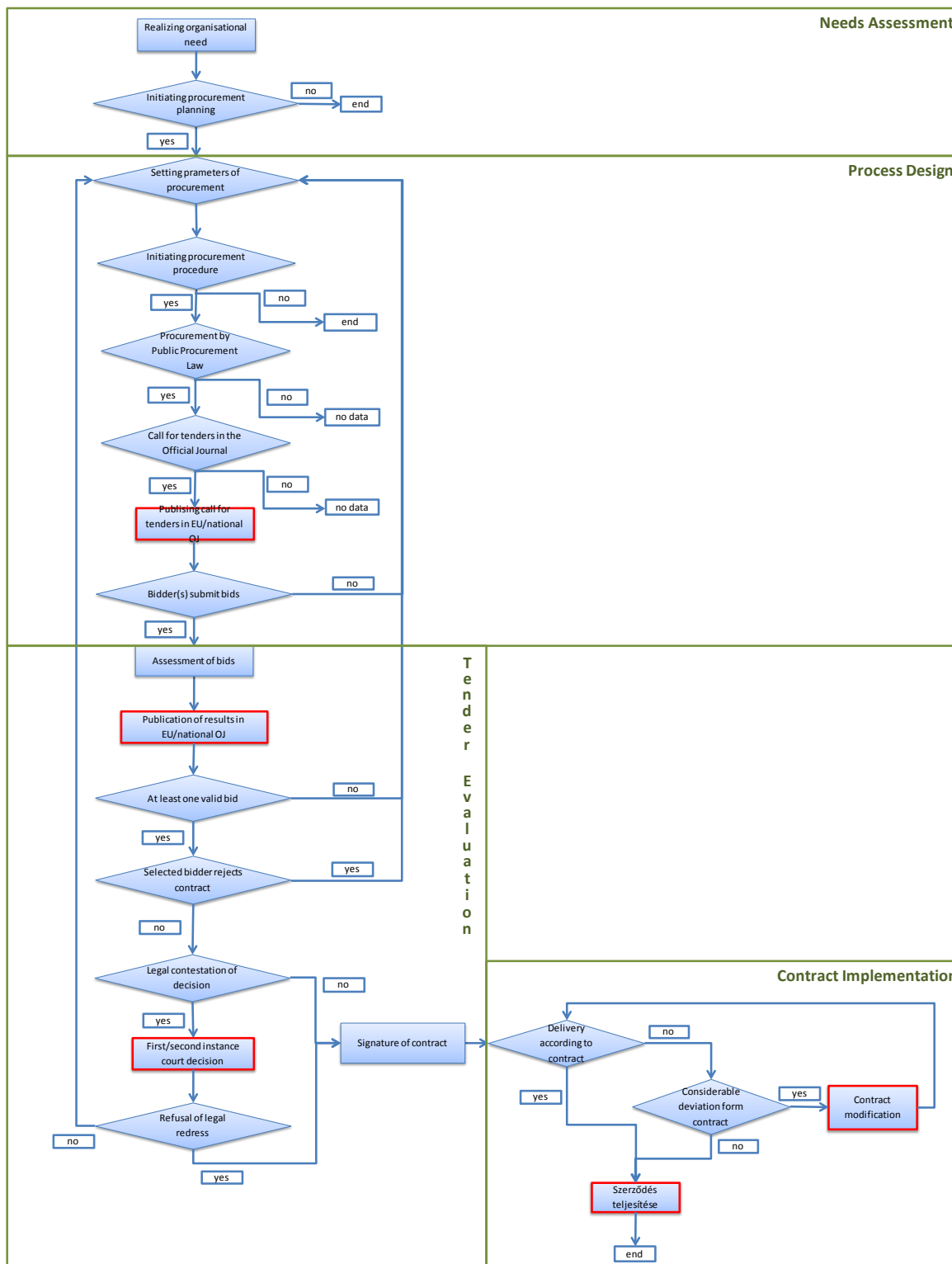
1. Needs assessment;
2. Process design and document preparation;
3. Tender evaluation and award decision; and
4. Contract implementation and management.

The needs assessment phase involves determining the object and quantity of the procurement task in line with the organisation's needs. The process design and

document preparation phase translates the decisions of the previous phase into the specific context of public procurement according to national laws and the organisation's own regulations (e.g. drafting the text of call for tenders). During the tender evaluation and award decision phase the bids are assessed according to the pre-defined criteria and contract is concluded with the winning bidder. The contract implementation phase encompasses all the activities which relate to managing and monitoring the implementation of the contract and its modifications.

The main decision points and steps of the public procurement process are highlighted in Figure 4 together with indications of officially available data in Hungary. The figure makes it clear that the only phase where there is no official data in the Public Procurement Bulletin is the needs assessment phase. Hence, our indicators won't cover these, quite important, aspects of public procurement, for example corruption may arise during planning a road construction project which otherwise is lawfully executed when the road unfairly benefits some who happen to own land along the planned path (Tanzi & Davoodi, 1997). While, corruption techniques can be mapped on to each step of the public procurement process (see section 4), it is suggested that they are typically used in concert to achieve the desired particularistic decision highlighting the important difference between official steps and procedures and informal decisions and power relations.

Figure 4. A simplified model of the public procurement process



Note: The rectangles mark those steps of the public procurement process which do not require decisions of the actor while the rhombuses mark those steps which require decisions. The red framing of some rectangles indicate that data is available from official sources in Hungary.



### 3. The data

The database used for developing the quantitative indicators corresponding to individual corruption techniques derive from Hungarian public procurement announcements from between 2009-2012 (e.g. individual contracts, calls for tender, court rulings on the decisions) (this database is referred to as PP henceforth). The data represent a complete database of all public procurement procedures conducted under national Public Procurement Law in Hungary. As already highlighted in Figure 4, among the different steps of any public procurement procedure there is a legal obligation to publish i) call for tender in most cases, ii) contract awards in every case, iii) modification of contract in every case, iv) completion of contract in most cases (the obligation ceased as of 1/1/2012), v) results of legal proceedings in every case (e.g. court decisions regarding contract awards), and vi) errors and corrections of previous announcements in every instance. Our database contains most of the variables regularly appearing as required by law in each of these announcements such as the name and address of the winner company or the contract value.

The place of publication of these documents is the Public Procurement Bulletin which appears on a weekly basis and is accessible online<sup>14</sup>. For this publication, the Hungarian Public Procurement Authority maintains a homepage where online announcements appear and a database supporting publication. Unfortunately, the Authority was unwilling to share its data with us (and it has also been unwilling to share its data with other key public institutions such as the Hungarian Competition Authority as our interview evidence indicates). By implication, we downloaded all the announcements available online mainly in html sometimes in pdf format. Then these texts became the source of our structured database which contains variables with clear meaning and well-defined categories. As the original texts available online and most likely the underlying database of the Hungarian Public Procurement Authority contain a range of errors, inconsistencies, and omissions we applied several correction measures to arrive at a database sufficient quality for quantitative analysis (detailed account of data cleaning procedures can be found in Hungarian in Fazekas & Tóth (2012a) and in English with somewhat less detail in Fazekas & Tóth (2012b)).

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<sup>14</sup> See: <http://www.kozbeszerzes.hu/nid/KE> (in Hungarian)

A major limitation of our database is that it only contains information on public procurement cases under the Hungarian Public Procurement Law as there is no central depository of other contracts. This law defines minimum estimated contract value for its application depending on the type of announcing body and kind of products or services to be procured (for example, from 1 January 2012, classical issuers have to follow the national regulations if they procure services for more than 8 million HUF or 27 thousand EUR). Some public organisations can be rather resourceful in circumventing the law if they find it in their interest (e.g. slicing up contracts so that the parts are under the threshold, or resorting to special exemptions). This is indicated by, for example, the gap between the OECD's estimation of public procurement in Hungary based on aggregate budget data: 20% of the GDP (2008)<sup>15</sup> (OECD, 2011) and the amount of public procurement carried out under the Public Procurement Law: 7% (2008) (Hungarian Public Procurement Authority, 2009).

Having data only on larger and more heavily regulated public procurement results is an obviously biased sample of all public procurement contracts. Larger contracts are rarer events than the rest of public contracting which limits the quantitative scope of our analysis. They are also more demanding administratively not only simply due to their sheer size, but also because of stricter regulations. Most importantly, procedures carried out under the Public Procurement Law are heavily regulated in terms of transparency (e.g. format and organ of announcements) and fairness (e.g. nature of award criteria or time available for tendering). While these regulations may well be flawed in a range of ways they definitely increase the cost of corruption. Moreover, larger contracts imply larger potential benefits from corruption. Hence, our sample of all public contracts is biased towards more costly and more high stakes corruption which indicates that any analysis of such data can be indicative only of grand corruption and state capture rather than petty corruption.

Contract award notices represent the most important part of a procedure's life-cycle. For each procedure under the Hungarian Public Procurement Law, at least the contract award announcement has to be published. Thus, we show some elementary statistics relating to contract awards in order to provide an overview of the data. Out

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<sup>15</sup> Even though it must be noted that the OECD's estimation is an upper bound estimate.

of the 84085 awarded contracts announced in the Hungarian Public Procurement Bulletin throughout 2009-2012 only 53272 were analysed in most calculations due to five distinctive, but sometimes overlapping reasons (Table 1):<sup>16</sup>

1. Repetitions,
2. Corrections,
3. Unsuccessfulness,
4. Cancellations, and
5. Framework contracts.

First, Hungarian announcements above the EU threshold have to be published both at the Journal of the European Union (TED) and the Hungarian Public Procurement Bulletin. However, for reasons unknown to the authors, the announcements appearing in TED also appear according to a special format in the Hungarian Public Procurement Bulletin. This leads to duplication of announcements with only slightly different information content (e.g. announcements in TED don't contain the names of bidders who lost, whereas notices in the Hungarian Public Procurement Bulletin do). In order to avoid double counting and retain maximum possible information content we excluded all the contract award notices appearing originally in TED and reappearing at the Hungarian Public Procurement Bulletin too. Second, those announcements which were later corrected by a full, repeated announcement were also excluded from our sample for most analyses.<sup>17</sup> More work is needed on this aspect as corrections are not referenced in a standardised fashion in many cases. Third, those announcements or parts of announcements which were contract award notices, but awarded no contract were also excluded. Unsuccessfulness or invalidity are explicitly marked in the announcements; however, as there was no name of winner in a great number of announcements, it is unclear if these are actually invalid

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<sup>16</sup> In fact, we should extend our data with one sample referring to centralised procurement whereby issuers don't procure on their own rather through a centralised body. Unfortunately, we don't yet have detailed data on who bought what and how much from this central public procurement body. For the moment, we account for centralised procurement as one other issuer without knowing the details of the flows of goods and services between individual issuers and the central body. Data acquisition is in progress.

<sup>17</sup> As many corrections don't appear completely anew, rather a specific correction is published that explains which parts of the original announcement were wrong and what the correct information is, we inputted the correct data to the corrected announcements. This introduces a slight bias to our sample as correct information appears to be available in our data earlier than it was in fact for the public. As this only concerns 132 contract award announcements, we consider this to be of relatively minor importance (there are additional corrections for other types of announcements which we still need to take into account).

announcements or data is simply missing. As crucial information is often missing, we did not exclude these notices. Fourth, cancellations refer to those announcements which were announced as valid and correct, however, subsequently had to be withdrawn or modified due to court decisions or withdrawal of the winner. Finally, framework contracts are awarded in two stages whereby winning the contract at the first stage only implies the possibility of bidding for contracts within the framework leading to actual work and payments. Hence, contract awards referring to the first stage of framework contracts are excluded in order to avoid double counting contract values.

**Table 1. Main statistics of the analysed data – contracts**

	2009	2010	2011	2012	<b>Total</b>
Estimated number of procedures observed	9051	1286 1	1059 9	9319	<b>41830</b>
Total number of contracts observed	2113	2863	1744	1688	<b>84085</b>
Total number of repeated contracts	0	0	3	2	
Total number of corrected contracts	6932	5626	995	4786	<b>18339</b>
Total number of corrected contracts*	4	81	43	0	<b>128</b>
Total number of unsuccessful contracts	2137	3767	1766	1740	<b>9410</b>
Total number of cancelled contracts	1193	1831	331	314	<b>3669</b>
Total number of framework contracts	984	608	317	888	<b>2797</b>
Total number of non-repeated, correct, valid, non-cancelled, and non-framework contracts	1098 2	1776 9	1414 0	1038 1	<b>53272</b>
Combined value of non-repeated, correct, valid, non-cancelled, and non-framework contracts (million EUR) **	4490	3527	1993	1295	<b>11305</b>

Source: PP

Notes: \* = the number of corrected contracts may further increase as additional search procedures are completed; \*\* = a 300 HUF/EUR uniform exchange rate was applied for exchanging HUF values.

#### **4. “Technologies” of corruption**

This section discusses each corruption technique and the corresponding indicators (note that some indicators relate to multiple techniques). Discussion follows a simple structure in each case: underlying rationale for using the technique, the principle of good public procurement breached, control mechanisms, some real-life examples, and indicators. Techniques are grouped according to the four major phases of the public procurement process (process design and document preparation are put under different headings in order to avoid any single heading containing too many techniques).

Indicators are formulated in a way that they are as closely associated with the underlying corruption technique as possible. However, there are complex non-linearities in the relationship between corruption and procurement characteristics so in many cases further refinement will be necessary through linking indicators to each other and potentially corrupt outcomes.

As the present discussion takes the viewpoint of tender issuers, the indicators primarily aim at capturing organisational behaviour (i.e. choices made by individual organisations) rather than meso- to macro level influences such as complexity of technology or investment projects of particular markets. Hence, in cases where strong market-level influences are suspected (e.g. complexity of technology is likely to impact heavily on complexity of eligibility criteria), the indicators are adjusted to reflect deviations from the market mean. While this focuses the indicator on organisational decisions, it also impedes cross-market comparisons. Thus, corruption risks emanating from the fact that an organisation operates on a particular market are downplayed even though they may be powerful contributing factors to its overall corrupt behaviour.

##### **4.1 Needs assessment and definition**

###### **T1.1 Defining unnecessary need**

Issuers of tenders can choose to procure goods and services which are in fact not necessary for them or procure them in a size and quantity excessive compared to their actual needs (Heggstad & Froystad, 2011; Tanzi & Davoodi, 1997; Transparency International, 2006). When this benefits particular supplier(s) mis-assessment of needs can serve as a corruption technique (for a US example see

Goldman et al., 2012 p. 11). By arbitrarily increasing the quantity and overall price of procured goods and services (e.g. by adding unnecessary capacities), the earned corruption fee can be increased as it tends to increase with overall contract value. Hence, this technique works well with other techniques allowing for limiting competition hence making it easy to capture rents.

In principle, there is a range of control mechanisms which are intended to make this technique difficult and costly to implement. These are the reviews of the State Audit Organisation (SAO), judicial review, and public/media scrutiny. Even though there have been instances when these presented an effective barrier, control functions are very limited in general (State Audit Organisation, 2008).

Prime examples of this kind of technique in Hungary come from large infrastructure projects, especially highway construction such as M7 or M6 in the recent years. In the latter case, a pan-European investigation was launched in November 2012 on charges of corruption and bribery. According to media reports these highways were constructed with additional unnecessary content such as tunnels on flat surfaces, the (in)famous viaduct of Kőröshegy which turned out to be one of CEE's largest such construct in spite of going through an only mildly hilly area. Moreover, some stories told by interviewees outline the usual approach whereby it is not the need which gets defined first, but the supply; that is, the company providing a particular service or goods and knowing about a relevant EU funding opportunity seeks an issuer to 'join-in' (Szántó & Tóth, 2008).

This technique is one of those few for which no quantitative indicator is proposed at this stage of the research. Later on, case by case analysis could be conducted involving additional data collection in order to reveal excess procurement content for example by comparing procured values of issuers with comparable needs (e.g. capacity of photo-copy machines for municipalities of similar size).

### **T1.2 Defining need in a way to benefit a particular supplier**

Issuers of tenders can choose to procure goods and services in a form or with capacities which are unnecessary for fulfilling their actual needs, but are advantageous for certain supplier(s) (Tanzi & Davoodi, 1997; Transparency International, 2006; World Bank, 2007). If the issuer requires characteristics and capacities which can only be performed by a single supplier's goods and services,

fair competition can be ruled out right from the beginning. Such requirements are most easily defined on markets where products and services have a high number of very specific characteristics such as large infrastructure construction or IT infrastructure and services. This technique largely supports other means of tailoring the public procurement process to one bidder (T2.2).

This kind of corruption is difficult to detect as knowing what is actually needed by an organisation is difficult to decipher by external control bodies (i.e. problem of information asymmetry). The Hungarian SAO regularly audits individual public organisations and conducts more comprehensive public procurement reviews, but these concern only a selected set of organisations over longer time periods making detection rather unlikely. Moreover, the lack of long term vision for sectors or the whole country make assessment of investment needs close to impossible as there is no solid benchmark (Báger, 2011). Supporting institutions such as the Hungarian National Development Agency or the European Commission's OLAF and European Court of Auditors also conduct reviews which have the potential to detect 'tailored' procurement, but they are likely to be ineffective due to information asymmetries and narrow focus on financial compliance.

There is one direct quantitative indicator for this technique suggested by the literature (Bandiera, Prat, & Valletti, 2009):

A) prevalence of avoiding centralised procurement.

Centralised procurement systems replace the multitude of local procurement processes with a few large purchases. Buying directly from the centralised procurement authority (in Hungary the Public Procurement and Supplies Bureau or *Közbeszerzési és Ellátási Főigazgatóság*) is likely to decrease corruption risks of local entities as they can no longer influence contract award (Bandiera et al., 2009). However, this logic is crucially dependent on the quality, price, and flexibility of centrally procured provision. In an environment ridden with systemic corruption, centralised purchasing simply centralises corruption and state capture leading to low quality and/or high price provision (Piga, 2011). Indeed, interview evidence suggests that, depending on the centralised procurement contract covering a specific market such as hospital stationery, or furniture, centralised procurement maybe more or less competitive than local procurement. If centralised procurement is more efficient than

potential local procurement corrupt tender issuers are more likely to opt out of the central system and conduct procurement locally. However, if the centralised contract is less competitive than the potential local ones even non-corrupt, well-governed issuers opt out. Assuming further research can reveal the relative efficiency of centralised purchasing, the adequate indicator is the following:

$$PACP_{it} = (PPV_{it} - CPPV_{it}) / PPV_{it}$$

where  $PACP_{it}$  refers to the proportion of not-purchasing through centralised public procurement within total value of contracts awarded according to the Public Procurement Law by the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $PPV_{it}$  denotes the total value of contracts awarded according to the Public Procurement Law by the  $i$ th unit of observation during period  $t$ , and  $CPPV_{it}$  refers to the total purchasing through centralised public procurement of the  $i$ th unit of observation over period  $t$ . As centralised purchasing is not available in every product and services markets only those spending items are taken into account which could be in principle obtained through centralised spending.

Unfortunately, we are still in negotiation with the Hungarian Public Procurement and Supplies Bureau for obtaining public organisation and product specific data. Consequentially, this indicator could not be calculated here.

## 4.2 Process design

### T2.1 Tinkering with the threshold and exceptional rules

In Hungary like in any other European country, the application of the Public Procurement Law as well as the different procedural regimes is dependent on expected contract value thresholds and a range of specific exceptions (*on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts*, 2004). Application conditions such as thresholds are crucial for corruption, first, as public procurement outside the Public Procurement Law is typically less stringently regulated in terms of transparency and open competition; second, different procedural regimes prescribe different degrees of transparency and openness (OECD, 2010a). For example, the open regime requires issuers to publish a call for tenders in the Public Procurement Bulletin whereas the negotiation procedure does not. Hence, bringing procedures outside the



applicability of the Public Procurement Law or into a less open and competitive procedural regime under the law provides better opportunities for hiding corrupt action (Heggstad & Froystad, 2011; Kenny & Musatova, 2010; OECD, 2007; Transparency International, 2006). Moving procedures across public procurement regimes or completely outside the remit of the Public Procurement Law can be done in three principal ways:

1. Slicing up contracts so that they fall out from the unwanted public procurement procedural regime (e.g. below the national threshold) (Papanek, 2009 ch. 6; Piga, 2011);
2. invoking special rules of exception such as national security or extreme urgency (OECD, 2007; Schultz & Soreide, 2008; Soreide, 2002); and
3. underestimating expected contract value (expected contract value is the basis for mandatory regime choice).

In addition, corrupt networks capable of moving contracts across public organisations can also resort to channelling money through institutions falling outside the remit of the Public Procurement Law such as the Hungarian Development Bank (Major Dezsériné, 2003; Papanek, 2009 ch. 6). Due to the difficulty of detecting quantitatively this latter technique no further discussion is offered.

As conducting public procurement according to different procedural regimes also has considerable costs for the issuers (i.e. some procedures are more costly than others) smaller or poorer issuers may also try to use this technique for cost saving reasons. By implication, the use of this technique as a signal of corruption should be seen in the light of issuer size and wealth.

The choice of procedural regime or the avoidance of applying the Public Procurement Law has wide-ranging impacts on other indicators and the structure of the PP database. First, contracts outside the remit of the Public Procurement Law are not recorded in the PP database. The only trace of such purchases is in public organisations' annual budget figures from which estimates can be constructed for overall procurement (Audet, 2002; European Commission, 2011b). Second, choice of procedural regime impacts on the availability of other corruption techniques which we discuss below: T2.6-Submission deadline and T3.2-Publication of calls for tender. While issuers' hands are tied in terms of minimum submission deadlines and

mandatory publication of calls for tender if they conduct an open procedure, they are offered more choice when using other regimes. By implication, the choice of regime type determines submission deadline and call for tenders publication to some degree in an asymmetric way. Third, the procedure choice may also support the use of other corruption techniques, especially T2.2-Tailoring eligibility criteria and T2.4-Tailoring evaluation criteria. It is possible to launch a public procurement procedure as a restricted procedure where there are two phases, the first serving the pre-screening and pre-selection of eligible bidders, and the second constituting the actual decision among the shortlisted bidders. Tailoring the eligibility and evaluation criteria to the benefit of a particular bidder is made easy by the detailed knowledge of shortlisted bidders remaining after the first phase.

Both slicing contracts and invoking special rules are regulated in the Public Procurement Law, making the application of this corruption technique difficult in principle. However, in practice, detection is difficult as the contracts are moved out of the more transparent domain and determining the actual joined-up nature of two or more contracts requires intimate knowledge of the contracts as well as the issuer (Piga, 2011). As with many other techniques, external control is exercised by the SAO and supporting institutions especially the National Development Agency managing most of the EU funding coming into Hungary. Early surveys of practice confirm what our interviews underlined: external control is rare and not very effective (Major Dezsériné, 2003). In the case of underestimating contract value, but still remaining under the umbrella of the Public Procurement Law, deviation between estimated and actual contract value can be observed. In these cases, the Public Procurement Arbitration Board may intervene and fine issuers. However, fines are incurred by issuers, whereas corruption fees accrue to the corrupt network making the fines a potentially weak instrument.

There are wide ranging examples of circumventing the more stringent regulations of the Public Procurement Law both from Hungary and from abroad. In Hungary, it is very telling that practitioners simply call the restricted procedure (“meghívásos eljárás” in Hungarian) the “three bidder procedure” as one public procurement adviser working in the industry for over a decade put it: “just bring two friends with whom we can agree on the exact content of their bids”. In Italy, a “culture of emergency” has evolved in public procurement leading to “a systematic search for

the exceptionality” and a frequent use of “mechanisms of arbitrary choice in public contracting” (Soreide, 2002 p. 18).

Due to the central position of this technique in relation to other techniques and the wide ranging ramifications of procedural regime choice to several aspects of public procurement, a large number of indicators are developed. We discuss three direct indicators:

- A) proportion of non-open procedures;
- B) average corruption risk score of procedures followed; and
- C) frequency of actual contract value above estimated contract value.

We also discuss one indirect indicator:

- D) ratio of contract value according to Public Procurement Law over total procurement contract value.

The frequency of using higher corruption risk procedure types signals in a simple and straightforward way the underlying corruption technique. Corruption risks indicated by the choice of procedural regime can be measured in a variety of ways. For example, a sophisticated econometric paper looking at corruption in public procurement in Paraguay uses the proportion of exceptional procedures over all other procedures (Auriol, Flochel, & Straub, 2011). In order to focus our indicator on the largest differences in corruption risks the proposed simple measure of tinkering with procedural regimes takes open procedures as a benchmark:

$$NOPR_{it} = 1 - ( OPR_{it} / TNP_{it} )$$

where  $NOPR_{it}$  refers to the proportion of non-open procedures over all procedures concluded of the  $i$ th unit of observation such as public organisation or bidder over period  $t$ ,  $OPR_{it}$  refers to the number of procedures following open procedural regime of the  $i$ th unit of observation during period  $t$ , and  $TNP_{it}$  refers to the total number of procedures concluded by the  $i$ th unit of observation over period  $t$  (Table 2).

It is possible to rank procedure types according to level of transparency and degree of openness of competition prescribed. Hence procedure types could be ranked according to their corruption risks. Averaging the corruption risk ranks of procedures concluded may serve as a more subtle indicator of corruption than simply looking at

the prevalence non-open procedures. By implication, the following indicator is proposed:

$$ARPR_{it} = (\sum_j R_j * N_{itj}) / TNP_{it}$$

where  $ARPR_{it}$  refers to the average corruption rank of procedures leading to contract award by the  $i$ th unit of observation over period  $t$  (corruption rank takes a higher value for higher corruption risk procedure types),  $R_j$  refers to the corruption rank of the  $j$ th procedure type,  $N_{itj}$  denotes the number of procedures following the  $j$ th procedure type of the  $i$ th unit of observation during period  $t$ , and  $TNP_{it}$  refers to the total number of procedures concluded by the  $i$ th unit of observation over period  $t$ .

As Table 2 indicates these two variables tell a fairly similar story with slight differences. 2010 experienced the lowest corruption risk according to these two indicators while there is a marked upward trend since then with a particularly strong increase in 2012 which at least partially reflect changes in the Public Procurement Law.

**Table 2. Mean proportion of non-open procedures and mean corruption rank of procedure types, 2009-2012**

Year	Mean proportion of non-open procedures	Mean corruption rank of procedure types	N
2009	0.4220	1.0635	10982
2010	0.3259	0.9267	17769
2011	0.3673	1.1959	14140
2012	0.5733	1.2376	10372
Total	0.4049	1.0869	53263

Source: PP

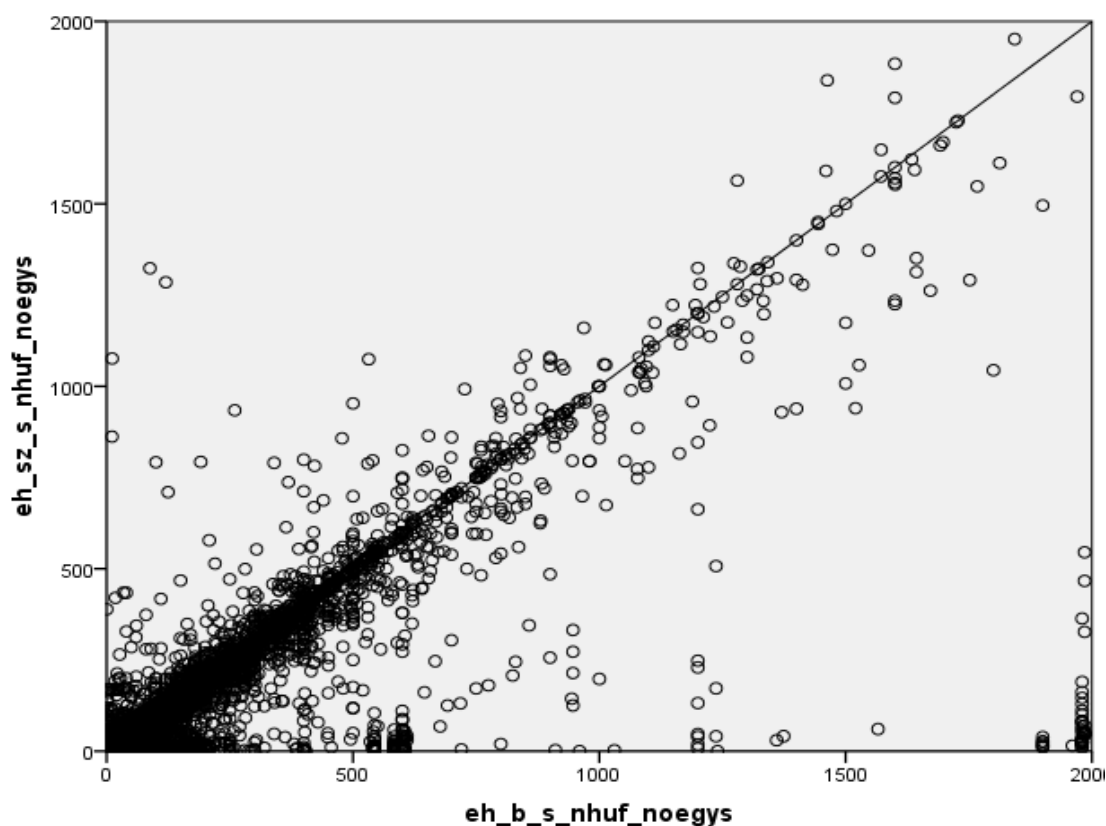
The underestimation of contract value can be observed simply by comparing estimated and actual contract values. While, some issuers may have indeed made an error in calculating estimated contract value, this is likely done on purpose when the 'error' allowed to switch procedure regime as interviewees pointed out. Hence, the suggested indicator is:

$$EVSPR_{it} = NSW_{it} / TNP_{it}$$

where  $EVSPR_{it}$  refers to the proportion of tenders where manipulating estimated contract value resulted in switching procedure regime within all tenders of the  $i$ th unit of observation over period  $t$ ,  $NSW_{it}$  denotes the number of tenders where manipulating estimated contract value resulted in switching procedure regime of the  $i$ th unit of observation during period  $t$ , and  $TNP_{it}$  refers to the total number of tenders concluded by the  $i$ th unit of observation over period  $t$ .

While in a great number of cases, estimated contract values are missing, it is possible to explore the differences between actual and estimated contract values for over 29000 contracts throughout 2009-2012 (Figure 5). While for most contracts, actual contract value is lower or equal to estimated contract value, about 7-9% of observed contracts have a considerably higher actual than estimated contract value (we took 1 million HUF as a threshold for large enough difference). As more work is needed to precisely determine the thresholds for each observed contract, we simply took this 1 million HUF threshold as a rough indicator of potential corruption risks concerning the manipulation of estimated contract value.

**Figure 5. The scatter plot of actual (Y axis) and estimated contract values (X axis), 2009-2012, million HUF (only contracts of less than 2 billion HUF are depicted)**



Source: PP

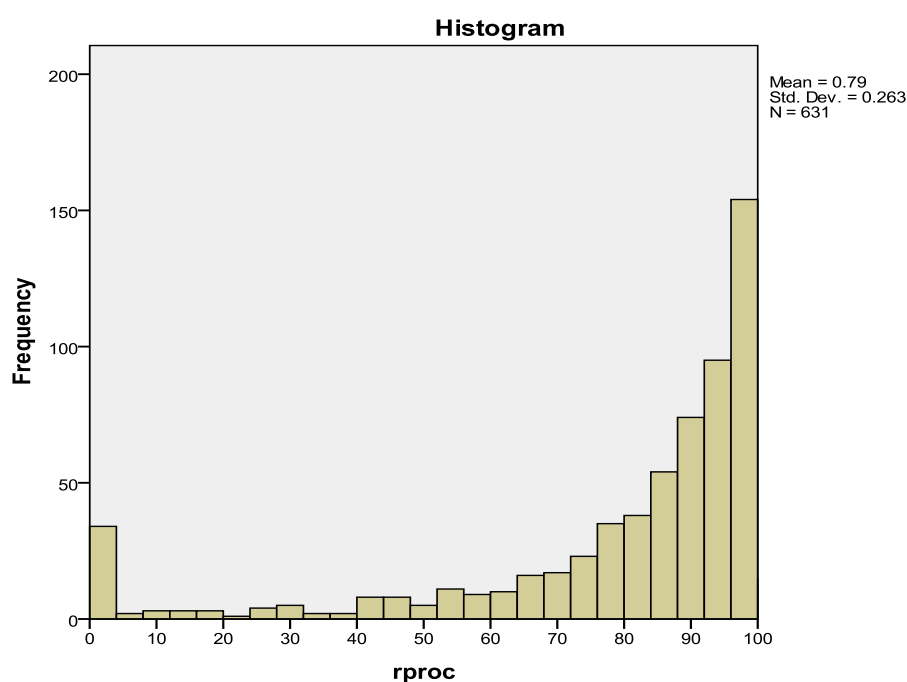
Even though there is no contract-level detailed data on public procurement contracts outside the remit of the Public Procurement Law, it is possible to construct an estimate of total procurement for each public organisation using annual budget figures reported to the Treasury (Audet, 2002; European Commission, 2011b). As avoiding the transparency and competition requirements set by the Public Procurement Law can be a powerful motivating factor for corrupt actors, comparing the contracted value according to the law to the total contracted value can signal the magnitude of these corrupt efforts. As contracting outside the Public Procurement Law can result from a range of non-corrupt reasons, only large gaps between the two types of contracting may actually signal this corruption technique. Nevertheless, we propose an indicator capturing the full scale of gaps leaving validation of different parts of the scale to later multivariate analysis:

$$NPP_{it} = 1 - (PPV_{it} / TPV_{it})$$

where  $NPP_{it}$  refers to the proportion of contract value not according to the Public Procurement Law within the total procurement spending of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $PPV_{it}$  denotes the total value of contracts awarded according to the Public Procurement Law of the  $i$ th unit of observation during period  $t$ , and  $TPV_{it}$  refers to the total procurement spending of the  $i$ th unit of observation over period  $t$ . As we dispose of more detailed budget figures than previous studies (Audet, 2002; European Commission, 2011b), we calculated total procurement as the sum of material expenses and investment expenses accrued in a given period.

Even though, we cannot yet present the full picture of the Hungarian public administration, data on central public organisations are already highly illuminating. It appears that on average close to 80% of procurement spending takes place outside the Public Procurement Law's remit throughout 2009-2011 (Figure 6). In addition, this proportion has increased from 75% in 2009 to 81% in 2011. This raises the concern that the analysis of PP data only looks at the "tip of the iceberg".

**Figure 6. Percentage of procurement spending not according to the Public Procurement Law, 2009-2011, N=631 issuer (the same issuer counts as multiple observations across the years)**



Source: PP

While there is no specific indicator developed based on the breaks in distributions of contract values around thresholds and after changes in thresholds, it is suggested that a more detailed analysis of contract value distributions could lead to additional insights as to how issuers may game the system of procedure regimes and the corresponding thresholds.

## **T2.2 Tailoring eligibility criteria**

Eligibility criteria define which potential bidders can bid and which bids can be considered for competition. That is, both bidders and their bids should meet a set of criteria in order to be considered for a tender. Hence, tailoring eligibility criteria to exclude most or all non-wanted bidders even though they could bid given the actual object of procurement can effectively inhibit fair competition. This is by far the most widely quoted corruption technique in the Hungarian (Báger, 2011; Major Dezsériné, 2003; Pálinkó, Szántó, & Tóth, 2008; Papanek, 2009) and international literature (Goldman et al., 2012; Grodeland, 2005, 2010; Heggstad & Froystad, 2011; Piga, 2011; Soreide, 2006) which was confirmed by our interviewees. Tailoring can be done by

1. defining a combination of hard criteria such as prior works or annual turnover clearly excluding some companies, or
2. setting vague and subjective criteria allowing issuers to exercise discretion in a partial manner.

Once, only the desired bidder remains as eligible bidder, it can submit a price considerably above market price earning a rent (OECD, 2007; Transparency International, 2006). Naturally, some criteria are justified as they aid sorting out capable bidders and bids; what makes them more than simple reasonable pre-screening is their excessive amount and overly restrictive nature in the light of the procured goods and services.

Consistently differentiating reasonable and excessive criteria, i.e. limiting the applicability of this technique, is difficult and requires robust case law and uniformly applied rules. In Hungary, there are several decisions of the Public Procurement Arbitration Board on this issue; however, according to interviewees, legal uncertainty is high as the very same issue could be judged differently by different judges. Nevertheless, due to potential judicial challenge, this technique may only result in



limiting the list of bidders rather than eliminating all but one. In a next step, involving other techniques, the list can be shrank further.

The most intimately linked corruption technique designed to further shrink the list of eligible bidders and bids is T2.3-abusing formal and administrative requirements. Once complicated and difficult to meet set of criteria is defined, it is relatively easy for the issuer to find at least one requirement which was not appropriately documented. This provides sufficient grounds for the issuer to exclude bidders and their bids. Furthermore, corruption technique T1.2 (defining needs to benefit a particular supplier) neatly supports this corruption technique as eligibility criteria should, in principle, follow from organisational needs and the characteristics of goods and services to be procured. Biased needs estimation makes biased criteria setting more easily defensible at court.

Interviewees in Hungary frequently shared concrete examples demonstrating the abuse of the system of references (i.e. proof of prior experience). One large construction company was excluded from a tender for building a hospital on the grounds that they had no specific experience with building a lone-standing morgue even though they had built hospitals with a morgue. As lone-standing and within hospital morgues have essentially the same technical parameters this criteria was likely used to exclude unwanted bidders. The respondent knew which 3 companies had specific experience with building lone-standing morgues. Other suspicious eligibility criteria made it clear to this company that the process was 'set-up' right from the beginning.

Other frequently quoted examples relate to detailed financial criteria (financial information on large companies is public so it is easy to tailor criteria to the detriment of unwanted bidders). A public procurement advisor gave an example: "During a public car purchase procedure, the company was excluded because there was a condition specified requiring bidders to have higher own capital than subscribed capital. The company couldn't meet this criterion due to an ongoing investment

(subscribed capital: 125 billion HUF, own capital: 124.7 billion HUF). Instead an XY ‘phantom’ company<sup>18</sup> won the tender.” (Papanek, 2009 p. 239).

There is one direct indicator associated with this corruption technique:

A) length of eligibility criteria.

Length and complexity of eligibility criteria both for bidders and bids provides a crude measure of the use of this technique especially when taking into consideration the size of the contract too (i.e. bigger contracts may require more lengthy and complex system of criteria for valid reasons). As looking at the use of specific ‘suspicious’ criteria was not made possible by our limited understanding and diverse nature of these ‘suspicious’ criteria<sup>19</sup>, we propose the following crude measure:

$$ADLEC_{it} = \sum_{jk} ( LEC_{itjk} - ALEC_k ) / N_{it}$$

where  $ADLEC_{it}$  denotes the average difference in the length of eligibility criteria between the call for tenders of the  $i$ th unit of observation such as issuer over period  $t$  and the average length at the  $k$ th market over period  $t$ ,  $LEC_{itjk}$  refers to length of eligibility criteria of the  $j$ th call for tenders of  $i$ th unit of observation belonging to the  $k$ th market during period  $t$ ,  $ALEC_k$  denotes the average length of eligibility criteria during the whole observation period for the  $k$ th market, and  $N_{it}$  refers to the number of calls for tenders of  $i$ th unit of observation during period  $t$ . Public procurement markets are taken as reference groups recognising that more lengthy and complex criteria is justified for specific markets. Unfortunately, if a market is dominated by excessively complicated and lengthy eligibility criteria due to the large number of corrupt procedures this normalisation will lead to an underestimation of corruption risks. Length of criteria is simply measured as the number of characters used.

The average length of eligibility criteria in each public procurement market as defined by CPV<sup>20</sup> main divisions varied between 4400 characters in the market of printed matter and related products (CPV division 22) to 9700 characters in the market of

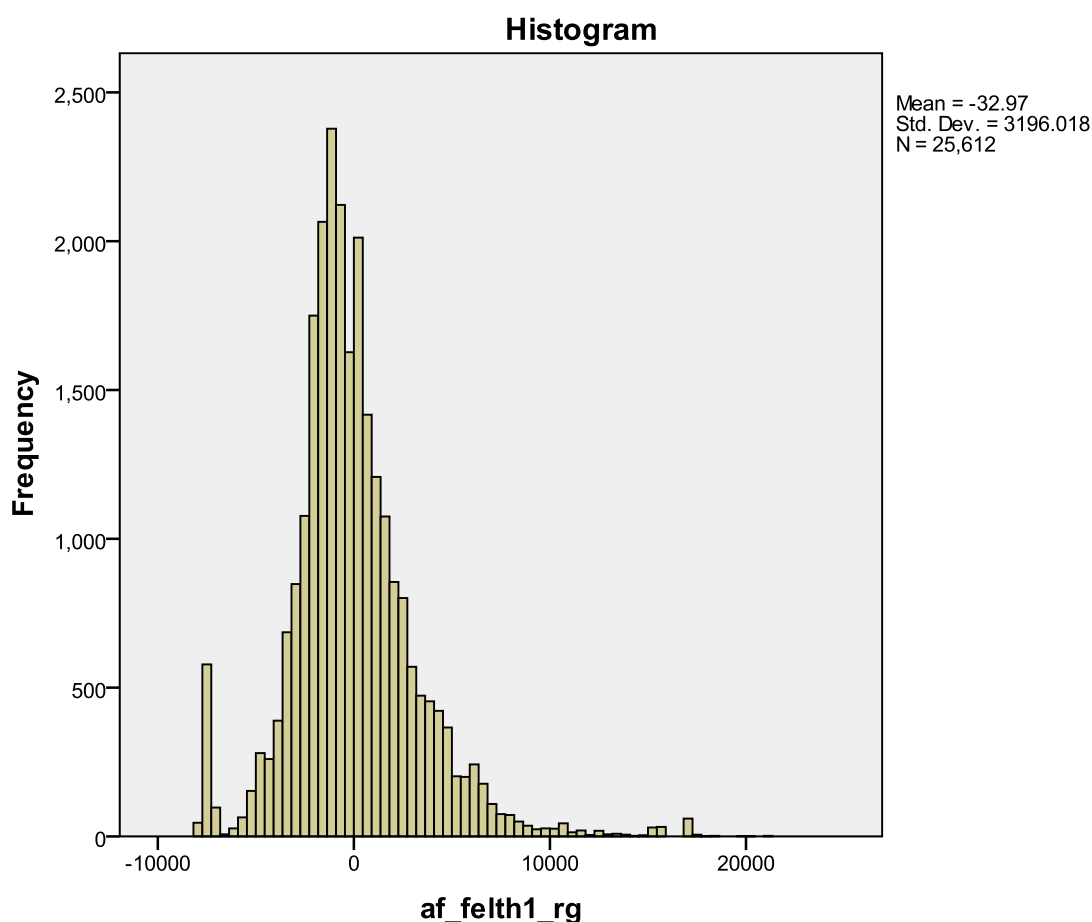
<sup>18</sup> Phantom company in ordinary Hungarian language (fantomcég) typically refers to a company created specifically for corrupt or tax evasion purposes having very little economic activity other than related to rent extraction.

<sup>19</sup> More work is under way to develop better direct measure of complexity and restrictiveness as the complete text of criteria is available to us for every call for tenders. We will combine additional interview examples of frequently used ‘suspicious’ criteria and text mining methods.

<sup>20</sup> CPV=Common Procurement Vocabulary. For more info see: [http://simap.europa.eu/codes-and-nomenclatures/codes-cpv/codes-cpv\\_en.htm](http://simap.europa.eu/codes-and-nomenclatures/codes-cpv/codes-cpv_en.htm)

Services related to the oil and gas industry (CPV division 76). These differences probably reflect the variation in the complexity of these markets and potentially the differences in average contract size too. The deviation from the market average follows a somewhat skewed distribution (Figure 7). Even though the deviation from the market averages is weakly correlated with contract size ( $r^2=0.28$ ) indicating that contract size may play role in the complexity of criteria, a version of this indicator based on deviations from market and contract size group averages carries little extra information (the two versions are highly correlated  $r^2=0.97$ ).

**Figure 7. Average difference in the length of eligibility criteria between the call for tenders and its market mean, number of characters, 2009-2012**



Source: PP

### T2.3 Abusing formal and administrative requirements

Public procurement bids easily encompass several hundred pages of documentation especially in case of large tenders. Each bid has to comply with formal and

administrative requirements such as the format of the budget or the provision of original documents from public bodies (e.g. registration at the court registry). While these requirements are desirable in general, their large number and complexity provide ample opportunities for abuse. According to our interviews as well as the international literature, it is practically always possible to find a formal or administrative error which provides grounds for excluding the bid from competition (Báger, 2011; Grodeland, 2005; Papanek, 2009; Transparency International, 2006). Hence, this corruption technique abuses minor technical errors to serve the interests of corrupt networks by allowing them to limit competition to their preferred bidders. Excluding bids on formal and administrative grounds is a legitimate activity, but it becomes cause for suspicion once it becomes excessive, inconsistently applied, and regularly leads to only one remaining bid.

In principle, the prescribed opportunity for bidders to correct such errors after submitting their bids limit the applicability of this technique. However, in Hungary, the procedure of requesting and submitting corrections is largely unregulated. This means that corrupt issuers comply with the law only formally, but not substantially: as a public procurement advisor working in the construction industry for over a decade put it: “it is easy, you request on Friday 13 o’clock the original copy of any minor document bearing a public agency’s stamp on it to be submitted by Monday 10h. It all looks fine, you left three days for correction, but in fact you made it impossible.” Another surprising sign of the frequency of this technique is that one of its specific versions acquired its own expression in public procurement ‘slang’: “exhaustion technique”. According to a Public Procurement Lawyer active in a range of sectors for several years this term means that “unwanted bidders are requested to submit corrections in several turns until they finally understand that there is no point in trying, they won’t ever win the contract they bid for.”<sup>21</sup> According to our interviews, it seems that this technique is one of the new ‘hype’ techniques in Hungary due to the ease of its applicability (i.e. lack of regulation).

A concrete example quoted by one interviewee concerned a procurement procedure for a garden reconstruction project where the company was excluded on the grounds

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<sup>21</sup> The „exhaustion technique” sometimes also includes periods of Public Procurement Arbitration Board intervention once again with the same message to unwanted bidders: give it up, no matter how hard you try, in the end we will find the right legal form for excluding you.

that its submitted budget was not *complete*. It was deemed incomplete because the price of grass seed was not explicitly highlighted as a separate line in the proposed budget even though it was included in the total budget for lawn installation costs. Challenging this decision at the Public Procurement Arbitration Board did not change the situation either in spite of prior court decisions annulling the decision of issuers in analogous situations.

This technique is closely related to technique T2.2-tailoring eligibility criteria as both stem from the complexity and length of the defined eligibility criteria. Moreover, this technique neatly works together with other techniques aiming at reducing competition. For example, tailoring needs and eligibility criteria could get the number of bidders down to 3-5 while formal and administrative reasons could remove the remaining unwanted bidders from the competition. If this would not lead to only one bidder, manipulation of evaluation criteria could still leave ample room for discretionary choice of preferred bidder.

Due to the close association between this and the previous techniques (T2.2), one proposed indicator is the same for them. There are two direct measures:

- A) proportion of excluded bids, and
- B) length of eligibility criteria.

The proportion of valid bids within all received bids can be considered as a direct measure of this corruption technique as it allows for directly gauging how excessively certain issuers or on certain markets exclusions of received bids is exercised. Hence, the proposed indicator is

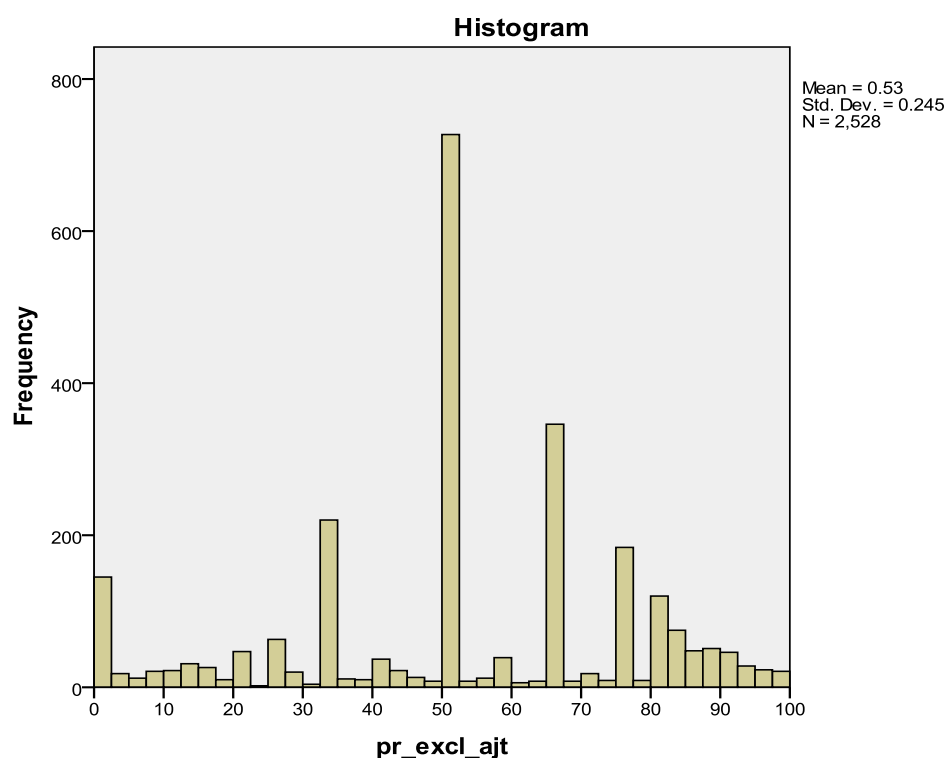
$$PERB_{it} = (NRB_{it} - NVB_{it}) / NRB_{it}$$

where  $PERB_{it}$  refers to the proportion of excluded bids over all received bids of the  $i$ th unit of observation (typically public organisation) over period  $t$ ,  $NRB_{it}$  refers to the total number of received bids by the  $i$ th unit of observation over period  $t$ , and  $NVB_{it}$  denotes the total number of valid bids of the  $i$ th unit of observation during period  $t$ .

The distribution of contract award notices according to the percentage of excluded bids displays particular spikes at 33%, 50% and 66% which reflect the most typical situations whereby one out of three, one out of two, and two out of three received

bids are excluded (Figure 8). Overall, 83% of all contract award notices exclude no bidder and about 5% of them exclude all the bidders. This measure may not adequately reflect reality as recording valid bids is not sufficiently standardized in contract award announcements.<sup>22</sup>

**Figure 8. Percentage of excluded bids, 2009-2011 (restricted sample: those contract award notes which excluded at least one bidder, but not all of them)**



Source: PP

Complexity and length of eligibility criteria defines the pool of items from which formal and administrative requirements can be chosen for arbitrary application and abuse. Hence, the previously discussed indicator of length also serves as a suitable measure for this technique.

#### T2.4 Tailoring assessment criteria

Assessment criteria are crucial in deciding to which bidder to award the contract among those bidders who jumped the eligibility hurdle. Issuers can generally decide between price-only and price plus quality criteria. If they choose price plus quality

<sup>22</sup> Due to frequent unstructured reporting of valid bids and bidders, this indicator is still not final for 2009-2011 and 2012 data is only partially collected.

there is a range of possible quality criteria which are more or less objectively measurable. By deliberately choosing those assessment criteria which are hard to objectively measure such as quality of organigram, issuers can grant themselves considerable discretion raising corruption risks (Lengwiler & Wolfstetter, 2006; OECD, 2007; Piga, 2011; Transparency International, 2006; World Bank, 2007). However, not all quality criteria are subjective, for example speed of completion, amount of indemnity, or payment deadline can be objectively assessed. In addition, there are markets such as IT where the standard is competition based on system performance while price is fixed.

Even though the Public Procurement Law defines the range of permissible evaluation criteria, there is still a broad arsenal from which corrupt networks can choose lawfully making effective external control difficult.

As mentioned earlier, this corruption technique may be used in tandem with other techniques limiting the range of eligible bidders. It can also serve as a substitute for excluding bidders, that is if exclusion efforts were not successful or were deemed too risky, subjective evaluation criteria can still 'do the job'. Postulating subjective evaluation criteria can only serve a corrupt purpose if the corrupt network manages to control the subjective scoring mechanism too. Hence, corruption technique T4.3-unfair scoring is essential for the success of this technique.

There are two proposed direct indicators for this corruption technique:

- A) length of assessment criteria, and
- B) weight of non-price criteria.

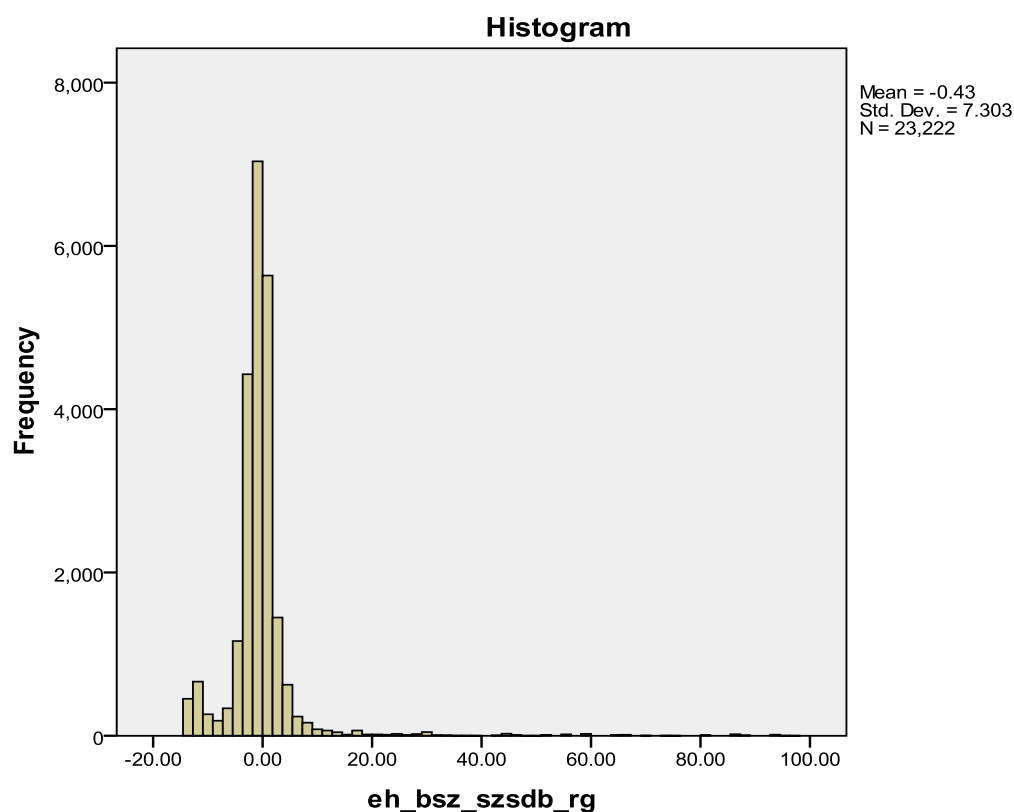
The length of assessment criteria serves as a proxy for the overall complexity of criteria. We consider more complex set of criteria as more difficult to check by external actors and giving more discretion to the decision maker hence involving higher corruption risks. Following a similar logic to eligibility criteria length (T2.2), the following indicator is calculated:

$$ADACL_{it} = \sum_{jk} (LAC_{itjk} - AAC_k) / N_{it}$$

where  $ADALC_{it}$  denotes the average difference in the length of assessment criteria between the call for tenders of the  $i$ th unit of observation such as issuer over period  $t$

and the average length at the  $k$ th market over period  $t$ ,  $LAC_{ijk}$  refers to length of assessment criteria of the  $j$ th call for tenders of  $i$ th unit of observation belonging to the  $k$ th market during period  $t$ ,  $AAC_k$  denotes the average length of assessment criteria during the whole observation period at the  $k$ th market, and  $N_{it}$  refers to the number of calls for tenders of  $i$ th unit of observation during period  $t$ . Public procurement markets are taken as reference groups recognising that more lengthy and complex criteria are justified for specific markets. In order to improve precision compared to the eligibility criteria length indicator where we only took the number of characters, here we use the number of assessment criteria rather than their number of characters (Figure 9). Nevertheless, the two versions of assessment criteria length are highly correlated:  $r^2=0.88$ . Similar to the length of eligibility criteria, the number of assessment criteria correlates only very weakly with contract size ( $r^2=0.27$ ) suggesting that there is no need to take into account contract size beyond market when defining group means.

**Figure 9. Average difference in the length of assessment criteria between the call for tenders and its market mean, number of criteria (items), 2009-2012**



Source: PP



The overall weight of subjective criteria compared to objective criteria may directly relate to corruption risks as it indicates the room for subjective judgement within the whole scoring process. It is easy to see that price is an objective criteria; however, quantitative indicators of quality such as completion deadline, while seem to be objective, may in fact signal corruption risks. Some argue that putting objective criteria into the evaluation criteria instead of keeping them among the eligibility criteria in itself signals corruption risks (Oživení, 2011). However, our interviews point at the corruption risks of subjective quality criteria such as organigram. As more research is needed to resolve this controversy and to come up with a close to complete list of objective quality criteria<sup>23</sup>, we only consider the relative importance of price versus non-price criteria. There are two possible formulations of this: first, a straightforward measure relates to whether price is the only criteria or whether other criteria also a matter; second, it is possible to calculate the relative weight of price-related criteria among all listed criteria using a keyword search. The first formulation is the following:

$$PPPA_{it} = NPPA_{it} / N_{it}$$

where  $PPPA_{it}$  refers to the proportion calls for tenders with price plus quality assessment over all calls for tenders of the  $i$ th unit of observation such as issuer over period  $t$  (tenders are either price-only or price plus quality),  $NPPA_{it}$  denotes the number of calls for tenders with price plus quality assessment criteria of  $i$ th unit of observation during period  $t$ , and  $N_{it}$  refers to the number of calls for tenders of  $i$ th unit of observation during period  $t$ . This indicator follows a declining trend with a peak in 2010 (the year of national elections) (Table 3) as well as having marked differences across public procurement markets throughout the whole period average proportion ranging from 4% to 93%. As these cross market differences may very well be related to differences in technology rather than only corruption, this indicator shall be used with greater than usual care (for discussion of the IT sector see the beginning of this, T2.4, section).

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<sup>23</sup> Once the list is completed text mining techniques quickly allow for identifying the weight of the individual objective and subjective elements in calls for tenders.

**Table 3. Proportion of tenders with price-plus assessment criteria, 2009-2012**

Year	Mean	N	Std. Deviation
2009	0.48	10982	0.50
2010	0.54	17769	0.50
2011	0.38	14140	0.48
2012	0.30	10372	0.46
2009-2012	0.44	53263	0.50

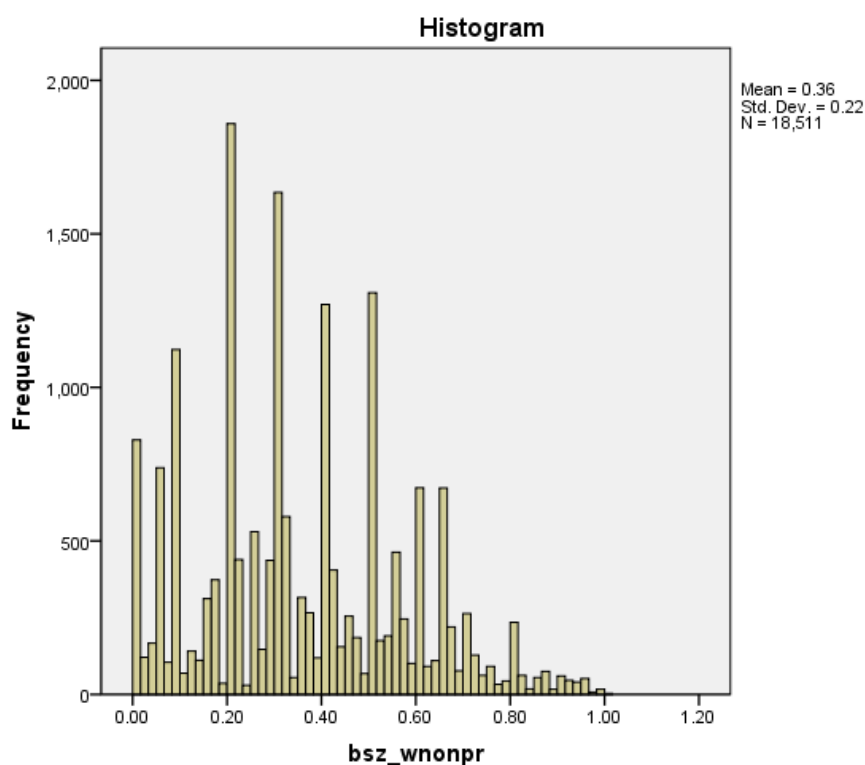
Source: PP

While the first formulation of the weight of non-price criteria is more reliably extracted from announcements, the second version is more fine-grained albeit with the possible error or missing price-related elements. This measure is the following:

$$AWNPA C_{it} = \sum_j WNPAC_{itj} / N_{it}$$

where  $AWNPA C_{it}$ , refers to the average combined weight of non-price related assessment criteria in calls for tenders of the  $i$ th unit of observation such as issuer over period  $t$ ,  $WNPAC_{itj}$  denotes the weight of non-price related assessment criteria in the  $j$ th call for tenders of  $i$ th unit of observation during period  $t$ , and  $N_{it}$  refers to the number of calls for tenders of  $i$ th unit of observation during period  $t$ . This indicator falls between 0 and 1, where 1 means high average combined weight of non-price related assessment criteria indicating higher corruption risks. There are a few procedures and contracts which almost exclusively rely on non-price assessment criteria (Figure 10).

**Figure 10. Frequency distribution of awarded contracts according to the combined weight of non-price related assessment criteria, 2009-2012**



Source: PP

### T2.5 Using a long term complex contract

There is theoretical as well as empirical evidence that the length of collaboration is positively related to corruption risks (Coviello & Gagliarducci, 2010). In addition, complex contracts involving many unforeseeable events and a range of options such as public-private partnerships (PPP) or framework contracts are harder to control (Báger, 2011). Hence, the overall weight of such contracts in the public procurement portfolio of an issuer may signal mid to long term corruption risks. Central purchasing bodies' framework contracts may reduce corruption risks for smaller entities buying through the central framework (Bandiera et al., 2009); but framework agreements awarded, especially those with only one bidder in the framework, may represent a considerable corruption risk as some of our interviewees pointed out.

In principle, the competitive award of such long term complex contracts assures sufficient control; however, the lack of pre-determined purchased quantities allow for specific forms of collecting corruption rent. For example, in the case of framework

contracts, bidders obtaining a framework agreement have to specify the unit price of each product or service potentially procured within the framework. Framework contracts are awarded on the basis of some hypothetical quantity of each product and service which can substantially deviate from the actual purchases. Then it is enough for the issuer to informally tell the preferred bidder which products will actually be procured in large quantities so that this bidder can set prices that look the cheapest when considering a hypothetical quantity set, but allows for extra profit in the case of actual quantities.

The problematic nature of such contracts, especially PPPs, may be signalled by several large-value investments ending in years of court proceedings and intense fights between private companies and the government right after a new government enters into power (e.g. Közraktárak redevelopment in Budapest).

The use of this corruption technique is potentially linked to all the other techniques limiting competition for contracts as it increases payoffs for corruption due to the long term and high value character of the contracts.

There are two direct indicators of this corruption technique which should be interpreted in the context of other corruption risk indicators:

- A) combined value of framework contracts and PPPs per total contract value,
- B) average contract duration.

The combined value of framework contracts (actual money spent as opposed to the value of the framework agreement) and PPPs compared to the total contract value of an issuer or market directly measures the potential for this kind of corruption technique to arise. The simple metrics we propose is:

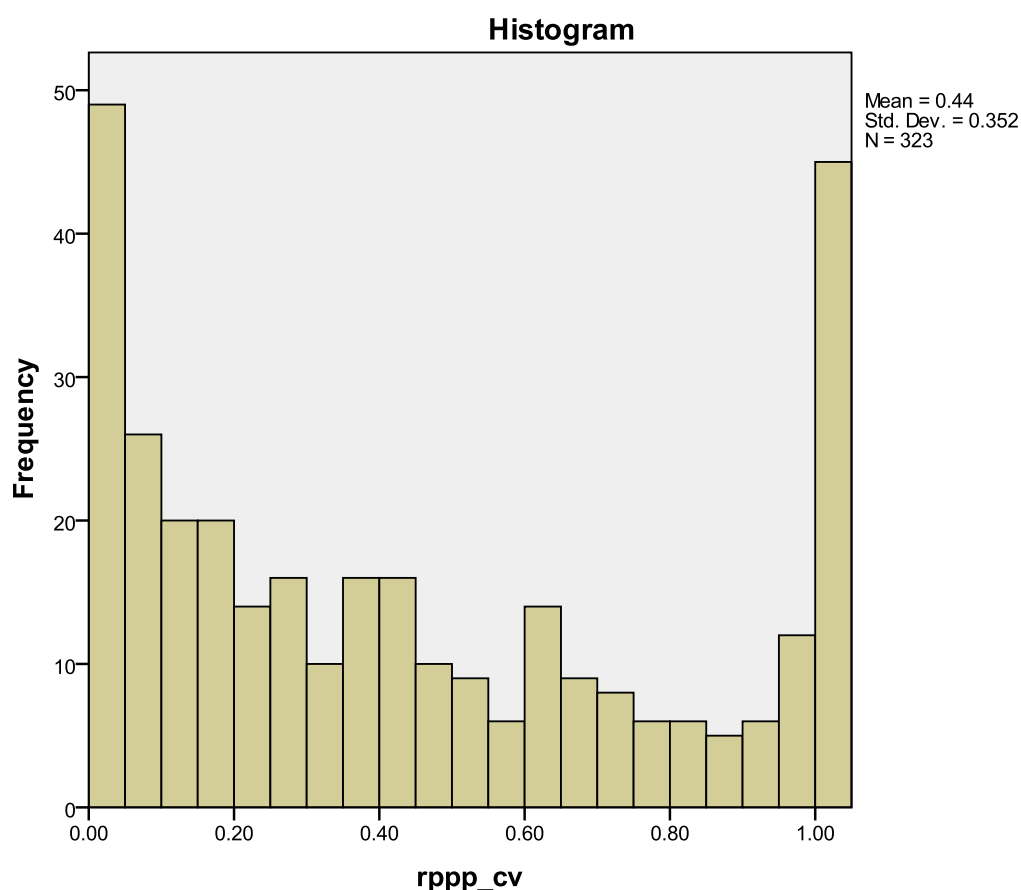
$$PLCC_{it} = LCCV_{it} / PPV_{it}$$

where  $PLCC_{it}$  refers to the proportion of total combined value of long term complex contracts (i.e. framework agreements and PPPs) within the total public procurement contract value of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $LCCV_{it}$  denotes the total combined value of long term complex contracts of the  $i$ th unit of observation during period  $t$ , and  $PPV_{it}$  denotes the total value of contracts

awarded according to the Public Procurement Law by the  $i$ th unit of observation during period  $t$ .

Throughout 2009-2012, 97% of Hungarian issuers has not issued a single contract as part of a framework agreement or public-private partnership. However, those issuers which have awarded at least one such contract typically have done so in a large proportion of their total public procurement spending (more than 44%) (Figure 11).

**Figure 11. Percentage of public procurement contract value of PPP and framework contracts within total public procurement contract value, 2009-2012 (only those issuers which have at least one PPP or framework contract)**



Source: PP

Average contract duration provides an alternative indicator for this corruption technique. It is superior to the previous one in the sense that it considers all the contracts awarded rather than the subset of highly complex and long-term contracts.

Following a similar logic to that of eligibility and assessment criteria, we normed contract length with market average as different technologies imply different reasonable contract lengths. The proposed metrics is:

$$ADCD_{it} = \sum_{jk} ( CD_{ijk} - ACD_k ) / TNC_{it}$$

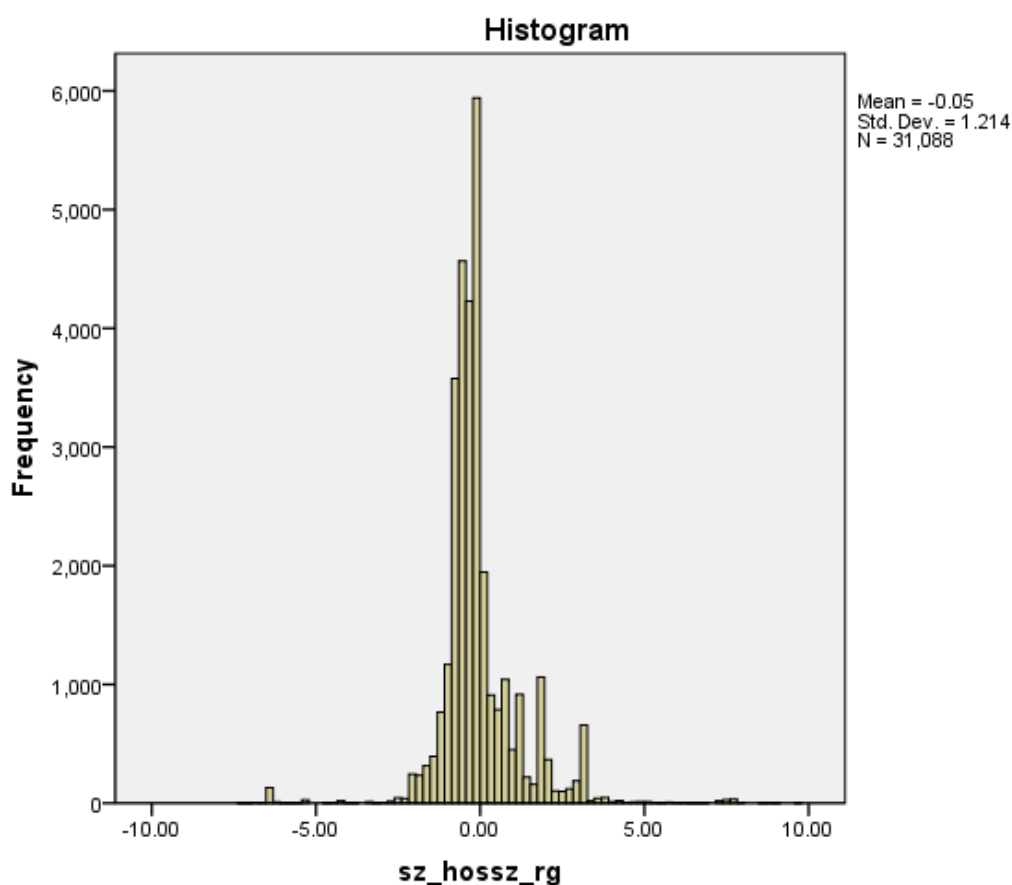
where  $ADCD_{it}$  denotes the average difference in contract duration between the call for tenders of the  $i$ th unit of observation such as issuer over period  $t$  and the average contract duration at the  $k$ th market over period  $t$ ,  $CD_{ijk}$  denotes the contract duration of the  $j$ th contract awarded by the  $i$ th unit of observation belonging to the  $k$ th market during period  $t$ ,  $ACD_k$  denotes the average contract duration during the whole observation period for the  $k$ th market, and  $TNC_{it}$  refers to the total number of contracts awarded by the  $i$ th unit of observation during period  $t$ . The limit of applicability for this metric is that contract duration is often unreliably disclosed in announcements.

Unfortunately, we could not gather data on the length of all the contracts awarded, first because some are of unlimited length; second, some others don't disclose any information on length even though we have reasons to suspect that they are of limited length<sup>24</sup>. There are about than 31 000 contracts where we have sufficient data on contract length (either from calls for tenders, contract award announcements or contract completion announcements). These reveal that the overwhelming majority of contracts cluster around the mean of their markets while a small number of contracts are considerably longer going up to 33 years 'excess' duration (Figure 12). This accentuates how atypical PPP-s, framework contracts, and other long term contracts are in general.

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<sup>24</sup> Contract length is either given in the contract award notice where there is an explicit requirement for publishing it, but unfortunately the relevant fields often remain empty. A further piece of the puzzle we could make use of is the contract completion announcement which allows for gauging the actual rather than the planned contract length.

**Figure 12. Contract length in years (normed by market average), contracts awarded in 2009-2012 (only contracts shorter than 10 years)**



Source: PP

## T2.6 Tinkering with the submission period

Submission periods, that is the time period between the publication of call for tenders and the deadline for submitting the bids, in Hungary and most EU countries, are tightly regulated for some procedure types while largely unregulated for others. Regulation typically implies postulating minimum submission periods for some procedure types, for example 45 days for open procedure above EU threshold under normal circumstances. Submission periods constitute a useful tool for limiting competition, as leaving too little time for preparing bids can effectively exclude bidders (Kenny & Musatova, 2010; OECD, 2007). An impossibly short submission period such as one day combined with early information provision to the ‘desired’ winner (T3.1 - selective information provision), so that it can start preparing before the publication of call for tenders, constitutes a highly effective way of excluding

unwanted bidders. Limiting competition to that bidder, which is part of the corrupt network, allows for collecting rents. Some of the short deadlines are obviously due to non-corrupt reasons such as issuers who are under time pressure trying to rush through a procedure in order to complete a project on time. While this can happen in some cases to some issuers, regular occurrences of such procedures and extremely short deadlines may indeed signal deliberate attempts to abuse the system of submission periods.

Checking whether the submission periods comply with legal requirements appears to be somewhat effective when the call for tenders is published in the Public Procurement Bulletin<sup>25</sup>. The Public Procurement Authority particularly heavily concentrates on compliance in this area, and the media often picks up some of the extreme stories. General compliance with legal requirements was confirmed by interviewees as well as inspection of time series data in Hungary, but internationally too (Fazekas & Tóth, 2012b; Oživení, 2011). Hence, it is expected that extremely short deadlines would appear only for procedure types where little or no regulation exists and by invoking special reasons for accelerated procedures where heavy regulation exists. However, procedures where the call for tenders has only been published on the homepage of the issuer or hasn't been published at all are expected to have extremely short submission periods more often.

This corruption technique is closely associated with a number of others. First, as already mentioned T3.1 - selective information provision constitutes its very crucial 'tandem' partner for putting the desired bidder in advantage over other bidders. Second, as procedure type defines the minimum length of submission period, the success of tinkering with thresholds and exceptions (T2.1) is a powerful determinant of the availability of this technique. Third, avoiding publication of call for tenders (T3.2) beyond greatly diminishing transparency also allows for unaccountable use of deadlines (i.e. it is difficult to check whether the submission period was reasonable).

A telling example of how widespread this technique was shared by one large procurer: "A fairly small procurement need – about 4 million HUF (14 thousand EUR)

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<sup>25</sup> According to a 'test announcement' recorded by one large issuer in Budapest in collaboration with the authors, there is no automatic control on submission deadlines in the online system of announcement submission. Hence, control relies exclusively on controllers of the Public Procurement Authority spotting the shorter than legal deadlines which has not been 100% accurate as our statistical evidence points out (see below for more details).



- arose in the organisation which had to be met swiftly. We sent out direct invitations with a one day submission period to the four major players of the market whom we knew from previous purchases. Neither of them even replied to the call. We enquired their reasons over the phone and 3 out of 4 said that they interpreted the invitation as 'set-up', that is they were needed to mimic competition whereas the winner is already decided." Another example widely covered by Hungarian media left four days of weekend plus national holidays for bidders to submit their bids for a 716 million HUF (2.5 million EUR) creative communications and PR tender<sup>26</sup>. This case has even resulted in a court proceeding in which the final decision is still pending; however the contract has been signed and delivery commenced so any court decision is unlikely to interrupt the suspicious deal.

We propose three direct indicators each measuring the same technique from a slightly different angle:

- A) proportion of tenders with accelerated submission periods within all procedures,
- B) proportion of tenders with extremely short submission periods within all procedures, and
- C) average contract value per weekday available for submission.

As Hungarian law allows for accelerating procedures (i.e. shortening submission periods), a direct indication of circumventing regulations of submission periods is the frequency or regularity of accelerated procedures. The legal framework determining acceleration rules and the minimum number of days has been intricately complex and has changed frequently. Hence, a simple approach was taken reflecting both general rules of accelerated procedures and the empirical distributions of submission periods (cut-points can be found in Table 4).

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<sup>26</sup> For the original call for tenders: [http://www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal\\_12337\\_2012/](http://www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_12337_2012/) and the contract award notice: [http://www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal\\_14257\\_2012/](http://www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_14257_2012/)

**Table 4. Submission period thresholds under which a procedure is deemed to be accelerated, 2009-2012**

year/ procedure type	missing	open	invitation	negotiation	other
2009	22	22	14	22	22
2010	22	22	14	22	22
2011	18	18	14	18	18
2012	18	18	14	18	18

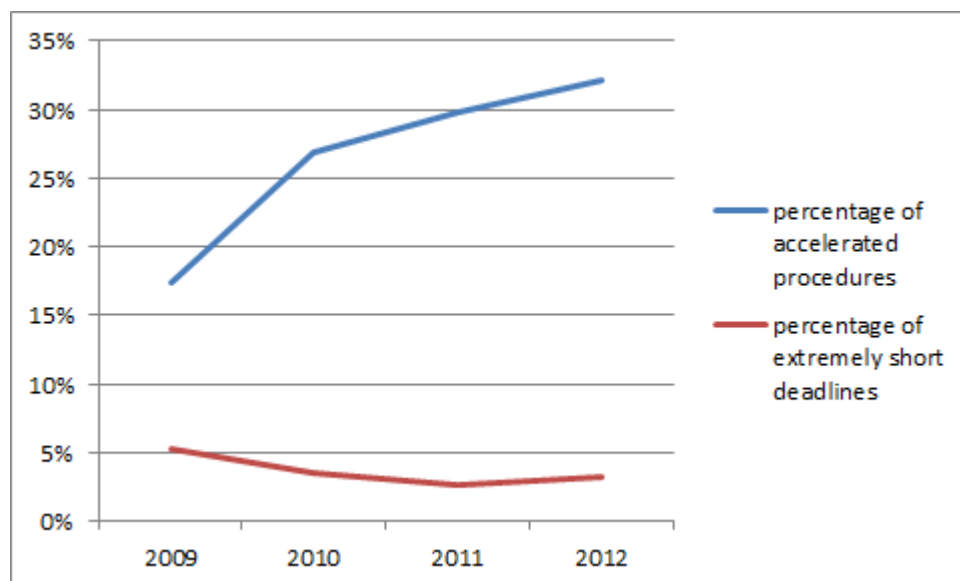
As acceleration is typically granted on the basis of urgency and extraordinary circumstances this indicator also signals to what degree the exception is the norm. Regularly invoking exceptional circumstances for increasing discretion is another aspect of corruption frequently quoted in the literature (Ionita, Nutu, Stefan, & Mungiu-Pippidi, 2011). Hence, we suggest the following indicator:

$$PSST_{it} = NSSP_{it} / TNT_{it}$$

where  $PSST_{it}$  refers to the proportion of accelerated tenders with shortened submission periods over all tenders concluded of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $NSSP_{it}$  denotes the total number of accelerated tenders with shortened submission periods of the  $i$ th unit of observation during period  $t$ , and  $TNT_{it}$  refers to the total number of tenders concluded by the  $i$ th unit of observation over period  $t$ .

There is a marked upward trend in the proportion of accelerated public procurement procedures throughout 2009-2012 (Figure 13). By 2012, almost one third of all procedures for which we have data have been accelerated, that is used a shorter than 'normal' submission period.

**Figure 13. Percentage of procedures with accelerated and extremely short submission periods, 2009-2012, %**



Source: PP

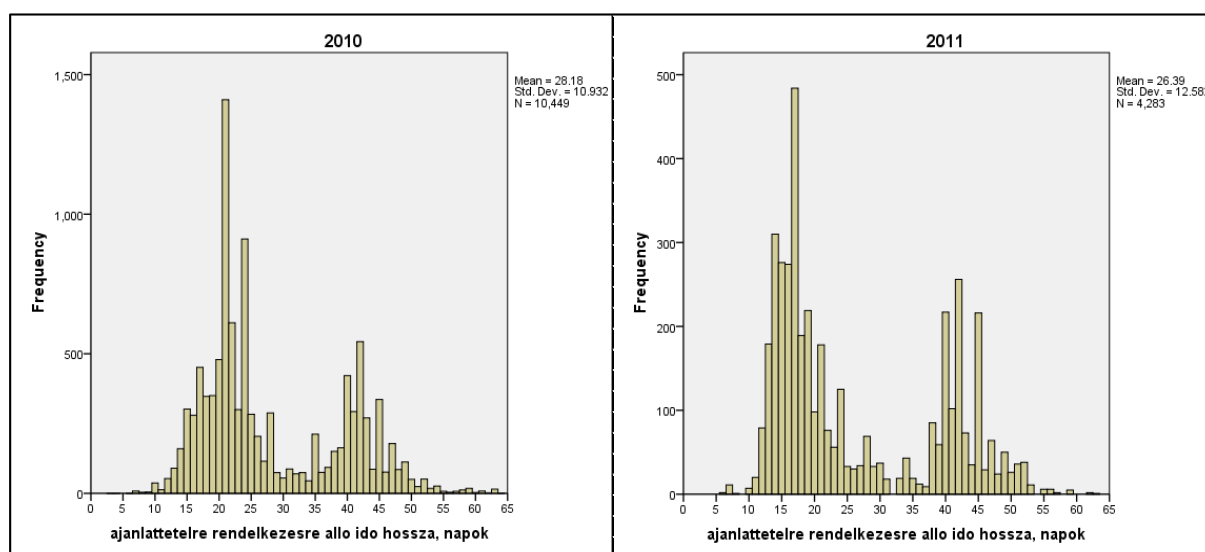
An indicator even more heavily concentrating on extreme cases in order to indicate unusually high corruption risks is the proportion of extremely short submission deadlines such as the one highlighted in the example above (4 days). While it is difficult to determine precisely how long an extremely short submission period is, we made use of the lowest legally permissible deadlines as benchmarks as well as identified the lower end of the empirical submission period distributions where frequency drops sharply as an indication that something unusual is happening throughout 2009-2012 (Figure 13 and Figure 14). As a result we employed a uniform 15 days threshold for 2009-2010 and 13 days threshold for 2011-2012. The following indicator is proposed:

$$PESST_{it} = NESSP_{it} / TNT_{it}$$

where  $PESST_{it}$  refers to the proportion of tenders with extremely short submission periods over all procedures concluded of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $NESSP_{it}$  denotes the total number of procedures with extremely short submission periods of the  $i$ th unit of observation during period  $t$ , and  $TNT_{it}$  refers to the total number of tenders concluded by the  $i$ th unit of observation over period  $t$ .

The distributions of submission periods changed considerably between 2009-2010 and 2011-2012, the spike at day 22 in 2010 moved down to day 18 in 2011 largely due to the shortening of official minimum thresholds in the Public Procurement Law (Figure 14). Large differences across procedure types have remained consistent (e.g. non-open procedures have much shorter submission periods on average) even though the relative frequencies of each type change from year to year. Importantly, extremely short submission periods appear recurrently in each year and procedure type as evidenced by the sharp drop in the number of cases below the threshold of 15-13 days even though these short submission periods are not permitted even under exceptional situations. Across every procedure type, the proportion of procedures with extremely short submission periods are rare amounting to about 3-5% throughout 2009-2012 (Figure 13).

**Figure 14. Distribution of contract award notices' submission periods, open procedures, 2010 and 2011, days (<65 days)**



Source: PP

In order to more broadly gauge the handling of submission periods we also look at the average submission period length normed by contract size. Norming by contract size recognises that larger projects generally need longer submission periods due to legal constraints, but also that having extremely short submission period for large contracts represents higher corruption risk than the same submission period for a smaller contract. In order to better reflect the actual time available for bidder

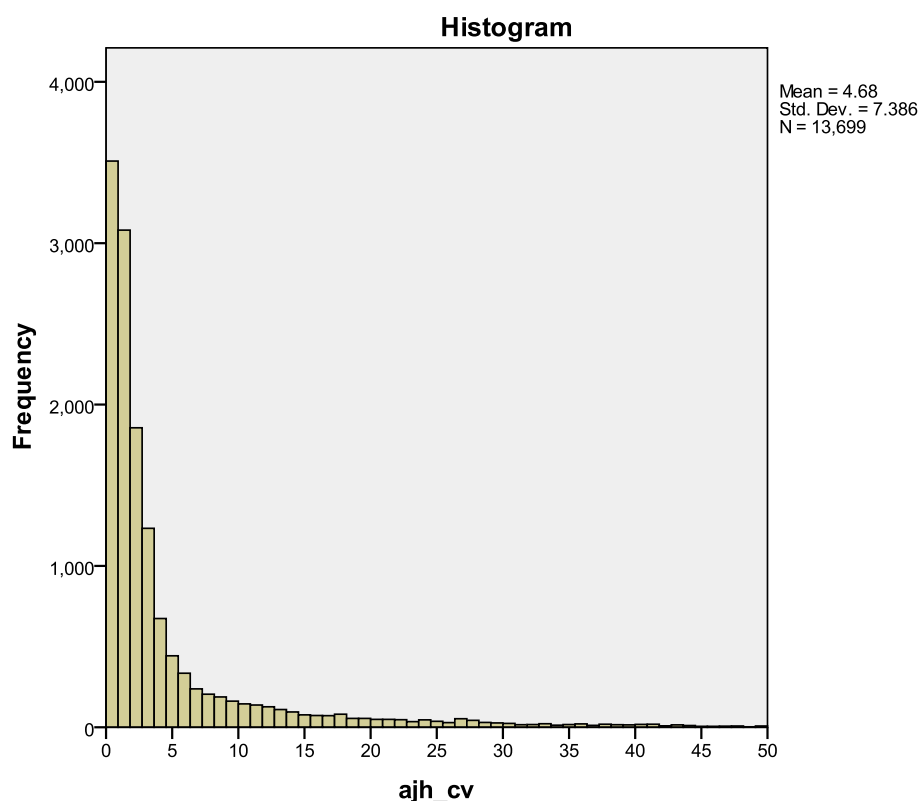
preparing for a tender, we took the number of weekdays as a reference rather than calendar days as prescribed in the Public Procurement Law. Hence, the indicator is:

$$ASPV_{it} = ( \sum_j ( CV_{itj} / SP_{itj} ) ) / TNT_{it}$$

where  $ASPV_{it}$  refers to the average contract value per number of weekdays available for submission for the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $SP_{it}$  denotes the number of week days available for submission in the  $j$ th procedure of the  $i$ th unit of observation during period  $t$ ,  $CV_{it}$  refers to the contract value of the  $j$ th procedure by the  $i$ th unit of observation over period  $t$ , and  $TNT_{it}$  refers to the total number of tenders concluded by the  $i$ th unit of observation over period  $t$ . This indicator cannot be treated as a continuous measure of corruption risks. Rather, its high values indicate unusually high corruption risks and middle and low values convey very little as to the level of corruption risks involved.

On average, this ratio almost reaches 5 throughout 2009-2012 that is, there were almost 5 million HUF of contract value for each weekday of submission period. It is noteworthy that the distribution of this ratio is highly skewed with only few very large numbers (Figure 15). As submission periods may also reflect differences in technology and industry standards, it is conceivable that norming by market means leads to a better indicator.

**Figure 15. The distribution of average contract value (million HUF) per submission period (week days), 2009-2012 (ratios < 50)**



Source: PP

### 4.3 Document preparation and dissemination

#### T3.1 Selective information provision

Communication between bidders and issuers is heavily regulated in Hungary as well as in EU member states because it can have a decisive impact on competition (Soreide, 2006). Getting more, better quality, or more timely information on tenders can put some bidders in an unbeatable position. This is exactly what corrupt informal networks use to win public contracts in seemingly fair competition in Hungary, but in other countries too (Goldman et al., 2012; Grodeland, 2010; Papanek, 2009; Piga, 2011). It is enough to give informally crucial information on specific aspects of the tender to one bidder while issuing a vague or erroneous tender specification. The use of this corruption technique infringes on the principle of fair competition as well as transparency.

There is little effective external control on any of these information flows as it is difficult, if not impossible, to monitor informal talks and information transmission through intermediaries. Several of our interviewees confirmed that there are informal talks putting the well-connected bidders in an advantageous position in Hungary rather frequently.

This technique is related to the choice of procedure type (T2.1) as less transparent procedure types such as negotiation make it very easy to provide information to one bidder while concealing it from other bidders. Furthermore, T2.7-tinkering with submission period works neatly in tandem with this technique as early informal 'warning' of the preferred bidder of a future call for tenders with very short submission deadline gives it a decisive competitive advantage (e.g. in extreme cases it can be the only one actually able to put together a valid bid).

A construction company's public procurement manager gave the example in an interview where there were two sets of tender documents: one for the official tender documentation and another one for the "friendly bidder" (in Hungarian: "csókos pályázó"). As a result, the "friendly bidder" was at a great advantage over all other bidders in terms of more accurate and detailed tendering information.

Due to the high level of secrecy and lack of any direct record of unfair information provision there is no direct indicator. The use of extremely short submission periods, which make it impossible to put together a bid on time without prior information, can indirectly signal the use of this corruption technique. Hence, the two indirect indicators:

- A) proportion of tenders with extremely short submission periods within all procedures; and
- B) proportion of procedures with call for tenders modified within all procedures.

The first indicator is likely able to signal only a particular type of corruption dealing (i.e. prior information provision) rather than all types falling under the umbrella of this corruption technique (e.g. better quality information provided to the pre-selected bidder). For detailed discussion of this indicator see section T2.6.

For the second indirect indicator relating to modifications of call for tenders, we adopt the following formula:

$$PMC_{it} = NMC_{it} / TNT_{it}$$

where  $PMC_{it}$  refers to the proportion of procedures with modified call for tenders within all procedures concluded of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $NMC_{it}$  denotes the total number of procedures with modified call for tenders of the  $i$ th unit of observation during period  $t$ , and  $TNT_{it}$  refers to the total number of tenders concluded by the  $i$ th unit of observation over period  $t$ . While this broad indicator certainly encompasses simple administrative error as well as deliberate corruption, later statistical analyses linking it to corrupt outcomes on organisational or market level can provide the necessary insights to refine it if needed. If this approach turns out to be too broad, more fine-tuned indicators of 1) only looking at modifications of eligibility and/or assessment criteria after the deadline for obtaining tender documentation passed; 2) only considering those modifications which move submission deadlines forward, and 3) only looking at recurrent modifications to the same call for tenders may prove to be valuable although there are very few calls for tender with multiple modifications.

Modifications of calls for tenders follows a distinctive pattern over time with 2010 and 2011 seeing the highest proportion of modifications (6% and 5% respectively) (Table 5).

**Table 5. Average proportion of contracts awarded whose call for tender was modified, 2009-2012**

	Mean	N	Std. Deviation
2009	0.026	1874	0.158
2010	0.055	6553	0.228
2011	0.049	3502	0.216
2012	0.009	331	0.095
2009-2012	0.048	12260	0.213

Source: PP

### T3.2 Avoiding the publication of call for tenders

The publication of call for tenders can take place at various places or can be avoided altogether. The most transparent place for publication is the Official Journal of the



European Union or the Hungarian Public Procurement Bulletin which can guarantee the highest number of potential bidders informed about the tender (e.g. there are for-profit providers who recycle and disseminate procurement notices to potential bidders<sup>27</sup>). If issuers decide to only publish the call for tenders on their homepage it still can be considered as transparent, but considerably less as potential bidders may find it harder to monitor hundreds of individual homepages as opposed to one national page of public procurement. In the case when no call for tender is published at all, but instead it is sent to selected bidders the principle of transparency is violated the most extensively. While the choice of publication organ is regulated by the Public Procurement Law, which requires publication in the Public Procurement Bulletin in the case of large tenders, issuers can effectively choose the place of publication in a great number of cases<sup>28</sup>. If choice is exercised in favour of less transparency, leading to lower number of bidders, it can be suspected that the issuer may have something to hide, thus raising corruption risks (Heggstad & Froystad, 2011; Lengwiler & Wolfstetter, 2006; OECD, 2007; Ware, Moss, Campos, & Noone, 2007).

The effectiveness of the external control of this corruption technique is problematic. As was underlined earlier, periodic reviews of individual organisations' public procurement activity and the rare systemic reviews by SAO constitute a weak instrument against abuses (Báger, 2011). When contract award announcements appear in the Public Procurement Bulletin, their references to prior call for tenders are checked but procedures are hardly ever cancelled due to a missing call for tenders.

This corruption technique is strongly associated with T2.1-tinkering with thresholds and exceptions defining the procedural regime to follow. As when the procedure type prescribes publication in the official journal, avoiding publicity becomes harder for issuers. Moreover, this technique forms a formidable combination with T2.6-tinkering with the submission period as publishing the call for tenders in a difficult to reach location (e.g. a hard to find part of the institution's own homepage) with a very short

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<sup>27</sup> For example: [www.tender-ertesito.hu](http://www.tender-ertesito.hu)

<sup>28</sup> In fact, the crossstabulation of procedure type and call for tenders published in the official journal reveals that a great many call for tenders are published in the Public Procurement Bulletin even though no regulation prescribes it. On the other hand, there are many procedures whereby the call for tenders should have been published in the Bulletin still it cannot be found there.

deadline competition from unwanted bidders can be minimized. Finally, this technique may be traded off with T3.3 - strategically modifying the call for tenders.

There is only one direct indicator proposed for this corruption technique focusing on the difference between the most widely used publication organ (Public Procurement Bulletin) and all other venues:

- A) proportion of procedures without call for tenders in the official journal within all procedures.

This indicator is directly measured by the following formula:

$$PNPC_{it} = NNPC_{it} / TNT_{it}$$

where  $PNPC_{it}$  refers to the proportion of procedures without a call for tenders published in the Hungarian Public Procurement Bulletin<sup>29</sup> within all procedures concluded of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $NNPC_{it}$  denotes the total number of procedures without a call for tenders published in the Hungarian Public Procurement Bulletin of the  $i$ th unit of observation during period  $t$ , and  $TNT_{it}$  refers to the total number of tenders concluded by the  $i$ th unit of observation over period  $t$ .

Interestingly, there has been a large increase in the proportion of procedures without call for tenders in the Public Procurement Bulletin between 2009-2010 and 2011-2012 largely coinciding the new government entering office. In 2009-2010 it amounted to 17%-24%, but jumped to 57%-267% in 2011-2012 (Table 6). While the full account of the reasons behind this pattern requires further analysis changes in the Public Procurement Law under the new government contributed for sure.

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<sup>29</sup> This Bulletin also contains copies of announcements in the European Union's Official Journal (TED) issued by Hungarian authorities.

**Table 6. Average proportion of procedures without call for tenders in the Public Procurement Bulletin, 2009-20112**

	Mean	N	Std. Deviation
2009	0.24	10918	0.43
2010	0.17	17914	0.38
2011	0.57	14070	0.49
2012	0.67	10342	0.47
2009-2012	0.39	53244	0.49

Source: PP

As publication at the issuers' own website still represents a more transparent solution compared to no public announcement at all, it is desirable to collect data, at least a sample, on calls for tenders on issuers' homepages. Collection of textual data has been done, but full analysis can commence only later when key information is extracted from the documents.

### **T3.3 Strategically modifying the call for tenders**

If an issuer has to publish a call for tenders, but wants to tailor it to benefit a particular bidder it faces a considerable information burden. In most markets, a wide range of companies can bid. The pool of potential bidders is uncertain for the issuer of tenders due to new companies entering the market, others leaving it, or simply the changing willingness of companies to bid for the particular tender. Publishing a call for tenders and subsequently observing which bidders buy or obtain the tender documentation can reduce the burden of acquiring information on potential bidders and the uncertainties of getting the pool of bidders wrong. Once information on interested bidders is obtained in such a way, it is easy to modify the eligibility and/or assessment criteria to favour the 'pre-selected bidder' as opposed to the other potential bidders. Furthermore, high frequency of call for tenders' modifications creates uncertainty about the actual requirements and conditions, hence can discourage competition. Modifying call for tenders strategically can decrease

transparency and discourage competition. This technique is primarily based on interview evidence coming from Hungary, so it may represent a Hungarian speciality or it may simply have escaped the attention of the literature so far.

Even though inadmissible eligibility or assessment criteria can be and does get detected and removed, the control of changing any criteria is very rare if not completely non-existent according to our interviewees.

This corruption technique is intimately linked to T2.2 - tailoring eligibility criteria and T2.4 –tailoring assessment criteria, as the combinations can readily increase the techniques' effectiveness. For example, initial eligibility criteria can be set so that it rules out all but one bidder, but when an unexpected or inadequately assessed bidder obtains the tender documentation, which could successfully bid for the tender, a modification to the call for tenders' eligibility criteria can exclude the unwanted bidder.

After identifying two versions of this corruption technique (i.e. modification after bidders are known and frequent modifications) it is possible to devise fine-tuned indicators gauging each version. However, in order to avoid using too narrowly focused indicators we adopt a broader approach and propose to use the metrics already discussed above (see section T3.1):

- A) proportion of procedures with call for tenders modified within all procedures.

#### **T3.4 Excessively pricey and hard to access documentation**

Public procurement tendering is open and transparent as long as the necessary tender documents are easily and cheaply accessible. If documents are difficult or expensive to obtain some potential bidders may be excluded or at least discouraged from competing. Asking a considerable price for tender documents is in principle fair; however, it can exclude less well-off potential bidders and those bidders who find their chances of winning lower. A rational potential bidder would only buy the tender documentation if it deems the expected profit (chances of winning \* profit earned if winning) higher than the price of tendering (tender preparation + tender document costs). If a company knows that it is a sure winner due to its corrupt connections it is willing to pay a very high price for the documentation; whereas an average bidder with uncertain winning chances would be less willing to pay a high price. Hence, it is

easy to set the price of documentation so high that it is prohibitive for all the bidders except for one. Making the acquisition of tender documents difficult is an additional method for increasing the costs of bidding. The easiest way to acquire documents is from the internet; however, issuers are free to define the ways of obtaining paper-based tender documents from themselves or their designated representatives. Corrupt networks can use these techniques for completely eliminating, or at least weakening competition. While this method was mentioned by two of our interviewees, we found little evidence of it in the literature so this corruption technique is potentially less reliable.

Collecting fees for providing the tender documentation is justified by the costs of compiling them accruing to the issuer. By law, price should reflect costs of producing the documents. In practice, it was usual in Hungary to ask for excessive prices up to several million HUF (several tens of thousands EUR). This practice has changed lately in Hungary as reported by one of our interviewees with legal background, when the Public Procurement Arbitration Board has started to force issuers to set more reasonable, that is lower prices. This shows that in some respects external control may function well in Hungary.

This technique can work most effectively together with others aimed at decreasing competition so that they can leave only the desired company standing in the competition.

One of the large construction companies operating almost exclusively on the public procurement market highlighted that high price of tender documentation effectively deters them from some tenders. Another interviewee working for a most likely exemplary issuer simply put it: “if one wants competition, it puts all the documents on the net accessible for free!”.

There is one proposed direct indicator corresponding to one of the forms of this technique<sup>30</sup>:

A) price of documentation divided by estimated contract value.

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<sup>30</sup> That is difficult access to documentation was not possible to measure, however, the location of accessing the tender documents such as postal address, internet address are regularly reported in call for tender announcements so later research can develop an additional indicator.

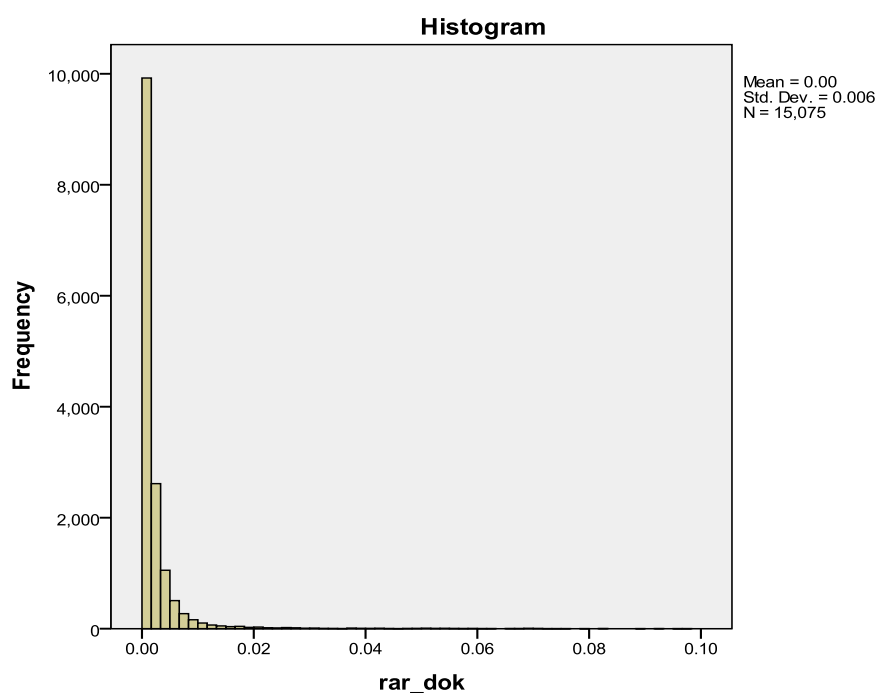
The price of documentation is expected to reflect the preparation costs of the tender documents for the issuer which is, by and large, increasing function of project size. Thus, we can consider those documentation prices as cause for suspicion which are excessively expensive compared to tenders of similar size. The proposed indicator is:

$$APDCV_{it} = \sum_j ( PD_{itj} / CV_{itj} ) / j$$

where  $APDCV_{it}$  refers to the average ratio of price for tender documentation over total value of contract of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $PD_{itj}$  denotes the price of tender documentation in the  $j$ th procedure of the  $i$ th unit of observation during period  $t$ , and  $CV_{itj}$  denotes the value of contract awarded in the  $j$ th procedure by the  $i$ th unit of observation during period  $t$ .

Looking at the distribution of document price to contract value ratio, a familiar picture appears: a highly skewed distribution where very few procedures show high corruption risks while most of them moderate to low risks only (Figure 16). For example, almost a quarter of procedures made the documents available for free.

**Figure 16. Proportion of document price to contract value, 2009-2012 (ratios smaller than 0.1)**



Source: PP

### T3.5 Deliberate errors in document publication

Preparing and publishing any tender document accurately is essential both for transparency, accountability and competition. The simple fact of publishing the necessary announcements is far from sufficient for establishing whether these three elementary principles are followed in the conduct of an issuer. Accuracy, completeness, and clarity of information are essential (OECD, 2009). Often, even a small omission or error can have considerable consequences. For example, erroneously categorizing a call for tender in the CPV nomenclature can effectively exclude potential bidders from a tender as most companies search by CPV codes rather than going through all the announcements made each day (there are commercial companies offering email alerts to potential bidder companies based on new calls for tenders in markets defined by CPV codes). This corruption technique can have basically two effects depending on the phase of the public procurement procedure: 1) during the tendering phase, omissions and errors can disadvantage some bidders (Ware et al., 2007); 2) during the award decision and contract management phase omissions and errors can infringe on the capacity of outsiders to hold actors accountable. The latter suggests that the use of this technique is not necessary if other corruption techniques already limited the number of bidders while making the procedure look by and large legal.

While every announcement is checked by the Hungarian Public Procurement Authority before publication and corrections are made if necessary, the wide range and frequent errors in the actual published documents clearly demonstrates that this check is insufficient. For example, contract value or the name of winner are missing in many cases. For most errors, even if they are identified by the Authority it can only ask issuers to correct them, but cannot deny or considerably delay publication in order to effectively sanction deviance. Nevertheless, there are cases when the announcement's publication date is much after the dispatch date of the issuer (i.e. organisation sent it long time before it actually gets published). More research is needed to explore why and how this can happen, and most importantly whether manipulating actual publication data as compared to dispatch date can be intentional (one interviewee suggested it can be, but failed to provide a detailed account of the methods used).

This corruption technique relates to two different sets of techniques depending on the stage of the procurement procedure. First, during the bidding stage, this technique can be very well combined with T3.1 - selective information provision. Second, during award decision and contract implementation stages, this corruption technique can work closely together with T4.2 – repeated violations of rules and T5.3 – performance violating contract in order to avoid external monitoring and punishment.

Relating to the first version this technique comes in: a construction company's public procurement manager highlighted in an interview that it has to check personally every plan and documentation as much as possible, for example by inspecting the would-be site of construction, as her experience is that tender documentation cannot be trusted. While she clearly sees incompetence as one major source of problems with the precision of tender documentation, she has come across multiple cases where deliberate manipulation of documentation took place to grant unfair advantage to the members of a corrupt network.

There are two direct measures of this corruption technique (sub-type relating to the avoidance of external scrutiny):

- A) prevalence of extremely erroneous contract award announcements and
- B) hiding or erroneously reporting the final contract value.

Unfortunately, it is not possible to verify the content of tender documents compared to what actually is on the ground (e.g. whether construction site descriptions are accurate) leaving the compliance of administrative records with official requirements the only way to build indicators. This, however, raises the risks of conflating a deliberate corruption technique with simple administrative error typically due to low administrative capacity. In order to minimise the overlap between these two causes, the proposed indicator only focuses on omissions and errors of key pieces of information where deviation from official requirements is more likely to be deliberate. Contract award announcements are taken as a reference point as opposed to all other announcement types we have information about because they are the key documents which are always available for every procedure. We employed the following formula.



$$PEC_{it} = NEC_{it} / TNT_{it}$$

where  $PEC_{it}$  refers to the proportion of procedures with extremely erroneous contract award announcements within all procedures concluded of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $NEC_{it}$  denotes the total number of procedures with extremely erroneous contract award announcements of the  $i$ th unit of observation during period  $t$ , and  $TNT_{it}$  refers to the total number of tenders concluded by the  $i$ th unit of observation over period  $t$ . Extremely erroneous contract award announcements were those which lacked or incorrectly reported<sup>31</sup> any of the following information:

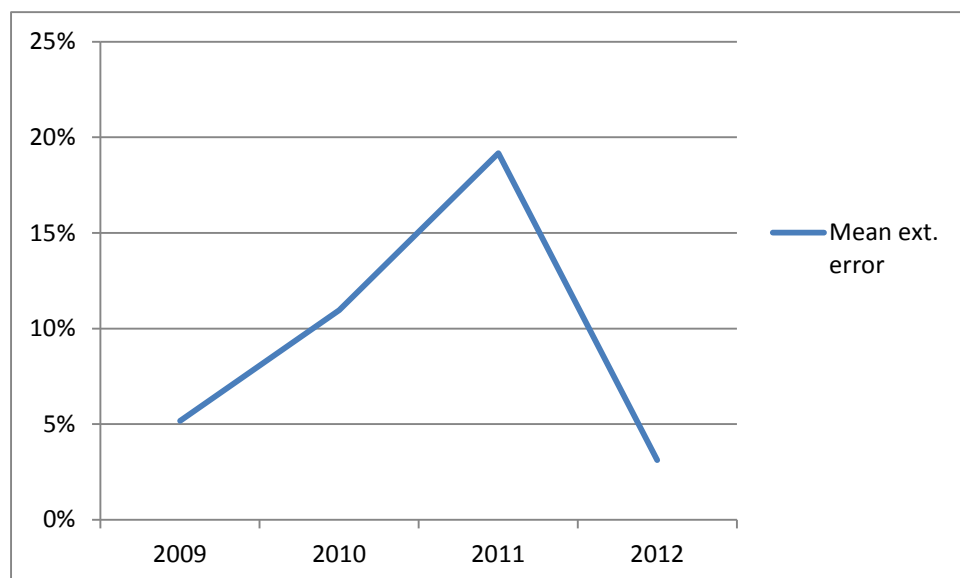
- Name of winner,
- Value of contract, and
- Type of procedure.

The proportion of announcements with such errors showed strong increase between 2009-2011, but dropped drastically in 2012 most likely due to the introduction of the new public procurement law which saw a more stringent control of announcements (Figure 17). As with many other indicators discussed here, the regularity of publishing extremely erroneous information is by no means a continuous measure of corruption. Rather, its high prevalence in spite of sufficient experience with conducting public procurement is what signals substantial corruption risks.

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<sup>31</sup> While using unit prices for reporting the final total contract value is clearly deemed as incorrect reporting, this indicator excludes these cases. The reason is that abusing unit prices is a different kind of error than simple omission or unclear information provision. Unit prices are discussed in section T4.4.

**Figure 17. Mean proportion of contract award announcements with extremely erroneous information, 2009-2012 (%)**



*Source: PP*

As final total contract value represent one of the key means of outside actors to hold issuers to account it is likely that this information will be hidden or erroneously reported by corrupt actors. This suspicion was confirmed by a many interviewees and the higher than usual number of errors in the contract completion announcements<sup>32</sup>: almost half of the procedures lacked a correct contract completion announcement containing the final contract value (Table 7).

<sup>32</sup> Arguably, correctly publishing contract completion announcements may be administratively more demanding as by the end of a typical contract a large number of potentially complex transactions would had to be precisely recorded.

**Table 7. Error statistics of relative value of contract modifications, 2009-2012**

	Frequency	%
Final vs original contract value defined, no error	6961	57.3
Final vs original contract value defined, but outlier	215	1.8
No final contract value defined, but there should have been	4975	40.9
Total	12151	100

Source: PP

#### 4.4 Tender evaluation and award decision

##### T4.1 Strategically annulling the procedure

As has been said already, issuers are obliged to follow certain procedures based on the size and nature of the prospective procurement contract. However, if the first procedure is annulled, for example due to unforeseen circumstances, issuers often have the right to re-launch the process, but using an accelerated and less open procedure (e.g. restricted or invitation procedure). This is the case not only in Hungary, but in a range of other countries too (OECD, 2007). Annulment can be used strategically for corrupt purposes in at least two ways: first, in order to avoid procedures requiring higher degrees of transparency and more open competition even though the awarded contract is big and no special exception could be invoked. Second, in the case when other corrupt techniques of limiting competition didn't work and a unwanted firm would have to be awarded the contract. So, when other techniques failed there is still the option of annulling the whole procedure and start it all over again with more effective arsenal of corruption techniques. For this corruption technique, annulment is the decision of the issuer. One of the most frequently invoked reasons for annulment is that the budget turned out to be insufficient by the time the contract had to be awarded (this reason is explicitly banned in the new 2012 Public Procurement Law).

Of course, annulment can be simply due to incompetent planning on the side of issuers. However, if we only look at issuers with considerable experience with public

procurement, for example, at least 3 procedures per year, successive annulations of the same public procurement procedure may in fact signal strategic behaviour to avoid fair competition and decrease transparency.

As the potential reasons for issuer induced annulation is limited and annulations are fairly visible, external control may represent a strong obstacle to the application of this technique. In addition, it is also costly for the issuers as they have to re-run the same procedure multiple times. Hence, it is likely that this is used either as a 'solution of last resort' or as a blunt and expensive technique.

First, this technique is linked in general to all other techniques aiming at decreasing competition if it is used once the other techniques failed to produce the desired result. Second, it can also be considered as an extension or alternative to the tinkering with thresholds and exceptions (T2.1) in order to get the most suitable procedural regime for corrupt conduct. Third, this technique is similar in effect to the next technique (T4.2 – violation of public procurement rules) as long as it leads to the annulation of the procedure. It is, however, very different in origin as it results from the issuer's decision whereas T4.2 is due to court decision.

A famous example extensively discussed by the press in Hungary was the contract for reconstruction the levee next to the settlement Csongrád at river Tisza.<sup>33</sup> It took *four* procedures to award a contract eventually to the same company as originally intended. The losing bidders complained several times that the procedure was tailored to one consortium close to the government and it also raised suspicion that the issuer annulled the process itself<sup>34</sup>. In addition, the Public Procurement Arbitration Board annulled the procedure twice, an issue we will get back to below.

This corruption technique can be associated with one direct indicator:

A) proportion of annulled procedures re-launched subsequently

and indirect indicator:

B) decrease in the number of bids received in subsequent rounds.

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[http://index.hu/belfold/2012/09/13/otodszorre\\_is\\_kozgep\\_nyerte\\_el\\_a\\_milliardos\\_csongradi\\_munkat/](http://index.hu/belfold/2012/09/13/otodszorre_is_kozgep_nyerte_el_a_milliardos_csongradi_munkat/)

<sup>34</sup> [http://www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal\\_16326\\_2011/](http://www.kozbeszerzes.hu/adatbazis/mutat/hirdetmeny/portal_16326_2011/)

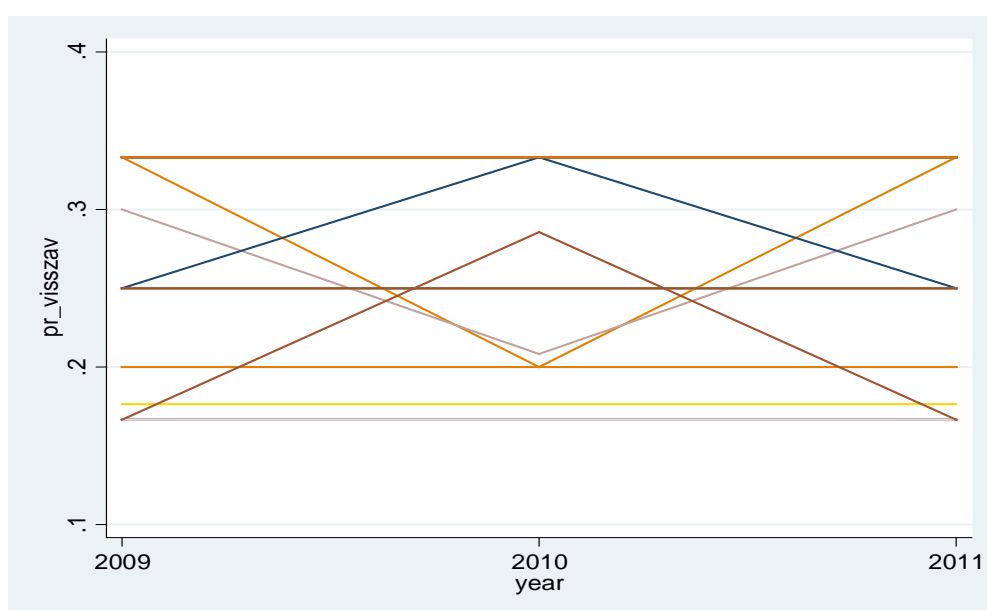
The regularity of annulling procedures and subsequently re-launching it with slightly different conditions directly signals the potential for strategic behaviour. As occasional errors can occur in even the cleanest issuer, what indicates heightened corruption risks is the regular and repeated annulations initiated by the issuer. As every annulation has to be reported in the Public Procurement Bulletin the proposed indicator is a likely precise measure of the potential use of this technique:

$$PAPR_{it} = APR_{it} / TNP_{it}$$

where  $PAPR_{it}$  refers to the proportion of annulled procedures re-launched subsequently within all procedures initiated of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $APR_{it}$  denotes the total number of procedures annulled by the issuer (not by the courts) of the  $i$ th unit of observation during period  $t$ , and  $TNP_{it}$  refers to the total number of procedures initiated by the  $i$ th unit of observation over period  $t$ .

While overall the proportion of annulled procedures is rather low approximately 3%, annulations tend to cluster with some issuers whose propensity to annul procedures is persistently high (Figure 18).

**Figure 18. Proportion of annulled procedures by issuer with proportion higher than 0.15, 2009-2011 (lines represent single issuers' annulation proportions over time)**



Source: PP

It follows from the above discussion that the major objective of using this corruption technique is to limit competition, that is, decreasing the number of bidders to one, even though decreased competition can be associated with other measures (e.g. subjective evaluation criteria used for arbitrary scoring). Hence, if subsequent rounds of re-launched tenders lead to decreased number of bidders it is likely that the underlying rationale of annulling the procedure was in line with the described corruption technique. We propose therefore the following indirect indicator signalling the potential use of this technique:

$$ADRB_{it} = \sum_j ( NRBA_{ij} - NRBS_{ij} ) / j$$

where  $ADRB_{it}$  refers to the average difference between the number of bids received in the annulled and completed public procurement procedures of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $NRBA_{ij}$  refers to the number of bids received in the  $j$ th procedure's annulled award notice of the  $i$ th unit of observation during period  $t$ , and  $NRBS_{ij}$  refers to the number of bids received in the  $j$ th procedure's final successful award notice of the  $i$ th unit of observation during period  $t$ . As multiple annulations can take place within the same procedure this indicator simply compares the first and last 'rounds' in order to simplify the calculations. This is justified on the grounds that intermediary annulations (i.e. those happening between the first and last 'round') most likely represent unsuccessful applications of the technique.

Unfortunately, this indicator could not be calculated due to technical complexities, further work must be done to arrive at a reliable estimate.

#### **T4.2 Repeated violations of public procurement rules**

The violation of Public Procurement Laws and regulations represents the simplest and crudest corruption strategy. As long as violations are not gross, they may remain undetected making the completed procurement process look legally acceptable. While violation of some rules is also a hallmark of a range of corruption techniques discussed in this section, what makes this technique distinct is the *repeated* violations within the same procedure (Ware et al., 2007; World Bank, 2007). Assuming that the judicial control is not completely captured by corrupt networks, repeated violations mean that the issuer is likely breaching regulations not simply out of administrative incompetence, but deliberately in order to benefit a 'desired'

company. If this is really the case, this technique impinges on fair competition and accountability. Obviously, not every violation and error is a tool for corruption, only those which appear recurrently suggesting strategic use of ‘minor mistakes’ should raise suspicion.

In principle, public procurement practice is closely monitored and we can safely assume that, at least in some cases, judicial control does function properly. But because, external control of the Public Procurement Arbitration Board, courts, and SAO is weak in general in this field (Báger, 2011), it is quite possible that repeated violations are not or partially detected. This, of course, limits our ability to use court decisions as a reliable indicator.

This corruption technique can be linked to most other techniques, especially those directly weakening competition.

An excellent example of this technique is the previously mentioned levee reconstruction project at the river Tisza. While on one occasion the issuer itself annulled the procedure, twice the Public Procurement Arbitration Board struck it down. This, nevertheless, did not stop the issuer from awarding the contract to the same consortium closely associated with the highest echelons of the government.

The only direct indicator for this corruption technique is

- A) repeated court rulings against the issuer within the same procedure.

Developing an indicator based on rulings of the Public Procurement Arbitration Board or the Hungarian courts potentially suffers from biases as monitoring and adjudication may be influenced strategically by corrupt networks (Jancsics & Jávör, 2012). In order to minimise this bias we only consider cases of repeated court rulings within the same procedure. The logic behind this twist is that once the first court ruling was made the case becomes more exposed making it harder for corrupt networks to strategically turn off judicial review. Hence, repeated court rulings may in fact represent appropriately the number of actual ‘irregularities’ of the procedure. Moreover, repeated errors infringing on the Public Procurement Law and other regulations are more likely to represent deliberate ‘bending’ of rules rather than simple errors. The proposed indicator is as follows:

$$PRCR_{it} = RCR_{it} / TNP_{it}$$

where  $PRCR_{it}$  refers to the proportion of procedures with more than one court rulings against the issuer within all procedures initiated of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $RCR_{it}$  denotes the total number of procedures with more than one court ruling against the issuer of the  $i$ th unit of observation during period  $t$ , and  $TNP_{it}$  refers to the total number of procedures initiated by the  $i$ th unit of observation over period  $t$ .

Using this indicator together with any of the other indicators outlined in this section may lead to double-counting some techniques. For example, when the court annuls the procedure for reasons already included in other corruption techniques, we count it twice in a composite indicator. While in general it may introduce a bias, we don't think it is an issue as court decisions are likely involving larger contracts (administrative fees make it no worth to go for smaller contracts) and more extensive violations. Hence, this double counting can be considered as weighting the importance of the revealed violations in some cases and simply revealing additional corruption risks in others.

Unfortunately, linking court rulings to public procurement procedures requires a large amount of manual labour as there is no standard reference in court rulings to the announcement being challenged.<sup>35</sup> Further work is needed to finalise this indicator.

### T4.3 Unfair scoring

Scoring of competing bids takes place every time bids are evaluated on the basis of price plus quality. Issuers are obliged to assemble an evaluation committee and keep records of their scoring. As the process of scoring is internal to the public organisation and attaching scores to subjective criteria (see T2.4) is difficult to effectively control from outside, scoring can be easily abused for the benefit of a corrupt network (Papanek, 2009). If scores are given to benefit a 'desired' company it clearly infringes upon the principle of fair competition.

The process of scoring is difficult to control for external bodies in general, but especially in the case of subjective evaluation criteria. Bidders who did not win are

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<sup>35</sup> In fact sometimes there is no direct reference at all besides the names of plaintiff and respondent and the short title of the announcement



likely to question the fairness of scoring; however, due to privacy law and trade secret considerations their chances of an effective challenge are rather low.

This technique works in tandem with T2.4 – tailoring evaluation criteria, as subjective criteria defined already at the outset makes the application of this technique easier.

According to one interviewee from the construction sector this technique is most likely exercised in a subtle way: the call for tenders defines evaluation criteria regarding non-quantitative performance and the evaluation committee scores these non-quantitative aspects in a barely visible unfair manner by giving the ‘desired bidder only one point in addition to the others. Nevertheless, these scores add up in the end just a little bit higher than the best ‘unwanted’ bidder.

Due to the lack of publicly available detailed records of the scoring and evaluation processes inside the issuer organisations there could be no direct indicator developed. Nevertheless, there are three indirect measures<sup>36</sup> which could point at the use of this technique:

- A) average contract value per weekdays available for decision,
- B) length of evaluation criteria, and
- C) weight of non-price criteria.

The number of days passed between the submission deadline and the final decision in general is likely to indicate the efficiency of the decision making process given the size (and complexity) of the contract to be awarded (Heggstad & Froystad, 2011; Strand, Ramada, & Canton, 2011). However, in the case of extremely short periods that is, a couple of days only the suspicion may arise that the decision was made in haste without serious consideration rather than extremely efficiently. This suspicion can be further strengthened if the total value of the contract is taken into account as more expensive contracts tend to be more complex, requiring longer time to arrive at an optimal decision. Hence, we propose the following indicator:

$$ADDCV_{it} = ( \sum_j (CV_{itj} / DD_{itj}) ) / TNT_{it}$$

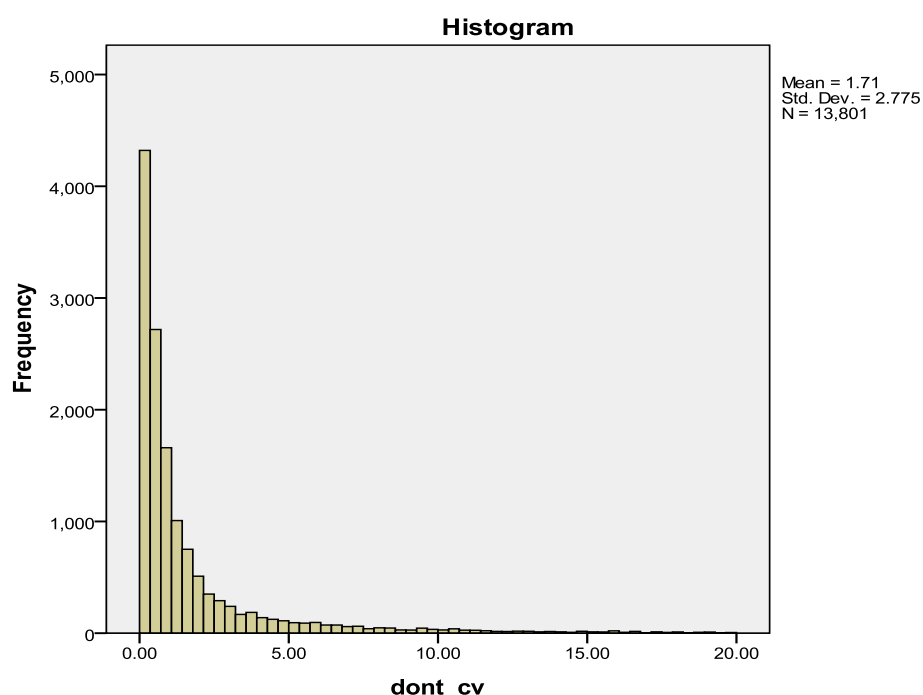
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<sup>36</sup> While in principle extremely short decision periods could be identified in a similar way extremely short submission periods were identified, unfortunately, the distribution of decision periods did not reveal any obvious cut-point or suspiciously short period (minimum was 7 days). Thus, no indicator is developed solely on the basis of decision periods.

where  $ADDCV_{it}$  refers to the average ratio of total contract value over the number of weekdays between submission and decision dates of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $DD_{ij}$  denotes the number of weekdays between submission and decision dates in the  $j$ th procedure of the  $i$ th unit of observation during period  $t$ ,  $CV_{ij}$  denotes the value of contract awarded in the  $j$ th procedure by the  $i$ th unit of observation during period  $t$ , and  $TNT_{it}$  refers to the total number of tenders concluded by the  $i$ th unit of observation over period  $t$ .

On average, this ratio almost reaches 3 throughout 2009-2011 that is, there were almost 3 million HUF of contract value for each weekday of submission period. It is noteworthy that the distribution of this ratio is highly skewed with only very few very large numbers (Figure 19). As decision periods may also reflect differences in technology and industry standards, it is conceivable that norming by market means leads to a better indicator.

**Figure 19. The distribution of average contract value (million HUF) per decision period (days), 2009-2011 (ratios < 20)**



Source: PP

The two other indirect indicators have already been discussed above (see T2.4) in detail. They are also relevant for this technique as subjective evaluation criteria make it easier and therefore more likely to score bids in an unfair manner. Using the

same indicators for techniques T2.4 and T4.3 reinforces the view that they are typically applied in tandem.

#### **T4.4 Abusing the unit price of contract value**

As has been outlined already, it is essential for any reporting system on public procurement to make information on contract values reliably and transparently available to the wider public. In this respect transparency may decrease corruption on its own (Transparency International, 2006). If the contract value is given in unit prices such as HUF per kWh or % of interest rate without explicitly specifying the corresponding quantities or at least the estimations of quantities the principle of transparency is violated as it is not possible to know how much money is being spent at the end of the day. Using unit prices in public procurement contracts can be source of abuse and corruption as reported by our interviewees and international examples (OECD, 2007). Contracts in unit prices allow for adjusting quantity intransparently throughout the lifespan of the contract hence obtaining corruption fee.

A particular widespread form of this technique can be found in the services sector where the pre-selected winner wins the actual tender on the basis of low unit costs. However, during delivery the corrupt issuer will allow the winner to invoice larger than actual quantities of at least some of the services delivered. 'Over-invoicing' is easily done without much risk of detection in services sector as hours spent on giving advice, meetings or fixing machines cannot be easily controlled externally. Obviously, those bidders which are not offered such a deal prior to bidding cannot offer so low prices for the services and lose out in competition which on paper looks fair, but in fact is not.

This corruption technique is closely associated with T3.5 – deliberate errors in document publication in its approach and effect, but it doesn't necessary imply an error in the figures presented rather a failure to provide additional information required for fully determining the value of a contract. This corruption technique works well with techniques related to performance of the contract, especially T5.4 – performance violating the contract, as it renders hiding such improper delivery less visible.

There is only one direct indicator of this corruption technique:

A) proportion of contracts using unit prices without stated total value,

while there could be no indirect indicators formulated.

At the heart of this technique lies the use of unit prices which can be done for a range of justifiable and non-corrupt reasons. For example, in the case of loans for a municipality, banks would compete on the basis of interest rate on the loan rather than simply on total cost as this is the standard pricing method of the industry. Nevertheless, even in standard cases where the use of unit prices is reasonable, the final total price of the goods and services delivered must be reported at least as an estimate according to the Public Procurement Law in order to avoid later intransparent modifications of spending value. The proposed indicator is:

$$PCAUP_{it} = NCAUP_{it} / NCA_{it}$$

where  $PCAUP_{it}$  refers to the proportion of awarded contracts using unit prices over the total number of contracts awarded by the  $i$ th unit of observation, typically public organisation, during period  $t$ ,  $NCAUP_{it}$  denotes the total number of awarded contracts using unit prices without stated total contract value of the  $i$ th unit of observation during period  $t$ , and  $NCA_{it}$  refers to the total number of contracts awarded by the  $i$ th unit of observation over period  $t$ .

Overall, there are very few contracts which are defined in unit prices and their proportion displays a strong decreasing trend in the period 2009-2012 (Table 8).

**Table 8. Average proportion of contracts awarded using unit precise for defining total contract value, 2009-2012**

	Mean	N <sub>unitp</sub>	N <sub>total</sub>
2009	4.2%	466	10982
2010	0.3%	59	17769
2011	0.4%	52	14140
2012	0.7%	77	10372
2009-2011	1.2%	655	53263

Source: PP

## 4.5 Contract implementation

### T5.1 Modifying the contract strategically

What gets delivered by the end of the contractual period is often different from what was originally contracted. If this deviation is not the result of plain negligence of contractual obligations then a contract has to be officially modified and announced in the Public Procurement Bulletin. While contract modifications can take place due to a range of justifiable reasons, such as exceptionally bad weather constraining construction works, it can also be abused for corrupt purposes (European Court of Auditors, 2012; Papanek, 2009). Corruption rent can be earned by increasing prices, extending deadlines, and diminishing quality each of which is regularly observed in a range of countries (Heggstad & Froystad, 2011; Kenny & Musatova, 2010; Lengwiler & Wolfstetter, 2006; OECD, 2007; Transparency International, 2006; Ware et al., 2007). This technique infringes on the principle of accountability, but it can also harm fair competition. This is the case when the 'desired' bidder knows about the possibility of contract modification prior to bidding enabling it to offer lower price and/or higher quality than its competitors

An effective constraint on this technique is that every modification of the original contract has to be announced in the Public Procurement Bulletin and all the other bidders have to be notified. There are no indications of regular breach of these obligations either according to interviews and media reports or court decisions. If the contract modification concerns aspects of the tender relevant for selecting the winning bidder those who lost the tender can challenge the contract award in court. In addition, supporting bodies like the National Development Agency try to minimize contract modification as much as possible due to EU funding regulations in particular.

This technique can be employed simultaneously with virtually any other technique. Nevertheless, it may be a substitute for any corruption technique limiting competition in the bidding phase as there is no need for modifying the contract if the 'desired winner' could offer a higher price and/or lower quality already at the outset. It is also a substitute for T5.4 – performance violating contract, as if simple violation is feasible it is not necessary to risk raising attention through modifying the contract with its publication requirements.

There could be three direct indicators conceived for this corruption technique while there is no indirect measure:

- A) proportion of modified contracts,
- B) difference between the awarded and final contract value, and
- C) difference between originally planned and final completion period.

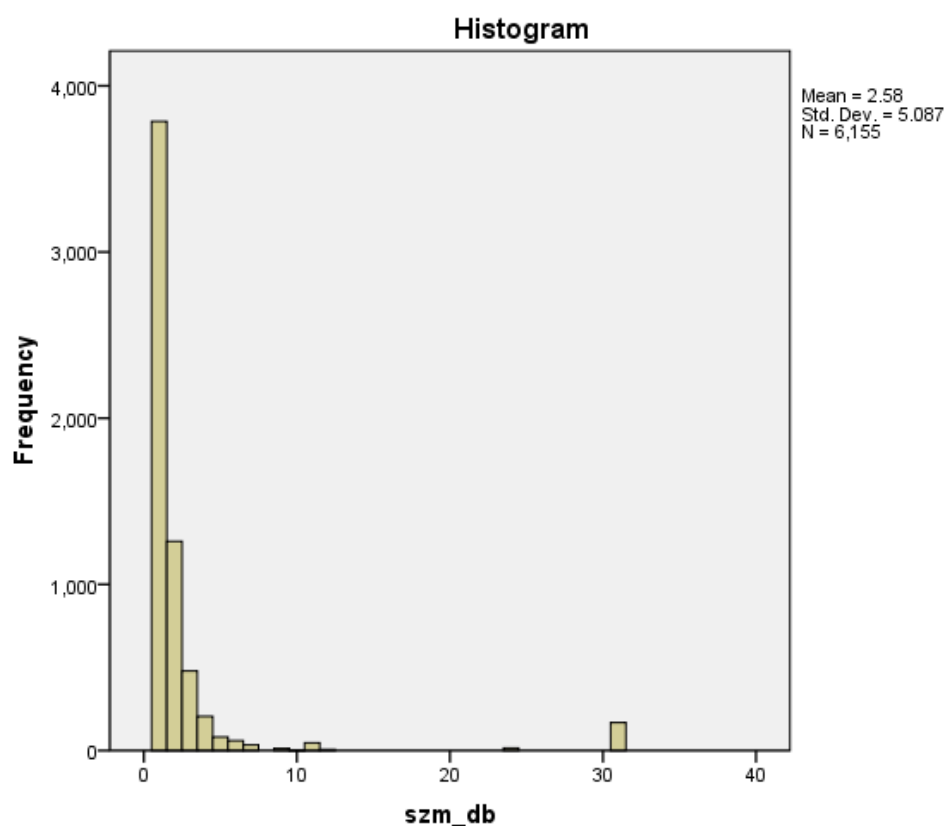
As highlighted above, contracts can be modified for a range of reasons; however, those markets or issuers where contract modification is a regular practice may still be considered as higher corruption risk markets or issuers. This is because, we can expect issuers to develop specific skills over time to manage more complicated or more uncertain contracts rendering contract modifications for non-corrupt reasons an exception rather than the rule. By implication, the proposed indicator is:

$$PMC_{it} = NMC_{it} / NCA_{it}$$

where  $PMC_{it}$  refers to the proportion of awarded contracts which were subsequently modified over the total number of contracts awarded by the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $NMC_{it}$  denotes the total number of awarded contracts which were subsequently modified of the  $i$ th unit of observation during period  $t$ , and  $NCA_{it}$  refers to the total number of contracts awarded by the  $i$ th unit of observation over period  $t$ .

Overall, contract modifications are surprisingly frequent events, annually between 4% to 16% of all contracts were subsequently modified. This underlies the importance of the contract implementation phase compared to the contract award phase in terms of final outcomes. What is even more surprising is that a large number of contracts, over 2300, were modified more than once (Figure 20). On average modified contracts were modified 2.6 times. Contract modification have experienced a considerable spike in 2010 and 2011, that is after the new government came into power suggesting the potential links between electoral cycles and contract modification activities.

**Figure 20. Number of contract modifications per contract, 2009-2011 (only those contracts are depicted which were modified at least once)**



Source: PP

Whether a contract has been modified or not is a rather blunt indicator of corruption risks as it leaves aside two major ways of earning corrupt rents: 1) increasing final contract value and 2) increasing completion period for saving production costs. In order to gauge the first kind of corrupt practice, the following direct indicator of the corruption technique is proposed:

$$ARVCM_{it} = ( \sum_j ((FCV_{ijt} - OCV_{ijt}) / OCV_{ijt}) ) / NCA_{it}$$

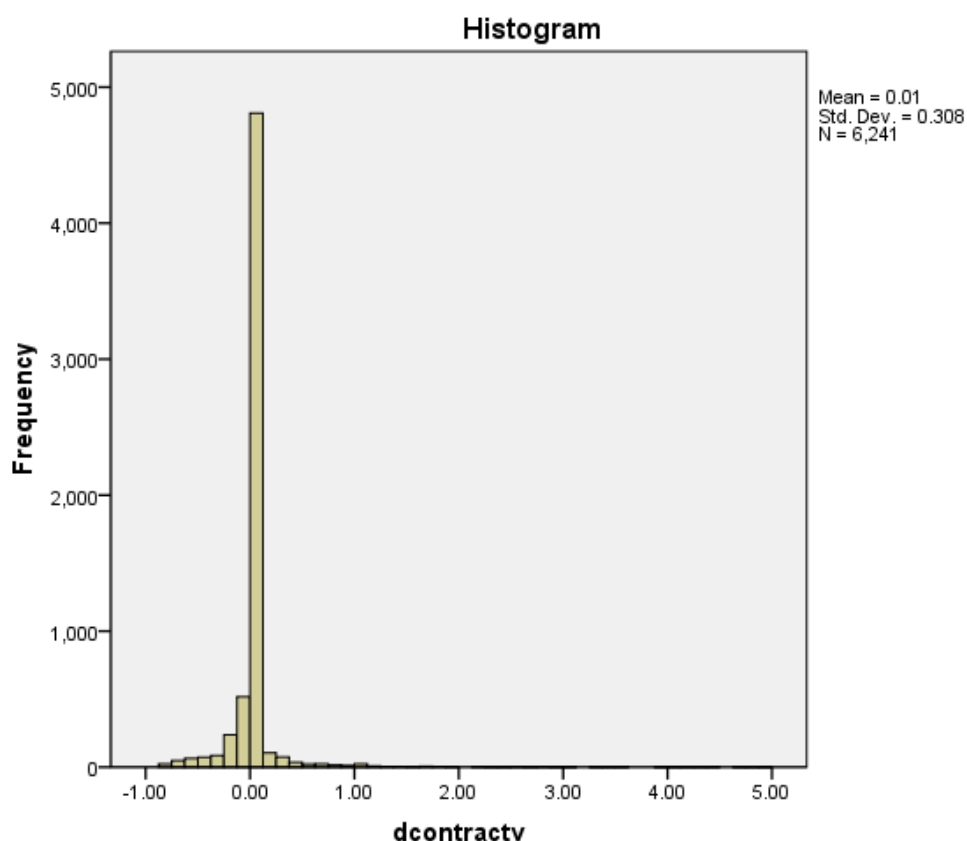
where  $ARVCM_{it}$  refers to the average relative value of contract modifications<sup>37</sup> of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $FCV_{it}$  denotes the final contract value in the  $j$ th procedure of the  $i$ th unit of observation during period  $t$ ,  $OCV_{it}$  refers to the original contract value of the  $j$ th procedure by the  $i$ th unit of

<sup>37</sup> This excludes the increases in contract value due to utilizing the pre-defined reserves. This source of additional spending as a corruption indicator is discussed below in section T5.2.

observation over period  $t$ , and  $NCA_{it}$  refers to the total number of contracts awarded by the  $i$ th unit of observation over period  $t$ . This indicator takes into account that in absolute terms larger contracts are more likely to have larger deviations, hence a proportionate indicator is suggested.

The final contract values differ in a great number of cases from the originally contracted contract values both exceeding it and falling under it (Figure 21) while the publication of these figures is frorn with a number of errors (see section T3.5). Over 80% of the observed procedures fall within +/- 1% of the original contract value. Interestingly, in slightly more than 7% of the observed procedures, the final contract value excessively surpasses the original contract value (taking a 10% price increase as a threshold, arguably an arbitrary cut-point).

**Figure 21. Distribution of procedures according to the relative value of contract modifications, 2009-2012**



Source: PP

Note: Contract value deviations less than 80% and more than 500% were removed because they most likely represent data errors (for more details see section T3.5).



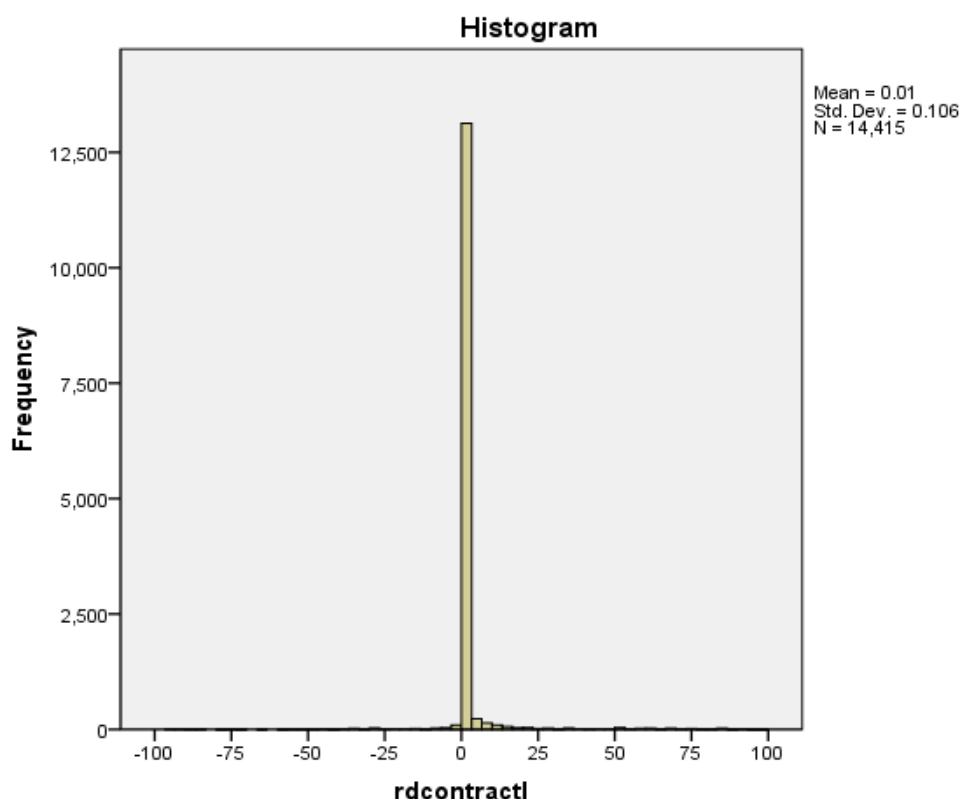
The ‘well-connected’ winner can also decrease its production costs by increasing the time available for delivery as it gives the supplier more flexibility to economise on its production factors and deliver when it is most beneficial for itself. This of course implies costs to the issuer in terms of foregone benefits of using the supplied products or goods. In order to capture this kind of potentially corrupt behaviour we propose the following indicator:

$$ARTCM_{it} = ( \sum_j ((FCT_{itj} - OCT_{itj}) / OCT_{itj}) ) / NCA_{it}$$

where  $ARTCM_{it}$  refers to the average relative change in the length of delivery due to contract modifications of the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $FCT_{it}$  denotes the final contract length in the  $j$ th procedure of the  $i$ th unit of observation during period  $t$ ,  $OCT_{it}$  refers to the original contract length of the  $j$ th procedure by the  $i$ th unit of observation over period  $t$ , and  $NCA_{it}$  refers to the total number of contracts awarded by the  $i$ th unit of observation over period  $t$ . This indicator takes into account that in absolute terms longer contracts are more likely to have longer changes, hence a proportionate indicator is suggested.

A picture very similar to contract values is revealed by this indicator, albeit deviations are even more rare in this case (Figure 22). A large majority, about 90% of contracts has exactly the planned contract length, whereas only 4% of contracts considerably exceeds the originally planned or contracted length (taking a 10% increase in contract length as an arbitrary cut-point).

**Figure 22. Distribution of awarded contracts according to the relative change in contract length, 2009-2012, %**



Source: PP

### T5.2 Abusing an add-on contract or emergency reserve

This corruption technique comes in two variants sharing the same logic, but differing in the method of realisation. First, once a contract is awarded, the need for additional but linked services or goods can arise, justifying the award of one or more add-on contracts. For example, unforeseen characteristics of a construction site may require additional work to be completed such as removing previously unknown objects from the site. This, nevertheless, creates the opportunity to extract rents in a corrupt manner (Papanek, 2009). Invoking some sort of technical reason – justified or not – (e.g. that the company is already on the construction site with its machines and people) is sufficient to invite only the winner of the prior contract to the public procurement procedure for the add-on contract (European Court of Auditors, 2012). Then the sole bidder can set a price substantially above market price earning extra profit for the corrupt network. If the well-connected bidder knows about the potential

for add-on contracts it can offer low price and/or high quality for the first contract, even if it loses money on it, as it will be able to more than compensate for the losses in the second or later contracts.

Second, additional services and goods can also be delivered within the framework of the main contract if it contained a reserve for unforeseen circumstances. According to interviewees, winning a contract at a competitive market price knowing that 10-15% of extra money will surely accompany the main contract from the reserve for 'unforeseen' events is the major technique for extracting the corrupt rent in Hungarian large infrastructure projects. While this variant of the corruption technique is essentially the same as the use of add-on contracts, it doesn't require any additional announcement or external intervention. Hence, it is very difficult to externally monitor.

While splitting up contracts is heavily regulated by the Public Procurement Law, it is relatively easy in complex projects, especially in construction, to name some unforeseen circumstances based on which add-on contracts can be awarded in a subsequent procedure. In addition, if the add-on contracts fall outside the Public Procurement Law, for example because they are small, then monitoring and external review becomes difficult.

A typical example of abusing add-on contracts was shared by one of our interviewees working as a supplier in the healthcare sector for several decades: "the contract for delivery of expensive machinery can be awarded to a company offering impossibly low prices making a considerable loss on the deal. However, moving the machines within the hospital from one room to another is not part of the original contract, rather there will be a separate contract between the hospital and the company using inflated prices (not announced anywhere publicly). For example 100 000 HUF (350 EUR) for moving a machine from one room to another, practically moving it 10 meters. Then you just need to move those machines a couple of times back and forth and you can imagine the amount of profit generated...".

An example for abusing emergency reserves comes from a large highway construction project where, according to the interviewee, it was easy to find justification for exhausting the contractual reserves simply by referring to the need for building auxiliary roads for the construction site. Such roads are built when bad

weather such as heavy rain makes it hard to approach the construction site and deliver the necessary equipment and material. It is unlikely that any review body would go and check weather data and contest the necessity of building expensive auxiliary roads.

Abusing add-on contracts comes very close to T2.1 - tinkering with thresholds and exceptions, but in this case at least one of the contracts is awarded under the umbrella of the Public Procurement Law and rules on combining contracts and exceptions are circumvented only for the other contract(s). Abusing emergency reserves is very similar in effect to T5.1 – modifying the contract strategically with the important difference that the contract modification can be achieved within the framework of the original contract. Furthermore, both of the variants of this technique can be substitutes for the techniques limiting competition during the bidding phase as there is no need to limit competition if the ‘pre-selected’ bidder can win through a fair competitive procedure and subsequently increase its profit through abusing add-on contracts and emergency reserves.

There could be conceived two direct indicators for this corruption technique, reflecting the two variants it comes in:

- A) proportion of add-on contracts, and
- B) proportion of contracts exhausting the planned reserves.

Focusing simply on the regularity of using add-on contracts signals the most substantive corruption risks, especially if this practice is standard in the given context. As add-on contracts may well fall below the threshold for applying the Public Procurement Law many of the less costly instances of this techniques cannot be recorded by our database. The proposed indicator is the following:

$$PAOC_{it} = NAOC_{it} / NCA_{it}$$

where  $PAOC_{it}$  refers to the proportion of awarded contracts followed by at least one add-on contract over the total number of contracts awarded by the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $NAOC_{it}$  denotes the total number of awarded contracts followed by at least one add-on contract of the  $i$ th unit of observation during period  $t$ , and  $NCA_{it}$  refers to the total number of contracts awarded by the  $i$ th unit of observation over period  $t$ .

Our method of identifying add-on contracts could only rely on simple key-word search in the contract title which often highlight the fact that a contract is on top of an existing one. Unfortunately, there is no standardized definition in the Public Procurement Law of add-on contracts and no uniform way of linking add-on contracts to main contracts. By implication, our identification procedure may only scratch the surface of the phenomenon. We identified 128 add-on contracts throughout 2009-2012 with a total value of 6.5 million EUR.

Gauging the regularity of exhausting the pre-defined emergency reserve can be directly measured in the following way even though some issuers may not readily report the reserves built-in their contracts<sup>38</sup>:

$$PEER_{it} = NEEC_{it} / NECA_{it}$$

where  $PEER_{it}$  refers to the proportion of awarded contracts exhausting the emergency reserve over the total number of contracts containing such a reserve provision awarded by the  $i$ th unit of observation, typically public organisation, over period  $t$ ,  $NEEC_{it}$  denotes the total number of awarded contracts exhausting the emergency reserve of the  $i$ th unit of observation during period  $t$ , and  $NECA_{it}$  refers to the total number of contracts containing a reserve provision awarded by the  $i$ th unit of observation over period  $t$ .

While it was possible to screen contracts for identifying whether they contain an emergency reserve, number of cases is too low to provide a meaningful analysis. Further work is needed in this respect to identify more relevant cases.

### T5.3 Performance violating the contract

At the end of the day, looking at contractual relationships, reported characteristics of public tendering and contracts are useful only to the degree they reflect what is happening in reality, that is whether performance is according to contract or not. However, if the issuer and contractor are parts of the same corrupt network, it is relatively easy to simply deviate from contractual obligations secretly and earn profit on it. This can be done by lower than agreed quality or lower quantity (Meagher

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<sup>38</sup> While there are numerous examples of reporting contractual emergency reserves, there is no clear evidence that this practice would be mandatory for every issuer or that the Public Procurement Authority would regularly control and enforce its reporting. Hence, we have the suspicion that the above indicator is downward biased.

Patrick, 1997; Piga, 2011). Such a corruption technique violates the principle of accountability and it has been observed in a range of countries (OECD, 2007; Papanek, 2009; Transparency International, 2006). A simple way to implement such transactions is to bribe the technical controller or involve the controllers in the network directly. In the case of large construction projects, low quality or deficient quantity may not be visible at all at for a couple of years. Often quoted examples by our interviewees were lower than contracted quality cables and tubes in the wall or deficient strength of the base for roads due to lower than contracted quantity of some expensive material.

If control was ineffective during the construction phase, it is very difficult to exercise effective ex-post control in the case of construction projects. The only means to keep this corruption technique at bay in construction projects is the effective enforcement of guarantee clauses forcing the suppliers to factor in future repair costs under a scenario that their 'connections' may not be in power anymore. For services contracts, performance cannot be effectively checked in many cases if the buyer and contractor cooperate in perpetrating corruption (see at section T5.2 on the example of add-on services contracts).

This corruption technique can be combined with practically any of the above techniques, while it may be a substitute for T5.1 – modifying contracts strategically as modification is not necessary if contractual obligations can be simply violated without consequences.

Unfortunately, due to its invisible nature even to thorough audits, this corruption technique could not be associated with any direct or indirect indicators. It is, nevertheless, suggested that we can consider this technique as an unmeasured, but very likely correlate of the above techniques. Based on media reports, low quality/quantity performance is typical of high corruption risk contracts.

#### **4.6 Summary of corruption techniques and their indicators**

As there are many corruption techniques and indicators, it is worth summarizing the above discussion in one table outlining corruption techniques and the corresponding direct and indirect indicators (Table 9). It is clear from the above discussion as well as the below table that a number of indicators could signal multiple techniques and that some techniques are likely substitutes or complements for each other bearing consequences for the correlations across their indicators. Later on, these hypothesized relationships across indicators can be used for verifying corruption indicators.

**Table 9. Summary of corruption techniques and their indicators**

ID	Name	Direct indicator	Indirect indicator
T1.1	Defining unnecessary needs	-	-
T1.2	Defining needs to benefit a particular supplier	A) Prevalence of avoiding centralised procurement	-
T2.1	Tinkering with thresholds and exceptions	A) Proportion of non-open procedures B) Average corruption risk score of procedures followed C) Frequency of actual contract value above estimated contract value	D) Contract value according to Public Procurement Law/total procurement contract value
T2.2	Tailoring eligibility criteria	A) Length of eligibility criteria	-
T2.3	Abusing formal and administrative requirements	A) Length of eligibility criteria B) Proportion of excluded bids	-
T2.4	Tailoring evaluation criteria	A) Length of evaluation criteria B) Weight of non-price criteria	-
T2.5	Using long term complex contracts	A) Combined value of framework contracts and PPPs / total contract value B) Average contract duration	-
T2.6	Tinkering with submission period	A) Proportion of tenders with accelerated submission periods B) Proportion of tenders with extremely short submission periods C) Average contract value per weekday available for submission	-
T3.1	Selective information provision	-	A) Proportion of tenders with extremely short submission periods B) Proportion of procedures with call for tenders modified within all procedures
T3.2	Avoiding publication of call for tenders	A) Proportion of tenders without call for tenders in the official journal	-
T3.3	Strategically modifying call for tenders	A) Proportion of procedures with call for tenders modified within all procedures	-
T3.4	Excessively pricey documents, difficult access to documents	A) Price of documentation/estimated contract value	-
T3.5	Deliberate errors in document publication	A) Prevalence of extremely erroneous contract award announcements B) Hiding or erroneously reporting the final contract value	-
T4.1	Strategically annulling procedures	A) Proportion of annulled procedures re-launched subsequently	B) Decrease in the number of bids received in subsequent rounds
T4.2	Repeated violations of public procurement rules	A) Repeated court rulings against the issuer within the same procedure	-
T4.3	Unfair scoring	-	A) Average contract value per weekday available for decision B) Length of evaluation criteria C) Weight of non-price criteria
T4.4	Abusing unit prices in the contract	A) Proportion of contracts using unit prices	-
T5.1	Modifying contracts strategically	A) Proportion of modified contracts B) Difference between the awarded and final contract value C) Difference between originally planned and final completion period	-
T5.2	Abusing add-on contracts	A) Proportion of add-on contracts B) Proportion of contracts exhausting the planned reserves	-
T5.3	Performance violating contract	-	-



## **5. Instead of conclusions: the use of such an inventory and some reservations**

According to the academic literature, interviews, and the media analysis, the list of corruption techniques in use has not changed much in the last 10 years in Hungary or internationally. While quantitative analysis revealed that the prevalence of individual techniques changed probably due to regulatory action and the evolution of corruption networks' resources. These observations suggest that there may be a reliable basis for the time series analysis performed later.

The indicators presented in this paper by no means exhaust the full list of corruption techniques and the potential measurement tools. On the one hand, they can only represent the best available evidence collected by the authors. On the other hand, they primarily relate to the Hungarian and Eastern European context. For these reasons, this paper shall be considered as a living book to which further techniques and indicators will be added as more evidence is unearthed either from Hungary or from other countries. Currently, research by the authors and further colleagues is ongoing in a range of countries such as Croatia, Czech Republic, Romania, Russia, and Slovakia which hopefully will add further detail and evidence to this list.

### **5.1 Use of such an inventory**

First and foremost, the long list of corruption techniques and the corresponding indicators set out above provide a solid basis on which indicator verification can take place and a composite corruption indicator can be built. Any composite indicator developed from these elementary measures should take into account the substitutability and synergies existing between many of the above variables. Hence, the analysis of their co-variation can increase our trust in their validity and usefulness as indicators of corruption. In a further paper, the authors link each of these elementary indicators situated on the input side of the corruption process to outcome indicators of the corrupt procurement process. Outcome indicators in this respect directly relate to the corrupt selection of bidders. Examples include single bidder contracts, exclusion of all but one bidder, or political office of winning bidder's owners.

Second, while the above list may appear very long and some description very cumbersome, it allows for detecting changes over time in the relative use of these

techniques. Thus, it also increases our confidence in linking the whole set of corruption indicators to the underlying actual level of corruption as hopefully only a few major techniques remained unaccounted for.

Third, this list may also be useful for audit and control institutions which aim at curbing corruption in public procurement and other areas of public spending in which bidding and auctions are a major method of resource allocation (e.g. EU funding for enterprise development or publicly owned land allocation).

## 5.2 Interpretation challenges

There are three main challenges to this paper's approach as we can see:

1. **The benchmark is moving:** the legal and societal norms are changing over time, so does the benchmark according to which we define corruption. But, principles and overarching objectives of public procurement are stable throughout our observation period hence this problem can be partially sidelined. Of course, the details of the legal framework are changing constantly which may be considered as a corruption risk on its own, but these can be taken into account in the details of the indicators developed without touching on the underlying principles (e.g. legally binding thresholds may change from year to year, the underlying behaviour of abusing exceptions remains the same and can be precisely measured).
2. **Confounding administrative incompetence and corruption:** Arguably, many of the behavioural patterns revealed by our indicators can also be produced by simple administrative incompetence that has nothing to do with corruption. On the one hand, carefully defining corruption indicators may solve a large part of this critique, as some non-random, but moderate values may very well result from incompetent procurement management, however, recurrent and gross errors and misconduct suggest deliberate action. On the other hand, systematically controlling for administrative capacity from independent sources such as the Treasury's institutional annual wage statistics and testing relationships among individual indicators can vastly increase our confidence in measurement and refine the indicators (e.g. length of eligibility criteria in general is unrelated to the decrease in the number of bidders while above a certain threshold it turns out to be a significant and

powerful predictor). Nevertheless, one could argue that administrative incompetence may very well co-evolve with corruption. Therefore, to some degree, disentangling the two may not be fully possible (Golden & Picci, 2005).

3. **Indicators and underlying mechanism describe attempts at solving the widespread problem of low trust in business transactions rather than corruption:** In a low trust environment where many companies cannot be trusted to deliver, official records are imprecise, and the courts are inefficient at resolving business disputes the behaviour described as corrupt may very well aim at getting things done in spite of generally unreliable business relationships. For example, deliberately tailoring the tender to the company of a cousin may serve the public interest if the family tie is used by the officials to enforce the contract. Now, this often implies an extra costs which we interpreted as corrupt rent; however, it may simply be the cost of extra-contractual monitoring and enforcement mechanism that has nothing to do with corruption. Further qualitative and quantitative work is needed to rule out this alternative explanation.

## Chapter 5 - Anatomy of grand corruption: a composite corruption risk index based on objective data<sup>39</sup>

### 1. Introduction

Various corruption indices have received considerable academic, policy, and media attention, at least partially due to the central role the underlying phenomena play in the quality of democratic governance, the provision of public goods, economic growth, and equality. Understanding their importance, some international organisations regularly monitor corruption in their member countries (European Commission, 2011c) and even tie funding to performance on governance indicators including corruption (Andersson & Heywood, 2009; Radelet, 2002, 2003).

In the absence of robust objective measures, there are three major sources of corruption indicators to date: 1) surveys of corruption perceptions and attitudes (which are most widely used); 2) reviews of institutional and legal frameworks; and 3) detailed analyses and audits of individual cases. Unfortunately, each of these has serious deficiencies leaving us without any reasonably reliable and valid indicator of corruption allowing for comparing countries over time or exploring within country diversity.

In order to fill some of the gap between the demand for corruption indices and the dire state of the data currently available, the goal of this paper is *to develop a novel measure of institutionalised grand corruption* which:

1. solely derives from objective data describing behaviour,
2. is defined on the micro level such as individual transactions,
3. allows for consistent temporal comparisons within and across countries, and
4. rests on a thorough understanding of the corrupt rent extraction process.

In the context of public procurement, institutionalised grand corruption refers to the particularistic allocation and performance of public procurement contracts by bending prior explicit rules and principles of good public procurement in order to benefit a

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<sup>39</sup> Some of the research underlying this chapter has been conducted in collaboration with István János Tóth from the Corruption Research Center Budapest.

group of individuals while denying access to all others (for a related discussion see Mungiu-Pippidi, 2006; North et al., 2009; Rothstein & Teorell, 2008).

The proposed indicator of institutionalised grand corruption fulfils all of the above criteria with potential for replication in most developed countries including every EU member state, Russia, and the US. Time series available in these countries range between 6-8 years. The approach makes use of micro-level data on individual public procurement procedures allowing for directly modelling corrupt actors' rent extraction activities. Institutionalised grand corruption in public procurement requires 1) the generation of corrupt rents and 2) the regular extraction of such rents. To achieve both of these, any corrupt group has to restrict competition prescribed by procurement laws to benefit a particular bidder multiple times. Hence, measuring the degree of competition restriction, recurrent contract awards to the same company, and the typical techniques used to achieve these goals allow for detecting institutionalised grand corruption consistently across countries, organisations and time.

The paper is structured as the follows: first, the literature on corruption measurement is reviewed; second, the proposed novel measurement approach is presented; third, Hungarian data and variables are summarized; fourth, the composite corruption risk index is constructed and some external validity measures offered; finally, conclusions and further research directions are provided.

## 2. Literature on measuring grand corruption

By now, an industry has emerged for measuring corruption. However, the available measurements are either fundamentally flawed or too narrow for testing theories of grand corruption and developing effective solutions to it.

In a broad sense, corruption indicators derive primarily from:

- Surveys of *attitudes, perceptions* and *experiences* of corruption among different stakeholders (e.g. general population, firms, experts);
- Reviews of *institutional features* controlling corruption in countries or individual organisations; and
- Audits and investigations of *individual cases* (see Kaufmann, Kraay, & Mastruzzi, 2006; Transparency International, 2012).

Among *perception and attitude surveys*, the two most widely used are the World Bank's Control of Corruption (Kaufmann et al., 2010) and Transparency International's Corruption Perceptions Index<sup>40</sup>. Both of these have received extensive criticism applicable to any similar survey (Andersson & Heywood, 2009; Kaufmann et al., 2007; Kurtz & Schrank, 2007a, 2007b; Lambsdorff, 2006b). Without trying to be exhaustive, some of the key arguments include: perceptions may or may not be related to actual experience (Rose & Peiffer, 2012), they can be driven by general sentiment reflecting, for example economic growth (Kurtz & Schrank, 2007a) or media coverage of high profile corruption cases (Golden & Picci, 2005). Arguably, perceptions of grand corruption are even more unreliable than perceptions of everyday corruption since experts and citizens have almost no direct experience of this type of corruption. As both indicators and others of this type primarily derive from non-representative surveys, representativeness bias is likely to occur, in addition to reflexivity bias (i.e. respondents influenced by prior and future measurements) exaggerated by small sample sizes (Golden & Picci, 2005). These indicators vary surprisingly little over time given the large changes in underlying governance structures suggesting that they are too *insensitive* to change (Arndt & Oman, 2006; Kurtz & Schrank, 2007a; Mungiu-Pippidi, 2011).

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<sup>40</sup> <http://cpi.transparency.org/cpi2012/results/> (accessed: 16/1/2013)

*Surveys of experiences* with corruption, that is low-level bribery, such as the Quality of Government Institute's regional survey (Charron, Dijkstra, & Lapuente, 2010) or surveys in Latin American countries (Seligson, 2002) while addressing some of the weaknesses of perception surveys fall short of a sufficient data source. A prime problem is non-response or false response to sensitive questions such as giving or receiving bribes. Most importantly, only a tiny fraction of the population has direct experience with grand corruption limiting the use of this method.

*Reviews of institutions controlling corruption*, while crucial in understanding the determinants of corruption, are, by design, not measuring corruption directly. In the absence of a precisely measured outcome variable, they have to rely on untested theories of which institutional features work.

*Analyses of individual cases* are highly reliable in establishing and explaining both petty and grand corruption, however, their narrow scope and lack of generalizability make them of only limited use for comparative purposes.

## **2.1 Objective measures of corruption**

Some authors recognising the deficiencies of the above indicators have embarked on developing objective measures which rely on directly observable, hard indicators of behaviour that likely indicate corrupt behaviour (Table 10). These studies look into corruption in various contexts such as elections and high level politics or welfare services and redistributive politics. For example Olken (2007) uses independent engineers to review road projects and calculates the amount and value of missing inputs to determine corruption. More closely associated with our approach are those studies which focus on corruption in public procurement and bidding markets. For example, Golden & Picci (2005) propose a new measure of corruption based on the difference between the quantity of infrastructure and public spending on it. Other authors use some indicators also part of our composite indicator such as the use of exceptional procedure types (Auriol et al., 2011) or explicit scoring rules (Hyytinen, Lundberg, & Toivanen, 2008) or political connections of winning companies (Goldman, Rocholl, & So, 2013).

While these papers inspired our approach and point in the right direction, they cannot readily be scaled up to allow for temporal comparisons across countries and organisations. The reason is that they rely on a too narrow single indicator which

may or may not be the primary vehicle for corrupt rent extraction depending on the regulatory framework in place (Olken & Pande, 2012). For example, corruption linked to exceptional procedure types may be easily removed by simply deleting the procedure from the procurement law, however it is unlikely that this alone would change the underlying corrupt phenomena much (Auriol et al., 2011). Instead, these and further elementary indicators have to be combined for meaningful temporal international comparisons.



**Table 10. Summary of selected studies using objective indicators of corruption**

paper	indicator used	Country	year	sector	potential for international comparison	part of CRI*
(Auriol et al., 2011)	Exceptional procedure type	Paraguay	2004-2007	general procurement	HIGH If procedure definitions can be aligned, international comparisons can be made widely	Yes
(Bandiera, Prat, & Valletti, 2009)	Price differentials for standard goods purchased locally or through a national procurement agency	Italy	2000-2005	various standardized goods (e.g. paper)	LOW Price data is not readily available in most countries, many countries don't have national procurement agencies, national procurement agencies are likely to be captured in many countries.	No
(Coviello & Gagliarducci, 2010)	Number of bidders Same firm awarded contracts recurrently Level of competition	Italy	2000-2005	general procurement	HIGH Number of bidders, recurrent contract award, and competitiveness of bids are available in many countries.	Yes
(Di Tella & Schargrodsky, 2003)	Difference in prices of standardized products such as ethyl alcohol	Brazil	1996-1997	health care	MEDIUM Detailed product-level price and quantity information is not readily available across many countries, but can be collected.	No
(Ferraz & Finan, 2008)	Corruption uncovered by federal audits of local government finances	Brazil	2003	federal-local transfers	LOW high quality audits, not influenced by powerful corrupt groups are unlikely to be available in many countries.	No
(Golden & Picci, 2005)	Ratio of physical stock of infrastructure to cumulative spending on infrastructure	Italy	1997	infrastructure	MEDIUM It is hard to compute comparable value of the stock of physical capital across countries different in the quality of infrastructure and geography.	No
(Goldman et al., 2013)	Political office holders' position on company boards	USA	1990-2004	general procurement	HIGH Company contract volumes can be estimated in many countries and publicly listed companies political connections can be traced relatively easily.	No**
(Hyytinen et al., 2008)	Number and type of invited firms Use of restricted procedure	Sweden	1990-1998	cleaning services	HIGH Both number of bidders and procedure types are readily available in many countries.	Yes
(Olken, 2006)	Difference between the quantity of in-kind benefits (rice) received according to official records and reported survey evidence	Indonesia	1998-1999	welfare spending	MEDIUM It is possible to design user surveys across a wide range of countries to track actual receipts, although it may be expensive.	No
(Olken, 2007)	Differences between the officially reported and independently audited prices and quantities of road construction projects	Indonesia	2003-2004	infrastructure (roads)	LOW Auditing large numbers of projects by independent engineers is costly and unlikely to allow for cross-country comparisons.	No
(Reinikka & Svensson, 2004)	Difference between block grants received by schools according to official records and user survey	Uganda	1991-1995	education	MEDIUM It is possible to design user surveys across a wide range of countries to track actual receipts, although it may be expensive.	No

\*CRI=Corruption Risk Index, developed in this paper; \*\*This approach is utilized in (Fazekas, Tóth, & King, 2013).

### 3. The measurement approach

#### 3.1 Corrupt rent extraction in public procurement

Institutionalised corruption's primary aim is earning corruption rents. Corruption rents in public procurement can be earned if and only if the winning contractor is a *pre-selected* company which earns *extra profit* due to higher than market price for the delivered quantity and/or quality.

The winning company has to be pre-selected in order to control rent extraction in an institutionalised manner. This rules out occasional corruption where the company is lured into corruption during the public procurement process. Extra profit has to be realised in order to create the pot of money from which rents can be paid.

In order to adequately measure extra profit; price, delivered quantity, and quality of deliveries has to be known with high precision. However, none of these three can adequately be measured. Price and quantity are publicly available, but they are comparable only for homogenous products such as electricity without laborious case-by-case analysis and even then it is difficult to arrive at accurate estimates. Quality cannot be reliably observed in official records without using expensive expert knowledge. Hence, *we can only measure the process of awarding contracts to pre-selected companies.*

Competition has to be eliminated or tilted in order to award the contract to the pre-selected company. Bypassing competition can be done in three primary forms, each corresponding to a phase of the public procurement process:

1. Limiting the set of bidders: submission phase;
2. Unfairly assessing bidders: assessment phase; and
3. Ex-post modifying conditions of performance<sup>41</sup>: delivery phase.

On the one hand, these three elementary corruption strategies can be combined in any way to reach the final desired outcome. For example, some bidders may be excluded with a tightly tailored eligibility criteria while the remaining unwanted

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<sup>41</sup> While modifying contract conditions does not belong to the set of company selection techniques, it can be part of an arsenal supporting the selection of the 'right' company. For example, the pre-selected company wins in a competitive process by promising low price and high quality knowing that later contract modifications will allow it to earn the agreed corruption rent.

bidders can simply be unfairly scored on subjective scoring items. On the other hand, once the desired outcome has been achieved at a given stage, there is no need for further corrupt actions which would increase the risk of detection with no additional benefit. For example, if the only company submitting a valid bid is the pre-selected company there is no need to modify contract content later to increase price.

### 3.2 Measurement model

Utilizing a public procurement database (for details see section 4), it is possible to measure a host of elementary indicators in relation to each of the above three stages of public procurement from which a composite indicator can be built (see chapter 4).

In order to most adequately model the company selection process, measurement is carried out on the level of individual contract award. Later, aggregation to organisation level per year can also be carried out to link procurement data to company profitability for example.

Likely *outcomes* of corrupt procurement procedures are defined for each of the above three main phases (see section 5.1). Indicators of likely corruption techniques to achieve these outcomes in each phase are also defined, which constitute the *inputs* for corrupt contract award and completion (see chapter 4)

The *corrupt contract award process is modelled* using multiple regression linking likely corruption inputs (e.g. eligibility criteria tailored to one company) to likely corruption outcomes (e.g. only one company submitting a bid) in the presence of variables controlling for alternative explanations (e.g. number of competitors on the market). Our models linking corrupt inputs to outcomes in public procurement explain recurrent contract award to a pre-selected company with those corruption techniques which typically serve as means for corruptly eliminating competitors (see chapter 4)

The explanatory model linking corruption inputs to outcomes delivers a set of coefficients which represent the strength of association between each underlying likely corruption input and likely corruption outcome. Reliability of elementary corruption indicators is defined using their regression coefficients, as those corruption inputs which are more powerful in predicting probable corruption outcomes are more likely to signal corruption rather than noise. Falsely indicating corruption is minimised by dropping those indicators which didn't prove to be

powerful and significant predictors in the model and assigning lower component weights to those whose effect is only moderate.

In each country's composite indicator, corruption outcomes, having no regression coefficients, receive *weight* of 1 reflecting their benchmark status in modelling the corruption process. Corruption outcomes measure most directly the underlying corrupt transactions hence their benchmark status. If overall model fit is adequate (i.e. passes standard tests of significance), the underlying model structure is verified supporting the conclusion that corruption outcome indicators are adequate themselves. Every powerful-enough corruption input receives a weight between 0 and 1, reflecting the size of its regression coefficient. This means that all weights are scaled compared to corruption outcomes.

For comparison across time and countries, both the list of components and component weights are kept constant unless there are differences in the institutional setup warranting any deviation. This is because some corruption inputs may be unused in some countries while widely used in others. Giving these different weights maximises the validity of the composite indicator while keeping measurement consistent across time and countries. As corruption techniques can substitute for each other, the different component weights reflect institutional features impacting on the form not the substance of institutionalised grand corruption (For details of comparative CRI see chapter 6).

Using the weights obtained from the measurement model, elementary indicators are simply summed to produce the corruption risk composite indicator of individual transactions. Summation reflects the view that any of the elementary corruption techniques is sufficient on its own to render a procedure corrupt; while multiple signs of corruption indicate higher corruption risks. Hence, we suggest the following formula for the composite indicator:

$$CRI^t = \sum_j w_j * CI_j^t \quad (1)$$

$$\sum_j w_j = 1 \quad (2)$$

$$0 \leq CRI^t \leq 1 \quad (3)$$

$$0 \leq CI_j^t \leq 1 \quad (4)$$

where  $CR^t$  stands for the corruption risk index of transaction  $t$ ,  $CI_j^t$  represents the  $j$ th elementary corruption indicator observed in transaction  $t$ , and  $w_j$  represents the weight of elementary corruption indicator  $j$ . Elementary corruption indicators can be either corruption inputs or outputs.

Higher level units' such as organisations' CRI can be obtained by calculating the arithmetic average of their transactions' CRI in a given period (it is also possible to use contract values for weighting). The added value of aggregating CRI to a higher unit of observation such as an issuer of tenders is that it further increases our confidence in CRI. An organisation consistently displaying high CRI over time is likely to be actually a corrupt organisation rather than simply a victim of random fluctuations in the data.

#### 4. Data

The database derives from Hungarian public procurement announcements of 2009-2012 (this database is referred to as PP henceforth). The data represent a complete database of all public procurement procedures conducted under Hungarian Public Procurement Law. PP contains variables appearing in 1) calls for tenders, 2) contract award notices, 3) contract modification notices, 4) contract completion announcements, and 5) administrative corrections notices. As not all of these kinds of announcements appear for each procedure, for example depending on procedure type, we only have the variables deriving from contract award notices consistently across every procedure. Comparable data sets exist or can be constructed from public records in all EU countries, the USA, and Russia for the last 6-8 years (Appendix 5A with details).

The place of publication of these documents is the Public Procurement Bulletin which appears is accessible online<sup>42</sup>. As there is no readily available database, we used a crawler algorithm to capture the text of every announcement. Then, applying a complex automatic and manual text mining strategy, we created a structured database which contains variables with clear meaning and well-defined categories. As the original texts available online contain a range of errors, inconsistencies, and omissions, we applied several correction measures to arrive at a database of sufficient quality for scientific research. For a full description of database development, see Fazekas & Tóth (2012a) in Hungarian and in somewhat less detail Fazekas & Tóth (2012b) in English.

A potential limitation of our database is that it only contains information on public procurement procedures under the Hungarian Public Procurement Law as there is no central depository of other contracts. The law defines the minimum estimated contract value for its application depending on the type of announcing body and the kind of products or services to be procured (for example, from 1 January 2012, classical issuers have to follow the national regulations if they procure services for more than 8 million HUF or 27 thousand EUR). By implication, PP is a biased sample of total Hungarian public procurement of the period, containing only the larger and more heavily regulated cases. This bias makes PP well suited for studying

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<sup>42</sup> See: <http://www.kozbeszerzes.hu/nid/KE> (in Hungarian)

more costly and more high stakes corruption where coverage is close to complete. Although, as removing contracts from the remit of the Public Procurement Law can in itself be part of corrupt strategies there remains some non-random bias in the data (for an estimation of this bias see

Figure 28 below).

As contract award notices represent the most important part of a procedure's life-cycle and they are published for each procedure under the Hungarian Public Procurement Law, their statistics are shown in Table 1 to give an overview of the database. It is noticeable that number and total value of contracts awarded has declined in the observation period. This is due to two parallel developments: 1) because of budget cuts since 2010, total public spending has declined; and 2) public procurement transparency has decreased since the new government entered office in 2010 (we will return to this point in section 6).

**Table 11. Main statistics of the analysed data – contracts**

	2009	2010	2011	2012	<b>Total</b>
Total number of contracts awarded	10918	17914	14070	10342	53244
Total number of unique winners	3987	5617	5587	4923	13557
Total number of unique issuers	1718	2871	2808	2344	5519
Combined value of awarded contracts (million EUR) *	4604	3834	1856	1298	11592

Source: PP

Notes: \* = a 300 HUF/EUR uniform exchange rate was applied for exchanging HUF values.

## 5. Building blocks: the corruption process' outcomes and inputs

### 5.1 Indicators of corruption outcomes

The key outcome of institutionalised corruption in public procurement, which we are measuring here, is contract performance by a pre-selected company. This corruption outcome can be secured at the procurement process'

1. Submission phase: only the pre-selected bidder submits a bid; or
2. Assessment phase: contract award to the pre-selected bidder;

As it is extremely rare that the company awarded a contract is changed during the delivery phase, the corruption outcome at the delivery phase<sup>43</sup> could be treated as fully determined by phases 1 and 2. Three outcome indicators are proposed to capture the full scale of institutionalised public procurement corruption where outcomes of any prior stage also serve as an inputs to later stages (Table 12). The corrupt outcome of the submission phase - only the pre-selected bidder submits a bid – is indicated by *whether a single bid was submitted to the tender*. In single submitted bid contracts, the issuer has an exceptionally large leeway to award the contract in a way which serves corrupt rent extraction. The corrupt outcome of the assessment phase - contract award to the pre-selected bidder – can only partially be captured by a quantitative indicator: *exclusion of all but one received bid*. Much of the award process such as scoring bidders is not extensively reported in public records hence the lack of further direct outcome indicators. In order to capture the final corruption outcome more appropriately, a further indicator is proposed which signals repeated contract award to the same company throughout multiple procedures: *winner's share of issuer's contracts* during the 12 month period before the contract award in question.

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<sup>43</sup> If corruption is not institutionalised the delivery phase may well be the location of forming corrupt links. This, however, falls outside the remit of our measurement model.



**Table 12. Summary of outcome indicators**

phase	indicator name	Definition
submission	single bidder	1=1 bid received, 0=more than 1 bid received
assessment	exclusion of bids	1=1 bid NOT excluded, 0=more than 1 bid NOT excluded
overall	winner's share of issuer's contracts	12-month total contract value of winner / 12-month total awarded contract value (by issuer)

### 5.1.1 Single bidder

Issuers of tenders are free to choose the bidder of their preference; however, they are prescribed to maximise value for money, most importantly through soliciting competing bids. Corruption arises when competition is blocked in order to earn corruption rent. The most obvious signal that there was absolutely no competition for a public contract is when a tender received only 1 bid. Interview evidence from Hungary suggests that tenders with only 2-3 bids are also highly likely to be prone to corruption, as one public procurement adviser working in the industry for over a decade put it: "it is easy, just bring two friends with whom we can agree on the exact content of their bids". Focusing only on single bidder contracts is, therefore, a conservative approach in line with the goal of delivering a lower bound estimate of large-scale corruption.

There are two potential criticisms to this indicator: 1) The single bidder indicator also signals corruption in cases when there was truly only one bidder capable of performing the task, but no corruption took place. While this is a serious weakness of the indicator, it is considered to be only of marginal magnitude as the overwhelming majority of products procured by governments are ordinary and widely produced such as office stationery, cars, national roads, or IT support services (less than 5% of contracts were awarded on markets with 3 or fewer companies). In addition, robustness checks of our models, excluding markets with a small number of competitors, warrant that *this concern is of minor importance*. 2) Some authors contend that a single bidder has no incentive to give a bribe (Soreide, 2002). However, in an environment of systemic corruption, a single bidder tender is the

ideal outcome created by colluding bidders and issuers, especially if the same single bidder wins contracts repeatedly (see section 5.1.3).

### **5.1.2 Exclusion of all but one bidder**

It is possible that a corrupt issuer didn't manage to deter all but one bidder from submitting a bid, in which case it can still award the contract to the 'well-connected' bidder if it manages 1) to exclude the bids of all unwanted bidders on administrative or formal grounds (Heggstad & Froystad, 2011); or 2) to unfairly assess the bids to favour a particular bidder. As there is no direct evidence available in public records for the latter, the assessment phase's corruption outcome indicator captures only the former. Having a single valid bid tender can be heavily associated with corruption for, by and large, the same reasons as for single submitted bid (see section 5.1.1). Counter-arguments follow the same lines too. This similarity between the two measures, while conveying additional information, is also supported by regression results (Table 18).

### **5.1.3 Winner's share of issuer's contracts**

While there is no separate indicator for the delivery phase, we develop a likely corruption outcome measure for the public procurement corruption process as a whole. The ultimate goal of large-scale institutionalised corruption is to repeatedly award contracts to the same company or companies controlled by the corrupt group (Heggstad & Froystad, 2011). By implication, winner's share of issuer's contracts indicates the likelihood of such corruption. As the primary location of collusion and capture is the individual public organisation disbursing public funds, this variable is defined as the ratio of contract value the winner won from a given issuer to the total value of contracts awarded by the given issuer throughout a 12-month period.

Using winner's share within issuer's contracts (or winner's contract share as we will call it to remain succinct) as corruption indicator is likely to suffer from disturbances in periods when a new dominant group takes control of public organisations with its new clientele, for example when a new government comes into office. Changes of dominant, captor groups are expected to be rare events, hence, this downward bias may only be moderate (and controlling for year of contract award in the below regressions captures much of this potential bias). Moreover, this indicator also underestimates corruption when the corrupt network uses multiple companies for

extracting rents. Interviews indicate that combining company ownership groups' contract volumes accounts for most of this bias.<sup>44</sup>

**Table 13. Descriptive statistics for the three outcome variables, 2009-2012, markets with at least 3 competitors**

	mean	min	max	st. deviation	N
single received bid	0.30	0.00	1.00	0.46	51012
single valid bid	0.37	0.00	1.00	0.48	41277
winner's share of issuer's contracts	0.31	0.00	1.00	0.40	37399

Source: PP

## 5.2 Indicators of corruption inputs

According to our measurement model, the above outlined likely outcomes of the corruption process at least partially result from corruption techniques such as tailoring eligibility criteria to one company. These corruption techniques are interpreted as corruption inputs to the corruption process in public procurement which aims at purporting institutionalised grand corruption. A much wider set of corruption techniques in public procurement and their expected effects are extensively discussed in chapter 4<sup>45</sup>. This section only provides a brief summary of 1) those factors which turned out to be powerful predictors in the below regressions in line with our prior expectations; and 2) of the theoretical expectations linking each input to each outcome.

14 input factors<sup>46</sup> are considered when building the models accounting for outcomes of the corruption process (variable definitions in Table 14, descriptive statistics in Table 15 and Table 16). These capture key characteristics of the public procurement process from the beginning of the submission phase until the end of delivery.

<sup>44</sup> A further potential bias comes from collusion between bidding firms which tends to be based on product market rather than public organisation, hence it is deemed a relatively minor problem. An ongoing research project of the authors aims at separating corruption from cartel which is expected to deliver high quality evidence on this potential bias.

<sup>45</sup> Chapter 4 discusses these indicators already applied to a group of contracts such as contracts awarded by an issuer over a period of time, while here they are interpreted on contract-level. This is only a formal difference without changing the logic of analysis.

<sup>46</sup> Note that single bidder contract is both an outcome of the submission phase as well as an input to the corruption process at later procurement stages.

**Table 14. Summary of corruption inputs (higher score indicates greater likelihood of corruption)**

phase	indicator name	indicator definition
submission	Single bidder contract	0=more than one bid received 1=ONE bid received
	Call for tender not published in official journal	0=call for tender published in official journal 1=NO call for tenders published in official journal
	Procedure type	0=open procedure 1=invitation procedure 2=negotiation procedure 3=other procedures (e.g. competitive dialogue) 4=missing/erroneous procedure type
	Length of eligibility criteria	number of characters of the eligibility criteria MINUS average number of characters of the given market's eligibility criteria
	Length of submission period	number of days between publication of call for tenders and submission deadline
	Relative price of tender documentation	price of tender documentation DIVIDED BY contract value
	Call for tenders modification	0=call for tenders NOT modified 1=call for tenders modified
assessment	Exclusion of all but one bid	0=at least two bids NOT excluded 1=all but one bid excluded
	Weight of non-price evaluation criteria	proportion of NON-price related evaluation criteria within all criteria
	Annulled procedure re-launched subsequently*	0=contract awarded in a NON-annulled procedure 1=contract awarded in procedure annulled, but re-launched
	Length of decision period	number of working days between submission deadline and announcing contract award
delivery	Contract modification	0=contract NOT modified during delivery 1=contract modified during delivery
	Contract lengthening	relative contract extension (days of extension/days of contract length)
	Contract value increase	relative contract price increase (change in contract value/original, contracted contract value)

\* Combining annulations by the issuer and the courts

Following from the discussion in chapter 4, specific expectations are formulated linking each input to each output (Table 17). Single received bid and single valid bid outcomes are discussed jointly because the theoretical considerations are very similar and the regressions unravel largely the same findings.

The expectations are formulated in a general linear form, for example, the shorter the submission period is the more likely that only one bid was received. However, many of the continuous variables are indeed not a continuous measure of corruption risks, rather there are critical thresholds beyond which corruption risks greatly increase. For example, a submission period of 5 days compared to 15 days is likely to convey higher corruption risks while a submission period of 35 days compared to 45 days may carry little to no information regarding corruption. By implication, behind any of our linear hypotheses lies the expectation of finding the thresholds which best capture spikes in the probability of a corruption outcome hence corruption risks.

In every case, the input variables are defined in a way that their higher values are expected to signal higher corruption risks. However, some of the corruption inputs are typically used as 'corrective action' later on in the procurement process to fix the failed attempts at bending competition earlier. These factors are expected to have negative association with corruption outcomes of earlier stages. For example, if only the well-connected company submitted a bid there is no need for subsequently modifying the contract as the corrupt bidder could set the price and quality allowing for corrupt rent extraction. However, if there was real competition at the submission phase the well-connected bidder is likely to be forced to submit a competitive bid with little scope for earning extra profit; hence the need for subsequent contract modification.

**Table 15. Descriptive statistics of corruption inputs, 2009-2012, markets with at least 3 unique winners**

	mean	min	max	sd	N
Single bidder contract	0.301	0.00	1.00	0.46	51012
Exclusion of all but one bid	0.367	0.00	1.00	0.48	41277
Call for tender not published in official journal	0.388	0.00	1.00	0.49	51823
Length of submission period	10.842	-7594.84	21594.88	3266.15	29215
Relative price of tender documentation	0.003	0.00	0.20	0.01	16743
Call for tenders modification	0.109	0.00	1.00	0.31	31726
Annulled procedure re-launched subsequently	0.061	0.00	1.00	0.24	55217
Weight of non-price evaluation criteria	0.216	0.00	1.00	0.33	51823
Length of decision period	90.871	0.00	1004.00	120.24	28605
Contract modification	0.189	0.00	1.00	0.39	51823
Contract lengthening	0.014	-0.97	30.29	0.26	16238
Contract value increase	0.079	-0.80	5.00	0.53	6547

Source: PP

**Table 16. Distribution of procedure type, 2009-2012, markets with at least 3 unique winners**

	N	%
open	31,007	59.83
invitation	906	1.75
negotiation	9,510	18.35
other	5,760	11.11
missing/error	4,640	8.95
Total	51,823	100

Source: PP

**Table 17. Summary of the expected direction of and grounds for the relationships between corruption inputs and outputs**

Phase	INPUT/OUTPUT	single received / valid bid		winner's share within issuer's contracts	
		direction	reason	direction	reason
Submission	Single bidder contract	<b>not relevant</b>	not relevant	<b>+</b>	Single received bid contracts make it easier for issuers to repeatedly award contracts to the same well-connected company.
	Call for tender not published in official journal	<b>+</b>	Not publishing the call for tenders in the official journal makes it less likely that eligible bidders notice the bidding opportunity and bid.	<b>+</b>	Not publishing the call for tenders in the official journal weakens competition allowing the issuer to more easily award contracts repeatedly to a well-connected company.
	Procedure type	<b>+</b>	Non-open procedures, which are less transparent and require less open competition, create more opportunities to limit the range of bids received and to exclude bids.	<b>+</b>	Non-open procedures, which are less transparent and require less open competition, create more opportunities for issuers to repeatedly award contracts to the same well-connected company.
	Length of eligibility criteria	<b>+</b>	Lengthy, hence complex, eligibility criteria allows issuers to tailor the tender to a single company and to exclude unwanted bids.	<b>+</b>	Lengthy, hence complex, eligibility criteria allows issuers to benefit a well-connected company, for example by keeping less competitive bidders in competition.
	Exceptionally short submission period	<b>+</b>	A short submission period leaves less time hence make it harder for non-connected companies to bid and to submit a bid.	<b>+</b>	A short submission period leaves less time hence make it harder for non-connected companies to bid successfully whereas a well-connected firm can use its inside knowledge to win repeatedly.
	Relative price of documentation	<b>+</b>	Relatively expensive tender documentation makes bidding more expensive and hence deters bidders from bidding except for the well-connected company which is close to certain of its success.	<b>+</b>	Relatively pricey tender documentation weakens competition allowing the issuer to more easily award contracts repeatedly to a well-connected company.
	Call for tenders modification	<b>+</b>	Modifying call for tenders allows for excluding unwanted bidders by changing eligibility criteria once the interested bidders are known.	<b>+</b>	Strategic modification of the call for tenders favours the well-connected company further increasing its market share.
Assessment	Exclusion of all but one bid	<b>not relevant</b>	not relevant	<b>+</b>	Single valid bid contracts make it easier for issuers to repeatedly award contracts to the same well-connected company.
	Weight of non-price evaluation criteria	<b>+</b>	Non-price related evaluation criteria tend to be more subjective, allowing issuers to favour the well-connected company. Apparently unfair assessment criteria deters bidders.	<b>+</b>	Non-price related evaluation criteria tend to be more subjective, allowing issuers to favour the well-connected company, hence repeatedly awarding contracts to the same company.
	Annulled procedure re-launched subsequently*	<b>-</b>	If unwanted bidders couldn't be deterred from bidding and their bids couldn't be excluded, annulling and subsequently re-launching the tender allows issuer to correct its failed attempt to eliminate competition.	<b>+</b>	If unwanted bidders couldn't be deterred from bidding and their bids couldn't be excluded, annulling and subsequently re-launching the tender allows issuer to more successfully award the contract to a well-connected company.
	Length of decision period	<b>+</b>	Overly lengthy decision period signals extensive legal challenges to the tender, suggesting that the issuer attempted to limit competition.	<b>+</b>	Lengthy decision periods signal extensive legal challenge to the tender, suggesting that the issuer wants to award the contract to a well-connected company.
Delivery	Contract modification	<b>-</b>	If competition couldn't be eliminated, the well-connected firm can still win with a competitive offer, but subsequent contract modification(s) still allow it to collect extra profit.	<b>+</b>	Contract modification(s) suggests that the issuer corruptly favour a well-connected company, potentially repeatedly.
	Contract lengthening	<b>-</b>	If competition couldn't be eliminated, the well-connected firm can still win with a competitive offer, but subsequent contract lengthening still allows it to collect extra profit.	<b>+</b>	A contract lengthening suggests that the issuer corruptly favour a well-connected company, potentially repeatedly.
	Contract value increase	<b>-</b>	If competition couldn't be eliminated, the well-connected firm can still win with a competitive offer, but subsequent contract value increase still allows it to collect extra profit.	<b>+</b>	A contract value increase suggests that the issuer corruptly favour a well-connected company, potentially repeatedly.

## **6. Composite corruption risk index**

This section discusses 1) the regressions modelling institutionalised grand corruption in public procurement, 2) derives component weights for composite indicator building, and 3) provides validity tests for the resulting composite indicator.

The regressions' primary purpose is to validate whether corruption inputs could contribute to outputs in line with our theoretical expectations reflecting institutionalised grand corruption on the procurement market. They provide the primary source of internal validity of the composite indicator. As different phases of the procurement process are intertwined with each other, most appropriate analytical technique would be Structural Equation Modelling (Hoyle, 2012). However, this technique cannot easily handle large numbers of binary variables among dependent and independent variables and many non-linear relationships, hence, we opted for modelling each stage separately, but using partially overlapping variable sets. For outcomes single received bid and single valid bid, we used binary logistic regression; while for the winner's contract share outcome, we used linear regression.

In any regression, a significant and large coefficient is interpreted as indicating that the given corruption input is typically used for reaching the corruption output even after taking into account alternative explanations, such as contract size or length, and all other corruption inputs. This still means that it can be used for other, non-corrupt purposes in atypical cases; conversely, all the non-significant and weak explanatory factors may still be used for corrupt purposes, albeit only exceptionally.

Component weights of the composite indicator are derived from regression coefficients; whereby, the larger coefficient means higher component weight. This reflects the view that the more often a corruption input is used in combination with corruption outcomes the more confident we can be that institutionalised grand corruption lies behind its use.

### **6.1 Modelling corrupt rent extraction: component weights**

Regression models were built based on the above theoretical expectations by entering each corruption input and controls step-by-step. Here, only final regression results are reported for the sake of brevity. The regressions are fitted only one markets with at least 3 different winners in 2009-2012, that is where there is surely enough adequate competitors present. As the validity of all three outcome variables crucially hinges on

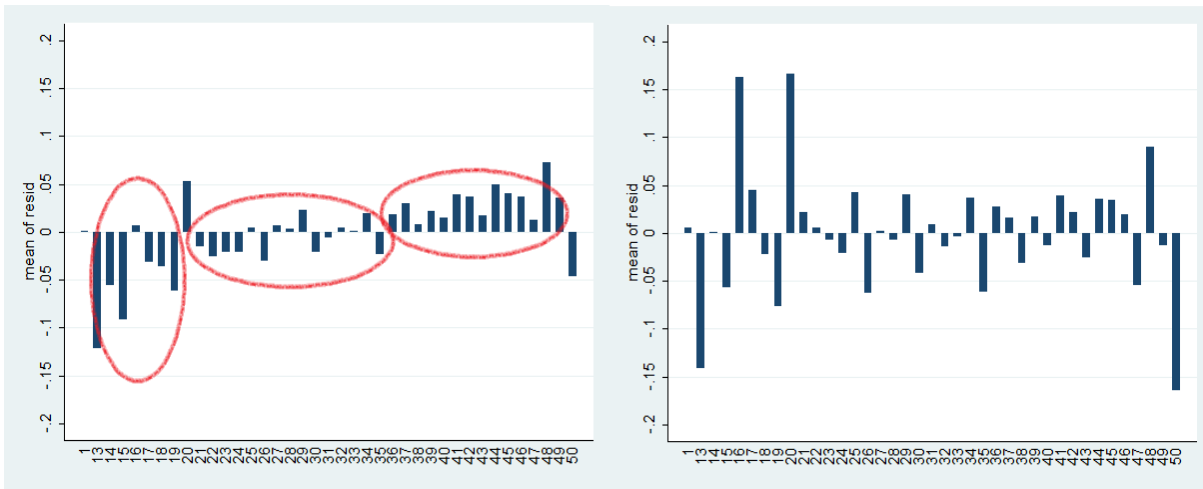


the availability of suitable competitors, robustness checks are presented in Appendix 5B excluding markets with less than 38 and 110 different winners throughout 2009-2012. The conclusions are substantially the same on the restricted samples too.

Thresholds in continuous variables were identified in an iterative process: first, a model was fitted using the linear continuous predictor; second, jumps in residual values were identified using residual distribution graphs. For example, average residual values of the regression using all the control variables plus the linear continuous measure of the relative price of documentation for predicting single received bid are depicted in Figure 23, left panel. It clearly indicates that there are three distinctive groups of relative document prices. For the lowest region, ranging between approximately the 24<sup>th</sup> and 40<sup>th</sup> percentiles, the model overestimates the probability of a single received bid, while it is the opposite case for the region between the 70<sup>th</sup> and 100<sup>th</sup> percentiles. These suggest at least three distinct categories. The right panel of Figure 23 shows the same residual distribution after the categorical measure of relative document price replaced its continuous version in the model with categories following the cut-points identified earlier. No clear pattern remains in the residual distribution, suggesting most non-linearity has been accounted for by the categorical measure of relative document price. A similar procedure was followed in the case of every continuous variable; if necessary completing multiple iterations of searching for thresholds.

In order to preserve the full population of observations, we always included a missing category in every categorical variable. In addition, this also helped measuring corruption inputs as concealing relevant tender information from bidders or the wider public often serves as a corruption technique.

**Figure 23. Mean regression residuals by two-percentiles of relative price of documentation, left panel: linear prediction; right panel: prediction after taking into account non-linearity**



Source: PP

When deciding on whether a variable is significant in the model, we used significance values from *Monte Carlo random permutation simulations* (Good, 2006), even though standard Fisher significance tests would have led to the same conclusions in most cases. This is because standard Fisherian significance tests are appropriate for statistical inference from a random sample to a population. However, our public procurement database contains the full population of interest, that is there is no sample. While some observations have been removed purposefully from the public domain hence from the database (a corruption risk on its own which is certainly far from random) this cannot be reflected by Fisher significance tests. Permutation tests are widely used in the natural as well as the social sciences, for example in social network analysis where data typically relates to full populations and observations are not independent of each other (Borgatti, Everett, & Johnson, 2013). The Monte Carlo random permutation simulation randomly reassigns the outcome variable to observations multiple times and calculates the regression coefficients each time. By doing so, it obtains a distribution of each regression coefficient when the outcome is truly random. The probability of the actual test statistic falling outside this random distribution, therefore, represents the probability of observing the relationship when the effect is truly random. A low significance level indicates that it is highly unlikely that the observed regression coefficient could be the result of a random process – a very intuitive interpretation.

Five different regressions are reported in Table 18, two binary logistic regressions on single received bid and two binary logistic regressions on single valid bid, following the same structure:

$$Pr(\text{single bidder}_i=1)=\frac{1}{1+e^{-Z_i}} \quad (5)$$

$$Z_i = \beta_0 + \beta_{1j}S_{ij} + \beta_{2k}A_{ik} + \beta_{3l}D_{il} + \beta_{4m}C_{im} + \varepsilon_i \quad (6)$$

where  $\text{single bidder}_i$  equals 1 if the  $i$ th contract awarded had only one bidder and 0 if it has more;  $Z_i$  represents the logit of a contract being a single bidder contract;  $\beta_0$  is the constant of the regression;  $S_{ij}$  is the matrix of  $j$  corruption inputs of the submission phase for the  $i$ th contract such as length of submission period;  $A_{ik}$  stands for the matrix of  $k$  corruption inputs of the assessment phase for the  $i$ th contract such weight of non-price evaluation criteria;  $D_{il}$  stands for the matrix of  $l$  corruption inputs of the delivery phase for the  $i$ th contract such contract lengthening;  $C_{im}$  stands for the matrix of  $m$  control variables for the  $i$ th contract such as the number of competitors on the market;  $\varepsilon_i$  is the error term; and  $\beta_{1j}$ ,  $\beta_{2k}$ ,  $\beta_{3l}$  and  $\beta_{4m}$  represent the vectors of coefficients for explanatory and control variables.

In addition to the four logistic regression models in Table 18, a linear regression on winner's share within issuer's contracts is reported following the structure:

$$Y_i = \beta_0 + \beta_{1j}S_{ij} + \beta_{2k}A_{ik} + \beta_{3l}D_{il} + \beta_{4m}C_{im} + \varepsilon_i \quad (7)$$

where  $Y_i$  represents winner's share within issuer's contracts;  $\beta_0$  is the constant of the regression;  $S_{ij}$  is the matrix of  $j$  corruption inputs of the submission phase for the  $i$ th contract such as length of submission period;  $A_{ik}$  stands for the matrix of  $k$  corruption inputs of the assessment phase for the  $i$ th contract such weight of non-price evaluation criteria;  $D_{il}$  stands for the matrix of  $l$  corruption inputs of the delivery phase for the  $i$ th contract such contract lengthening;  $C_{im}$  stands for the matrix of  $m$  control variables for the  $i$ th contract such as the number of competitors on the market;  $\varepsilon_i$  is the error term; and  $\beta_{1j}$ ,  $\beta_{2k}$ ,  $\beta_{3l}$  and  $\beta_{4m}$  represent the vectors of coefficients for explanatory and control variables.

The main differences among regressions are the outcome variables and whether the sample also includes withdrawn contracts (models 2 and 4). Withdrawn contracts

couldn't be included in regressions on winner's share within issuer's contracts as they would have inflated contract values of 12 month periods. Each regression includes the full list of controls and predictors having non-missing values in the given sample. Control variables account for the most obvious alternative explanations to our corrupt outcomes:

- type of product procured using 40 different CPV<sup>47</sup> divisions which control for differences in technology and market standards;
- number of winners throughout 2009-2012 on the product market using a matrix of 820 CPV categories at level 3 and 4 geographical regions using NUTS<sup>48</sup> definitions which makes sure that our findings on single bidders and winner's share within issuer's contracts are not driven by the low number of competitors available on the market.
- year of contracting which by and large proxies the changes in the legal framework and government in power;
- log real contract value (2009 constant prices) and contract length, both controlling for the differences emanating from contract size and complexity;
- whether the contract is a framework contract which have specific regulations and procedural rules<sup>49</sup>; and
- issuer type, sector, and status controlling for the regulatory as well as the institutional specificities of different issuers.

The regressions are performed on a restricted sample in order for the regressions to adequately fit a corrupt rent extraction logic as opposed to market specificities or inexperience with public procurement:

- markets with at least 3 unique winners throughout 2009-2012 for markets defined by a matrix of 820 CPV categories at level 3 and 4 geographical regions using NUTS definitions; and
- issuers awarding at least 3 contracts in the 12 months period prior to the contract award in question.

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<sup>47</sup> CPV=Common Procurement Vocabulary. For more info see: [http://simap.europa.eu/codes-and-nomenclatures/codes-cpv/codes-cpv\\_en.htm](http://simap.europa.eu/codes-and-nomenclatures/codes-cpv/codes-cpv_en.htm)

<sup>48</sup> NUTS=Nomenclature of territorial units for statistics. For more info see: [http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts\\_nomenclature/introduction](http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction)

<sup>49</sup> For details see: [http://ec.europa.eu/internal\\_market/publicprocurement/docs/explan-notes/classic-dir-framework\\_en.pdf](http://ec.europa.eu/internal_market/publicprocurement/docs/explan-notes/classic-dir-framework_en.pdf)

By and large, our hypotheses are supported by regressions, warranting the construction of a composite indicator reflecting systematically corrupt public procurement (Table 18).<sup>50</sup> First, the *single received or valid bid* is a powerful predictor of winner's share within issuer's contracts. Those contracts with a single bid tend to be awarded to winners with 1.8% higher share within issuer's contracts on average compared to contracts with more than one bids. This significant effect confirms that restricting the number of bids to one can support corrupt rent extraction on a recurrent basis. The magnitude of the impact is modest which is not surprising as restricting competition at the submission phase is only one of many ways to bent competition in public procurement.

Second, *not publishing the call for tenders in the official journal* increases the probability of single received and valid bids and the winner's contract share in every regression in line with expectations. For example, in model 1 and 3, it increases the average probability of a single received bid contract award by 14.8%-16.9% which is one of the strongest impact across models.

Third, every *non-open procedure type* carries a higher corruption risk than open procedures in terms of single received and valid bids and winner's contract share, supporting and further refining our theoretical expectations. Other, exceptional procedures carry the highest corruption risks adding 2.9% to winner's share within issuer's contracts compared to open procedures. Invitation and negotiation procedures are powerful and significant predictors in the regressions explaining single bidder contracts, but they have weak or counterintuitive impacts in the winner's contract share regressions which suggests that their main effect is likely to come through number of bidders. Invitation procedures appear to have about twice as strong effect on the probability of a single bidder contract award (7.1%-7.8%) as negotiation procedures (2.7%-5.9%).

Fourth, *relative length of eligibility criteria* behaves as expected with more lengthy, thus complex, criteria associated with higher probability of a single bidder contract and higher winner contract share. The effect of criteria length around the market average length seems weak, but positive indicating that there may be markets where complex criteria is frequently used to deter bidders. Criteria lengths considerably higher than

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<sup>50</sup> Of course, a number of further corruption inputs identified in chapter 4 are not presented here as they turned out to be either insignificant or too small.

market average are especially strongly associated with higher probability of single bidder contracts and higher winner contract share. For example, criteria length above market average by 520-2639 characters<sup>51</sup> increases probability of a single received bid by 10.4%-11.9% and the winner's share within issuer's contracts by 1.3% compared to the shortest criteria-length group. Interestingly, the call for tenders which are published, but don't contain eligibility criteria at the section where it is prescribed by law, are associated with especially high corruption risks: 9%-16% higher probability of single received bid contract compared to the shortest character length group. This signals that making eligibility criteria less visible deters bidders.

Fifth, the shorter the *submission period* the higher the probability of single received and valid bids and winner contract share in line with expectations. This relationship appears in distinct jumps around legally prescribed thresholds and the abuse of weekends. The exceptionally short submission period abusing weekends is one of the most powerful predictors in all of the models. It increases the winner's share within issuer's contracts by 7.6% and the probability of single valid bid by 17.2%-19.8%. Similar to criteria length, not displaying visibly and clearly the submission deadline is associated with very high corruption risks, for example 16%-24% higher probability of single received bid. As the effect is negligible on winner contract share, this corruption technique's impact arises primarily in the submission phase.

Sixth, more *expensive tender documents* increase both the probability of single bidder contracts and winner contract share in line with expectations. Compared to free documentation, document prices between 0.04%-0.1% of the contract value increase the probability of single received bid by 2.9%-3.4% and increase winner's share within issuer's contracts by 3.5%. Even more expensive tender documents have a stronger impact in the single bidder regressions, but insignificant and small effect in the winner contract share regression. This indicates that their main effect is exercised in the submission phase. The effect of the cheapest tender documentation is ambiguous across regressions. Missing tender documentation price is insignificant in most regressions. Therefore, these categories receive a zero weight in the composite indicator.

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<sup>51</sup> Standard deviation of character lengths from the population mean is 3435 for the whole 2009-2012 period. So, eligibility criteria 2639 characters above its market average is about three quarters standard deviation difference.

Seventh, call for tenders modifications behave according to expectations only for the period of the previous government (before 01/05/2010)<sup>52</sup>, that is it increases the probability of single bidder contracts and the winner's market share. While it takes on a considerable significant negative coefficient under the current government' period. These differences signal the changing role call for tenders modifications may play in corrupt rent extraction in response to changing regulatory (e.g. new Public Procurement Law entering into force soon after the new government entered into force) and political climate such judicial review of modifications (interviews indicate that the regulations and practice of judicial review of procurement tenders changed considerably after the new government entered office). Call for tenders modifications receive a positive weight in the composite indicator only for the pre-May 2012 period reflecting a conservative approach.

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<sup>52</sup> Restricted sample results are not reported here. Regression outputs can be obtained from the authors.

**Table 18. Regression results on contract level, 2009-2012, average marginal effects reported for models 1-4 and unstandardized coefficients for model 5, nr. of winners  $\geq 3$** 

models	1	2	3	4	5
Independent vars / dependent vars	single received bid	single received bid	single valid bid	single valid bid	winner's 12 month market share
<b>single received/valid bid</b>					0.018***
P(Fisher)					0.000
P(permute)					0.000
<b>no call for tenders published in official journal</b>	0.169***	0.14***	0.148***	0.121***	0.039***
P(Fisher)	0.000	0.000	0.000	0.001	0.040
P(permute)	0.000	0.000	0.000	0.000	0.000
<b>procedure type</b>					
ref. cat.=open procedure					
1=invitation procedure	0.078***	0.071***	0.069***	0.06***	-0.032*
P(Fisher)	0.126	0.122	0.301	0.308	0.259
P(permute)	0.000	0.000	0.000	0.000	0.015
2=negotiation procedure	0.027***	0.03***	0.059***	0.058***	0.009*
P(Fisher)	0.064	0.036	0.002	0.001	0.379
P(permute)	0.000	0.000	0.000	0.000	0.030
3=other procedures	0.275***	0.274***	0.257***	0.258***	0.029***
P(Fisher)	0.000	0.000	0.000	0.000	0.001
P(permute)	0.000	0.000	0.000	0.000	0.000
4=missing/erroneous procedure type	0.021**	0.028***	0.011	0.017	-0.008
P(Fisher)	0.134	0.049	0.484	0.270	0.256
P(permute)	0.000	0.000	0.140	0.055	0.155
<b>length of eligibility criteria</b>					
ref.cat.=length<-2922.125					
1= -2922.125<length<=520.7038	0.062***	0.046***	0.028*	0.019	0.001
P(Fisher)	0.009	0.044	0.328	0.505	0.942
P(permute)	0.000	0.000	0.015	0.065	0.895
2= 520.7038<length<=2639.729	0.119***	0.104***	0.07***	0.063***	0.013
P(Fisher)	0.000	0.000	0.026	0.041	0.427
P(permute)	0.000	0.000	0.000	0.000	0.110
3= 2639.729<length	0.138***	0.124***	0.077***	0.071***	0.014
P(Fisher)	0.000	0.000	0.021	0.035	0.418
P(permute)	0.000	0.000	0.000	0.000	0.105
4= missing length	0.16***	0.09***	0.05***	0.018***	0.048***
P(Fisher)	0.000	0.007	0.247	0.621	0.045
P(permute)	0.000	0.000	0.000	0.000	0.000
<b>short submission period</b>					
ref.cat.=normal submission period					
1=accelerated submission period	0.02***	0.022***	0.005	0.007	0.014***
P(Fisher)	0.067	0.051	0.715	0.581	0.028
P(permute)	0.000	0.000	0.525	0.335	0.000
2=exceptional submission period	0.086***	0.09***	0.076***	0.084***	0.047***
P(Fisher)	0.005	0.002	0.025	0.009	0.163
P(permute)	0.000	0.000	0.000	0.000	0.000
3=except. submission per. abusing weekend	0.189***	0.216***	0.172***	0.198***	0.076***
P(Fisher)	0.000	0.000	0.001	0.000	0.087
P(permute)	0.000	0.000	0.000	0.000	0.000
4=missing submission period	0.24***	0.16***	0.082***	0.028	-0.009
P(Fisher)	0.000	0.000	0.088	0.490	0.743
P(permute)	0.000	0.000	0.000	0.055	0.545
<b>relative price of tender documentation</b>					
ref.cat.= relative price=0					
1= 0<relative price<=0.0004014	-0.003	-0.01	-0.02	-0.042***	0.062***
P(Fisher)	0.902	0.598	0.371	0.060	0.001
P(permute)	0.860	0.360	0.130	0.000	0.000
2= 0.0004014<relative price<=0.0009966	0.034***	0.029**	0.016	-0.005	0.035***
P(Fisher)	0.095	0.128	0.419	0.796	0.013
P(permute)	0.000	0.005	0.225	0.715	0.000
3= 0.0009966<relative price<=0.0021097	0.035***	0.031***	0.027*	0.008	0.009
P(Fisher)	0.079	0.097	0.155	0.677	0.412
P(permute)	0.000	0.000	0.025	0.495	0.230
4= 0.0021097<relative price	0.058***	0.049***	0.03**	0.012	0.000

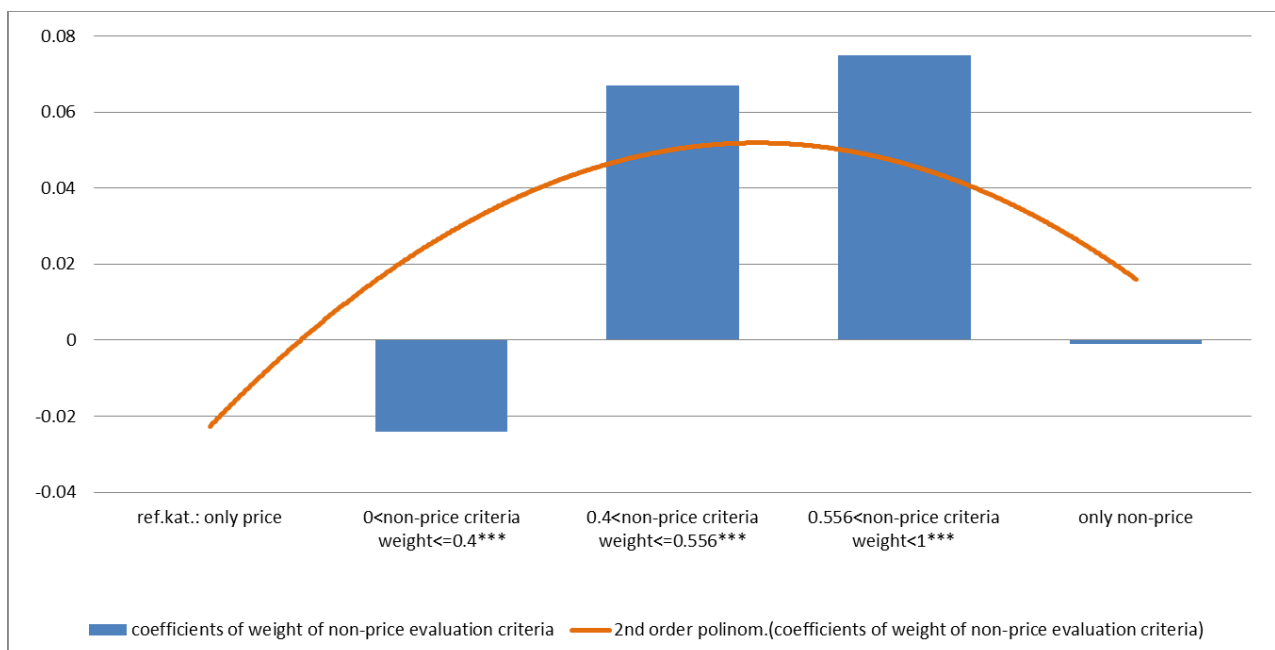


models	1	2	3	4	5
P(Fisher)	0.005	0.012	0.092	0.487	0.989
P(permute)	0.000	0.000	0.005	0.235	0.985
5=missing relative price	-0.011	-0.001	-0.004	-0.017	-0.008*
P(Fisher)	0.651	0.971	0.834	0.389	0.451
P(permute)	0.195	0.940	0.605	0.065	0.190
<b>call for tenders modified</b>	-0.032***	-0.036***	-0.043***	-0.043***	0.017***
P(Fisher)	0.059	0.029	0.039	0.033	0.032
P(permute)	0.000	0.000	0.000	0.000	0.000
<b>weight of non-price evaluation criteria</b>					
ref.cat.= only price					
2= 0<non-price criteria weight<=0.4	-0.024***	-0.019***	-0.043***	-0.034***	-0.002
P(Fisher)	0.053	0.121	0.004	0.019	0.782
P(permute)	0.000	0.000	0.000	0.000	0.705
3= 0.4<non-price criteria weight<=0.556	0.067***	0.069***	0.05***	0.05***	0.028***
P(Fisher)	0.000	0.000	0.004	0.002	0.006
P(permute)	0.000	0.000	0.000	0.000	0.000
4= 0.556<non-price criteria weight<1	0.075***	0.076***	0.078***	0.075***	0.038***
P(Fisher)	0.000	0.000	0.000	0.000	0.000
P(permute)	0.000	0.000	0.000	0.000	0.000
5=only non-price criteria	-0.001	0.001	-0.012	-0.012	0.007***
P(Fisher)	0.947	0.938	0.464	0.465	0.265
P(permute)	0.925	0.885	0.175	0.190	0.220
<b>procedure annulled and re-launched</b>		-0.112***		-0.031*	
P(Fisher)		0.000		0.357	
P(permute)		0.000		0.010	
<b>length of decision period</b>					
ref.cat.= 44<decision period<=182					
1= decision period<=32	0.085***	0.078***	0.121***	0.117***	0.013**
P(Fisher)	0.000	0.000	0.000	0.000	0.059
P(permute)	0.000	0.000	0.000	0.000	0.005
2= 32<decision period<=44	0.037***	0.032***	0.046***	0.047***	0.016***
P(Fisher)	0.002	0.004	0.001	0.000	0.028
P(permute)	0.000	0.000	0.000	0.000	0.000
4= 182<decision period	0.142***	0.147***	0.155***	0.161***	0.046***
P(Fisher)	0.000	0.000	0.001	0.001	0.002
P(permute)	0.000	0.000	0.000	0.000	0.000
5= missing decision period	-0.043***	-0.02	-0.036***	-0.016	0.022*
P(Fisher)	0.076	0.324	0.251	0.549	0.120
P(permute)	0.000	0.090	0.000	0.095	0.025
<b>contract modified during delivery</b>	-0.004	-0.004	-0.026***	-0.024***	0.015***
P(Fisher)	0.718	0.726	0.028	0.032	0.016
P(permute)	0.465	0.430	0.000	0.000	0.000
<b>contract extension(length/value)</b>					
ref.cat.=c.length diff.<=0 AND c.value diff.<=0.001					
2=0<c.length d.<=0.16 OR 0.001<c.value d.<=0.24	-0.064***	-0.061***	-0.02	-0.026	-0.01
P(Fisher)	0.000	0.001	0.359	0.204	0.405
P(permute)	0.000	0.000	0.175	0.060	0.355
3= 0.16<c. length diff. OR 0.24<c.value diff.	-0.008	-0.017	0.007	0.000	-0.006
P(Fisher)	0.701	0.373	0.753	0.986	0.550
P(permute)	0.580	0.125	0.675	0.985	0.450
4= missing (with contr. completion ann.)	-0.023**	-0.022**	-0.017*	-0.017*	-0.002
P(Fisher)	0.176	0.176	0.315	0.289	0.782
P(permute)	0.005	0.005	0.045	0.015	0.715
5= missing (NO contr. completion ann.)	-0.01	-0.011*	0.003	0.005	0.003
P(Fisher)	0.394	0.296	0.773	0.623	0.709
P(permute)	0.120	0.050	0.610	0.340	0.565
constant included in each regression; control variables: product market (cpv divisions); number of winners on the market (market defined by cpv level 4 & nuts 1) year of contract award; log real contract value; contract length; framework contract; issuer type, sector, and status (public or private)					
N	48853	52390	39309	42607	20653
R2/pseudo-R2	0.1038	0.0998	0.1022	0.0986	0.2433

Source: PP; Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; clustered standard errors clustered by issuer for P(Fisher), Monte Carlo random permutation simulations for P(permute) (200 permutations) using stata 12.0

Eight, the effect of the *weight of non-price evaluation criteria* turned out to be somewhat different from expectations. Instead of a clearly positive relationship, we found an inverted U-shape relationship (Figure 24). This can be interpreted using our interview evidence: stipulating only or predominantly price-related evaluation criteria warrants fair competition, hence, it is associated with lower corruption risks. While majority subjective criteria suggests rigged competition deterring bidders and increasing winner contract share. Only non-price evaluation criteria combined with fixed price is most likely complying with certain industry standards such as IT procurement without signalling heightened corruption risks (see chapter 4). Hence, only the two categories with positive coefficient receive non-zero weight in the composite indicator.

**Figure 24. Effect sizes of weight of non-price evaluation criteria from model 1**



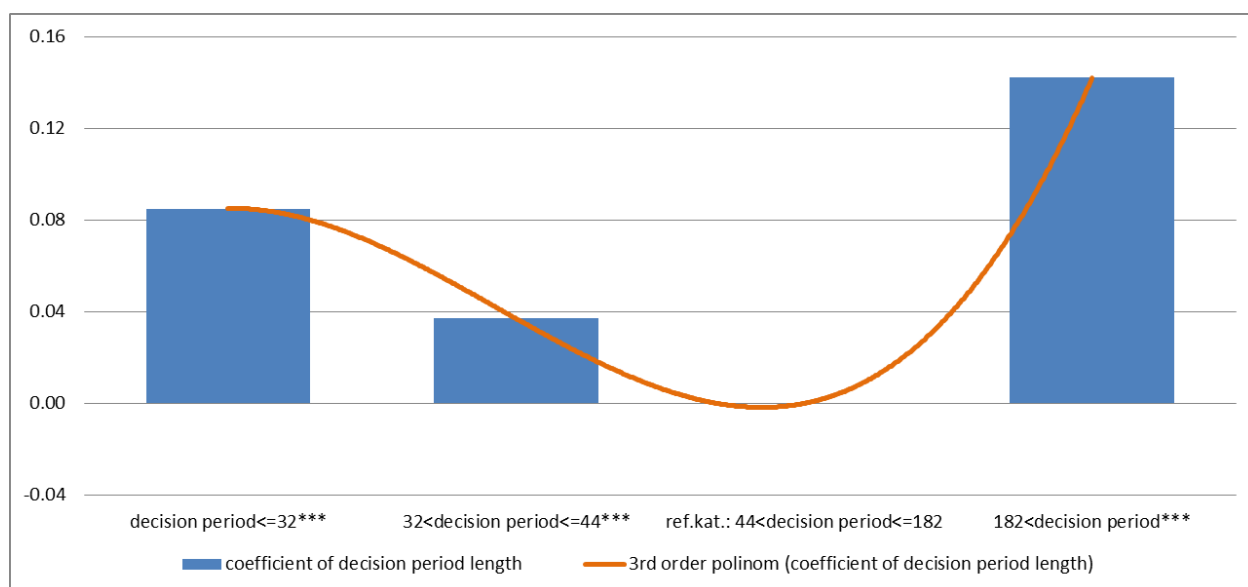
Source: PP

Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Ninth, *annulling and re-launching procedures* has the expected sign for both single received and single valid bid outcomes, but its effect cannot be determined on winner contract share due to technical complexities. Annulling a contract award is associated with 3.1%-11.2% *lower* probability of single bidder contract award, that is contract awards are annulled and re-launched more often when there were multiple bidders. This is completely contradictory to the prescriptions of the EU Public Procurement Directive or the Hungarian Public Procurement Law, but in line with a corrupt rent extraction logic.

Tenth, the effects of *decision period length* on probability of single bid and winner contract share are both somewhat different from our expectations. It seems that the relationship follows a U-shaped pattern with average decision period lengths (between 40<sup>th</sup> and 90<sup>th</sup> percentile) having the lowest corruption risk (Figure 25). Compared to this reference category, exceptionally long decision periods and exceptionally short decision periods are both associated with high corruption risks. Decision periods longer than 182 working days result in 14.2%-16.1% higher probability of single bid contract and 4.6% higher winner's share within issuer's contracts. Decision periods shorter than 32 working days are associated with 7.8%-12.1% higher probability of single bid contract and 1.3% higher winner contract share. Decision periods between 32 and 44 working days have a somewhat weaker effect than exceptionally short decision periods. These results suggest that there are two mechanisms at play. First, exceptionally short decision periods may indicate rushed through decisions and the corresponding high corruption risks. Second, exceptionally long decision periods may signal multiple legal challenges and troubled decision making hence high corruption risks. While the missing category is significant in some models, its effect is far from clear, thus, it cannot be included in the composite indicator.

**Figure 25. Effect sizes of decision period length from model 1**



Source: PP

Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Eleventh, *contract modification* has the expected relationships with probability of single bid and winner contract share albeit effect sizes are small in general and insignificant

for model 1-2. Modifying contract at least once after contract award is associated with 2.4%-2.6% *lower* probability of single valid bid and 1.5% higher winner's share within issuer's contracts. This indicates that a competitive contract award procedure may necessitate contract modification to assure rent extraction.

Twelfth, *increasing contract length* and increasing the contract value after contract award had to be considered together due to low number of relevant observations. These two techniques can be combined in as much as they represent two parallel methods for increasing the profitability of a contract, that is making delivery cheaper by extending the completion deadline or making price higher by increasing contract value. Contract extension (length/value) display the expected relationships, but effects are insignificant for the winner contract share regression.

Compared to contracts which were performed within the timeframe of delivery and original contract price (less than 0.1% value increase), contracts with 0%-16.2% longer delivery period *or* 0.1%-24% higher contract value were associated with 6.1%-6.4% *lower* probability of single received bid. For contracts which were extended even more the effects are insignificant which may signal that excessive project overruns are more often due to non-corrupt reasons such as low state capacity. For contracts whose contract completion announcement didn't contain the prescribed final contract length or final contract value information the probability of single bid was 1.7%-2.3% lower which is a moderately strong impact. This suggests that competitive tendering makes it more necessary to hide the final total performance potentially not according to original contractual terms. Hence, contract extensions of moderate magnitude and missing information are included in the composite indicator.

Based on these regression results the variables and their categories could be selected which will make up the composite corruption risk index (CRI). First, all three corruption outcomes could be part of CRI because the regressions accounting for them are of adequate quality (i.e. formal tests of model appropriateness are affirmative). Second, as mentioned earlier, outcome variables get the weight of 1 reflecting their benchmark status. Qualitative evidence clearly underlines that any of the corruption inputs (i.e. corruption techniques) is sufficient on its own to render a procurement procedure corrupt. Therefore, each significant corruption input receives the weight of 1. In order to reflect coefficient sizes of categories in each corruption input, we ranked categories of each variable with the most impactful category receiving weight 1 and the others

proportionately lower weights. For example, if there are four significant categories of a variable, then they would get weights 1, 0.75, 0.5, and 0.25. Finally, we normed each component weight so that the resulting composite indicator falls between 0 and 1 (Table 19). This was achieved in two steps: component weights were divided by the total number of components ( $N=13$ ), then the resulting score was divided by its observed maximum ( $CRI_{[raw]}=0.805$ ). This rescaling assures that the minimum (maximum) of the score corresponds to the lowest (highest) corruption risks observed. The upper end of the scale may be too conservative as the combined presence of 3-4 corruption inputs and/or outputs ( $CRI=0.27-0.36$ ) is already almost certainly very corrupt according to our interviewees<sup>53</sup>.

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<sup>53</sup> Calculating CRI for court decisions which established corruption in public procurement could serve as a more robust upper bound for the CRI scale. Further work is in progress.

**Table 19. Component weights of CRI reflecting variable and category impact on corruption outcomes, normed to have an overall sum of 1**

variable	component weight
<b>single received/valid bid</b>	0.096
<b>no call for tenders published in official journal</b>	0.096
<b>procedure type</b>	
ref. cat.=open procedure	0.000
1=invitation procedure	0.048
2=negotiation procedure	0.072
3=other procedures	0.096
4=missing/erroneous procedure type	0.024
<b>length of eligibility criteria</b>	
ref.cat.=length<-2922.125	0.000
1= -2922.125<length<=520.7038	0.024
2= 520.7038<length<=2639.729	0.048
3= 2639.729<length	0.072
4= missing length	0.096
<b>short submission period</b>	
ref.cat.=normal submission period	0.000
1=accelerated submission period	0.048
2=exceptional submission period	0.072
3=except. submission per. abusing weekend	0.096
4=missing submission period	0.024
<b>relative price of tender documentation</b>	0.000
ref.cat.= relative price=0	0.000
1= 0<relative price<=0.0004014	0.000
2= 0.0004014<relative price<=0.0009966	0.096
3= 0.0009966<relative price<=0.0021097	0.064
4= 0.0021097<relative price	0.032
5=missing relative price	0.000
<b>call for tenders modification(only before 01/05/2010)</b>	
<b>weight of non-price evaluation criteria</b>	0.000
ref.cat.= only price	0.000
2= 0<non-price criteria weight<=0.4	0.000
3= 0.4<non-price criteria weight<=0.556	0.048
4= 0.556<non-price criteria weight<1	0.096
5=only non-price criteria	0.000
<b>procedure annulled and re-launched subsequently</b>	0.096
<b>length of decision period</b>	
ref.cat.= 44<decision period<=182	0.000
1= decision period<=32	0.064
2= 32<decision period<=44	0.032
4= 182<decision period	0.096
5= missing decision period	0.000
<b>contract modified during delivery</b>	0.096
<b>contract extension(length/value)</b>	
ref.cat.= c.length diff.<=0 AND c.value diff.<=0.001	0.000
2= 0<c. length d.<=0.162 OR 0.001<c.value d.<=0.24	0.096
3= 0.162<c. length diff. OR 0.24<c.value diff.	0.000
4= missing (with contr. completion ann.)	0.048
5= missing (NO contr. completion ann.)	0.000
<b>winner's market share</b>	0.096

Source: PP

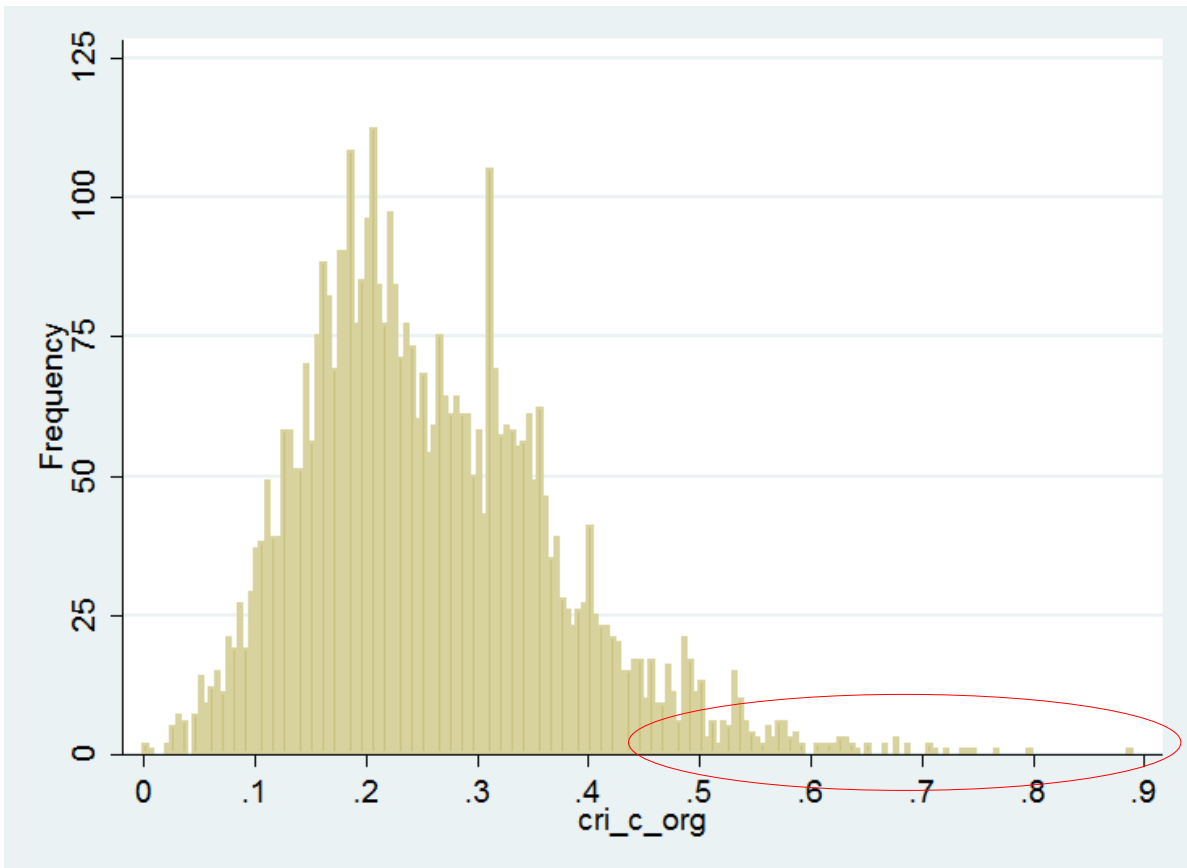
Note: If the call for tenders or contract fulfilment announcements are missing, the index is reweighted to only reflect the available variables (i.e. proportionately increasing the weight of observed variables).

## 6.2 Validating the corruption risk index

Validating CRI will take several years of work, here only elementary validating procedures are done. First, we look at the cross-sectional and time-series distribution of CRI to see if it behaves in any apparently unusual way. Second, the relationship between the amount of spending not reported in the PP database and CRI on the organisational level is explored to gauge the possible extent of distortion due to missing observations. Third, profitability and turnover growth of winning firms with different CRI are analysed. Fourth, political control of winning companies is collated with their CRI. Fifth, average CRI of companies whose market success seems to be strongly determined by the government in power is compared with those whose success is largely unaffected by government change (Fazekas et al., 2013).

First, applying the weights specified in Table 19, each contract receives a corruption risk index (CRI) falling into a 0–1 band. Calculating the average CRI of each winning firm results in a CRI distribution which doesn't deviate extensively from a normal distribution, albeit it has a long tail to the right (Figure 25). These companies with CRI higher than approximately 0.4-0.5 represent particularly high corruption risks and hence deserve attention in later research.

**Figure 26. Frequency distribution of winners according to CRI, 2009-2012<sup>54</sup>, N=4430**



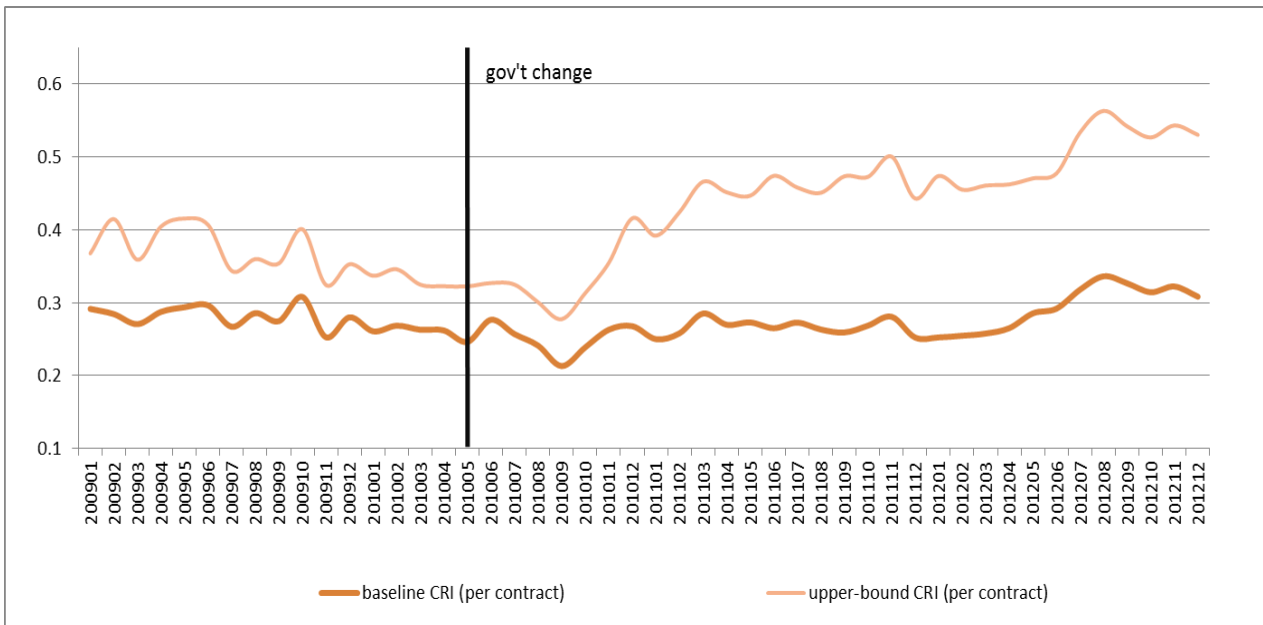
Source: PP

A simple test of indicator reliability is whether it displays any unexpected jumps at particular points in time or whether it reflects drastic changes known to impact on corruption. As CRI is defined for individual contract awards, monthly time series can be developed by calculating the CRI of the average contract. Such aggregation leads to a CRI time-series which is stable over time while showing some interesting variation from month to month (Figure 27). For example, it displays a spike just after the new government came into power which is primarily driven by contract modifications and longer decision periods. These are expected when dominant corrupt networks succeed each other and the newcomer tries to gain control of as many active sources of rent extraction as possible.

<sup>54</sup> In order to calculate CRI for 2009 where the 12-month values of winner's share within issuer's contracts is not available we had to input this variable using model 5 in Table 18.



**Figure 27. Monthly average CRI, 1/1/2009 – 31/12/2012 (averaging using the number and value of contracts awarded in each month), N=43642**



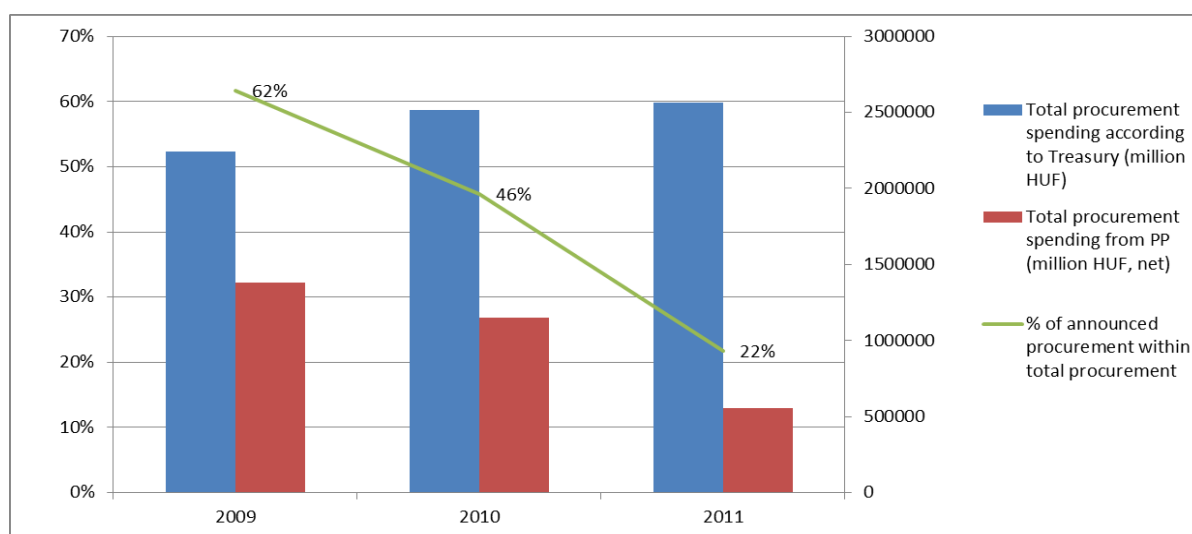
Source: PP

CRI declined between January 2009 and September 2010, but has increased since then which may provide hints at the performance of the new Fidesz government (Figure 27); although public procurement follows distinct cycles around elections hence comparisons are more appropriate at the same points in each cycle. Most interestingly, the Fidesz government has introduced a range of changes to the public procurement law which decreased transparency in at least three ways: 1) introducing less stringent requirements to publish call for tenders; 2) removing the requirement to publish contract fulfilment announcements; and 3) making it easier to move contracts outside the public procurement law for example by invoking national security concerns. Each of these can be tracked with our data creating an alternative estimate for CRI.

The baseline CRI is simply reweighted if call for tenders or contract fulfilment announcements are not available by relying on the available variables more extensively. However, as limiting transparency is a corruption technique confirmed by qualitative as well as quantitative evidence, it is reasonable to assume that the non-observed announcements are as risky as the highest corruption risk announcements observed. Under such a scenario, the starkly increasing corruption risks become visible after the Fidesz government takes power (Figure 27).

It is also possible to track the ratio of public procurement spending announced in the Public Procurement Bulletin to total public procurement spending (Figure 28). Since, the Fidesz government took power in 2010, this ratio has been cut by a half to reach only 22%. Once again, knowing that contracts awarded outside the remit of the Public Procurement Law represent higher corruption risks (see above in chapter 4), it seems that corruption risks have increased between May 2010 and December 2012.

**Figure 28. Public procurement spending announced in the Public Procurement Bulletin and total public procurement spending, 2009-2011**



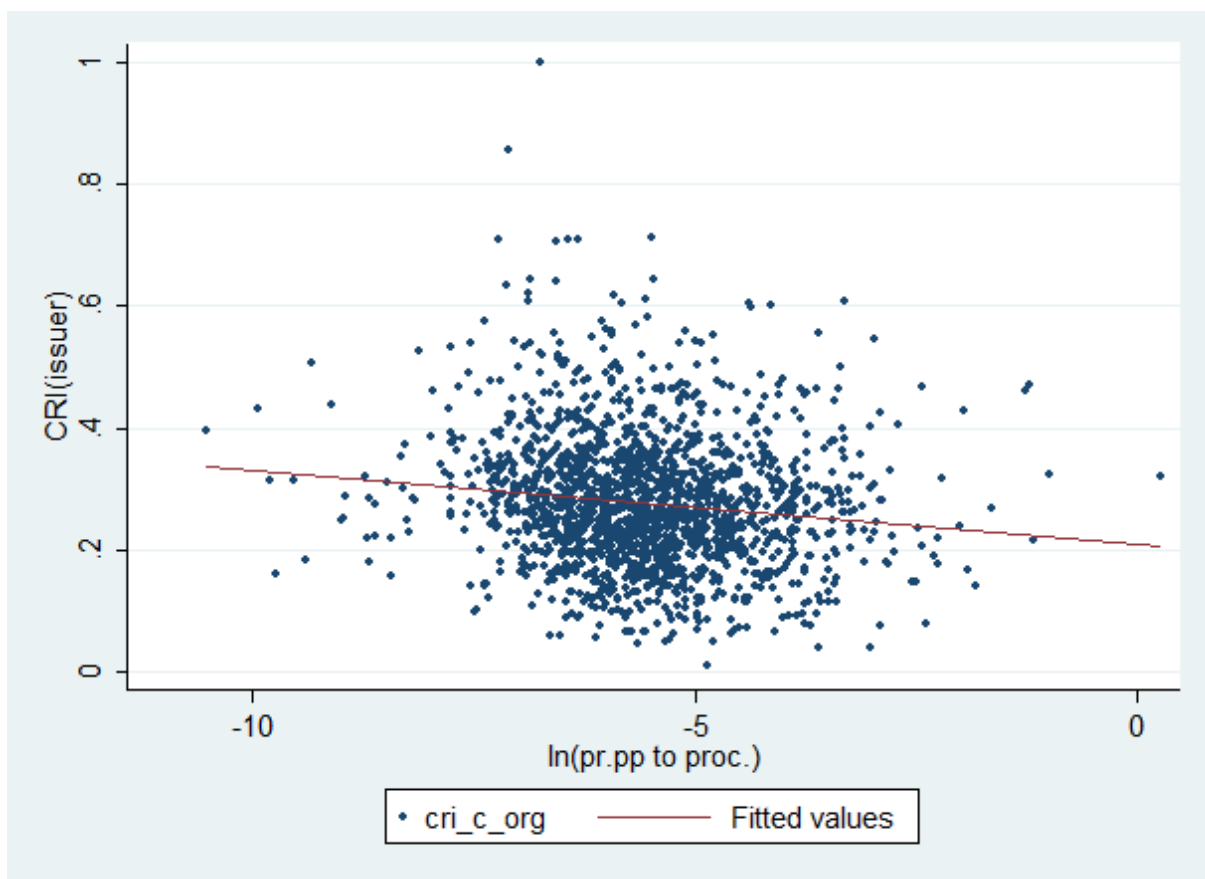
Source: PP

Notes: for details of calculating total procurement spending from Treasury annual budget accounts see: (Audet, 2002; European Commission, 2011b). The ratio reported is only an estimation as spending as announced in PP refers to the total lifetime of the contract while Treasury accounts contain only the spending accrued in a given year. Further reason for imprecision of the ratio is that the set of institutions submitting accounts to the Treasury and those subject to the Public Procurement Law are somewhat different.

Second, as qualitative evidence points out that removing contracts and procedures from the remit of the Public Procurement Law and hence the public domain is a corruption technique on its own, it is possible that the PP database is a biased sample of all the contracts and procedures relevant for analysing institutionalised grand corruption. It is possible to calculate the total estimated public procurement spending for each public organisation using Treasury data on individual organisations' annual budget breakdowns. By exploring the relationship between the amount of missing spending

and average CRI per organisation, we get an insight into the potential bias due to missing data. The natural logarithm of the ratio of total procurement spending (Treasury records) to reported public procurement spending (Public Procurement Bulletin) is weakly negatively correlated with average organisational CRI ( $r^2=-0.12$ ) (Figure 28Figure 29). This implies that the missing data bias is in line with our overall conservative approach of developing a lower bound estimate of institutionalised grand corruption, at least on the level of organisations. In addition, the overall weak relationship indicates that this bias is mostly due to random factors rather than systematic avoidance of transparency.

**Figure 29. Issuer annual mean CRI and log total procurement to procurement reported in the Public Procurement Bulletin, 2009-2012, N=1717**



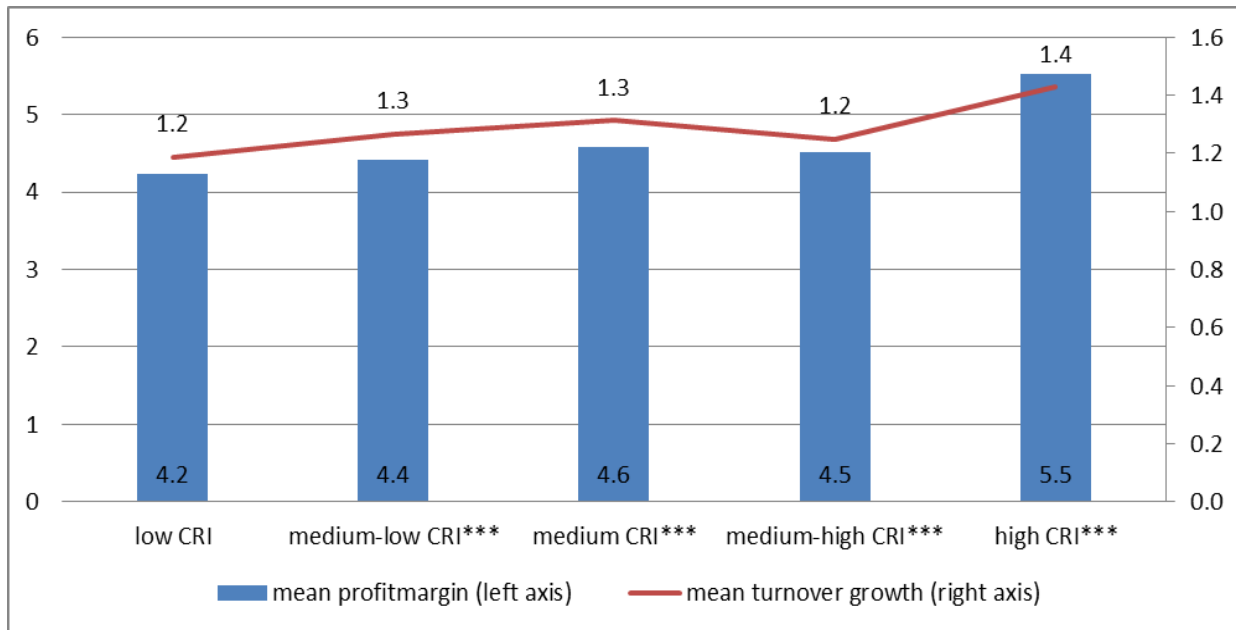
Source: PP

Third, we expect high CRI companies to earn higher profit and increase their turnover quicker than their low CRI peers because the primary aim of institutionalised grand corruption, which we are measuring with CRI, is to generate extra profit considerably above market average. However, we believe this relationship is likely to be only of moderate magnitude and probabilistic as high corruption companies are often hiding

their profits and turnover through offshore companies, chains of subcontractors, and tax fraud. These have been confirmed by interviews in Hungary.

Simple comparisons of companies falling in the quintiles of CRI reveal a relationship in line with expectations (Figure 30). Percentile comparisons are preferable to simple correlations as corruption may have a non-linear effect on profitability and turnover growth (linear correlation coefficients are 0.04 and 0.02). Companies of highest CRI ( $0.35 < \text{CRI} < 0.87$ ) are more profitable than any other company group, but the difference is especially large when compared to the lowest CRI companies ( $0 < \text{CRI} < 0.16$ ): 1.3% points higher profit margin or 30% more profitable ( $1.3/4.4$ ). Turnover growth, that is turnover in  $t_1$  divided by turnover in  $t_0$ , is characterised by the same relationship with CRI. The highest CRI group has a 24% higher growth rate than the lowest CRI group. To some up, public procurement suppliers designated as high corruption risk companies by our corruption risk index are both more profitable and increase their turnover quicker than companies of the lowest corruption risk group. The fact that the relationship is particularly pronounced when comparing the two ends of the CRI distribution suggests that extremities of the CRI distribution may be the most precise in signalling institutionalised grand corruption.

**Figure 30. Mean profit margin and mean turnover growth by CRI quintiles, 2009-2012, N (pr.margin)=3097; N(turno.growth)=2894**



Source: PP

Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$  designate the significance of the difference from the “low CRI” group. Significance levels computed using Monte-Carlo random permutations (300 repetitions) with stata

Fourth, we expect that companies with political connections to display higher corruption risks as the primary vehicle for maintaining institutionalised grand corruption is to have strong ties between powerful political and business actors. We mapped the owners and manager of each company winning in 2009-2012 (15% of companies were either unidentifiable or we lacked the relevant data) and matched them with key political officeholders of public organisations existing in the period (for full list of institutions and offices see Appendix 5C). The matching was done between more than 35000 owners/managers of winning firms and more than 10000 political officeholders based on full name<sup>55</sup>. Matching solely on name is obviously prone to random error which is nevertheless set aside for the present analysis by assuming that name frequency is not correlated with CRI. Those companies which have or had at least one owner or manager holding a political office at any point in time were designated as politically connected firms.

<sup>55</sup> Matching based on publicly available biographical data will be available in a later version of this paper.

In line with our expectations, politically connected firms are of higher CRI (Table 20), they have a higher CRI by 0.01 on average than companies without political connections. While this difference is relatively small, increasing the precision of identifying political connections will shed more light at the validity of CRI. The magnitude of group differences may also signal that political connections serve as a means to corruption only in some cases while in others the politicians just picking profitable companies winning procurement contracts.

**Table 20. Comparisons of mean CRI of politically connected and not connected firms, 2009-2012**

Group	N	Mean CRI	Std. Err.	Std. Dev.	95% Conf.Interval	
0=no political connection	2687	0.254	0.002	0.113	0.250	0.258
1=politically connected	1318	0.264	0.003	0.112	0.258	0.270
combined	4005	0.257	0.002	0.113	0.254	0.261
difference (CRI1-CRI0)		<b>0.010***</b>	0.004		0.017	0.003

Source: PP

Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; Significance levels computed using Monte-Carlo random permutations (300 repetitions) with stata

Fifth, it is possible to predict the total contract volumes of companies winning public procurement contracts between 2009-2012, and hence to identify those companies which win considerably more or less when the government changed in 2010 controlling for company characteristics such as prior investment and main market (Fazekas et al., 2013). While more work is needed to reliably carry out this analysis, we expect that those companies whose market success highly depends on who is in power, i.e. latent political connections, display higher CRI. This is because institutionalised grand corruption is likely to be strongest where political connections are present. A simple comparison of the two groups' CRIs reveal a relationship in line with our expectations (Table 21). Companies with government dependent contract volume have 0.01 or 5% higher CRI than those whose contract volume is unaffected by which government is in

power. While this difference is relatively small, it supports the claim that latent political connections translate into institutionalised grand corruption as measured by CRI.

**Table 21. Comparisons of mean CRI<sup>56</sup> of companies whose market success does or does not depend on the which government is in power, 2009-2012**

Group	N	Mean CRI	Std. Err.	Std. Dev.	95% Conf.Interval	
0=success <i>not</i> linked to government change	428	0.205	0.006	0.120	0.193	0.216
1=success linked to government change	2481	0.214	0.002	0.111	0.210	0.219
combined	2909	0.213	0.002	0.112	0.209	0.217
difference (CRI1-CRI0)		<b>0.010***</b>	0.006		0.021	-0.002

Source: PP

Note: \*  $p < 0.05$ ; \*\*  $p < 0.005$ ; \*\*\*  $p < 0.001$ , Significance levels computed using Monte-Carlo random permutations (300 repetitions) with stata

<sup>56</sup> Unlike in other validation tests, this test makes use of CRI aggregated by contract value rather than number of contracts. Hence, its meaning is closer to ‘corruption risk index of the average HUF won’ rather than average corruption risk index of the average contract won’. The reason for using contract value-based aggregation is that identification of companies as government-dependent is done using their contract volumes hence contract value aggregated CRI is more consistent with the company identification strategy. Findings are qualitatively the same with the alternative aggregation method.

## **7. Conclusions and the uses of the indicators**

The analysis demonstrated that it is feasible and fruitful to construct a corruption risk index (CRI) at the micro-level based on objective behavioural data only. Initial evidence confirms the validity of CRI. The great advantage of our approach is that a large amount of data is available for research across every developed country for the last 6-8 years, opening up a new horizon for comparative corruption research. In addition, such comparative research will be able to use a conceptually much clearer concept whose measurement avoids the pitfalls of subjective indicators as well as prior objective indicators.

Almost every corruption input displayed a relationship with corruption outcomes in line with prior expectations (Table 22). Robust models linking corruption inputs to outputs allowed for deriving component weights for CRI composed of 14 variable groups neither of which dominates the resulting index (linear correlation coefficients between corruption inputs and CRI range between 0.01 and 0.57). The strength of this approach is that any change of regulation impacting on the relative costs of a corruption technique compared to other techniques leaves our CRI robust, as the increasing use of measured substitutive corruption techniques are adequately reflected. This characteristic of our CRI is particularly useful when comparing different countries of diverse regulatory environments and power constellations between elite groups. Further comparative work will use the same set of variables and regression setup in order to identify country- and period-specific parameters, as for example character-length of eligibility criteria tailored to a single company is likely to vary across countries and time with different regulatory institutions while the underlying institutionalised corruption may remain the same (for a demonstration of this idea in practice see chapter 6).



**Table 22. Summary of regression results**

Phase	INPUT/OUTPUT	single received/ valid bid	winner market share
		empirical relationship	direction of
submission	Single bidder contract	not relevant	+
	Call for tenders not published in official journal	+	+
	Procedure type	+	+
	Length of eligibility criteria	+	+
	Exceptionally short submission period	+	+
	Relative price of documentation	+	+
	Call for tenders modification(only before 01/05/2010)	+	+
assessment	Exclusion of all but one bid	not relevant	+
	Weight of non-price evaluation criteria	∩	∩
	Annulled procedure re-launched subsequently*	-	not tested
	Length of decision period	U	U
delivery	Contract modification	-	+
	Contract extension (length/value)	-	0

Source: PP

We expect subsequent research to further validate CRI collating it to additional measures of grand corruption in more detail in Hungary and replicate measurement and analysis in other countries (work is ongoing for Czech Republic, Slovakia, Romania, and Russia).

## Chapter 6 - Are EU funds a corruption risk? The impact of EU funds on grand corruption in Central and Eastern Europe<sup>57</sup>

### 1. Introduction

It is hard to miss the ‘buzz’ around how extensively corruption affects the spending of European Union (EU) funds across many new and old member states: Italian mafia hijacking highway projects, or the European Commission freezing Structural Funds payments in countries such as Romania, Bulgaria, or Hungary. Some of these cases point at 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.

EU funds constitute a considerable part of GDP in many member states, especially in Central and Eastern Europe (CEE) where it amounts to 1.9%-4.4% of annual member state GDPs (KPMG, 2012) and well above 50% of public investment. Even if only a fraction of these amounts is impacted by corruption, the negative effects are likely to be considerable in terms of mis-investment (e.g. empty highways leading to nowhere) and distorted economic incentives, jeopardizing regional convergence, one of the primary goals of EU funds. If corruption in EU funds spending is indeed connected to high-level politics and organised crime, then ramifications are more severe, impacting political competition, democracy, and social welfare eventually.

Given high – suspected – corruption risks in EU funds spending, especially in CEE, the large sums involved, and the potential negative consequences, this paper sets out to explore the following research question:

**What is the impact of EU funds spending on institutionalised grand corruption in CEE?**

It focuses on three new EU member states: **Czech Republic, Hungary, and Slovakia** throughout 2009-2012. These three EU member states represent different levels of wealth and development trajectories. Their political institutions differ considerably with Hungary increasingly displaying some authoritarian characteristics lately and generally

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<sup>57</sup> Some of the research underlying this chapter has been conducted in collaboration with Jana Chvalkovska, Jiri Skuhrovec, and István János Tóth.

failing to tackle corruption (Batory, 2012); Slovakia making some progress towards clean government albeit with question marks (Beblavy, 2009), and Czech Republic being one of the good performers of CEE while displaying some signs of a deteriorating situation (Transparency International, 2012b). In spite of differences, these countries share a broadly similar post-communist heritage and a relatively homogenous regulatory framework defined by the EU.

**2009-2012** constitutes a turbulent period with the global economic crisis unfolding and turning into a sovereign debt crisis in Europe, with the three countries being affected in different ways. There was at least one general election in 2009-2012 in each of these countries. This turbulent environment provides the perfect setting for testing the robustness of our theory in different political and economic contexts.

EU funds are spent in various forms which make it hard to arrive at a blanket assessment. Therefore, we opted for looking only at **public procurement spending by public or semi-public organisations (e.g. state owned enterprises) financed from EU funds**, which predominantly means the use of Cohesion and Structural Funds. This approach carries the advantage that projects can be compared which are similar in most respects except for the source of financing: predominantly EU or national. Moreover, there is exceptionally good data available on public procurement spending in all three countries on the level of individual contracts for the period.

Our approach is a major departure from prior studies in this area, as it utilizes a large-scale micro-level quantitative database which allows for unearthing a rich detailed picture on the level of individual actors while also being broad enough to evaluate whole systems of governance.

The paper is structured as follows: first, a brief overview of key arguments in the literature is provided; second, the data sources and our new indicators are discussed; third, our hypotheses are assessed; fourth, conclusions and further research directions are offered.

## 2. Theory

In spite of the considerable public and policy interest in corruption risks in EU funds spending, there is **remarkably little scientific work on the question to date**<sup>58</sup>. Looking into the broader discussion, there are two potential sources of theoretical underpinning: the broad economic, sociological, and political science literature on aid dependence and the Europeanization literature in political science. These two literatures offer no unambiguous theoretical expectation on whether and how EU funds contribute to the quality of institutions and impact corruption. Rather, what we find is a set of conflicting predictions and mechanisms which need empirical evaluation.

The literature looking at the effect of development aid on quality of institutions and corruption is vast; however, it can be applied to the context of CEE countries and EU funds only with caution due to the greatly different contexts and funding volumes (i.e. EU funding amounts to 3-4% of recipient countries' GDP whereas many developing countries receive aid more than 10% of GDP (Bräutigam & Knack, 2004)). Nevertheless, according to this literature, **foreign aid can have a positive effect on governance** by providing clear policy goals of 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 a similar way as natural resources can (Djankov, Montalvo, & Reynal-Querol, 2008). Development aid 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 directly destruct domestic administrative capacity by reallocating talented bureaucrats from domestic institutions to aid organisations and by providing additional organisational goals potentially increasing institutional fragmentation. Probably most importantly, development aid increases the pool of public resources available for rent seeking which easily translates into additional corruption in contexts with weak controls of corruption (Bräutigam, 2000). While these causal pathways may work differently in the CEE context, the above arguments may still account for a large part of the mechanisms linking EU funds to corruption in the region. Combining these insights with

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<sup>58</sup> Keyword searches using "EU funds" and "corruption" returned not a single article in search engines: Google scholar, Jstor, Wiley online, Business Source Complete, Project Muse, and Sage Journals when searching only in the title. Only the Web of Knowledge database returned an article: (Dimulescu et al., 2013). However, searching in the main text of articles returns a large number of hits. For example, Google scholar found 98400 hits for the same keywords (25/9/2013).

scholarship specific to CEE and EU governance leads to more robust theoretical underpinnings.

In the Europeanization literature, few would debate that that the **EU contributed to institution building and improvement of governance in CEE countries throughout the accession process** (Epstein & Sedelmeier, 2009). The EU provided the highly popular goal of accession for CEE governments and guidance on which institutional improvements should be implemented to reach this goal albeit with varying clarity (Meyer-Sahling, 2011). These resulted in a wealth of reforms of public administration, democratic checks and balances, or financial management.

However, many authors expressed **concerns that CEE countries reversed a range of reforms after accession** and left many EU-supported and/or requested new rules as 'empty shells' (Dimitrova, 2009; Epstein & Sedelmeier, 2009; Mungiu-Pippidi, 2007). These concerns stem from the EU's diminishing leverage to keep new member states in line with principles of good government and the perceived limited embeddedness of many pre-accession reforms. Many of these reforms were either 'implemented' only on paper or created islands of excellence isolated from the rest of public administration (Goetz, 2001).

Similarly to the literature on aid dependency, the Europeanization literature delivers good reasons for believing that **EU funds advance good government**. First, one of the most important remaining post-accession levers of Brussels for disciplining new member states is EU funds and the threat of withdrawing them (Epstein & Sedelmeier, 2009) which should, in principle, motivate recipient countries to manage funds well. This argument implies a macro to micro causal mechanism whereby governments in general and national managing authorities in particular, take additional steps to guard the integrity of EU funds spending compared to national spending. Second, the disbursement of EU funds is more heavily regulated, making, in principle, corruption more costly. For example, project management and payments have to be rigorously documented and detailed regulations followed. Heavy administrative and regulatory requirements can also contribute to higher administrative capacity in the recipient organisations as they often have to invest in their capacities to be able to receive and manage EU funds. Third, more extensive monitoring and controls of EU funds also point at potential beneficial effects (Pricewaterhouse Coopers, 2013). Public spending financed from EU funds are subject to EU monitoring in addition to the usual national

audit frameworks making detection and punishment of wrongdoing more likely (European Commission, 2003; European Court of Auditors, 2012, 2013). Moreover, the European Court of Justice represents an additional venue for judicial review, making the capture of domestic courts a less effective way of avoiding punishment for corruption.

Similar to the development aid literature, the Europeanization literature also delivers arguments stating that external funding such as **EU funds in CEE deteriorate the quality of government and increase corruption**. There are at least three reasons. First, EU Cohesion and Structural Funds are spent on investment projects where public discretion is high. From the wider literature, it is clear that discretionary spending is more likely to involve corruption than non-discretionary spending such as pensions, albeit the direction of causality is far from clear (Mauro, 1998; Tanzi & Davoodi, 2001). Second, EU funding provides a large additional pool of public resources for rent extraction. Hence, all else being equal, EU funds add to the pool of particularistically allocated public resources (Mungiu-Pippidi, 2013). Third, EU funds, like external funding in developing countries, weaken the link between domestic civil society, taxation, and policy performance. While the relative value of EU funding in CEE countries' budgets is considerably lower than development aid in least developed countries, for particular public organisations the proportion can be extremely high (e.g. in 24.5% of Hungarian issuing bodies between 2009-2012, all the public procurement contracts awarded were financed from EU funds).

In addition to the above broader arguments, preliminary evidence from Hungary (Fazekas et al., 2013) and Romania (Dimulescu, Pop, & Doroftei, 2013) suggest that corruption in EU funds reaches up to high-level politicians. Therefore, it is conceivable that EU funds, in fact, fuel high-level corruption networks which can simultaneously control business and political positions. This implies that EU funding keeps corrupt elites in power rather than promoting integrity.

From the above discussion, the following hypotheses result: on the one hand,

H<sub>0</sub>: EU funds decrease institutionalised grand corruption in CEE,

on the other hand:

H<sub>A1</sub>: EU funds increase institutionalised grand corruption in CEE.

While the literature doesn't discuss this possibility extensively, theoretically, it is also possible that

H<sub>A2</sub>: EU funds leave institutionalised grand corruption unchanged in CEE.

In the context of public procurement, institutionalised grand corruption refers to the particularistic allocation and performance of public procurement contracts by bending universalistic rules and principles of good public procurement in order to benefit a group of individuals while denying access to all others (for a similar understanding of corruption see: Mungiu-Pippidi, 2006; North et al., 2009; Rothstein & Teorell, 2008).

While causal mechanisms cannot be tested one by one in detail, three major effects can be identified and hence will be tested separately: 1) the effect of additional resources represented by EU funding; 2) the effect of different monitoring and incentive structures attached to EU funding; and 3) the spillover effect of managing EU funds in the public administration (unfortunately this third effect could not be tested in this version of the paper, more work is in progress).

The above hypotheses assume a simple, linear relationship between EU funding and corruption which may be an oversimplification of reality. The aid dependency literature touches upon a number of crucial factors mediating the effect of external funding on institutional quality. Among these, the most essential is prior quality of government in the recipient countries (Moss, Pettersson, & van de Walle, 2006). Extrapolating from this argument, it is also possible that EU spending's effect on corruption depends on the level of corruption and administrative capacity in the recipient organisations. We will return to this consideration in light of the empirical findings.

### 3. Data and variables

#### 3.1. Data sources

**The database derives from public procurement announcements of 2009-2012 in Czech Republic, Hungary, and Slovakia** (this database is called Public Procurement Comparative database, referred to as **PPC** henceforth). The data represent a complete database of all public procurement procedures conducted under national public procurement laws. PPC contains variables appearing in 1) calls for tenders, 2) contract award notices, 3) contract modification notices, and 4) administrative corrections notices. As not all of these kinds of announcements appear for each procedure, for example depending on procedure type, we only have the information deriving from contract award notices consistently across every procedure. All the countries' public procurement legislation is within the framework of the EU Public Procurement Directive and hence are, by and large, comparable. Utilization of certain regulatory tools are different, nevertheless, which provides useful variability for later analysis.

**The data derives from official government online sources** in each country (Table 23). As there is no readily available database, we used a crawler algorithm to capture every announcement available online. Then, applying a complex automatic and manual text mining strategy, we created a structured database which contains variables with well-defined categories. As the original texts available online contain a range of errors, inconsistencies, and omissions, we applied several correction measures to arrive at a database of sufficient quality for scientific research<sup>59</sup>. For a full description of database development, see Soudek & Skuhrovec (2013) on the Czech Republic, Fazekas & Tóth (2012a, 2012b) on Hungary, and Transparency International Slovakia (2009) on Slovakia.

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<sup>59</sup> For example, contract award announcements and calls for tenders are directly linked through a unique procedure ID in the Czech Republic only. Whereas in Hungary and Slovakia, the announcements refer to each other in varying formats making our linking procedure imperfect.



**Table 23. Primary sources of public procurement data and minimum thresholds**

Country	Source of PPC data	URL	Minimum thresholds (EUR) <sup>60</sup>
Czech Republic	Ministerstvo pro místní rozvoj ČR	<a href="http://www.isvzus.cz/usisvz/">http://www.isvzus.cz/usisvz/</a>	39,000
Hungary	Közbeszerzési Értesítő	<a href="http://www.kozbeszerzes.hu/">http://www.kozbeszerzes.hu/</a>	27,300
Slovakia	Úrad pre verejné obstarávanie	<a href="http://www.uvo.gov.sk/sk/evestnik">http://www.uvo.gov.sk/sk/evestnik</a>	30,000

**A potential limitation of PPC** is that it only contains information on public procurement procedures under national public procurement laws as there is no central depository of other contracts. The law defines the minimum estimated contract value for its application depending on the type of announcing body and the kind of products or services to be procured (see for example Table 23). By implication, PPC is a biased sample of total public procurement of these countries, containing only the larger and more heavily regulated cases. This bias makes PPC well suited for studying more costly and higher stakes corruption where coverage is close to complete. Although, as removing contracts from the remit of the Public Procurement Law can in itself be part of corrupt strategies there remains some non-random bias in the data. This bias is, however, estimated to be small based on Hungarian data, where the linear correlation between the proportion of procurement spending not reported in the Public Procurement Bulletin and the public agency's average corruption risk index is small and negative ( $r=-0.12$ ) (see chapter 5).

As **contract award notices** represent the most important part of a procedure's life-cycle and they are published for each procedure under national public procurement laws, their statistics are shown in Table 24 to give an overview of the database. In spite of the relative similarity of thresholds for applying national public procurement laws, the three countries have very different proportions of transparent public procurement spending to total GDP (see last row in Table 24). On the one hand, this is due to the

<sup>60</sup> Thresholds refer to 2012, classical issuers, in services sector. National currencies are converted to EUR using official exchange rates of 5/2/2013 of the European Central Bank.

use of exceptions, most notably in Hungary, and announcing contract awards in the official journal even if they would fall outside the remit of the law, most typically in the Czech Republic. On the other hand, this is due to the different total amounts spent on public procurement in the three countries whereby Hungary spends the least (OECD, 2013).

**Table 24. Main statistics of the analysed data by country, total public procurement spending, 2009-2012**

	Czech Republic	Slovakia	Hungary	Total
Total number of contracts awarded (with valid contract value)	46945	20841	51231	119017
Total number of unique winners	11015	4912	10739	26666
Total number of unique issuers	5838	2069	5171	13078
Combined value of awarded contracts (million EUR)*	41591	22947	12514	77052
Combined value of awarded contracts (% GDP)**	6.9%	8.5%	3.2%	6.1%

Source: PPC

Notes: \* Exchanged into EUR using average monthly exchange rate of the contract award, not corrected for inflation;\*\* GDP figures are from Eurostat (GDP at market prices).

### 3.2 Variables used in the analysis

#### 3.2.1 EU funds use

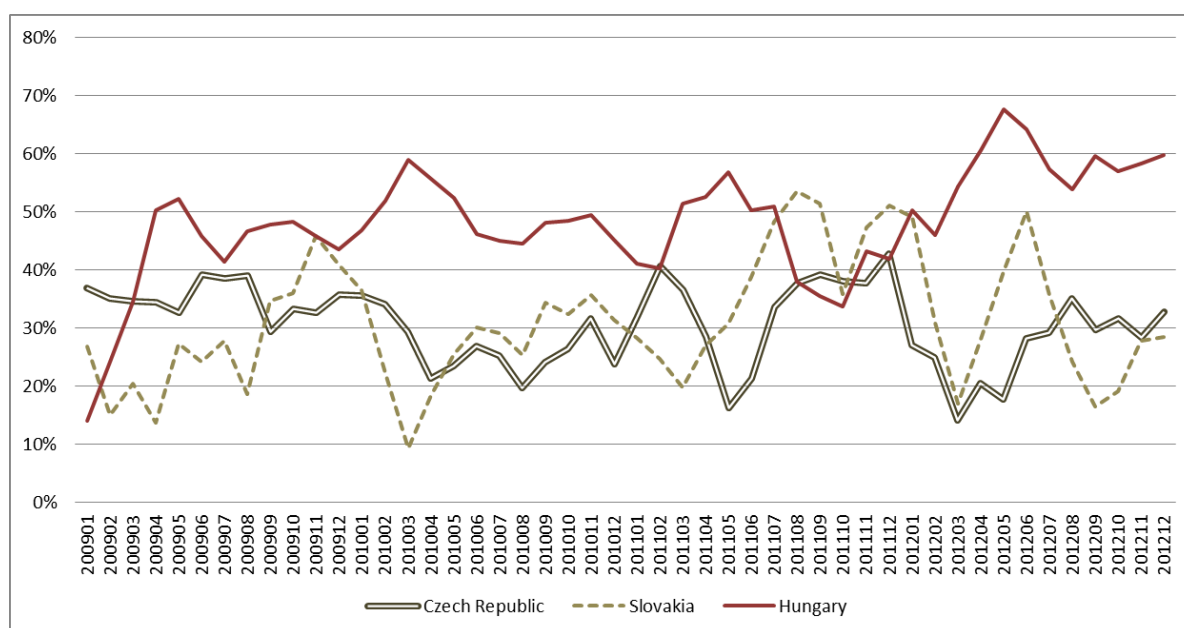
The spending of EU funds in public procurement can be directly identified in each contract award announcement which records the use or non-use of EU funds along with the reference to the corresponding EU program (this latter information will only be used at a later research stage as it requires text mining procedures for precise program identification). However, no information is published as to the proportion of EU funding within the total contract value. Hence, we had to employ a simplistic **yes-no categorisation of each contract awarded**. In most cases, regulation allows for the EU contribution to cover 80-95% of total investment. Data from large investment projects indicate that EU funds amount to the majority of project costs if EU funding is involved.

Our approach nevertheless implies that throughout this paper, EU funding figures also include some national co-financing of between 5-20%.

Contrary to popular perceptions, public procurement from EU funds does not fall under a different procedural regime. The same procurement rules and thresholds apply regardless of funding source. **Common national and European public procurement legal frameworks warrant a meaningful comparison between EU funded and non-EU funded public procurement procedures.** The crucial difference between procurement procedures funded from EU funds and by national governments lies in additional monitoring and controls and different motivation structures associated with spending EU funds.

The three countries have made use of EU funding in their procurement spending to varying degrees with Hungary spending most extensively (Figure 31).

**Figure 31. Proportion of contract value making use of EU funding to total contract value, 2009-2012, by country (% of total contracted value\*, 3-month rolling averages)**



Source: PPC

Notes: \* contract values are converted to EUR using the average exchange rate of the month of contract award, and they are corrected for inflation differentials across the 3 countries. Values are in 2009 Slovak EUR.

### 3.2.2 Indicators of institutionalised grand corruption

Developing comparative indicators of institutionalised grand corruption in public procurement for all three countries represent the primary methodological innovation of this article. The approach follows closely the composite indicator building methodology developed by the author (see chapter 5) making use of a wide range of elementary indicators of corruption in public procurement deriving from a review of international academic and policy literature, key informant interviews in Hungary, and content analysis of the Hungarian media (see chapter 4).

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 bent or broken. By implication, it is possible to identify the input side of the corruption process, that is techniques used for limiting competition (e.g. leaving too little time for bidders to submit their bids), and also the output side of corruption, that is signs of limited competition (e.g. a single bid received). By measuring the degree of unfair restriction of competition in public procurement, an indirect indicator of corruption can be obtained. This indicator, called **corruption risk index (CRI) represents the probability of particularistic contract award and delivery in public procurement** falling between 0 and 1.

The variables describing the input side of the corruption process in public procurement, that is **elementary corruption techniques**, are reported in Table 25. There is a more complete list of conceivable and measurable elementary corruption indicators (see chapter 4); however for the purposes of comparability only a subset is used in this paper. Indicators are grouped according to the phase of the procurement process they relate to. This is a work in progress; data will be processed for 2-3 additional elementary corruption risk indicators in each country.

**Table 25. Summary of elementary corruption risk indicators**

Proc. phase	Indicator name	Indicator values	availability		
			CZ	HU	SK
submission	Single bidder contract (valid/received)	1=1 bid received 0=more than 1 bid received	x	x	x
	Call for tenders not published in official journal	1=NO call for tender published in official journal 0=call for tender published in official journal	x	x	x
	Procedure type	0=open procedure 1=invitation/restricted procedure 2=negotiation procedure 3=other/framework procedures 4=outside PP law 5=missing/erroneous procedure type	x	x	x
	Call for tender modification	1=modified call for tenders 0=NOT modified call for tenders	x	x	
	Length submission period	Number of days between the publication of call for tenders and the submission deadline (for short submission periods weekends are deducted)	x	x	x
assessment	Number of evaluation criteria	number of distinct evaluation criteria (separate rows)	x	x	
	Length of decision period	number of days between submission deadline and announcing contract award	x	x	x
overall	winner contract share	12-month total contract value of winner / 12-month total awarded contract value (by issuer)	x	x	x
<i>Number of components</i>			<i>8</i>	<i>8</i>	<i>6</i>

Source: PPC

**Component weights** are assigned to elementary corruption risk indicators using a set of regressions directly modelling corrupt rent extraction in public procurement (Table 26 and ). In these regressions, two likely corrupt outcomes of the corruption process: 1) single bidder contracts and 2) winner's share of issuer's contracts are regressed on elementary corruption risk indicators (Table 25)<sup>61</sup> and variables controlling for alternative explanations:

- low administrative capacity: number of employees of the issuer,
- institutional endowments: type of issuer,
- market specificities: CPV division of products procured (2 digit level),
- number of competitors on the market: number of unique winners throughout 2009-2012 on CPV level-3 product group (4 digit level) and NUTS-1 geographic region,
- contract size and length, and

<sup>61</sup> Note that 'single bidder' is a variable which both constitutes an output and input of the corruption process. It is an output in as much as it signals the lack of competition; while it is an input in as much as it serves as a means of recurrently awarding the contract to the same company.

- regulatory changes: year of contract award;

and using a restricted sample in order for the regressions to adequately fit a corrupt rent extraction logic as opposed to market specificities or inexperience with public procurement:

- markets with at least 3 unique winners throughout 2009-2012 for markets defined by cpv (level 3) and nuts (level 1) categories for each country; and
- issuers awarding at least 3 contracts in the 12 months period prior to the contract award in question.

For continuous variables such as the length of submission period, **thresholds** had to be identified in order to reflect the non-linear character of corruption. This was done in two steps in each country. First, the above regression models were fit using the continuous version of the variable and the residual distribution was analysed in order to identify distinct patterns lending themselves to categorisation; second, the same regression models were re-estimated using the categorical version of the continuous variable and the residual distribution checked for remaining patterns. If some systemic error remained, further categories were introduced. As a result thresholds are different for each country. These differences can be interpreted as reflections on different regulatory and market conditions. For example, submission period thresholds differ per country, year, and procedure type, primarily because the legally permissible submission period lengths and the degree to which actors abide by these rules greatly differ.

Regression results indicate that there is considerable market access restriction, hence likely institutionalised grand corruption, going on in all three countries during the 2009-2012 period, by and large following the same techniques and ‘tricks’ (Table 26 and Table 27). These results on their own demonstrate that corruption is systemic in public procurement in these countries. Arriving at robust regression models with considerable explanatory power (pseudo  $R^2$  between 0.11 and 0.30 for binary logistic regressions; and  $R^2$  between 0.19 and 0.29 for linear regression) by using the same regression set-up and variables point at the feasibility of cross-country measurement.

While there is not enough space to discuss each variable in detail, some examples show the logic of analysis and our approach to interpretation. In the **Czech Republic**, the modification of the call for tenders is associated with a 0.6% higher probability of receiving a single bid and with a 1.5% higher winner’s contract share. Both results point

at a likely interpretation that modifying call for tenders during the bidding phase is systematically used for restricting access and recurrently benefiting the same company. This result warrants that the modification of call for tenders will be part of the Czech CRI. In **Slovakia**, not publishing the call for tenders in the official journal is associated with 9.0% higher probability of a single bidder contract award and a 1.3% higher winner's contract share. Both results suggest that avoiding the transparent and easily accessible publication of a new tender can typically be used for limiting competition to recurrently benefit a particular company. This implies that call for tenders not published in the official journal becomes part of the Slovak CRI. In **Hungary**, leaving only 5 or fewer days, inclusive the weekend, for bidders to submit their bids is associated with 20% higher probability of a single bidder contract and with a 7.9% higher winner's contract share compared to periods longer than 20 calendar days. These indicate that extremely short submission periods are often used for limiting competition and awarding contracts recurrently to the same company. Once again, this provides sufficient grounds for including this category in the Hungarian CRI.

Following this logic, only those variables and variable categories are included in CRI which are in line with a rent extraction logic and proven to be significant and powerful predictors in at least one of the two regressions for each country<sup>62</sup>.

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<sup>62</sup> Being significant and of substantive size in only one of the two regressions is a sufficient condition for inclusion in the CRI of the given country because some corruption techniques are most typically used during the bidding phase or at later phases. Recall that single received bid is a likely corrupt outcome of the bidding phase while the winner's contract share is indicative of corrupt outcomes for the whole public procurement process.

**Table 26. Binary logistic regression results on contract level, 2009-2012, by country, average marginal effects, for markets where nr. of winners >=3**

Independent vars-CZ		Dependent var: single bidder contract (1), multi-bidder contract (0)				
	CZ	Independent vars-SK		SK	Independent vars-HU	
<b>NO call for tenders in off. journal</b>	0.116***	<b>NO call for tenders in off. journal</b>		0.091***	<b>NO call for tenders in off. journal</b>	0.098***
P(Fisher)	0.000	P(Fisher)		0.002	P(Fisher)	0.000
P(permute)	0.000	P(permute)		0.000	P(permute)	0.000
<b>procedure type</b>		<b>procedure type</b>			<b>procedure type</b>	
ref. cat.=open procedure		ref. cat.=open procedure			ref. cat.=open procedure	
1=invitation procedure	-0.042***	1=invitation procedure		0.01	1=invitation procedure	0.082***
P(Fisher)	0.126	P(Fisher)		0.796	P(Fisher)	0.212
P(permute)	0.000	P(permute)		0.575	P(permute)	0.000
2=negotiation procedure	0.4***	2=negotiation procedure		0.498***	2=negotiation procedure	0.074***
P(Fisher)	0.000	P(Fisher)		0.000	P(Fisher)	0.001
P(permute)	0.000	P(permute)		0.000	P(permute)	0.000
3=outside PP law	-0.087***	3=other procedure types		0.344***	3=other procedure types	0.276***
P(Fisher)	0.000	P(Fisher)		0.000	P(Fisher)	0.000
P(permute)	0.435	P(permute)		0.000	P(permute)	0.000
4=other/missing/erroneous procedure typ	-0.049	4=outside PP law		-0.029	4=missing/error	0.025***
P(Fisher)	0.278	P(Fisher)		0.629	P(Fisher)	0.171
P(permute)	1.000	P(permute)		0.190	P(permute)	0.000
<b>modification of call for tenders</b>	0.006***	<b>modification of call for tenders</b>		n.a.	<b>modification of call for tenders</b>	n.a.
P(Fisher)	0.747					
P(permute)	0.000					
<b>short submission period</b>		<b>short submission period</b>			<b>short submission period</b>	
ref.cat.=s.period>55*		ref.cat.=s.period>25			ref.cat.=s.period>20	
1= 47<s.period<=55	0.044***	1= 14<s.period<=25		0.078***	1= 17<s.period<=20	0.001
P(Fisher)	0.060	P(Fisher)		0.011	P(Fisher)	0.944
P(permute)	0.000	P(permute)		0.000	P(permute)	0.875
2= 43<s.period<=47	0.067***	2= s.period<=14		0.02	2= 5<s.period<=14	0.103***
P(Fisher)	0.014	P(Fisher)		0.776	P(Fisher)	0.005
P(permute)	0.000	P(permute)		0.680	P(permute)	0.000
3= 38<s.period<=43	0.05***	3= missing		0.064	3= 0<s.period<=5 (incl.weekend)	0.2***
P(Fisher)	0.049	P(Fisher)		0.657	P(Fisher)	0.002
P(permute)	0.000	P(permute)		0.600	P(permute)	0.000
4= 27<s.period<=38	0.007				4=missing	0.05***
P(Fisher)	0.811				P(Fisher)	0.213
P(permute)	0.440				P(permute)	0.000
5= 0<s.period<=27	0.009					
P(Fisher)	0.734					
P(permute)	0.230					
6=missing submission period	-0.053					
P(Fisher)	0.559					
P(permute)	0.455					
<b>number of assessment criteria</b>		<b>number of assessment criteria</b>		n.a.	<b>number of assessment criteria</b>	
ref.cat.= nr.of criteria=0					ref.cat.=2<nr.of criteria<=4	
1= 0<nr.of criteria<=2	0.053				1=nr.of criteria=0	0.053***
P(Fisher)	0.014				P(Fisher)	0.014
P(permute)	1.000				P(permute)	0.000
2= 2<nr.of assessment criteria<=8	-0.006***				2= 0<nr.of criteria<=2	0.087***
P(Fisher)	0.772				P(Fisher)	0.003
P(permute)	0.000				P(permute)	0.000
3= 8<nr.of criteria	0.009				4= 4<nr.of criteria	0.068***
P(Fisher)	0.713				P(Fisher)	0.007
P(permute)	0.520				P(permute)	0.000
<b>length of decision period</b>		<b>length of decision period</b>			<b>length of decision period</b>	
ref.cat.= 113<dec.period<=201		ref.cat.=62<dec.period<=120			ref.cat.= 44<dec.period<=182	
1= 0<dec.period<=54	0.212	1= 0<dec.period<=62		0.127***	1= 0<dec.period<=32	0.14***
P(Fisher)	0.000	P(Fisher)		0.000	P(Fisher)	0.000
P(permute)	0.470	P(permute)		0.000	P(permute)	0.000
2= 54<dec.period<=67	0.111***	3= 120<dec.period<=227		0.134***	2= 32<dec.period<=44	0.056***
P(Fisher)	0.000	P(Fisher)		0.034	P(Fisher)	0.000
P(permute)	0.000	P(permute)		0.000	P(permute)	0.000
3= 67<dec.period<=100	0.083***	4= 227<dec.period<=322		0.16***	4= 182<dec.period	0.16***
P(Fisher)	0.000	P(Fisher)		0.016	P(Fisher)	0.000
P(permute)	0.000	P(permute)		0.000	P(permute)	0.000
4= 100<dec.period<=113	0.053***	5= 322<dec.period		0.173***	missing	-0.045***
P(Fisher)	0.010	P(Fisher)		0.698	P(Fisher)	0.179
P(permute)	0.000	P(permute)		0.000	P(permute)	0.000
6= 201<dec.period	0.075***	6= missing		0.047		
P(Fisher)	0.003	P(Fisher)		0.000		
P(permute)	0.000	P(permute)		0.550		
7= missing decision period	0.128					
P(Fisher)	0.521					
P(permute)	1.000					
constant included in each regression						
control variables: type of issuer, number of employees, product market; number of winners on the market; year of contract award; log contract value; contract length						
N	39423			16957		32006
Pseudo-R2	0.295			0.231		0.108

Source: PPC; Note: \* p<0.05; \*\* p<0.01; \*\*\* p<0.001; clustered standard errors clustered by issuer for P(Fisher), Monte Carlo random permutation simulations for P(permute) (200 permutations) using stata 12.0



**Table 27. Ordinary least squares regression results on contract level, 2009-2012, by country, average marginal effects, for markets where nr. of winners >=3**

Dependent var: winner's contract share in the last 12 months					
Independent vars-CZ	CZ	Independent vars-SK	SK	Independent vars-HU	HU
<b>single bidder contract</b>	0.032***	<b>single bidder contract</b>	0.021***	<b>single bidder contract</b>	0.02***
P(Fisher)	0.00	P(Fisher)	0.021	P(Fisher)	0.000
P(permute)	0.000	P(permute)	0.000	P(permute)	0.000
<b>NO call for tenders in off. journal</b>	-0.002***	<b>NO call for tenders in off. journal</b>	0.013	<b>NO call for tenders in off. journal</b>	0.021***
P(Fisher)	0.869	P(Fisher)	0.320	P(Fisher)	0.005
P(permute)	0.000	P(permute)	0.055	P(permute)	0.000
<b>procedure type</b>		<b>procedure type</b>		<b>procedure type</b>	
ref. cat.=open procedure		ref. cat.=open procedure		ref. cat.=open procedure	
1=invitation procedure	0.015***	1=invitation procedure	0.099***	1=invitation procedure	-0.037***
P(Fisher)	0.000	P(Fisher)	0.000	P(Fisher)	0.205
P(permute)	0.000	P(permute)	0.000	P(permute)	0.005
2=negotiation procedure	0.01***	2=negotiation procedure	-0.014	2=negotiation procedure	0.011***
P(Fisher)	0.000	P(Fisher)	0.347	P(Fisher)	0.299
P(permute)	0.000	P(permute)	0.115	P(permute)	0.025
3=outside PP law	-0.009***	3=other procedure types	0.054***	3=other procedure types	0.03***
P(Fisher)	0.290	P(Fisher)	0.008	P(Fisher)	0.001
P(permute)	0.000	P(permute)	0.000	P(permute)	0.000
4=other/missing/erroneous procedure typ	0.004***	4=outside PP law	-0.003	4=missing/error	-0.005
P(Fisher)	0.000	P(Fisher)	0.942	P(Fisher)	0.417
P(permute)	0.000	P(permute)	0.820	P(permute)	0.275
<b>modification of call for tenders</b>	0.015***	<b>modification of call for tenders</b>	n.a.	<b>modification of call for tenders</b>	n.a.
P(Fisher)	0.328				
P(permute)	0.000				
<b>short submission period</b>		<b>short submission period</b>		<b>short submission period</b>	
ref. cat.=s.period>55*		ref. cat.=s.period>25		ref. cat.=s.period>20	
1= 47<s.period<=55	-0.009***	1= 14<s.period<=25	0.016	1= 17<s.period<=20	0.014***
P(Fisher)	0.402	P(Fisher)	0.517	P(Fisher)	0.026
P(permute)	0.000	P(permute)	0.170	P(permute)	0.000
2= 43<s.period<=47	0.016***	2= s.period<=14	0.036	2= 5<s.period<=14	0.05***
P(Fisher)	0.252	P(Fisher)	0.559	P(Fisher)	0.149
P(permute)	0.000	P(permute)	0.210	P(permute)	0.000
3= 38<s.period<=43	-0.016***	3= missing	-0.019	3= 0<s.period<=5 (incl.weekend)	0.079***
P(Fisher)	0.160	P(Fisher)	0.613	P(Fisher)	0.073
P(permute)	0.000	P(permute)	0.845	P(permute)	0.000
4= 27<s.period<=38	-0.005			4=missing	-0.01***
P(Fisher)	0.664			P(Fisher)	0.683
P(permute)	0.735			P(permute)	0.485
5= 0<s.period<=27	-0.005***				
P(Fisher)	0.657				
P(permute)	0.000				
6=missing submission period	0.155**				
P(Fisher)	0.034				
P(permute)	0.010				
<b>number of assessment criteria</b>		<b>number of assessment criteria</b>	n.a.	<b>number of assessment criteria</b>	
ref. cat.= nr.of criteria=0				ref. cat.=2<nr.of criteria<=4	
1= 0<nr.of criteria<=2	-0.01			1=nr.of criteria=0	-0.01***
P(Fisher)	0.144			P(Fisher)	0.144
P(permute)	1.000			P(permute)	0.010
2= 2<nr.of assessment criteria<=8	0.014			2= 0<nr.of criteria<=2	-0.005***
P(Fisher)	0.293			P(Fisher)	0.622
P(permute)	0.610			P(permute)	0.430
3= 8<nr.of criteria	0.092*			4= 4<nr.of criteria	0.022*
P(Fisher)	0.002			P(Fisher)	0.053
P(permute)	0.040			P(permute)	0.000
<b>length of decision period</b>		<b>length of decision period</b>		<b>length of decision period</b>	
ref. cat.= 113<dec.period<=201		ref. cat.=62<dec.period<=120		ref. cat.= 44<dec.period<=182	
1= 0<dec.period<=54	0.006	1= 0<dec.period<=62	0.033***	1= 0<dec.period<=32	0.013
P(Fisher)	0.507	P(Fisher)	0.113	P(Fisher)	0.066
P(permute)	0.365	P(permute)	0.000	P(permute)	1.000
2= 54<dec.period<=67	0.008**	3= 120<dec.period<=227	-0.001	2= 32<dec.period<=44	0.017***
P(Fisher)	0.430	P(Fisher)	0.368	P(Fisher)	0.026
P(permute)	0.010	P(permute)	0.830	P(permute)	0.000
3= 67<dec.period<=100	0.011***	4= 227<dec.period<=322	0.016	4= 182<dec.period	0.047***
P(Fisher)	0.235	P(Fisher)	0.496	P(Fisher)	0.000
P(permute)	0.000	P(permute)	0.205	P(permute)	0.000
4= 100<dec.period<=113	0.03***	5= 322<dec.period	0.014	missing	0.026***
P(Fisher)	0.016	P(Fisher)	0.114	P(Fisher)	0.063
P(permute)	0.000	P(permute)	0.115	P(permute)	0.000
6= 201<dec.period	0.001	6= missing	-0.039		
P(Fisher)	0.910	P(Fisher)	0.000		
P(permute)	0.270	P(permute)	0.370		
7= missing decision period	-0.11				
P(Fisher)	0.005				
P(permute)	1.000				
constant included in each regression					
control variables: type of issuer, number of employees, product market; number of winners on the market; year of contract award; log contract value; contract length					
N	26830		12847		20658
Pseudo-R2	0.294		0.185		0.234

Source: PPC; Note: \* p<0.05; \*\* p<0.01; \*\*\* p<0.001; clustered standard errors clustered by issuer for P(Fisher), Monte Carlo random permutation simulations for P(permute) (200 permutations) using stata 12.0

Once the list of elementary corruption risk indicators is determined with the help of the above regressions (note that corruption outcomes are also part of this list even though they don't have regression coefficients), each of the variables and their categories receive a component weight (Table 28). As we lack the detailed knowledge of which elementary corruption technique is a necessary or sufficient condition for corruption to occur, we assign equal weight to each variable and the sizes of regression coefficients are only used to determine the weights within variables. For example, if there are 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 sizes. The component weights are normed so that the observed CRI falls between 0 and 1.

The strength of this composite indicator approach is that the individual components of CRI are vulnerable to changes in regulation, competitive environment, or elite power balance on their own, but taken together they are a more **robust proxy of legal corruption over time**.

In an international comparative perspective, a further strength of CRI is that it **balances national specificities with international comparability**. On the one hand, it provides a comparative indicator in as much as the logic of indicator building and the underlying indicators are the same in each country (of course, as much as data availability permits, further work is in progress). On the other hand, component weights and variable category thresholds (e.g. the definition of accelerated procedure in terms of submission period length differs by country and year) reflect the different national contexts. The same overall scale of country level CRI (i.e. 0-1) lends some meaning to the 'which country is more corrupt' question; nevertheless, the primary purpose of the measurement exercise is to go beyond simplistic understandings of corruption and explore the structure of corruption within each context.

**Table 28. Component weights of CRI reflecting variable and category impact on corruption outcomes, normed to have an overall sum of 1**

cz		sk		hu	
variable	weight	variable	weight	variable	weight
<b>single bid</b>	0.16	<b>single bid</b>	0.17	<b>single bid</b>	0.15
<b>NO call for tenders published in o. journal*</b>	0.16	<b>NO call for tenders published in o. journal*</b>	0.17	<b>NO call for tenders published in o. journal*</b>	0.15
<b>Procedure type</b>		<b>Procedure type</b>		<b>Procedure type</b>	
open	0.00	open	0.00	open	0.00
invitation	0.00	invitation	0.06	invitation	0.11
negotiation	0.16	negotiation	0.17	negotiation	0.07
outside pp law	0.00	other/framework	0.11	other	0.15
other/missing/error	0.00	outside pp law	0.00	missing/error	0.04
		missing/error	0.00		
<b>Modification of call for tenders</b>	0.16	<b>Modification of call for tenders</b>	n.a.	<b>Modification of call for tenders</b>	0.00
<b>Length of submission period</b>		<b>Length of submission period</b>		<b>Length of submission period***</b>	
s.period>55**	0.00	s.period>25	0.00	s.period>20	0.00
47<s.period<=55	0.08	14<s.period<=25	0.17	17<s.period<=20	0.04
43<s.period<=47	0.16	s.period<=14	0.08	5<s.period<=14	0.11
38<s.period<=43	0.12	missing	0.00	0<s.period<=5 (incl.weekend)	0.15
27<s.period<=38	0.04			missing	0.07
0<s.period<=27	0.04				
missing	0.00				
<b>Number of assessment criteria</b>		<b>Number of assessment criteria</b>	n.a.	<b>Number of assessment criteria</b>	
nr.of criteria=0	0.00			nr.of criteria=0	0.05
0<nr.of criteria<=2	0.00			0<nr.of criteria<=2	0.10
2<nr.of criteria<=8	0.00			2<nr.of criteria<=4	0.00
8<nr.of criteria	0.16			4<nr.of criteria	0.15
missing	0.00			missing	0.00
<b>Length of decision period</b>		<b>Length of decision period</b>		<b>Length of decision period</b>	
0<dec.period<=54	0.16	0<dec.period<=62	0.17	0<dec.period<=32	0.10
54<dec.period<=67	0.12	62<dec.period<=120	0.00	32<dec.period<=44	0.05
67<dec.period<=100	0.08	120<dec.period<=227	0.04	44<dec.period<=182	0.00
100<dec.period<=113	0.04	227<dec.period<=322	0.08	182<dec.period	0.15
113<dec.period<=201	0.00	322<dec.period	0.13	missing	0.00
201<dec.period	0.08	missing	0.00		
missing	0.12				
<b>Winner contract share</b>	0.16	<b>Winner contract share</b>	0.17	<b>Winner contract share</b>	0.15

\* for procedures with missing call for tenders, component weights are proportionately increased to account for missing information on variables: 1) modification of call for tenders; 2) length of submission period; and 3) length of decision period.

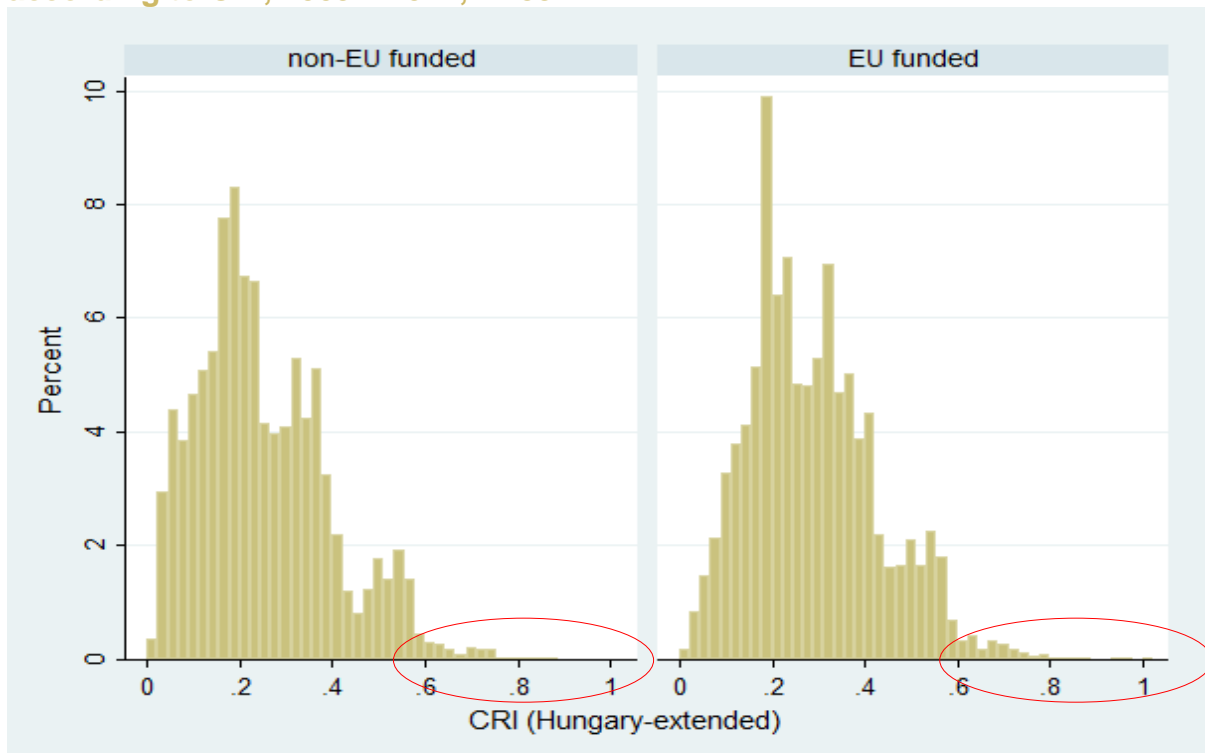
\*\* for invitation procedures: submission period>31

\*\*\* exact thresholds deviate from the given numbers depending on the year and procedure type, for full description see chapter 4

Applying the weights specified in Table 28, each contract receives a corruption risk index (CRI) falling into a 0 – 1 band, where 0 indicates the lowest observed probability of corruption (i.e. every component takes the value of 0); and 1 indicates the highest observed probability of corruption. The latter is lower than the theoretically possible highest probability of corruption (i.e. every component takes the value of 1) which reflects the observation that it is certainly not necessary to employ all the possible ‘corruption techniques’ for rendering a project fully corrupt, rather only a subset of them. This definition of the CRI scale allows it to be interpreted as a probability of institutionalised grand corruption to occur.

For example, in Hungary throughout 2009-2012, there are very few contracts with CRI higher than 0.6 (Figure 26). The distribution of contracts does not deviate extensively from a normal distribution (CRIs based on fewer elementary indicators follow less neat distributions), albeit it has a long tail to the right. These contracts with CRI higher than 0.6 represent particularly high corruption risks. As a precursor for latter analysis, it is worth noticing the somewhat different distributions of EU and non-EU funded procurement procedures in Hungary

**Figure 32. Frequency distribution of Hungarian public procurement procedures according to CRI, 2009<sup>63</sup>-2012, N=39142**



Source: PP

<sup>63</sup> In order to calculate CRI for 2009 where the 12-month values of the winner’s share within issuer’s contracts is not available we had to input this variable using model 5 in Table 18.

While the principal demonstration of **validity** of CRI is to be found in the regressions directly modelling corrupt rent extraction in public procurement, external validity tests are also constructed by using other 'objective' indicators of high-level corruption. For example, **in Hungary, companies owned or managed by political office holders have a significantly higher CRI** (CRI difference=0.01, approximately one standard deviation). There are further validity tests using company profitability, turnover growth and the dependence of winning companies' contract volumes on which government is in power, each pointing at the robust validity of CRI (for full details see chapter 5).

In a comparative perspective, CRI of the average contract awarded can be calculated for each country even for short periods such as months (Figure 33). This aggregate CRI comes closest to frequently used subjective indicators of the prevalence of corruption. Monthly average CRIs allow for **tracking the countries' changing corruption performance over time**: albeit starting from a much higher level, Slovakia appears to permanently improve its performance; Czech Republic remains largely stable; while Hungary greatly deteriorates since the May 2010 change of government. As a result of these movements, the three countries have somewhat converged in terms of their average level of grand corruption.

There are two alternative CRI lines for Hungary as the new government greatly decreased transparency in public procurement, for example by loosening the requirement for publishing call for tenders, and there are alternative ways of taking this change into account. The lower corruption risk path ignores missing variables due to non-published calls for tenders and re-weights components in order to take into account only the non-missing information; while the higher corruption risk path assumes that the non-published calls for tenders are as corrupt as the worst published call for tenders. While there is no data available to test which assumption is more appropriate, interview evidence points out that deliberate decreases in transparency are associated with high levels of corruption (see chapter 5).<sup>64</sup>

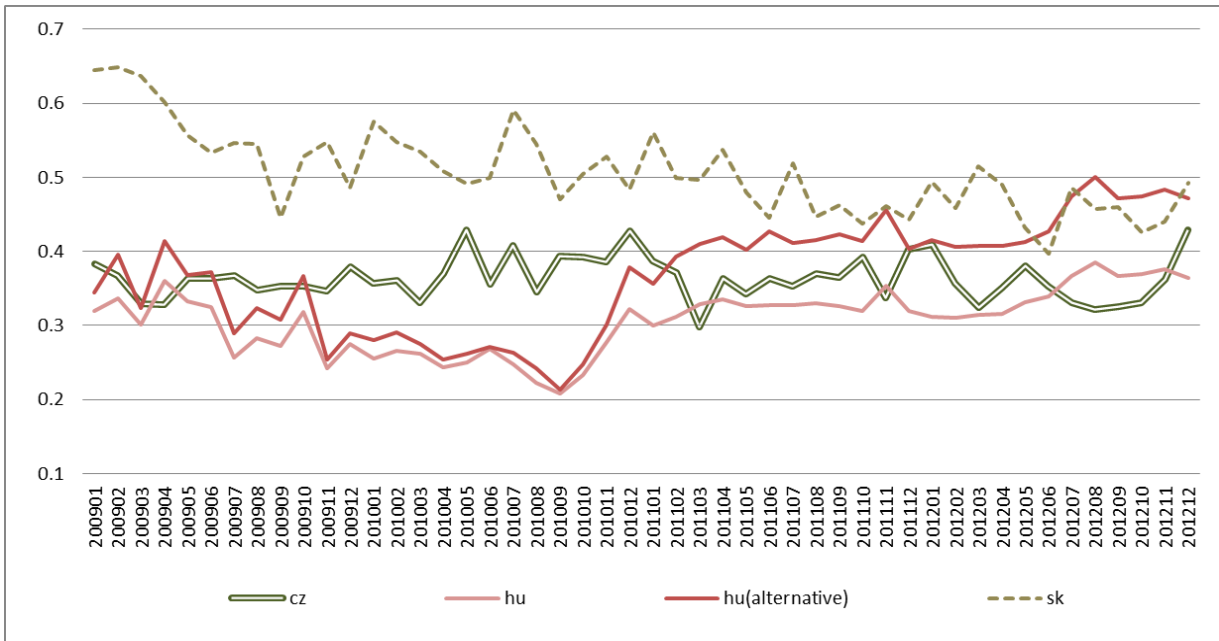
Depicting data only on markets with at least three competitors (i.e. three different companies which have won at least one procurement contract on the market) corrects for the small market and small country biases by removing them from the sample. Only looking at issuers who have awarded at least 3 procurement contracts in the 12 months

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<sup>64</sup> While the scale of decreasing transparency clearly sets Hungary apart, the same arguments apply to the two other countries as they have many tenders submitted without a published call for tenders. Nevertheless, the difference between alternative calculations is only small in their case.

preceding the contract award analysed, assures that data from issuers with little experience in public procurement does not bias the results.

**Figure 33. Average CRI of the representative contract awarded, by country and month, 2009-2012 (markets with at least three competitors, issuers with at least three contracts awarded over 12 months),  $N_{cz}=39445$ ,  $N_{hu}=39367$ ,  $N_{sk}=16986$**



Source: PPC

#### 4. Corruption risks and particularistic allocation of EU funding

EU funds can exert influence on institutionalised grand corruption in CEE countries in two principal ways: **first, by providing additional funding for public investment hence increasing the pool of potential rents to earn; second, by changing the motivation structure and constraints of corrupt networks.** Motivations and constraints of corruption are different for EU Structural and Cohesion Funds because monitoring may be more intense and thorough, and because national accountability mechanisms may work in a different way when funding comes from outside. The first approach focuses attention on increased amount of spending, whereas the second on the different motivations for and controls of corruption.

##### 4.1 Corruption risks of spending more

Institutionalised grand corruption thrives on public resources, especially on public resources whose allocation can be influenced to benefit a small circle of businessmen and politicians without restraint (Auriol et al., 2011; Goldman et al., 2013; Soreide, 2002). Hence, by increasing the overall value of public procurement spending, corruption risks and corrupt rent extraction increase, unless they are offset by more stringent controls of corruption. This section estimates the increase in corruption risks due to increased spending only while holding motivations and controls, that is average corruption risks, constant.

As EU regulation prescribes that EU Structural and Cohesion Funds should represent additional spending rather than substituting national spending (European Council, 2006), we assumed 100% additionality, including national co-financing. This means that every euro of EU funding spent in public procurement is considered to come on top of nationally funded public procurement.

Changes in overall prevalence of corruption due to the increased amount of spending are approximated by the expected value of EU funds allocated in a particularistic way, where this expected value is calculated by relying on expected value theory (Kahneman & Tversky, 1979):

**Expected total value of particularistic resource allocation (EUR) =**

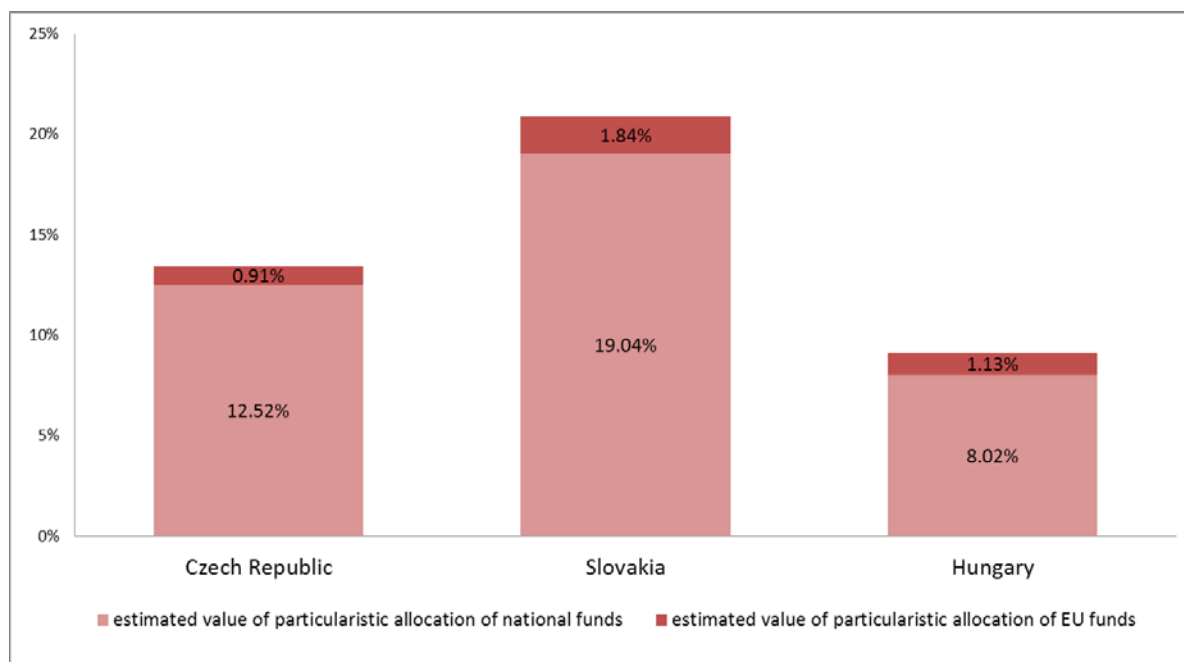
**probability of corruption (%) \* total value spent (EUR)**

where the probability of corruption to occur is measured by CRI. This value captures the amount of resources allocated in a particularistic way which, by no means, equates with the value of corruption rents extracted or cost of corruption. Rather, it implies the overall value of public funds most likely available for rent extraction, while this rent very much depends on the profitability and cost structure of benefiting companies (e.g. even in a very corrupt road construction project, something must be built which costs at least some amount to the contractor). The total social cost of corruption is composed of many components of which corruption rent is only one, and perhaps not even the biggest. Imagine, for example the misallocation of public investment to high corruption rent, but low social return projects such as barely used stadiums expensive to maintain.

Using this formula and holding corruption risks (CRI) constant at the national funding's average, **the value of additional particularistically allocated public resources generated by EU funding was between 0.9% and 1.8% of national GDPs in 2009-2012 in the three countries** (Figure 34). Recall, CRI of EU funding has to be held constant (i.e. at the average CRI of nationally funded public procurement) in order to separate the effect of additional spending from the effect of different motivation for and control of corruption. This second factor will be estimated in the next section.



**Figure 34. Estimated value<sup>65</sup> of national and EU funded public procurement disbursed in a particularistic way, by country, % of 2009-2012 total GDP**



Source: PPC

Note: In order to arrive at an approximate total public procurement spending figure, spending values based on announcements in the National Public Procurement Bulletins were approximated to total public procurement spending estimated by the OECD based on the system of national accounts (OECD, 2013). As the total public procurement spending figures are upper bound estimations and the proportion of EU funding within public procurement spending not reported in the National Public Procurement Bulletin is unknown, figures in the graph may be overestimations.

#### 4.2 Corruption risks of spending differently

While additional public resources available for discretionary allocation have considerably increased the prevalence of corruption in the Czech Republic, Hungary, and Slovakia, it is possible that such additional corruption is counter balanced by more stringent regulation, monitoring, and transparency. If such controls are effective, overall corruption risks would not increase at all or would increase only slightly. In order to check the effectiveness of EU and national institutional frameworks to control corruption of the additional resources available, we compare the corruption risks (CRI) in public procurement procedures of EU and non-EU funding. Furthermore, the defining aspects of corruption risk differentials are also explored in detail in order to develop policy recommendations.

<sup>65</sup> Estimation followed a simple **expected value formula** whereby corruptly spent public money equals the probability of corruption multiplied by the total amount of public money spent.

#### 4.2.1 Corruption risks in EU and non-EU funded procurement procedures

In order to identify the causal impact of EU funding on corruption risks, EU and non-EU funded procurement procedures are compared which are as similar in every major respect as possible except for the funding source. As EU funding is not randomly assigned to procurement procedures, we have to rely on state-of-the-art statistical methods to select similar procedures, that is constructing the treatment (EU funding) and control groups (no EU funding) (Imbens & Wooldridge, 2009). Therefore, first, we show a baseline comparison of CRI between EU and non-EU funded procedures in the three countries; second, we employ propensity score matching using stata (Leuven & Sianesi, 2003).

EU and non-EU funded procurement procedures' CRIs are compared within each country. In Hungary, two alternative comparisons are made: one using a comparative CRI (henceforth hu(comparative)), and another one using a CRI composed of a wider indicator set indicators (henceforth hu(extended), for full description see chapter 5). The reason for also including the extended CRI for Hungary is that it paints a richer picture of the driving forces behind corruption risks of EU funding.

**A simple comparison of average CRI scores within each country suggests that EU funded procurement carries higher corruption risks than nationally funded procurement in the Czech Republic and Hungary, while it carries lower corruption risks in Slovakia.** However, these comparisons may very well be biased as EU and non-EU funded projects could be fundamentally different. For example, if EU funded projects are larger and more complex, then comparisons are inadequate.

**Table 29. Naïve comparison of EU and non-EU funded procedures' CRI, 2009-2012, by country**

	cz	sk	hu (comparative)	hu (extended)
non-EU funded	0.360	0.522	0.291	0.251
EU funded	0.369	0.421	0.310	0.289
<b>Difference (non-EU - EU funded)</b>	<b>-0.009</b>	<b>0.101</b>	<b>-0.019</b>	<b>-0.038</b>
95% c.interval-lower bound	-0.014	0.092	-0.023	-0.041
95% c.interval-upper bound	-0.005	0.110	-0.015	-0.035
N non-EU funded	26975	14159	25437	25460
N EU-funded	12470	2827	13698	13711

Source: PPC

The propensity score matching technique employed here controls for 1) the main market of procured goods and services; 2) log value of contract; and 3) contract length, as corruption risks can be very different for procurement procedures on different markets and of different sizes or complexities. While it would also be possible to control for the characteristics of awarding public bodies, it is not done because it would remove a crucial impact mechanism. For example, if non-corrupt awarding bodies select EU funded projects *because* these projects have low corruption risks, then equalizing the composition of awarding bodies among the EU funded and non-EU funded projects would underestimate the beneficial effects of EU funding.

Propensity score matching, taking into account confounding factors, reveals a similar picture as above, albeit one different in effect magnitudes (Figure 35).<sup>66</sup> The negative effect of EU funding on corruption, that is worsening corruption, has stayed the same in the Czech Republic, while it slightly decreased in Hungary. The positive effect in Slovakia greatly diminished compared to the baseline. All the effects are statistically significant at the 0.1% level. **In the Czech Republic, EU funded projects have 0.011 or 3% higher CRI compared to similar non-EU funded projects. In Slovakia, EU funded projects have 0.065 or 13% lower CRI than similar non-EU funded**

<sup>66</sup> Figures depicting the goodness of matching can be found in Appendix 6A.

**projects. In Hungary, EU funded projects have 0.01 or 3% higher CRI compared to similar non-EU funded projects using the comparable CRI definition.**

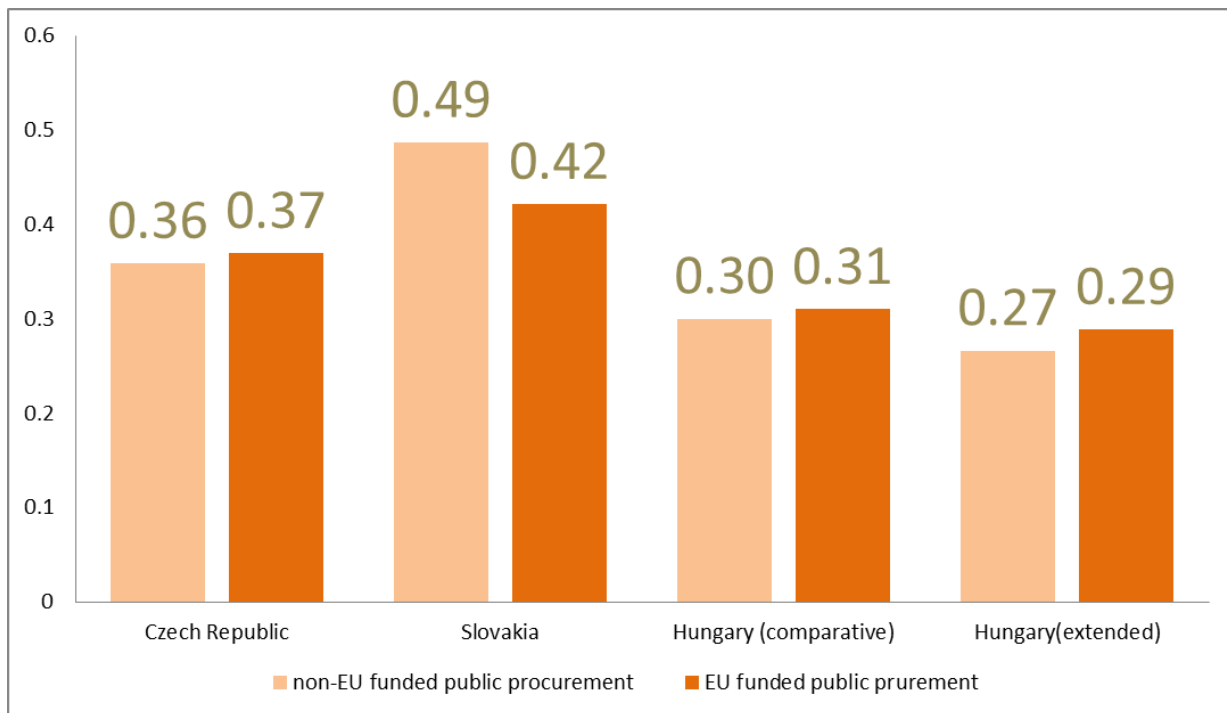
The effect on **Hungarian extended CRI is a great deal larger than for the comparative CRI: 0.022 or 8% higher CRI for EU funded projects than for comparable non-EU funded projects.** This suggests that corruption risks may come from harder to track factors such as complexity of eligibility criteria or factors associated with the delivery phase such as contract modification (note that Hungary is unique among the three countries in the mandatory publication of every contract modification and contract fulfilment notice). As the differences in driving factors may reveal additional findings, they are explored in the next section.

In order to get a sense of how big these differences are, we calculated the expected value of changes once again. **In the Czech Republic, the increase in the expected value of particularistic resource allocation due to higher corruption risks of EU funds amounts to 158 million EUR or 0.03% of the total 2009-2012 GDP. In Hungary, the same figure is only 52 million EUR or 0.02% of total 2009-2012 GDP.** The difference in overall values between the Czech Republic and Hungary are due to lower public procurement spending in Hungary and slightly smaller average effect. **In Slovakia, the expected value of lower average corruption risks associated with EU funds translate into a 381 million EUR or 0.23% of total 2009-2012 GDP.** While this positive effect appears very large in comparison to the other two analysed countries, it must be borne in mind that Slovakia seems to have a much higher overall prevalence of institutionalised grand corruption. This improvement of 0.23% of GDP is only a small correction in comparison to the 1.84% of GDP additional particularistic resource allocation (see Figure 34). Taken together, the overall effect of EU funds spending in Slovakia is still considerably higher than in the two other countries: 1.61% (1.84% minus 0.23%) as opposed to 0.94% and 1.15% for Czech Republic and Hungary, respectively.

Overall, effect sizes are dwarfed by the effect of additional amount of spending, discussed in the previous section. **This implies that the increasing corruption risks due to the greatly increased amount of public resources available for allocation could not be met with more stringent controls of corruption preventing a worsening corruption situation.** In spite of being designed for controlling fraud and misuse, the EU's monitoring system have failed to moderate increasing corruption risks

in Hungary and Czech Republic, while it only partially offset increasing risks in Slovakia. What is most striking is that EU funds are of slightly higher corruption risks in Czech Republic and Hungary than comparable nationally funded procurement procedures calling into question the overall institutional framework in place in these countries.

**Figure 35. Average CRI scores of EU and non-EU funded public procurement procedures, by country, 2009-2012,  $N_{cz}=39320$ ,  $N_{sk}=15760$   $N_{hu}=38862$**



Source: PPC

Note: Every within country difference is significant at  $p < 0.001$  level, standard errors obtained using Monte Carlo random permutations (200 repetitions)

#### 4.2.2 Components driving corruption risk differentials

In order to identify the driving factors behind corruption risk differences between EU and non-EU funded public procurement procedures, we performed binary logistic regression with EU funds use on the left hand side of the equation and corruption risk components on the right hand side of the equation, while also including the control variables used for propensity score matching.

**The comparison of elementary corruption risk indicators driving CRI differences between EU and non-EU funded procurement procedures reveals a remarkably consistent picture across the three countries** (Table 30). First, EU funded procedures perform better in highly visible formally required aspects of procurement

such as publishing the call for tenders, using open procedure type, or allowing sufficient time for bidders to bid. For example, procurement tenders are 3%-12% more likely to be funded by the EU rather than nationally if they have a published call for tenders, clearly indicating that transparency requirements are implemented in all three countries.

Second, less strictly regulated aspects such as period of time for making an award decision, call for tender modification, or complexity of assessment criteria represent consistently higher corruption risks for EU funded projects. Although, effects are multi-directional in most of the cases. For example, Czech procurement tenders are 9% more likely to be funded by the EU than nationally if the call for tenders was modified or Slovakian procurement tenders 17% more likely to be EU funded with lengthy decision periods (between 227 and 322 days).

Third, the key dimension according to which **EU funded projects are underperforming is corruption risks associated with lack of competition**: single bidder contract award and winners' contract share. The extensive efforts to make EU funded projects high value for money through competition seem to be insufficient. Procurement procedures are 3%-4% more likely to be EU funded if they have a single bidder and their markets are much more concentrated too: Procurement procedures are 12%-28% more likely to be funded by the EU if their winner market share is high (i.e. every prior contract is won by the same winner compared to no prior contract won by the winner).

**Taking into account the broader set of elementary corruption risk indicators in Hungary alters the picture considerably** (Table 31). First, the detrimental corruption risk effect of weak competition remains very strong. Second, the effects of procedure type, submission period length, and decision period length have become insignificant or only weakly negative. Third and most importantly, some less visible procurement corruption risk characteristics take on a crucial role in increasing EU funds corruption risks: weight of non-price evaluation criteria, length of eligibility criteria, and contract modification during delivery.

**Table 30. Binary logistic regressions on EU funding (EU funding used=1), marginal effects, by country, 2009-2012**

Independent vars-CZ	CZ	Independent vars-SK	SK	Independent vars-HU	HU
<b>winner contract share</b>	0.284***	<b>winner contract share</b>	0.122***	<b>winner contract share</b>	0.275***
P(Fisher)	0.00	P(Fisher)	0.000	P(Fisher)	0.000
P(permute)	0.000	P(permute)	0.000	P(permute)	0.000
<b>single bidder contract</b>	0.04***	<b>single bidder contract</b>	0.029***	<b>single bidder contract</b>	0.037***
P(Fisher)	0.01	P(Fisher)	0.075	P(Fisher)	0.000
P(permute)	0.000	P(permute)	0.000	P(permute)	0.000
<b>NO call for tenders in off. journal</b>	-	<b>NO call for tenders in off. journal</b>	-0.03***	<b>NO call for tenders in off. journal</b>	-
P(Fisher)	0.116***	P(Fisher)	0.121	P(Fisher)	0.085***
P(permute)	0.005	P(permute)	0.000	P(permute)	0.079
<b>procedure type</b>		<b>procedure type</b>		<b>procedure type</b>	
ref. cat.=open procedure		ref. cat.=open procedure		ref. cat.=open procedure	
1=invitation procedure	-	1=invitation procedure	0.134***	1=invitation procedure	-0.08***
P(Fisher)	0.015***	P(Fisher)	0.000	P(Fisher)	0.256
P(permute)	0.584	P(permute)	0.000	P(permute)	0.000
2=negotiation procedure	-	2=negotiation procedure	-	2=negotiation procedure	-
P(Fisher)	0.115***	P(Fisher)	0.112***	P(Fisher)	0.018***
P(permute)	0.000	P(permute)	0.000	P(permute)	0.697
3=outside PP law	-	3=other procedure types	-	3=other procedure types	-
P(Fisher)	0.071***	P(Fisher)	0.106***	P(Fisher)	0.103***
P(permute)	0.028	P(permute)	0.000	P(permute)	0.009
4=other/missing/erroneous procedure type	-	4=outside PP law	0.084***	4=missing/error	0.009
P(Fisher)	-0.08***	P(Fisher)	0.407	P(Fisher)	0.679
P(permute)	0.065	P(permute)	0.000	P(permute)	0.440
<b>modification of call for tenders</b>	0.088***	<b>modification of call for tenders</b>	n.a.	<b>modification of call for tenders</b>	n.a.
P(Fisher)	0.000				
P(permute)	0.000				
<b>short submission period</b>		<b>short submission period</b>		<b>short submission period</b>	
ref.cat.=s.period>55*		ref.cat.= s.period>25		ref.cat.=s.period>20	
1= 47<s.period<=55	-	1= 14<s.period<=25	-	1= 17<s.period<=20	-
P(Fisher)	0.025***	P(Fisher)	0.043***	P(Fisher)	0.012***
P(permute)	0.330	P(permute)	0.020	P(permute)	0.461
2= 43<s.period<=47	-	2= s.period<=14	-0.049*	2= 5<s.period<=14	-
P(Fisher)	0.069***	P(Fisher)	0.562	P(Fisher)	0.029***
P(permute)	0.006	P(permute)	0.045	P(permute)	0.570
3= 38<s.period<=43	-	3= missing	-	3= 0<s.period<=5 (incl.weekend)	-
P(Fisher)	0.072***	P(Fisher)	0.142***	P(Fisher)	0.146***
P(permute)	0.007	P(permute)	0.000	P(permute)	0.007
4= 27<s.period<=38	-0.004			4=missing	-
P(Fisher)	0.900			P(Fisher)	0.096***
P(permute)	0.735			P(permute)	0.028
5= 0<s.period<=27	-				0.000
P(Fisher)	0.081***				
P(permute)	0.001				
6=missing submission period	-0.176*				
P(Fisher)	0.027				
P(permute)	0.010				

Independent vars-CZ	CZ	Independent vars-SK	SK	Independent vars-HU	HU
<b>number of assessment criteria</b>		<b>number of assessment criteria</b>	<b>n.a.</b>	<b>number of assessment criteria</b>	
ref.cat.= nr.of criteria=0				ref.cat.=2<nr.of criteria<=4	
1= 0<nr.of criteria<=2	-0.028			1=nr.of criteria=0	- 0.028***
P(Fisher)	0.337			P(Fisher)	0.337
P(permute)	1.000			P(permute)	0.000
2= 2<nr.of assessment criteria<=8	-0.019			2= 0<nr.of criteria<=2	- 0.031***
P(Fisher)	0.454			P(Fisher)	0.317
P(permute)	0.610			P(permute)	0.000
3= 8<nr.of criteria	-0.011*			4= 4<nr.of criteria	0.019*
P(Fisher)	0.735			P(Fisher)	0.584
P(permute)	0.040			P(permute)	0.025
<b>length of decision period</b>		<b>length of decision period</b>		<b>length of decision period</b>	
ref.cat.= 113<dec.period<=201		ref.cat.=62<dec.period<=120		ref.cat.= 44<dec.period<=182	
1= 0<dec.period<=54	-0.022	1= 0<dec.period<=62	- 0.084***	1= 0<dec.period<=32	-0.009
P(Fisher)	0.383	P(Fisher)	0.000	P(Fisher)	0.726
P(permute)	0.365	P(permute)	0.000	P(permute)	1.000
2= 54<dec.period<=67	0.06*	3= 120<dec.period<=227	0.162***	2= 32<dec.period<=44	- 0.023***
P(Fisher)	0.349	P(Fisher)	0.000	P(Fisher)	0.313
P(permute)	0.010	P(permute)	0.000	P(permute)	0.000
3= 67<dec.period<=100	0.026***	4= 227<dec.period<=322	0.168***	4= 182<dec.period	- 0.106***
P(Fisher)	0.263	P(Fisher)	0.010	P(Fisher)	0.000
P(permute)	0.000	P(permute)	0.000	P(permute)	0.000
4= 100<dec.period<=113	0.012***	5= 322<dec.period	0.114***	missing	-0.02***
P(Fisher)	0.701	P(Fisher)	0.000	P(Fisher)	0.668
P(permute)	0.000	P(permute)	0.000	P(permute)	0.000
6= 201<dec.period	-0.012	6= missing	0.721***		
P(Fisher)	0.657	P(Fisher)	0.000		
P(permute)	0.270	P(permute)	0.000		
7= missing decision period	0.094				
P(Fisher)	0.576				
P(permute)	1.000				
constant included in each regression					
control variables: product market (cpv divisions); year of contract award(only for Hungary); log contract value; contract length					
N	39351		11831		38908
Pseudo-R2	0.255		0.4357		0.192

Source: PPC; Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; clustered standard errors clustered by issuer for P(Fisher), Monte Carlo random permutation simulations for P(permute) (200 permutations) using stata 12.0



Table 31. Binary logistic regr. on EU funding, marginal effects, Hungary (extended), 2009-2012

Independent vars / dependent var	EU funding=1
<b>winner contract share</b>	0.187***
P(Fisher)	0.000
P(permute)	0.000
<b>single bidder contract</b>	0.034***
P(Fisher)	0.002
P(permute)	0.000
<b>no call for tenders published in official journal</b>	-0.036*
P(Fisher)	0.519
P(permute)	0.010
<b>procedure type</b>	
ref. kat.=open procedure	
1=invitation procedure	0.001
P(Fisher)	0.986
P(permute)	0.950
2=negotiation procedure	-0.01
P(Fisher)	0.864
P(permute)	0.060
3=other procedures	-0.006
P(Fisher)	0.771
P(permute)	0.390
4=missing/erroneous procedure type	0.006
P(Fisher)	0.706
P(permute)	0.345
<b>length of eligibility criteria</b>	
ref.kat.=length<-2667.145	
1= -2667.145<length<=520.7038	0.045***
P(Fisher)	0.217
P(permute)	0.000
2= 520.7038<length<=3369.102	0.1***
P(Fisher)	0.016
P(permute)	0.000
3= 3369.102<length	0.177***
P(Fisher)	0.000
P(permute)	0.000
4= missing length	0.177***
P(Fisher)	0.025
P(permute)	0.000
<b>short submission period</b>	
ref. kat.=normal submission period	
1=accelerated submission period	-0.008
P(Fisher)	0.584
P(permute)	0.165
2=exceptional submission period	-0.063***
P(Fisher)	0.151
P(permute)	0.000
3=except. submission per. abusing weekend	-0.171***
P(Fisher)	0.002
P(permute)	0.000
4=missing submission period	0.084***
P(Fisher)	0.126
P(permute)	0.000
<b>relative price of tender documentation</b>	
ref.kat.= relative price=0	
1= 0<relative price<=0.0004014	-0.004
P(Fisher)	0.891
P(permute)	0.645
2= 0.0004014<relative price<=0.0009966	-0.018
P(Fisher)	0.548
P(permute)	0.080
3= 0.0009966<relative price<=0.0021097	-0.034***
P(Fisher)	0.238

Independent vars / dependent var	EU funding=1
P(permute)	0.000
4= 0.0021097<relative price	-0.031***
P(Fisher)	0.293
P(permute)	0.000
5=missing relative price	-0.05***
P(Fisher)	0.165
P(permute)	0.000
<b>call for tenders modified</b>	<b>0.013</b>
P(Fisher)	0.512
P(permute)	0.080
<b>weight of non-price evaluation criteria</b>	
ref.kat.= only price	
2= 0<non-price criteria weight<=0.4	-0.008
P(Fisher)	0.656
P(permute)	0.120
3= 0.4<non-price criteria weight<=0.556	0.033***
P(Fisher)	0.122
P(permute)	0.000
4= 0.556<non-price criteria weight<1	0.094***
P(Fisher)	0.023
P(permute)	0.000
5=only non-price criteria	0.015
P(Fisher)	0.411
P(permute)	0.065
<b>length of decision period</b>	
ref.kat.= 44<decision period<=182	
1= decision period<=32	-0.026***
P(Fisher)	0.211
P(permute)	0.000
2= 32<decision period<=44	-0.035***
P(Fisher)	0.063
P(permute)	0.000
4= 182<decision period	0.016
P(Fisher)	0.755
P(permute)	0.110
5= missing decision period	-0.009
P(Fisher)	0.811
P(permute)	0.380
<b>contract modified during delivery</b>	<b>0.136***</b>
P(Fisher)	0.000
P(permute)	0.000
<b>contract extension(length/value)</b>	
ref.cat.=c.length diff.<=0 AND c.value diff.<=0.001	
2=0<c.length d.<=0.162 OR 0.001<c.value d.<=0.24	-0.061***
P(Fisher)	0.009
P(permute)	0.000
3= 0.162<c. length diff. OR 0.24<c.value diff.	-0.032**
P(Fisher)	0.191
P(permute)	0.010
4= missing (with contr. completion ann.)	-0.04***
P(Fisher)	0.053
P(permute)	0.000
5= missing (NO contr. completion ann.)	-0.058***
P(Fisher)	0.001
P(permute)	0.000
constant included in each regression	
control variables: product market (cpv divisions); number of winners on the market (market defined by cpv level 4 & nuts2); year of contract award; log contract value; contract length; framework contract; issuer type, status, and sector	
N	31770
R2/pseudo-R2	0.301

## 5. Conclusions and policy consequences

While much additional work is needed, this paper 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. Chapter 5 discusses data availability in Europe and beyond in detail.

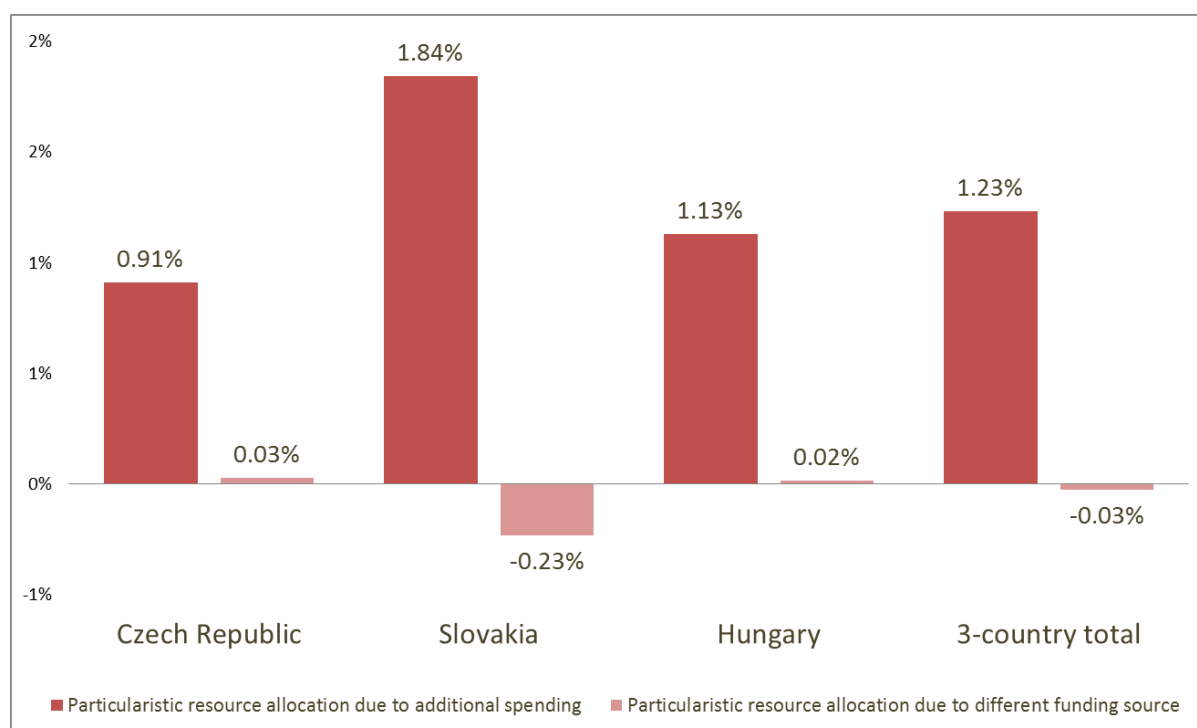
**Our preliminary findings indicate that EU funding considerably increase corruption risks in Central and Eastern Europe** in at least two principal ways (Figure 36). First, by making a large amount of additional public resources available for rent extraction in public procurement; second, by failing to implement sufficient controls of corruption counter-balancing additional resources for corruption. In spite of extensive monitoring efforts of EU authorities, EU funded procurement spending represents even higher corruption risks than the comparable national spending in Czech Republic and Hungary. EU funded public procurement in Slovakia carries only slightly lower corruption risks than comparable national procurement spending, albeit national spending is generally of much higher corruption risk than in the two other countries. In either case, this positive effect falls long way short of offsetting the negative effect of increased discretionary spending available. Nevertheless, the comparatively better performance of Slovakian public procurement projects funded by the EU suggests that EU funding can have a somewhat positive effect in a very high corruption risk environment. Based on this finding further research could look at the conditional effect of EU funding on corruption.

**For the three countries combined, our results imply an estimated additional particularistic resource allocation worth up to 1.20% of combined GDP of the three countries throughout 2009-2012.** This is the result of an estimated maximum 1.23% of GDP in terms of additional funding disbursed in a particularistic way, and an estimated maximum 0.03% of GDP in terms of lower corruption risk of EU funded procurement than national procurement. These figures are exceptionally high, for example compared to total EU funds allocation to these countries which is about 3.3% of their GDP.

While EU funded public procurement may well be effective in lifting growth rates in Central and Eastern Europe, its desired benefits stand in contrast with corruption

risks and potential corruption costs. While further work is needed to get more precise estimates of particularistic resource allocation and the associated corruption costs, our preliminary findings already indicate that such costs may not be negligible.

**Figure 36. Estimated value<sup>67</sup> of additional particularistic resource allocation due to EU funding in national public procurement, decomposition into effect of additional spending and different funding source, by country, % of 2009-2012 total GDP**



Source: PPC

Note: In order to arrive at an approximate total public procurement spending figure, spending values based on announcements in the National Public Procurement Bulletins were approximated to total public procurement spending estimated by the OECD based on the system of national accounts (OECD, 2013). As the total public procurement spending figures are upper bound estimations and the proportion of EU funding within public procurement spending not reported in the National Public Procurement Bulletin is unknown, figures in the graph may be overestimations.

Looking at the driving forces behind corruption risks in EU funding reveals that salient, easily controlled corruption risks are considerably lower, while risks of more subtle procedure characteristics and overall strength of competition considerably increase corruption risks in EU funded public procurement procedures (Table 32).

<sup>67</sup> Estimation followed a simple **expected value formula** whereby corruptly spent public money equals the probability of corruption times the total amount of public money spent.

These findings highlight the importance of monitoring the whole project cycle from initiation to completion as well as the need for a wide indicator set for adequately measure corruption.

**Table 32. Summary of driving factors of CRI differences between EU and non-EU funded projects, 2009-2012**

<b>variable/country</b>	<b>cz</b>	<b>sk</b>	<b>hu(comp)</b>	<b>hu(ext)</b>
Winner contract share	++	++	++	++
Single bid	+	+	+	+
NO call for tenders published in o. journal	--	-	-	-
Procedure type	--	-/+	-	0
Length of submission period	--	--	--	-/0
Length of decision period	-/+	-/+	-/0	-/0
Modification of call for tenders	+			0
Number of assessment criteria	-/0		-/+	
Weight of non-price evaluation criteria				++
Length of eligibility criteria				++
Relative price of documentation				-
Annulled procedure re-launched subsequently				-
Contract modification				++
Contract lengthening				--

Source: own calculation

Note: -- means strong negative effect on EU funds corruption risks; - means weak negative effect on EU funds corruption risks; + means weak positive effect on EU funds corruption risks; ++ means strong positive effect on EU funds corruption risks; 0 means insignificant or negligible effect on EU funds corruption risks; representing two signs in the same cell indicates a diverse effect of corruption risk categories within the same variable.

## Appendices

### Appendix 4A-examples of corruption techniques in the Hungarian media

This appendix contains more detailed information about the methods and results of the media review conducted in order to support the development of corruption techniques and indicators in section 4.

The keywords used in identifying potentially relevant articles from the complete population of articles in our database referred to corruption, embezzlement, bribery, and cronism. In Hungarian, these were: antikorrupciós, korrupció-ellenes, korrupció-megelőzési, korrupcióellenes, korrupciómegelőzési, korrupciómentes, korrupciómentesen, korrupciómentesség, korrupciómentesít, korrupciótlánítási, csúszópénz, kenőpénz, kenőpénzes, közkenőpénz, megken, Korrupciókutató-központ, korrupció, korrupció-elterjedtség, korrupció-kutató, korrupció-érzékelési, korrupciófelismerési, korrupciógyanús, korrupciógyár, korrupciós, corrupt, korruptabb, mutyi, mutyizik, mutyizás, pénzmosás, megveszteget, megvesztegethető, megvesztegetés, megvesztegető, veszteget, vesztegetett, vesztegetés, vesztegetési.

After eliminating articles which discussed the same case, we ended up with 42 articles which made concrete references to at least one potentially or actually corrupt public procurement procedure and revealed at least one specific corruption technique. Mapping each article according to the techniques discussed can be found below (Table 33)



**Table 34. IDs, titles, and hyperlinks of articles discussing corruption techniques in the Hungarian media, 2008-2012 (linked to Table 33), continued overleaf**

ID	title	source
1	Most 100 ezer forintos bicikliket venne a Posta	<a href="http://index.hu/gazdasag/magyar/pst090122/">http://index.hu/gazdasag/magyar/pst090122/</a>
2	Háziversenyen dőlt el a papírtender	<a href="http://index.hu/belfold/2009/11/05/haziversenyen_dolt_el_a_papirtender/">http://index.hu/belfold/2009/11/05/haziversenyen_dolt_el_a_papirtender/</a>
3	Fidesz: Panírban számolták a kenőpénzt	<a href="http://index.hu/belfold/2010/03/31/fidesz_panirban_szamoltak_a_kenopenzt/">http://index.hu/belfold/2010/03/31/fidesz_panirban_szamoltak_a_kenopenzt/</a>
4	Ejtették a kellemetlenné vált ötmilliárdos légitótóbiznistról	<a href="http://index.hu/belfold/2010/10/28/otmilliardot_sporolt_az_index_az_orzagnak/">http://index.hu/belfold/2010/10/28/otmilliardot_sporolt_az_index_az_orzagnak/</a>
5	Az NBH-nak is kínos az eredetiségvizsgálós cég bűnügye	<a href="http://www.origo.hu/itthon/20100311-mentesseg-a-kozbeszerzes-alol-nemzetbiztonsagi-okok-miatt.html">http://www.origo.hu/itthon/20100311-mentesseg-a-kozbeszerzes-alol-nemzetbiztonsagi-okok-miatt.html</a>
6	Hat nap alatt költött 770 milliót a Daimler-botrányban felbukkanó Volánbusz	<a href="http://www.origo.hu/itthon/20100324-daimlerugy-hallgat-a-mercedes-a-magyarorszagi-korruptios-vadakrol.html">http://www.origo.hu/itthon/20100324-daimlerugy-hallgat-a-mercedes-a-magyarorszagi-korruptios-vadakrol.html</a>
7	Trükkös HM-es ingatlanüzemeltetés	<a href="http://www.mno.hu/portal/781468">http://www.mno.hu/portal/781468</a>
8	A pártfinanszírozás debreceni modellje	<a href="http://www.nol.hu/belfold/20110430-a-debreceni-modell">http://www.nol.hu/belfold/20110430-a-debreceni-modell</a>
9	Gyanús elemek a csuklóbusz- tenderben? Demszkynek korai az idő	<a href="http://mno.hu/portal/541455">http://mno.hu/portal/541455</a>
10	Milliárdok a Kossuth téri mélygarázsra	<a href="http://mno.hu/portal/585854">http://mno.hu/portal/585854</a>
11	Volt HM-es dandártábornokot vádolnak vesztegetéssel	<a href="http://hvg.hu/itthon/20110927_katona_karoly_dandartabornok#rss">http://hvg.hu/itthon/20110927_katona_karoly_dandartabornok#rss</a>
12	Jól van, Zsoltikám: egy Nokiás-doboz hanyattatásai	<a href="http://m.index.hu/belfold/budapest/2011/10/08/egy_nokias-doboz_hanyattatasai/">http://m.index.hu/belfold/budapest/2011/10/08/egy_nokias-doboz_hanyattatasai/</a>
13	Verseny nélküli megbízás a Közbeszerzések Tanácsánál	<a href="http://www.vg.hu/kozelet/jog/verseny-nekuli-megbizas-a-kozbeszerzesek-tanacsanal-363931">http://www.vg.hu/kozelet/jog/verseny-nekuli-megbizas-a-kozbeszerzesek-tanacsanal-363931</a>
14	A Lakos család esete a budapesti beruházásokkal	<a href="http://hetivalasz.hu/reflektor/szenyes-25374/">http://hetivalasz.hu/reflektor/szenyes-25374/</a>
15	Úton állók	<a href="http://hetivalasz.hu/itthon/uton-allok-18664/">http://hetivalasz.hu/itthon/uton-allok-18664/</a>
16	Rendőrvice	<a href="http://hetivalasz.hu/itthon/rendorvice-23619/">http://hetivalasz.hu/itthon/rendorvice-23619/</a>
17	Korrupciós kiskaté kezdő vállalkozóknak	<a href="http://index.hu/belfold/2011/12/09/korrupcios_kiskate_kezdo_vallalkozoknak/">http://index.hu/belfold/2011/12/09/korrupcios_kiskate_kezdo_vallalkozoknak/</a>
18	Feljelentés gyanús gyors közbeszerzés miatt	<a href="http://index.hu/belfold/2012/08/21/gyanusan_gyors_kozbeszerzes_miatt_tesz_feljelentest_az_lmp/">http://index.hu/belfold/2012/08/21/gyanusan_gyors_kozbeszerzes_miatt_tesz_feljelentest_az_lmp/</a>
19	Villámtenyért írt ki autósárlásra a rendőrség	<a href="http://index.hu/belfold/2012/08/24/villamtendert_irt_ki_autovasarlasra_a_rendorseg/">http://index.hu/belfold/2012/08/24/villamtendert_irt_ki_autovasarlasra_a_rendorseg/</a>
20	A verseny csak látszat? - sorra nyeri a tendereket a volt Fidesz-pártigazgató cége	<a href="https://www.napi.hu/magyar_vallalatok/a_verseny_csak_latszat_sorra_nyeri_a_tendereket_a_volt_fidesz-partigazgato_cege.530349.html">https://www.napi.hu/magyar_vallalatok/a_verseny_csak_latszat_sorra_nyeri_a_tendereket_a_volt_fidesz-partigazgato_cege.530349.html</a>
21	Kétmillió bírság az OMSZ-nek az esetkocsik beszerzése miatt	<a href="http://index.hu/belfold/2012/06/06/ketmillios_birsag_az_omsz-nek_az_esetkocsik_beszerzese_miatt/">http://index.hu/belfold/2012/06/06/ketmillios_birsag_az_omsz-nek_az_esetkocsik_beszerzese_miatt/</a>
22	Titkosították a Ludovika Campus beruházását is	<a href="http://index.hu/belfold/2012/08/08/titkosítottak_a_ludovika_campus_beruhazasat_is/">http://index.hu/belfold/2012/08/08/titkosítottak_a_ludovika_campus_beruhazasat_is/</a>
23	Budapest Szíve európai uniós bírságot kaphat	<a href="http://index.hu/belfold/budapest/2012/03/06/tarlost_es_rogant_egyutt_szivatja_az_eu/">http://index.hu/belfold/budapest/2012/03/06/tarlost_es_rogant_egyutt_szivatja_az_eu/</a>
24	Egy kicsit könnyebb lesz lopni a MÁV-nál-Cégekre szabott beszerzések	<a href="http://index.hu/gazdasag/magyar/2012/09/10/mav/">http://index.hu/gazdasag/magyar/2012/09/10/mav/</a>



25	Ötödik nekifutásra tudott csak nyerni a Zsurmó Csongrádban	<a href="http://index.hu/belfold/2012/09/13/otodszorre_is_kozgep_nyerte_el_a_milliardos_csongradi_munkat/">http://index.hu/belfold/2012/09/13/otodszorre_is_kozgep_nyerte_el_a_milliardos_csongradi_munkat/</a>
26	Menő korrupciós technikák	<a href="http://www.fn.hu/cegek/20080611/meno_korrupcios_technikak/">http://www.fn.hu/cegek/20080611/meno_korrupcios_technikak/</a>
27	MSZP: lopva költ a kormány	<a href="http://www.hir24.hu/belfold/2011/08/25/mszp-lopva-kolt-a-kormany/">http://www.hir24.hu/belfold/2011/08/25/mszp-lopva-kolt-a-kormany/</a>
28	Hogyan rothasztja a túlzott győzni akarás a társadalmat?	<a href="http://www.fn.hu/belfold/20100421/hogyan_rothasztja_tulzott_gyozni/">http://www.fn.hu/belfold/20100421/hogyan_rothasztja_tulzott_gyozni/</a>
29	Egymilliárdért szerez be nyomkövetőket a rendőrség	<a href="http://index.hu/belfold/2012/10/31/egymilliardert_szerez_be_nyomkoveteket_a_rendorseg/">http://index.hu/belfold/2012/10/31/egymilliardert_szerez_be_nyomkoveteket_a_rendorseg/</a>
30	Projektiroda-vezető lett, akitől félmilliárdot követelnek	<a href="http://index.hu/belfold/2012/11/22/projektiroda_vezeto_lett_akitol_felmiardot_kovetelnek/">http://index.hu/belfold/2012/11/22/projektiroda_vezeto_lett_akitol_felmiardot_kovetelnek/</a>
31	Egy NFÜ-s vezető egykori üzlettársa is nyertese a kétmilliárdos megbízásnak	<a href="http://www.origo.hu/itthon/20110220-nemzeti-fejlesztési-ugynokseg-draga-tanacsadai-szerzodese-a.html">http://www.origo.hu/itthon/20110220-nemzeti-fejlesztési-ugynokseg-draga-tanacsadai-szerzodese-a.html</a>
32	Versenymentes ügyvédek	<a href="http://www.nol.hu/archivum/archiv-482235">http://www.nol.hu/archivum/archiv-482235</a>
33	Az orvosbárókat kell meggyőzni	<a href="http://hvg.hu/gazdasag/20120531_korhazi_korrupcio_orvosbarok#rss">http://hvg.hu/gazdasag/20120531_korhazi_korrupcio_orvosbarok#rss</a>
34	A gemkapoccsal is mutyiztak az önkormányzatok?	<a href="http://www.fn.hu/belfold/20091016/gemkapoccsal_is_mutyiztak/">http://www.fn.hu/belfold/20091016/gemkapoccsal_is_mutyiztak/</a>
35	Újra tendergyőztes a Fidesz volt kabinettitkára	<a href="http://index.hu/belfold/2012/04/04/ujra_tendergyoztes_a_fidesz_volt_kabinettitkara/">http://index.hu/belfold/2012/04/04/ujra_tendergyoztes_a_fidesz_volt_kabinettitkara/</a>
36	Megint az IMG nyert egy állami tenderen	<a href="http://index.hu/kultur/media/2012/11/12/az_img_kapja_az_mtva_1_5_milliardjat/">http://index.hu/kultur/media/2012/11/12/az_img_kapja_az_mtva_1_5_milliardjat/</a>
37	Offshore lovag a közbeszerzési bizottság elnöke?	<a href="http://varanus.blog.hu/?utm_source=ketrec&amp;utm_medium=link&amp;utm_content=2013_02_01&amp;utm_campaign=index">http://varanus.blog.hu/?utm_source=ketrec&amp;utm_medium=link&amp;utm_content=2013_02_01&amp;utm_campaign=index</a>
38	Nem tudtunk hülyébbek lenni a kormánynál	<a href="http://index.hu/belfold/2013/02/12/megprobaltunk_hulyebbek_lenni_a_kormanynal/">http://index.hu/belfold/2013/02/12/megprobaltunk_hulyebbek_lenni_a_kormanynal/</a>
39	Két forintot engedett az árból a Közgép - kétmilliárddal emelte a tétet	<a href="http://www.napi.hu/magyar_vallalatok/ket_forintot_engedett_az_arbol_a_kozgep_ketmilliarddal_emelte_a_tetet.552308.html">http://www.napi.hu/magyar_vallalatok/ket_forintot_engedett_az_arbol_a_kozgep_ketmilliarddal_emelte_a_tetet.552308.html</a>
40	Közbeszerzés nélkül épül újjá a fél Belváros	<a href="http://index.hu/belfold/2013/05/16/kozbeszerzes_nelkul_epul_ujja_a_belvaros/">http://index.hu/belfold/2013/05/16/kozbeszerzes_nelkul_epul_ujja_a_belvaros/</a>
41	Búzlótt az iskolagyümölcs-tender, lefújták	<a href="http://index.hu/gazdasag/2013/06/12/budos_volt_az_iskolagyumolcs-tender_lefujtak/">http://index.hu/gazdasag/2013/06/12/budos_volt_az_iskolagyumolcs-tender_lefujtak/</a>
42	A kormány kedvenc újjáépítői	<a href="http://index.hu/belfold/2013/07/05/a_kormany_kedvenc_ujjaepitoi/">http://index.hu/belfold/2013/07/05/a_kormany_kedvenc_ujjaepitoi/</a>

## Appendix 5A - Availability of public procurement data

Table 35. Overview of contract-level public procurement data availability in selected countries and regions, 2000-2012

Country	Data-source	Key online source	Minimum threshold (2012, classical issuer, services, EUR) <sup>68</sup>	Period	Availability
Czech Republic	Ministerstvo pro místní rozvoj ČR	<a href="http://www.isvzus.cz/usisvz/">http://www.isvzus.cz/usisvz/</a>	39,000	2006-2012	structured data readily available and partially cleaned
EU	Tenders Electronic Daily	<a href="http://ted.europa.eu/">http://ted.europa.eu/</a>	130,000	2005-2012	structured data partially available and cleaned
Germany	Bund.de- Verwaltung Online	<a href="http://www.bund.de/DE/Ausschreibungen/ausschreibungen_node.html">http://www.bund.de/DE/Ausschreibungen/ausschreibungen_node.html</a>	130,000 <sup>69</sup>	2010-2012 <sup>70</sup>	raw data available, not cleaned
Hungary	Közbeszerzési Értesítő	<a href="http://www.kozbeszerzes.hu/">http://www.kozbeszerzes.hu/</a>	27,300	2005-2012	structured data available and partially cleaned
Romania	eLicítatie	<a href="http://www.e-licitatie.ro/">http://www.e-licitatie.ro/</a>	30,000	2007-2012	raw data available, not cleaned
Russia	Goszakupki	<a href="http://www.zakupki.gov.ru">www.zakupki.gov.ru</a>	2,500	2006-2012 <sup>71</sup>	structured data partially available and cleaned
Slovakia	Úrad pre verejné obstarávanie	<a href="http://tender.sme.sk/en/">http://tender.sme.sk/en/</a>	30,000	2005-2012	structured data readily available and partially cleaned
UK	UK Contracts Finder	<a href="http://www.contractsfinder.businesslink.gov.uk/">http://www.contractsfinder.businesslink.gov.uk/</a>	11,600	2000-2012	raw data available, not cleaned
US	Federal Procurement Data System - Next Generation	<a href="https://www.fpds.gov/fpdsng cms/">https://www.fpds.gov/fpdsng cms/</a>	1,850	2004-2012	structured data readily available and partially cleaned

<sup>68</sup> National currencies are converted into EUR using official exchange rates of 5/2/2013 of the European Central Bank.

<sup>69</sup> It was increased from 30,000 EUR during the economic crisis.

<sup>70</sup> Earlier data have to be requested from the relevant bodies.

<sup>71</sup> 2006-2010 only for some regions.

## Appendix 5B - Robustness checks

The most convincing alternative explanation to this paper's interpretation of regressions as models of corrupt contract award states that products and services bought by public agencies are highly specific. Therefore, both single bidder and high share of the winner within the issuer's contracts are driven by the lack of adequate suppliers rather than corruption. In order to control for this important confounding factor each regression contains the number of winners on the market throughout 2009-2012 as an explanatory factor. In addition, this appendix reports regressions on restricted samples which include contracts for products and services procured on markets with more than 2, 9, and 37 winners in 2009-2012. The cut-points 2 and 37 were defined using the same technique of identifying thresholds in continuous variables as spelled out in section 6.1. The cut-point of 9 was added arbitrarily in order to display an intermediary value.

To define the number of adequate competitors on a market, an appropriate definition of market has to be found. We defined markets along two dimensions: 1) the nature of product or service procured, and 2) the geographical location of contract performance. CPV codes differentiate over 3000 products and services as detailed as eggs (03142500-3) or potatoes (03212100-1). While we aim at being conservative in market definition, such level of detail is surely excessive. Exploiting the hierarchical nature of CPV classification, level-4 categories were selected as suitable for market definition, because the distribution of winners throughout 2009-2012 suggested that there are a large number of markets with a fairly small winners. Contracts were awarded in 820 level-4 CPV categories such as crops, products of market gardening and horticulture (0311) or construction materials (4411). Even though Hungary is a relatively small country interviewees suggested that there may be geographical frontiers of markets. Hence, we used 3 NUTS-1 regions plus the whole country to define markets along a geographical dimension (national reach typically requires an extensive set of local offices warranting an effective market barrier). Taken together, these resulted in  $820 \times 4 = 3280$  distinct markets.

To define how many suitable competitors a market has, we simply calculated the winners of each market throughout 2009-2012. This is a conservative estimate as

bidders who never won, for example because they were too expensive, but submitted valid bids were not taken into account. As some companies may have gone bankrupt or been bought by others, this estimation strategy may also be somewhat upward biased; therefore in some regressions we excluded markets with very many competitors.

The below tables demonstrate the robustness of our models to excluding markets with specific products and services (**Error! Reference source not found.**, Table 36, and Table 37). Each of the findings in these alternative specifications remain unchanged compared to the main regressions, while indicators of goodness of fit improve somewhat.

**Table 36. Regression results on contract level, 2009-2012, average marginal effects reported for models 1-4 and unstandardized coefficients for model 5, nr. of winners  $\geq 38$** 

models	1	2	3	4	5
Independent vars / dependent vars	single received bid	single received bid	single valid bid	single valid bid	winner's 12 month market share
<b>single received/valid bid</b>					0.027***
P(Fisher)					0.000
P(permute)					0.000
<b>no call for tenders published in official journal</b>	0.173***	0.131***	0.167***	0.128***	0.057***
P(Fisher)	0.000	0.000	0.000	0.002	0.000
P(permute)	0.000	0.000	0.000	0.000	0.000
<b>procedure type</b>					
ref. cat.=open procedure					
1=invitation procedure	0.065***	0.06***	0.067***	0.058***	-0.021
P(Fisher)	0.224	0.206	0.332	0.339	0.471
P(permute)	0.000	0.000	0.000	0.000	0.195
2=negotiation procedure	0.025***	0.03***	0.066***	0.063***	0.013
P(Fisher)	0.14	0.074	0.002	0.002	0.235
P(permute)	0.000	0.000	0.000	0.000	0.055
3=other procedures	0.305***	0.3***	0.282***	0.281***	0.031***
P(Fisher)	0.000	0.000	0.000	0.000	0.003
P(permute)	0.000	0.000	0.000	0.000	0.000
4=missing/erroneous procedure type	0.03**	0.039***	0.019	0.026***	-0.008
P(Fisher)	0.062	0.017	0.315	0.165	0.379
P(permute)	0.000	0.000	0.060	0.000	0.275
<b>length of eligibility criteria</b>					
ref.cat.=length<-2922.125					
1= -2922.125<length<=520.7038	0.054***	0.033***	0.02	0.009	0.014
P(Fisher)	0.067	0.227	0.556	0.784	0.233
P(permute)	0.000	0.000	0.105	0.420	0.175
2= 520.7038<length<=2639.729	0.125***	0.106***	0.079***	0.07***	0.022
P(Fisher)	0.000	0.001	0.031	0.052	0.114
P(permute)	0.000	0.000	0.000	0.000	0.070
3= 2639.729<length	0.135***	0.116***	0.079***	0.068***	0.025
P(Fisher)	0.000	0.001	0.049	0.087	0.106
P(permute)	0.000	0.000	0.000	0.000	0.025
4= missing length	0.151***	0.057***	0.03	-0.008***	0.041*
P(Fisher)	0.001	0.132	0.540	0.841	0.052
P(permute)	0.000	0.000	0.060	0.000	0.015
<b>short submission period</b>					
ref.cat.=normal submission period					
1=accelerated submission period	0.023***	0.025***	0.005	0.009	0.015***
P(Fisher)	0.048	0.028	0.719	0.530	0.045
P(permute)	0.000	0.000	0.515	0.260	0.010
2=exceptional submission period	0.08***	0.089***	0.047***	0.065***	0.012
P(Fisher)	0.028	0.006	0.265	0.090	0.514
P(permute)	0.000	0.000	0.020	0.000	0.500
3=except. submission per. abusing weekend	0.136***	0.193***	0.088*	0.153***	0.039
P(Fisher)	0.019	0.004	0.131	0.013	0.423
P(permute)	0.000	0.000	0.045	0.000	0.520
4=missing submission period	0.28***	0.163***	0.123***	0.047*	-0.014
P(Fisher)	0.000	0.000	0.030	0.308	0.641
P(permute)	0.000	0.000	0.000	0.015	0.495
<b>relative price of tender documentation</b>					
ref.cat.= relative price=0					
1= 0<relative price<=0.0004014	-0.003	-0.013	-0.019	-0.047***	0.056***
P(Fisher)	0.901	0.531	0.463	0.053	0.010
P(permute)	0.855	0.295	0.165	0.000	0.000
2= 0.0004014<relative price<=0.0009966	0.022	0.016	0.011	-0.019	0.038***
P(Fisher)	0.361	0.455	0.673	0.418	0.015
P(permute)	0.070	0.195	0.440	0.175	0.000
3= 0.0009966<relative price<=0.0021097	0.038***	0.031***	0.022	-0.005	0.012
P(Fisher)	0.121	0.135	0.346	0.839	0.388
P(permute)	0.000	0.005	0.120	0.720	0.245

4= 0.0021097<relative price	0.07***	0.055***	0.044***	0.015	0.003
P(Fisher)	0.005	0.009	0.055	0.482	0.803
P(permute)	0.000	0.000	0.000	0.160	0.765
models	1	2	3	4	5
5=missing relative price	-0.005	0.005	0.001	-0.02	-0.012*
P(Fisher)	0.856	0.828	0.983	0.416	0.304
P(permute)	0.565	0.620	0.970	0.065	0.180
<b>call for tenders modified</b>	-0.015	-0.02*	-0.013	-0.016	0.005
P(Fisher)	0.441	0.288	0.617	0.538	0.610
P(permute)	0.090	0.030	0.185	0.105	0.515
<b>weight of non-price evaluation criteria</b>					
ref.cat.= only price					
2= 0<non-price criteria weight<=0.4	0.002	0.005	-0.024***	-0.017***	-0.003
P(Fisher)	0.882	0.718	0.176	0.316	0.722
P(permute)	0.675	0.405	0.000	0.000	0.585
3= 0.4<non-price criteria weight<=0.556	0.091***	0.091***	0.071***	0.069***	0.047***
P(Fisher)	0.000	0.000	0.001	0.000	0.000
P(permute)	0.000	0.000	0.000	0.000	0.000
4= 0.556<non-price criteria weight<1	0.102***	0.102***	0.095***	0.086***	0.045***
P(Fisher)	0.000	0.000	0.000	0.000	0.000
P(permute)	0.000	0.000	0.000	0.000	0.000
5=only non-price criteria	-0.005	-0.002	-0.008	-0.009	0.001
P(Fisher)	0.711	0.900	0.672	0.615	0.893
P(permute)	0.530	0.840	0.520	0.360	0.865
<b>procedure annulled and re-launched</b>		-0.098***		-0.027*	
P(Fisher)		0.001		0.422	
P(permute)		0.000		0.035	
<b>length of decision period</b>					
ref.cat.= 44<decision period<=182					
1= decision period<=32	0.075***	0.067***	0.123***	0.119***	0.014*
P(Fisher)	0.000	0.000	0.000	0.000	0.110
P(permute)	0.000	0.000	0.000	0.000	0.020
2= 32<decision period<=44	0.03***	0.023***	0.04***	0.042***	0.021***
P(Fisher)	0.030	0.067	0.012	0.003	0.019
P(permute)	0.000	0.000	0.000	0.000	0.000
4= 182<decision period	0.133***	0.147***	0.179***	0.187***	0.05***
P(Fisher)	0.000	0.000	0.000	0.000	0.005
P(permute)	0.000	0.000	0.000	0.000	0.000
5= missing decision period	-0.057***	-0.024*	-0.053***	-0.022	0.032**
P(Fisher)	0.027	0.249	0.114	0.418	0.112
P(permute)	0.000	0.010	0.000	0.060	0.005
<b>contract modified during delivery</b>	-0.005	-0.003	-0.034***	-0.029***	0.023***
P(Fisher)	0.678	0.765	0.013	0.028	0.001
P(permute)	0.400	0.545	0.000	0.000	0.000
<b>contract extension(length/value)</b>					
ref.cat.=c.length diff.<=0 AND c.value diff.<=0.001					
2=0<c.length d.<=0.162 OR 0.001<c.value d.<=0.24	-0.069**	-0.063***	-0.017	-0.026	-0.011
P(Fisher)	0.000	0.000	0.524	0.269	0.445
P(permute)	0.005	0.000	0.400	0.110	0.475
3= 0.162<c.length diff. OR 0.24<c.value diff.	-0.005	-0.015	0.022	0.011	-0.008
P(Fisher)	0.842	0.468	0.367	0.605	0.523
P(permute)	0.735	0.335	0.220	0.520	0.575
4= missing (with contr. completion ann.)	-0.01	-0.008	-0.009	-0.007*	-0.001
P(Fisher)	0.549	0.634	0.655	0.707	0.883
P(permute)	0.190	0.340	0.260	0.395	0.825
5= missing (NO contr. completion ann.)	-0.01	-0.013*	0.005	0.007	0.005
P(Fisher)	0.412	0.252	0.712	0.594	0.582
P(permute)	0.100	0.030	0.480	0.255	0.380

constant included in each regression; control variables: product market (cpv divisions); number of winners on the market (market defined by cpv level 4 & nuts 1) year of contract award; log real contract value; contract length; framework contract; issuer type, sector, and status (public or private)

N	33440	36977	27067	30365	13019
R2/pseudo-R2	0.1183	0.1101	0.1074	0.1024	0.2558

Source: PP.Note: \*  $p<0.05$ ; \*\*  $p<0.01$ ; \*\*\*  $p<0.001$ ; clustered standard errors clustered by issuer for P(Fisher), Monte Carlo random permutation simulations for P(permute) (200 permutations) using stata

**Table 37. Regression results on contract level, 2009-2012, average marginal effects reported for models 1-4 and unstandardized coefficients for model 5, nr. of winners  $\geq 110$** 

models	1	2	3	4	5
Independent vars / dependent vars	single received bid	single received bid	single valid bid	single valid bid	winner's 12 month market share
<b>single received/valid bid</b>					0.034***
P(Fisher)					0.000
P(permute)					0.000
<b>no call for tenders published in official journal</b>	0.201***	0.136***	0.18***	0.114***	0.032
P(Fisher)	0.000	0.001	0.000	0.010	0.150
P(permute)	0.000	0.000	0.000	0.000	0.085
<b>procedure type</b>					
ref. cat.=open procedure					
1=invitation procedure	0.066*	0.054***	0.071**	0.05**	-0.054*
P(Fisher)	0.276	0.304	0.350	0.451	0.196
P(permute)	0.010	0.000	0.005	0.010	0.030
2=negotiation procedure	0.019*	0.023**	0.06***	0.056***	0.032***
P(Fisher)	0.328	0.208	0.009	0.009	0.051
P(permute)	0.010	0.005	0.000	0.000	0.000
3=other procedures	0.314***	0.309***	0.29***	0.287***	0.037***
P(Fisher)	0.000	0.000	0.000	0.000	0.007
P(permute)	0.000	0.000	0.000	0.000	0.000
4=missing/erroneous procedure type	0.023**	0.037***	0.009	0.02	-0.004
P(Fisher)	0.235	0.062	0.685	0.376	0.741
P(permute)	0.010	0.000	0.410	0.080	0.660
<b>length of eligibility criteria</b>					
ref.cat.=length<2922.125					
1= -2922.125<length<=520.7038	0.057***	0.029*	0.016	-0.004	0.008
P(Fisher)	0.081	0.345	0.620	0.896	0.565
P(permute)	0.000	0.015	0.215	0.785	0.605
2= 520.7038<length<=2639.729	0.122***	0.093***	0.075***	0.056***	0.02
P(Fisher)	0.001	0.006	0.038	0.121	0.247
P(permute)	0.000	0.000	0.000	0.000	0.195
3= 2639.729<length	0.136***	0.107***	0.078***	0.052**	0.027*
P(Fisher)	0.000	0.003	0.047	0.178	0.140
P(permute)	0.000	0.000	0.000	0.005	0.035
4= missing length	0.18***	0.039***	0.059**	-0.009***	0.018
P(Fisher)	0.001	0.325	0.276	0.829	0.527
P(permute)	0.000	0.000	0.005	0.000	0.380
<b>short submission period</b>					
ref.cat.=normal submission period					
1=accelerated submission period	0.021**	0.025***	0.001	0.006	0.014
P(Fisher)	0.116	0.062	0.966	0.715	0.177
P(permute)	0.010	0.000	0.955	0.605	0.060
2=exceptional submission period	0.064***	0.086***	0.025	0.062**	0.015
P(Fisher)	0.063	0.006	0.550	0.120	0.660
P(permute)	0.000	0.000	0.310	0.005	0.585
3=except. submission per. abusing weekend	0.122*	0.204***	0.073	0.169**	-0.027
P(Fisher)	0.067	0.008	0.255	0.016	0.501
P(permute)	0.010	0.000	0.150	0.005	0.765
4=missing submission period	0.316***	0.165***	0.157***	0.053*	0.004
P(Fisher)	0.000	0.001	0.007	0.273	0.907
P(permute)	0.000	0.000	0.000	0.010	0.885
<b>relative price of tender documentation</b>					
ref.cat.= relative price=0					
1= 0<relative price<=0.0004014	0.012	-0.007	-0.022	-0.063***	0.036
P(Fisher)	0.720	0.765	0.502	0.029	0.168
P(permute)	0.410	0.615	0.240	0.000	0.070
2= 0.0004014<relative price<=0.0009966	0.03*	0.014	0.003	-0.04*	0.022
P(Fisher)	0.349	0.555	0.934	0.146	0.269
P(permute)	0.025	0.255	0.895	0.015	0.140
3= 0.0009966<relative price<=0.0021097	0.048***	0.032*	0.01	-0.029	-0.004
P(Fisher)	0.123	0.193	0.717	0.258	0.834
P(permute)	0.000	0.020	0.580	0.070	0.735
4= 0.0021097<relative price	0.102***	0.069***	0.057***	0.009	-0.005
P(Fisher)	0.001	0.005	0.032	0.707	0.768
P(permute)	0.000	0.000	0.000	0.540	0.700
5=missing relative price	0.002	0.01	-0.011	-0.039***	-0.038***

P(Fisher)	0.965	0.687	0.717	0.146	0.033	
P(permute)	0.850	0.305	0.405	0.000	0.000	
<b>call for tenders modified</b>	-0.023*	-0.028***	-0.019	-0.02	0	
P(Fisher)	0.211	0.118	0.489	0.456	0.989	
P(permute)	0.025	0.000	0.125	0.095	0.990	
	models	1	2	3	4	5
<b>weight of non-price evaluation criteria</b>						
ref.cat.= only price						
2= 0<non-price criteria weight<=0.4	-0.013	-0.005	-0.047***	-0.031***	-0.008	
P(Fisher)	0.433	0.729	0.017	0.087	0.456	
P(permute)	0.085	0.425	0.000	0.000	0.270	
3= 0.4<non-price criteria weight<=0.556	0.074***	0.077***	0.044***	0.048***	0.049***	
P(Fisher)	0.001	0.000	0.043	0.017	0.007	
P(permute)	0.000	0.000	0.000	0.000	0.000	
4= 0.556<non-price criteria weight<1	0.124***	0.124***	0.112***	0.102***	0.077***	
P(Fisher)	0.000	0.000	0.000	0.000	0.000	
P(permute)	0.000	0.000	0.000	0.000	0.000	
5=only non-price criteria	0.011	0.014	0.01	0.005	-0.004	
P(Fisher)	0.486	0.355	0.631	0.795	0.751	
P(permute)	0.310	0.115	0.525	0.675	0.720	
<b>procedure annulled and re-launched</b>						
		-0.076***		-0.025		
P(Fisher)		0.007		0.445		
P(permute)		0.000		0.100		
<b>length of decision period</b>						
ref.cat.= 44<decision period<=182						
1= decision period<=32	0.03***	0.033***	0.084***	0.089***	0.005**	
P(Fisher)	0.044	0.015	0.000	0.000	0.688	
P(permute)	0.000	0.000	0.000	0.000	0.610	
2= 32<decision period<=44	0.023*	0.019*	0.024*	0.03**	0.01	
P(Fisher)	0.167	0.212	0.173	0.051	0.441	
P(permute)	0.025	0.035	0.015	0.005	0.305	
4= 182<decision period	0.116***	0.143***	0.138***	0.159***	0.055***	
P(Fisher)	0.002	0.000	0.007	0.001	0.013	
P(permute)	0.000	0.000	0.000	0.000	0.000	
5= missing decision period	-0.082***	-0.035***	-0.084***	-0.038***	0.016	
P(Fisher)	0.000	0.088	0.020	0.177	0.461	
P(permute)	0.000	0.000	0.000	0.000	0.440	
<b>contract modified during delivery</b>						
	0	0.001	-0.027***	-0.023**	0.022***	
P(Fisher)	0.973	0.922	0.065	0.102	0.015	
P(permute)	0.945	0.835	0.000	0.005	0.000	
<b>contract extension(length/value)</b>						
ref.cat.=c.length diff.<=0 AND c.value diff.<=0.001						
2=0<c. length d.<=0.162 OR 0.001<c.value d.<=0.24	-0.052**	-0.048**	0.006	-0.01	-0.022	
P(Fisher)	0.012	0.012	0.856	0.719	0.252	
P(permute)	0.005	0.005	0.775	0.580	0.225	
3= 0.162<c. length diff. OR 0.24<c.value diff.	-0.028	-0.035*	0.007	-0.005	-0.023	
P(Fisher)	0.311	0.119	0.813	0.858	0.192	
P(permute)	0.130	0.025	0.715	0.790	0.185	
4= missing (with contr. completion ann.)	0.001	0.002	0.015	0.015	0	
P(Fisher)	0.961	0.900	0.495	0.457	0.995	
P(permute)	0.945	0.830	0.240	0.195	0.985	
5= missing (NO contr. completion ann.)	-0.004	-0.009	0.011	0.011	-0.01	
P(Fisher)	0.767	0.454	0.490	0.416	0.372	
P(permute)	0.655	0.195	0.240	0.190	0.220	
constant included in each regression; control variables: product market (cpv divisions); number of winners on the market (market defined by cpv level 4 & nuts 1) year of contract award; log real contract value; contract length; framework contract; issuer type, sector, and status (public or private)						
N	22276	25813	18273	21584	7806	
R2/pseudo-R2	0.1442	0.1272	0.1274	0.1148	0.2448	

Source: PP

Note: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; clustered standard errors clustered by issuer for P(Fisher), Monte Carlo random permutation simulations for P(permute) (200 permutations) using stata



## Appendix 5C – List of political offices considered for political connection measurement

The full list of institutions and positions can be obtained from the data provider, the government owned MTI Hungarian News Agency, which maintains a database of the most significant political office holders of the country for more than 20 years.

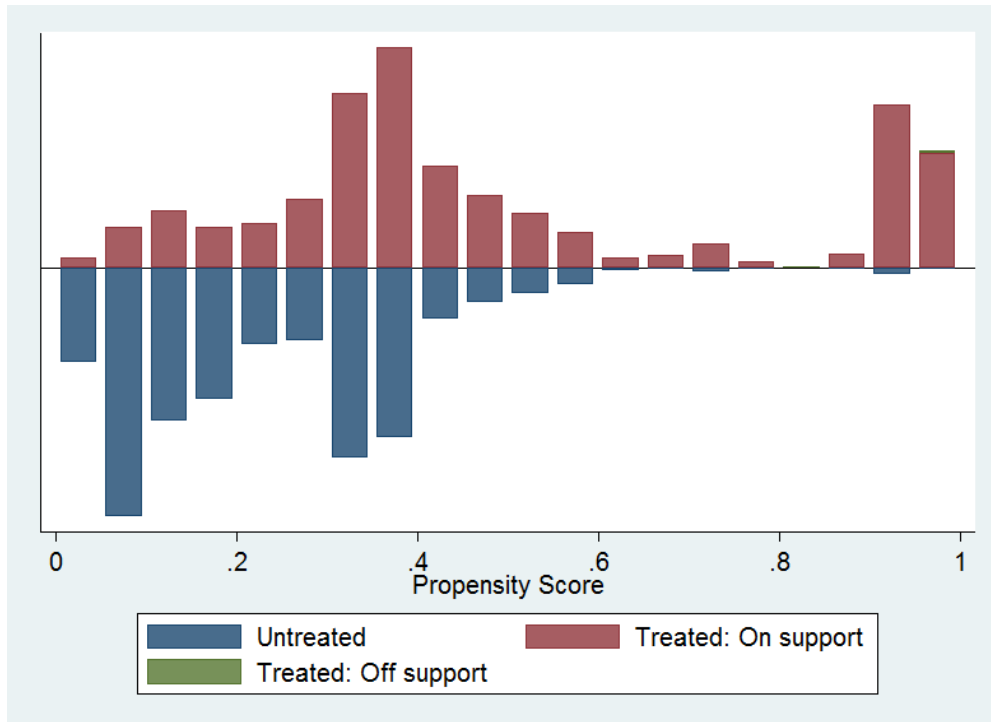
For more information see: <http://mkk.mti.hu/>

**Table 38. List of institutions and positions of the political office holder database, 2010-2011**

<b>Institution</b>	<b>Position</b>
Ministries	minister, secretary of state, vice-secretary of state, ministerial councillor,
Constitutional court	members and leaders
County courts	president, vice-president
Supreme court	President, vice-president, spokesperson
Prosecutors' Office	Chief prosecutor, vice-chief prosecutor, spokesperson
Municipalities	Major, vice-major, notary
County governments (new "kormányhivatal" too)	president, vice-president, notary
Regional police	Chief
National police headquarters	Chief, vice-chief, spokesperson
Minority governments	president, vice-president, head of office head of secretary
National medical service	Chief doctor, chief pharmacist
National Healthcare Fund	Director, vice-director
Army headquarters	Marshal, Vice-marshal
Treasury	President, vice-president, head of finances
Tax Administration	President, vice-president, spokesperson
Office of the president	President of the state, heads of every bureau of the office
State Audit Office	President, vice-president, chief director, director of finances
Regional Development Councils	presidents, member of governing committee
Office of the parliament	Head of office, heads of offices
Ombudsmen offices	Ombudsmen, heads of offices
National headquarters of Prisons	National chief, national vice-chief,
Competition Authority	President, vice-president, head of secretary
Central statistical office	president, vice-president
Other regulatory agencies and background institutes	top-management (2-3 positions)

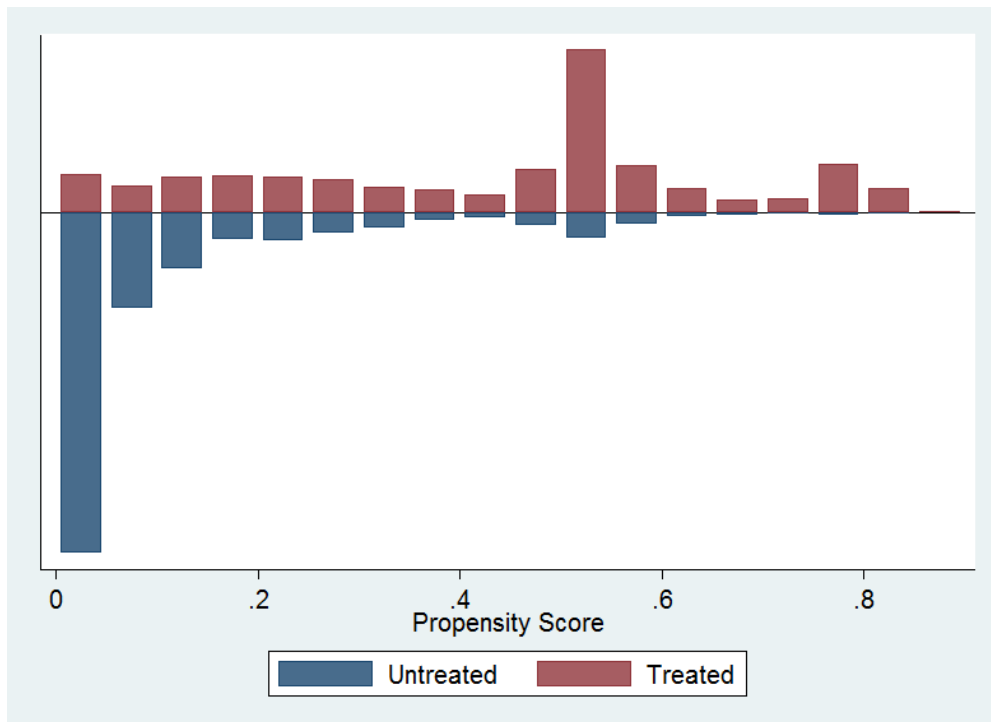
### Appendix 6A-Goodness of propensity score matching

Figure 37. Common support in Czech Republic, psgraph in psmatch2 package of stata 12.0



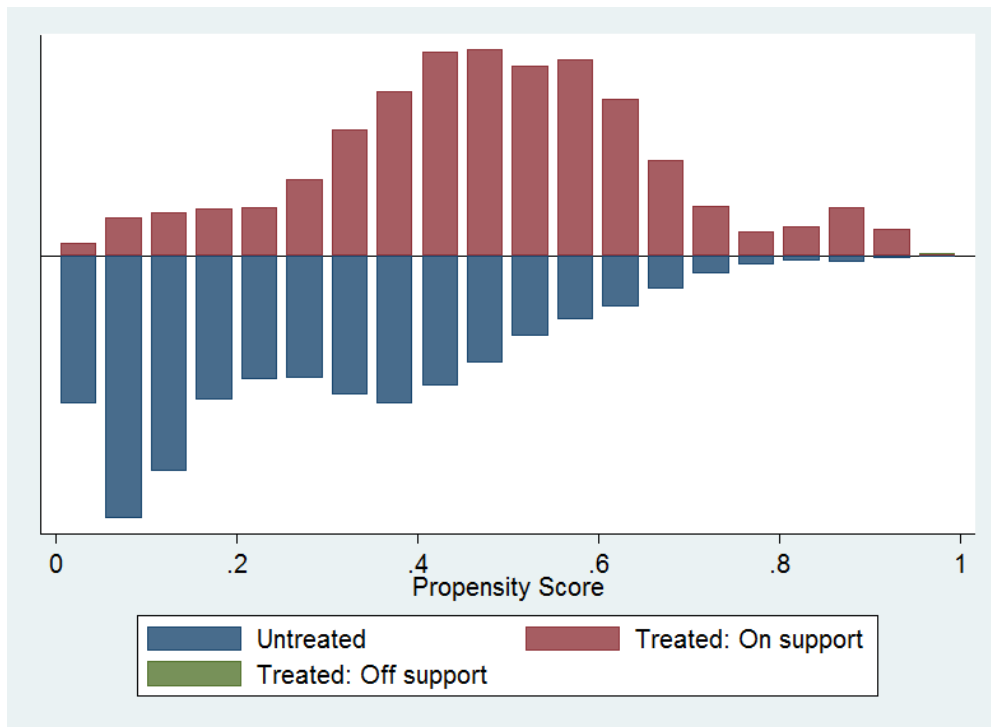
Source: PPC

Figure 38. Common support in Slovakia, psgraph in psmatch2 package of stata 12.0



Source: PPC

**Figure 39. Common support in Slovakia, psggraph in psmatch2 package of stata 12.0**



Source: PPC

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