Norwegian School of Economics
Bergen, Fall, 2016



# The Determinants and Impact of Business Corruption

*Evidence from establishments in Eastern Europe and Central Asia*

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# Abstract

As corruption gains public attention, there is an increased acknowledgement of its impact on business. Circumstances around a corrupt may act differ, but thesis seeks to understand some common factors. Corruption might be embedded in a country or occur sporadically. One of the many ways a business can participate in corrupt acts, willingly or reluctantly, is via bribery of public officials. This thesis seeks to examine corruption and bribery in relation to the government from the firm's perspective, using firm-level data from Eastern Europe and Central Asia.

We use the Business Environment and Enterprise Performance Survey to focus on the way corruption affects businesses and when they are more likely to encounter it. This thesis adds several aspects to current corruption research using BEEPS. Given a possibly changing corruption environment, this thesis uses numbers from both 2009 and 2013; it also separates bribery from corruption, and compares the two.

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Surprisingly, firm characteristics, except firm size, do not affect the probability that a firm pays a bribe. However, firms are more likely to bribe when faced with increasingly challenging financial constraints due to corruption, access to finance, land access, courts and tax administration, business licensing, practices of informal competitors.

# Preface

My interest in occupational crime first started after participating in a very interesting presentation at school in 2010. The subject and lecturer, Frank Murud, was Head of Real Estate in the School Building Department in the Municipality of Oslo from 2003 to 2006 and he had embezzled 89 million NOK over two years. Most intriguing was that the Internal Auditing Department caught him only by accident as he had sole decision responsibility within the department.

The requirement for integrity in the workplace made me want to study this subject further during my Master's Degree. The economics of crime, due to its hidden nature, is not well researched. I participated in the TI Summer School on Integrity in Lithuania. Although very informative, I felt it lacked the view of crime from a business leader's perspective, so I decided that I wanted this to be the topic of my final thesis. However, I soon came to realize that this was not an easy topic. After hunting around and finding a lot of dead ends and intertwining topics, and with some stubbornness on my part, I found something that I wanted to work on.

The road to this point has been a struggle in which I have conquered both physical and mental obstacles. I have learned a lot about econometrics and the economics of crime beyond corruption and bribery. I want to thank my family, friends, roommates and advisor for their patience, support and inspiration during my work.

# Abbreviations

| | |
|---|---|
| BEEPS | Business Environment and Enterprise Performance Survey |
| CSR | Corporate Social Responsibility |
| EBRD | European Bank for Reconstruction and Development |
| EU | European Union |
| ISIC Rev.3.1 | International Standard Industrial Classification of All Economic Activities, Rev.3.1 |
| LPM | Linear Probability Model |
| LR | Likelihood Ratio |
| MLE | Maximum Likelihood Estimation |
| OECD | Organisation for Economic Co-operation and Development |
| SME | Small and medium-sized enterprises |
| UNSD | United Nations Statistics Division |
| WBG | World Bank Group |
| WGI | World Governance Indicator |

**Country abbreviations**

| | |
|---|---|
| ALB | Albania |
| ARM | Armenia |
| AZE | Azerbaijan |
| BLR | Belarus |
| BIH | Bosnia & Herzegovina |
| BGR | Bulgaria |
| HRV | Croatia |
| CZE | Czech Republic |
| EST | Estonia |
| GEO | Georgia |
| HUN | Hungary |
| KAZ | Kazakhstan |
| RKS | Kosovo |
| KGZ | Kyrgyzstan |
| LVA | Latvia |
| LTU | Lithuania |
| MKD | F.Y.R. of Macedonia |
| MDA | Moldova |
| MNE | Montenegro |
| POL | Poland |
| ROU | Romania |
| RUS | Russia |
| SRB | Serbia |
| SVK | Slovakia |
| SVN | Slovenia |
| TJK | Tajikistan |
| UKR | Ukraine |
| UZB | Uzbekistan |

Source: (United Nations Statistics Division, 2015)

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# 1. Introduction

*"Indeed, each day it seems that new revelations of corrupt practices in the business world hit the headlines. It is almost as if an inversion has taken place and we now expect corruption to be a part of every day corporate life, and are rather surprised if it does not feature somewhere in the business model of large global-spanning corporations"* (Fleming & Zyglidopoulos, 2009, p. vii).

Undoubtly, corruption has become a hot topic. Although corruption as a phenomenon existed at least two thousand years ago (Tanzi, 1998), the focus of researchers and policy makers has traditionally been government officials who thus illegally gain advantage. However, as Fleming and Zyglidopoulos (2009) point out, corruption is also an issue in business. Corruption may be within the private sector itself, or in the interaction between business and the public sector. This thesis seeks to examine the risk of financial distress when facing government corruption.

Bribes can be offered or extracted, and is one of the main forms of corruption in interactions with the public sector (The World Bank, 1997). Some firms bribe to get goods through customs, others to get building permits illegally or more rapidly. Corruption, with its several forms, can occur in a big or small scale and is a complex phenomenon that can have numerous and severe consequences. Even nonmonetary or small transactions, or gestures, can accumulate to great amounts and affect business profitability. This makes understanding the concepts and consequences of corruption important to investors, boards, managers and employees from an economic perspective (leaving aside its issue of morality). Corruption can be an integral part of the daily challenges for a firm in many countries. Even companies that are not involved may feel the need to strategize around it. For example, in the precense of corruption, some foreign firms may consider working with local entities instead of entering the market itself or dealing with local governments (Garviria, 2002).

With the increased focus on corruption, several institutions and non-governmental organizations have made it their intention to fight it. Several key laws and regulations have been put in place to fight and reduce corruption. As Bishop & Hydoski (2009) states, "tolerance of bribery as an accepted business practice is diminishing rapidly as more countries acknowledge the tremendous downside risks of corruption and the fraud that always almost [*sic*] accompanies it". However, due to its hidden nature, corruption will most likely always be a part of the business environment.

Research on corruption in business-government interactions distinguishes between administrative corruption and state capture. This thesis will mainly focus on the first, from a business perspective, when examining:

*"When do enterprises suffer from business corruption? Furthermore, under which conditions are they willing to participate by paying bribes?"*

Keeping in mind that corruption involves more than bribery, a three-way approach is used to discover the common features. First, I briefly discuss how a firm might suffer from corruption. Thereafter, I look at some of the theories that drive businesses to engage in corrupt acts. Having surveyed theory and previous research, I use data available in the Business Environment and Enterprise Performance Survey (BEEPS). To test empirically the different circumstances in which firms risk being constrained by business corruption. Thereafter I look at the circumstances in which they pay bribes.

## 1.1 Empirical base: BEEPS

According to the Corruption Perception Index by Transparency International, nowhere on earth is free of corruption (Gander, 2015). BEEPS is a firm-level survey collected through a joint initiative by the World Bank Group (WBG) and the European Bank for Reconstruction and Development (EBRD), covering countries in Eastern Europe and Central Asia. It provides data for local firms in 2009 and 2013, which will form the basis of my analysis. As corruption differs between geographical areas, this region is particularly interesting. Corruption has been prevalent in many transition economies, preventing economic growth and privatzation of

enterprises. Following the organizational framework of the United Nations Statistics Division (UNSD) (United Nations Statistics Division, 2015), the 28 countries are divided into sub-regions as follows:

*Table 1.1 Countries divided into regions*

| **Eastern Europe** | **Northern Europe (Baltics)** | **Southern Europe** | **Western Asia (Caucasus)** | **Central Asia** |
|---|---|---|---|---|
| Belarus | Estonia | Albania | Armenia | Kazakhstan |
| Bulgaria | Latvia | Croatia | Azerbaijan | Kyrgyzstan |
| Czech Republic | Lithuania | Montenegro | Georgia | Tajikistan |
| Hungary | | Serbia | | Uzbekistan |
| Poland | | Slovenia | | |
| Moldova | | Kosovo[1] | | |
| Romania | | Macedonia | | |
| Russia | | Bosnia & Herzegovina | | |
| Slovakia | | | | |
| Ukraine | | | | |

When possible, following the BEEPS, the discussion in this thesis will be limited to the industries surveyed in the data set: 1) Manufacturing; 2) Construction; 3) Wholesale and retail trade; 4) Hotels and restaurants; 5) Transport, storage and communications; and 6) Real estate, renting and business activities.

## 1.2 Previous research

The study of corruption differs from geographical area, and whether you look at the origin of corruption from the demand side or the supply side. The field of research is dominated by empirical research rather than theories. Some literature uses the Enterprise Surveys, and even the BEEPS Survey in their empirical literature. The data is often used to examine other aspects of the business environment, such as innovation. Specific countries are examined in addition to regions such as Latin America, Africa, or Eastern Europe and Central Asia). Results depend

[1] Kosovo is included in Southern Europe as it was formerly a part of Serbia. Since the thesis focuses on 2009 and 2013, all the three countries borne of Serbia and Montenegro are included in the thesis. Although Kosovo is not acknowledged as an independent state in some countries, it is analyzed on its own and denoted “Kosovo” in The Enterprise Surveys.

on the angle of the author and the year they study. To my knowledge, except reports from the World Bank, no published research is done on corruption and bribery for the BEEPS Survey for 2013 and for both 2009 and 2013. Research in total lack a view of industrial differences.

## 1.3 Structure of the thesis

This thesis is organized as follows. Section 2 presents definitions and clarifications of terminology within corruption. Section 3 explores how corruption can constrain or affect a business and its environment. Section 4 explores some of the reasons for involvement in corruption. Section 5 presents the empirical base, The BEEPS Survey. Section 6 explains the construction of the data set and the removal of some variables. Sections 7 and 8 present corruption and bribery in the relevant countries and industries respectively. Thereafter, the methodology of the empirical analysis is presented in Section 9, followed by a discussion of our variables of interest in Section 10. Sections 11, 12 and 13 present the descriptive analysis, findings and concluding remarks. Finally, limitations and criticisms of the research are considered in Section 14.

# 2. Corruption and bribery

## 2.1 Definitions

With no agreed international legal definition, the definitions of corruption vary across countries and disciplines (Nowak, 2001). In economics, *corruption* is widely defined as "the abuse of entrusted power for private gain" (Transparency International, 2015). Corruption entails the element of a 'deal' whereby the decision maker commonly departs from official procedures whilst accepting or soliciting payment for a service or decision under his control (Søreide & Williams, 2014, p. 3). The abuse of power, typically hidden from the public eye, does not necessarily have to involve cash payments. Normally involving a criminal offence, some of its many forms involve; bribery, fraud, embezzlement, extortion, theft, deception, collusion, cartels, industrial espionage, nepotism, trading in influence, tax evasion and money laundering. The forms often occur together, and can result in consequences such as financial loss or defective quality (Global Infrastructure Anti-Corruption Crime Centre, 2015a). Bribery is one of the main forms of corruption in business and government interactions (The World Bank, 1997). Following many of the relevant theories, corruption will only be distinguished from bribery where needed.

Bribes can be disguised as gifts, and there are not always clear distinctions between the two. However, bribes imply reciprocity while pure gifts should not (Tanzi, 1998). Transparency International (2015) defines *bribery* as "the offering, promising, giving, accepting or soliciting of an advantage as an inducement for an action which is illegal, unethical or a breach of trust. Inducements can take the form of gifts, loans, fees, rewards or other advantages such as taxes, services, donations, etc." Essentially, a briber offers or give a bribe to a bribetaker, normally a public official, for him or a third party to act dishonestly. In acting dishonestly also lies omission, such as if public officials disregard flaws when it comes to quality certification. However, sometimes firms make facilitation payments to expedite or obtain services to which they are entitled, such as getting overdue contract payments, import permits or work permits. The difference lies in the facilitation of an existing agreement. Tolerance of facilitation payments is internationally decreasing as many conventions prohibit facilitation payments (Kochan & Goodyear, 2011, pp. 145-146). Following the BEEPS Survey, facilitation payments are treated as bribes in this thesis.

Without indicating the initiator, laws often distinguish between passive and active bribery. The one who takes or receives a bribe commits *passive bribery*, and *active bribery* is committed when promising or giving this bribe. Similarly, the *demand side* of corruption might be an officer soliciting extra payment in order to issue a license, also known as a kickback. Conversely, the *supply side* might be the firm who is not willing to wait and pays, or might even offer, this payment (Anti-Corruption Resource Center, 2015).

Business corruption, the core focus of this thesis, describes corruption that primarily occurs between enterprises and public officials or authorities (Søreide, 2006), and mainly concerns some form of bribery by firms. A common distinction made in business corruption is between administrative corruption and state capture (Gray, et al., 2004) (Hellman, 2002). Nowak (2001) defines *administrative corruption* as "bribery associated with the implementation of laws and regulations" and points out that it takes place when public officials design programs or apply laws to increase bribe revenues. The public official's control over routine activities as tax collection, customs and licensing, is his *discretionary power* (Nowak, 2001, p. 4). *State capture* refers to payment to public officials to influence the rules of the market economy through laws, rules and regulations (Hellman & Kaufmann, 2001). Hence, it advances the possibility of profits to narrow sectors and groups and entails some of the benefits also gained by administrative corruption. Possible advantages might be government contracts, access to limited government goods, or even lower taxes (Hellman, 2002).

Another well-known classification of corruption follows the money lost and the sector it occurs: grand, petty and political corruption (Transparency International, 2015). As with administrative corruption and state capture, they might exist in the same business community or country. *Petty corruption* is "everyday abuse of entrusted power by low- and mid-level public officials in their interactions with ordinary citizens, who often are trying to access basic goods or services in places like hospitals, schools, police departments and other agencies" (Transparency International, 2009, p. 33). Even if there is an intuitive relationship between administrative and petty corruption, all examples of administrative corruption cannot be considered petty as illegal payments and discretionary power in implementation of laws can be found at all levels of government (Gray, et al., 2004, p. 10). On the other hand, corruption at a higher level might be grand or political corruption. Sampford, et al., (2006, p. 9) write

that *grand corruption* involves distortion or corruption of the central functions of government, whilst petty corruption develops and exists within the context of established governance and social frameworks. In turn, *political corruption* is "manipulation of policies, institutions and rules of procedures in the allocation of resourcing and financing by political decison makers, who abuse their positions to sustain their power, status and weath" (Transparency International, 2009, p. 35). Since this thesis concerns business-government interactions the terms administrative corruption and state capture will be used.

## 2.2 Encountering administrative corruption

Business corruption can possibly be found at all points of contact with the government, such as in dealing with tax, courts or customs, or competing for contracts through corrupt circles. Alternatively, the firm might be applying for finance, land development concessions, building permits or business licenses and permits.

In these interactions, a bribe does not necessarily have to be initiated by the firm. The government official might e*xtort* directly or indirectly, using power or knowledge when demanding cooperation or compensation through coercive threats (Transparency International, 2009, p. 19). A company is subject to extortion when payment is demanded for something to which it is already entitled, or is merely seeking to avoid unlawfully inflicted disadvantages (Søreide, 2013, p. 34). Examples might be demanding payment to issue a license, or refusing to provide customs clearance or certificates. Nowak (2001, pp. 2-4) points out that, combined with discretionary power, it is the "monopoly power" that allows public officials to refuse, prolong or otherwise complicate transactions through non-transparent or unclear processes with the purpose of extracting bribes.

On the other hand, firms themselves might bribe or take other actions with *true corrupt intent* to gain an illegal advantage, or as *necessary corruption* to get things done (Business Anti Corruption Portal, 2015). By bribing government officials, either voluntarily or reluctantly, companies can gain benefits by economic activity that would otherwise be restricted (The World Bank, 1997). The World Bank (1997) describe some things that can be 'bought' when dealing with government officials:

1. *Government contracts:* choice and terms of contracts when it comes to supplying goods, services or work, or covering up contractual breaches. For example, bribes are made to secure public procurement contracts or to plan projects to favor one bidder.

2. *Government benefits:* distribution of money, such as subsidies, or in-kind benefits such as access to land or stakes in an enterprise.

3. *Lower taxes:* reducing taxes or other fees.

4. *Licenses:* rights in the form licenses. For example, use of natural resources, building licenses or planning permissions for a project.

5. *Time:* to shorten delays, get extensions of time or prevent hold-up because of inaction or delays.

6. *Legal outcomes:* change the outcome of a legal process. The firm might bribe a witness or a judge to favor one party over another.

However, this list is not exhaustive and is subject to many additional forms. For example, firms might initially pay a bribe to avoid tax in total, to bypass laws and regulations, or to block entry of potential competitors. With its many faces, business corruption is highly dependent on the situation. Notably, public officials can make different bribe demands across firms (Svensson, 2003). In addition, not all the interactions have to be corrupt, and one firm might need to bribe whilst others do not. Corruption can be *sporadic or individual* exploitation of an occasional opportunity, and occur irregularly. On the other hand, it might be embedded in the industry where most businesses have few alternatives. Corruption that is a part of the political, economic and social system, is known as *systematic or endemic* (Anti-Corruption Resource Center, 2015). There might be both formal and informal rules so that firms are expected to pay even if corruption is illegal. It can range from uncontrolled extortion by multiple officials to highly organized bribe collection and distribution systems (The World Bank, 1997).

# 3. Business corruption constraining activity

While firms encounter corruption differently, Budak and Rajh (2011, p. 10) point to how business culture and corporate social responsibility (CSR) shape acceptable business behavior in a country. Exposure to other obstacles constraining business' activities can lead to less emphasis on the consequences of corruption. Additionally, anti-corruption awareness affects attitudes towards corruption among business people. If the perceived levels decreases, and anti-corruption efforts are higher, the business people might be more conscious of its negative impact. By contrast, increased levels of corruption might lead the firm to surrender to it more easily. Besides, successful experience when bribing might shape attitudes and encourage further bribing. Conversely, previous experience might encourage victims to challenge corrupt practices or refuse extra payment.

Validation of corrupt behavior may lead to more corruption. Bribes can become a means of "greasing the wheels" to overcome burdensome red tape, or to expedite a process (Kaufmann & Wi, 1999). However, some empirical research testing the "efficient grease hypothesis" that corruption can improve efficiency when paying to speed up a business decision actually finds the opposite. Contrary to "the efficient grease hypothesis", Kaufman and Wei (1999) find that firms facing more demands for bribes spend more time with public officials negotiating regulations, and they face higher capital costs.

When it comes to the effects of corruption, Cockcroft (2012, p. 70) points out:
*"The economic consequences of corruption depend on which decisions the corrupt act affects, how the bribes are used by the recipients and what would have been done with the money had there been no corruption"*.

## 3.1 Consequences of business corruption on the firm itself

Isolated effects of business corruption are hard to measure, mainly because of its hidden nature and the costs of corruption being not necessarily monetary. However, some literature points to a direct impact through higher costs and an indirect impact through ripple effects. Corruption might not even be seen as destructive if considered necessary. Then again, lack of

quality in construction, poor selection of construction projects or insufficient maintenance can reduce the return on investment for example. Corruption in construction cannot only lead to reduced return on investment, but also to high human cost in case of injury and death (Kenny, 2009, p. 22). Corruption can also affect firms that are not directly involved themselves. Firms do not exist in a vacuum and are inseparable from society: they shape, and are shaped, by it (Kochan & Goodyear, 2011, p. 93).

Direct financial costs differ in size and might not always be considered as a great cost to the company. Under the assumption that a firm is profit maximizing, it offers a bribe only if the benefits are greater than the cost. Søreide (2013, p. 144) points to three different ways a firm can internalize a bribe:

- *Profit-based bribes*: accumulated savings cover the expense.
- *Surplus-based bribes*: expenses are covered by earnings when the contract in question is executed. The work is adjusted accordingly, for example the quality can be set lower to secure a surplus for the bribe.
- *Price inflated corruption*: the official price rises to cover the bribe payment.

Hence, the firm does not necessarily see the direct cost of bribe payments. In a corrupt environment the costs of doing business can increase significantly, in terms of the resources needed to cope with expenses and risks. Expenses related to corruption can represent a corruption fee in order to enter the market, comply with regulations, survive excessive bureaucracy or be protected politically (Budak & Rajh, 2011).

### 3.1.1 Direct impact on firms

As discussed in Section 2.2, firms might have multiple intentions when engaging in business corruption such as reducing costs such through lower taxation or enhancing benefits through getting subsidies or government contracts. Others bribe government regulators to sign off on poor quality products, which might lead to defective work and higher maintenance costs (Global Infrastructure Anti-Corruption Crime Centre, 2015a). The cost to the firm depends on the corrupt act and its intentions. Some of the factors that have shown to be affected are as follows.

*Productivity:* De Rosa, et al., (2010) find that bribes have a significant negative impact on firm-level productivity, using firm-level data for the economies of Central and Eastern Europe and the Commonwealth of Independent States.

*Efficiency:* Corruption can also lead to efficiency problems as fewer resources are available to run the business, especially when internalizing bribe payments. Time spent away from managing, productive activities and core business might lead to other delays.

*Employees*: Business corruption might affect the workforce. An additional cost might be incurred through payment of employees to cover up corrupt activities. Firms might also face difficulties in the recruitment of new employees if they previously engaged in corrupt acts (Global Infrastructure Anti-Corruption Crime Centre, 2015a). Kochan and Goodyear (2011) also point to a "…loss of morale amongst employees and shareholders, while other shareholders will sell the stock". Additionally, if involved in corruption, there might be reputational damage for individuals, or even dismissal from employment or disciplinary action by professional associations (Global Infrastructure Anti-Corruption Crime Centre, 2015a).

*Legal risks*: Involvement in corruption and bribery involves a risk of legal action, as there might be formal and informal rules in a country. Through laws and country ratification of conventions, the firm faces a risk of criminal prosecution that can imply serious penalties and potentially harsh punishment for both managers and employees. Corporate managers face fines and even jail sentences (Wu, 2005). Suspicion or sentencing for corruption brings legal costs, judicial penalties and the need for resources to deal with the media. Investigation, and the payment of fines and sanctions, also lead to unnecessary use of company assets, employees and time (Global Infrastructure Anti-Corruption Crime Centre, 2015a).

*Customers and competition*: If a firm has been involved in corruption, the news might affect customer respect, trust and loyalty. For fear of losing customers, brand power and market

position, the company may need to invest resources to maintain and reassure customers (Global Infrastructure Anti-Corruption Crime Centre, 2015a). Additionally, to the cost of the corrupt acts will often lead to inflated prices to the end-consumer, potentially decreasing demand.

*Reputational damage and investor confidence*: Growing emphasis on ethical investments can negatively affect share value, attract undesirable business partners and create difficulties in obtaining work (Global Infrastructure Anti-Corruption Crime Centre, 2015a). There is also a risk of termination of corrupt contracts. Further, a sentence of corruption might affect investor confidence (Kochan & Goodyear, 2011, p. 20) and even incur difficulties in raising finance, as some investors may steer clear of businesses with a corrupt history. Firms sanctioned under the WBG's fraud and corruption policy are debarred from WBG-financed procurement contracts.[2]

### 3.1.2 Impact on the business environment

Business corruption also affects the whole business environment. Importantly, business corruption undermines the rule of law (Anderson & Gray, 2006, p. 8) and can encourage continued criminal activity when undetected. Sporadic corruption is not necessarily destructive of the economy or mechanisms of control, but can undermine morale and draw resources from the economy (Anti-Corruption Resource Center, 2015). On the other hand, systemic business corruption distorts markets and creates unfair competition through restricted market entry and the allocation of economic preference to influential leaders (Anderson & Gray, 2006, p. 8).

Seen as a barrier to entry, business corruption is highlighted as a cause of the large informal sector in developing countries. Djankov, et al., (2002) find that the regulatory burden of entry increases corruption and the size of economies. Friedman, et al., (2000) also show that

[2] These firms are recorded on a public list on the World Bank website.

corruption promotes informality, and that reduced corruption, measured through the International Country Risk Guide, decreases the informal sector. Gaviria (2002) finds that the size of informal competition increases with the size of corruption, as many firms avoid registering or go underground to avoid corrupt public officials. Informal firms do not have the same advantages as formal firms, such as access to formal financial systems and public services. They might also deliberately limit their expansion to avoid attracting unnecessary attention (Forgues-Puccio, 2013). This, in turn, limits innovation in the business environment and may reduce country income.

Nowak (2001, p. 5) points out that even if the time managers spend dealing with red tape shortens waiting time, it gives public officials further incentives to create kickbacks by introducing vague rules in the first place. Business corruption also influences the composition of government spending. Corrupt officials may steer investments towards sectors where the bribe collection is more expeditious, as in infrastructure, instead of sectors where bribe collection is more difficult, such as health and education (Global Infrastructure Anti-Corruption Crime Centre, 2015a). It might also involve unnecessary government, and undermine government ability to enact and implement policies (The World Bank, 1997).

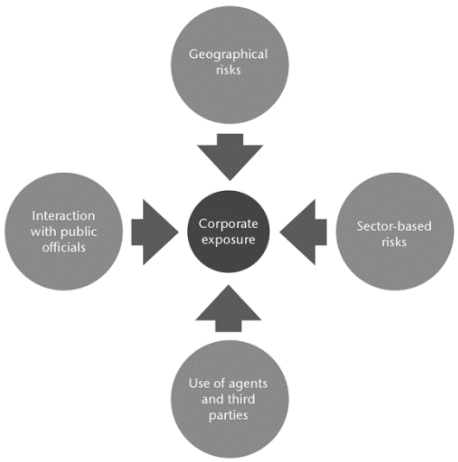
Additionally, market mechanisms might lose their function as competition is based on bribes rather than price and quality. Some get unfair competitive advantages such as tax benefits or long-term delivery contracts. Bribes can also drive up prices through price fixing and backroom deals. However, the firm might want to prevent change and suppress competition deliberately in order to retain their dominant position, slow down unavoidable technological change or resist environmental regulations efforts (Kochan & Goodyear, 2011, p. 20). Lastly, the presence of business corruption in a country might affect the level and composition of foreign direct investment. The foreign investors prefer to have local partners when dealing with bureaucrats because of their knowledge. Conversely, they might prefer to have wholly owned subsidiaries present (Garviria, 2002).

# 4. Involvement in business corruption

A company's involvement in business corruption is not necessarily voluntary. Certain factors within the company and its business environment make the firm more exposed, or prone, to business corruption. Naturally, it depends on the corruption level in the country, which public officials they meet, which licenses they need and other contact with the government. Firms want to maximize their profits through gaining advantages, getting market shares, overriding competitors, influencing government decisions, reducing costs, receiving additional payments or leveling the field. However, sometimes bribes might be extorted or even be the normal business practice within the industry. Taken to the extreme, they might bribe in fear of losing investment.

Depending on the industry, a company might use agents and third parties. The company can encounter corruption through agents, subsidiaries, or by entering into joint venture. Depending on the legislation in the country, the company can be liable for corruption through others. Kochan and Goodyear (2011) presents a model by Masons and Vitou (2010) shown in Figure 4.1 that also suggests that geographical location, sector of operations and interactions with public officials raise the potential risk of corruption. The geographical and sectoral risks for the BEEPS data will be discussed in Section 7 and 8.

*Figure 4.1 Corporate exposure to bribery*




Source: (Kochan & Goodyear, 2011)

In interactions between firms and government, there are several theories of situations where the firm is more prone to corruption. Svensson (2003) points to several reasons why some firms pay bribes and others do not. First, different public officials have different moral cost of demanding bribes. Their perceptions of potential punishment as well as likelihood of getting caught, and found guilty, also differ. The official's possibilities for extracting bribes also differ, as there are industrial and locational differences influencing the firm's business decisions and cash flows. The 'control rights hypothesis' states that the more often the enterprise is in contact with government or public officials, the more often they are likely to bribe (Malomo, 2013). Svensson (2003) explains that these control rights arise from the regulatory system and the discretionary power of public officials when it comes to implementing, executing and enforcing regulations concerning the firm. The firm manager can avoid paying bribes if the control rights lie with him, but if the public official has these through regulations then the firm must pay or exit. Additionally, if left with the control rights, the public official does not necessarily demand the same across firms. When faced with a corrupt official, a case of prisoner's dilemma can strike the company. If they do not bribe, they fear that their competitors will and they would be better off bribing. Kochan and Goodyear (2011, p. 13) point out that in an ideal world, the initial price of the contract or commodity would be lower, savings would be distributed to the end-consumer and the best bids would be accepted. However, as there is no certainty of honest competition, they pay bribes when facing corrupt officials.

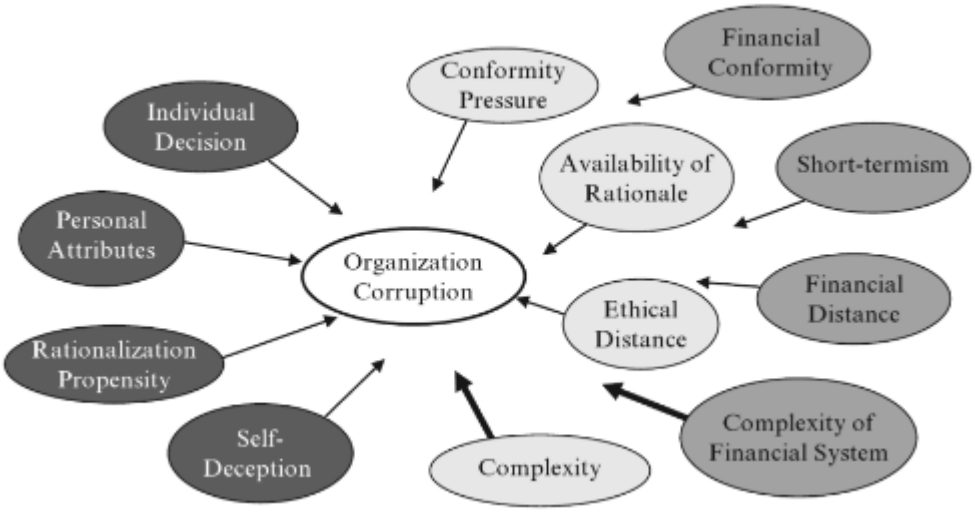
## 4.1 'Bad apples' vs 'Bad barrels'

Corruption may emerge as a reaction to the difficulties that lower-level employees meet when trying to perform routine activities (Kochan & Goodyear, 2011, p. 93). In the case of institutional bribery, bribes are paid or received with full approval of the organization; in the case of personal bribery then this is not so (Global Infrastructure Anti-Corruption Crime Centre, 2015b). However, in the end there are individuals who bribe.

Fleming and Zyglidopoulos (2009) point to different factors that influence an organization's involvement in corruption. These factors are portrayed in Figure 4.2. The left hand side indicates the factors of a 'bad apple' that influences an individual's involvement in corruption.

Individual choice, personal attributes, values and beliefs, propensity for rationalism and self-deception, all contribute to an individual taking part in corruption. However, these factors assume that an individual is the only one involved in illegal acts, going against all others. The other side opens up for the 'bad barrel' as a rationale for involvement in corruption. Culture, history and morals might matter, along with the desire for financial gain. A person can have high morals, which are challenged by the morals of the market place (Ackerman, 2007). Fleming and Zyglidopoulos (2009) argue that good people can take part in things they normally would not because of the situation in which they have found themselves. They explore four organizational factors that lead individuals to perform corrupt acts under the right circumstances, and that take advantage of predispositions we all may share. Conformity, available rationale, ethical distance and organizational complexity form the structural factors for organizational corruption. With conformity, the individuals are likely to match their opinion to the group's opinion to be liked and admired, or because of pressure, stress or culture in the organization. An available rationale justifies their need for conformity, and individuals often protect themselves from consequences through ethical distance. They further argue that there are two kinds of ethical distance. First, how far into the future the consequences are. Second, structural distance, where complex organizational forms distance the individuals from the end-results of their actions. These factors are influenced by organizational complexity, where, for example profession, task, information and technology are specialized.

*Figure 4.2 Factors influencing organizational corruption*



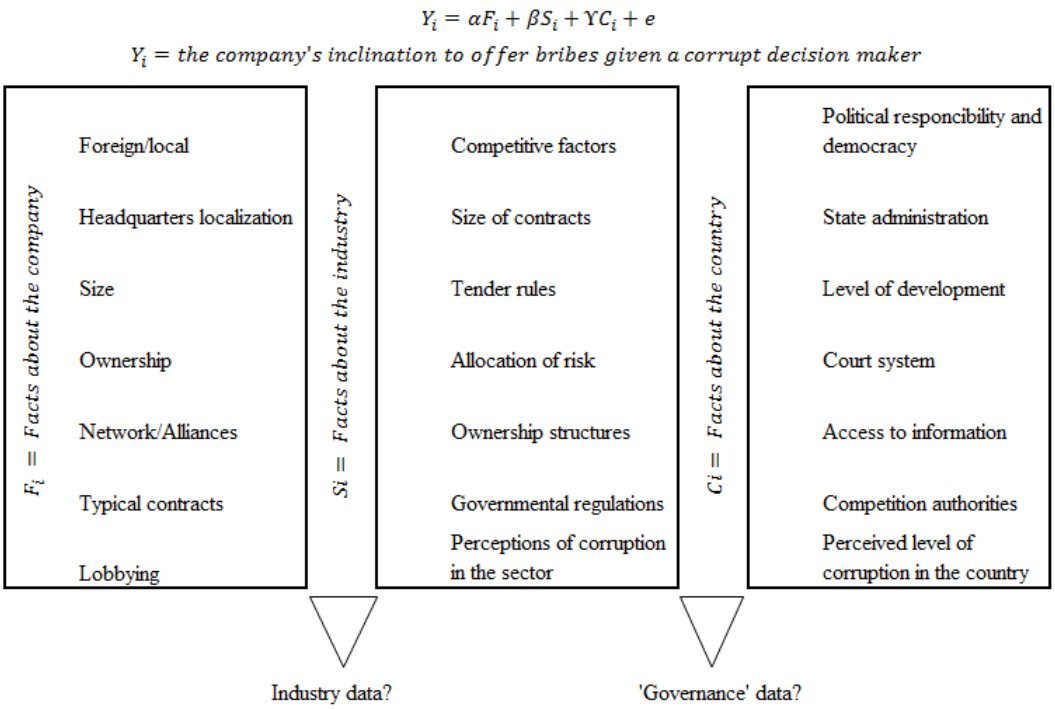

Source: (Fleming & Zyglidopoulos, 2009, p. 113)

Thereafter, the financial environment influences involvement in corruption. Pressure for financial performance builds pressure to cut corners: emphasis on profit and growth, in addition to impossible financial demands from investors, make it easy to rationalize corrupt acts. Short-term pressure can make managers trade-off long-term profits, so earnings are inflated by cutting expenditures. In the case of financial distance, where analysts do not know enough, corruption goes undetected. The more complex the financial system, the more possible ways there are for corrupt acts to go undetected. Hence, corruption is more likely in the case of lower transparency and accountability.

## 4.2 Companies' propensity to pay bribes

Figure 4.3, proposed by Søreide (2013, pp. 55-57), illustrates a model of companies' propensity to pay bribes. Given a corrupt official, there are three main categories that drive the firm to bribe: company factors, industry factors and country factors. Some of the information might mean more than other, and Søreide (2013) points out that the list is not exhaustive..

*Figure 4.3 Companies' propensity to pay bribes*



## 4.3 Corruption in economic cycles

Another influential factor is the economic situation of the establishment and the economic situation in the country. De Rosa, et al., (2010) state that poor countries tend to be the most corrupt, and that corruption can be both a cause and a consequence of low income per captia. Tackett (2010) points out that "bribery and corruption schemes occur in every phase of an economic cycle, but they are most prevalent during recessions, when competition for business can be extreme". This might be because corporate executives might have to meet, or try to meet, pre-set performance measurements to retain their jobs. Feeling an increased risk of losing their jobs, they may be desperate to avoid reporting a performance shortfall. Additionally, the employees might be under personal financial pressure. If internal controls are weak then there is a higher potential for fraud (Bishop & Hydoski, 2009, p. xii).

# 5. The Enterprise Surveys

BEEPS is part of The Enterprise Surveys, a series of outsourced interviews providing firm-level responses from business owners and top managers in emerging markets and developing countries all over the world. The survey covers business environment topics such as access to finance, corruption, infrastructure, crime, competition, labor, obstacles to growth, and performance measures (The Enterprise Surveys, 2015a), and it features additional regional or country specific questions. Following the initial World Business Environment Survey from 1999-2000, The Enterprise Surveys have been conducted in four waves: 2002, 2005, 2009 and 2013. However, a standardization in 2006 in order to create future panel data has made it hard to measure change in corruption over the four benchmark years as some of the key variables changed from a four to a five-point scale. The standardization also involved changes in the sampling of firms. Being cautious in comparing the benchmarks, this thesis examines the years of 2009 and 2013. Additionally, several variables have been included, excluded or changed over the years, putting further limitations on the analysis.

Establishments are screened and sampled in order to survey a particular set of companies. The sample is stratified following three criteria: sector, firm size (small, medium, large) and the geographical distribution of the non-agricultural economic activity for the country. Stratification by sector depends on sector size within the economy, as measured by Gross National Income. To determine the industry of operation the BEEPS follows the International Standard Industrial Classification of All Economic Activities, Rev.3.1 (ISIC Rev.3.1) as developed by UNSD (The Enterprise Surveys, 2009b). According to industry of operations, establishments are surveyed through a core questionnaire with additional questions in supplementary manufacturing and service modules. This thesis includes only variables that cover all firms.

To be eligible, there are some limitations on the responding establishment. An establishment is limited to a location where business, services or industrial operations are conducted. Further, it has to take its own financial decisions and have its own accounts even if it is part of a larger firm. It should also be managed on its own, including control of their own payrolls. Additionally, The Enterprise Surveys seek to interview establishments located in major or

urban centers, with five or more full-time employees working up to eight or more hours daily. Lastly, establishments that are 100% governmentally owned are not eligible (The Enterprise Surveys, 2009a).

## 5.1 BEEPS

Covering establishments in 28 countries in different regions of Eastern Europe and Central Asia, the BEEPS Survey has an additional question on bribery in business-government interactions. As a foundation for examining the two research questions set at the beginning of this thesis, I will focus on two questions in BEEPS regarding business-government interactions:

1. *To what degree is **corruption** an obstacle to the current operations of this establishment?*

Each establishment is given alternatives on an ordinal scale of "no obstacle", "minor obstacle", "moderate obstacle", "major obstacle" and "very severe obstacle". Ordinality implies that there is no fixed or precise distance between the responses. The difference between the first and second outcome may be different to that between the second and the third (Gripsrud, et al., 2004). The question implicitly covers both administrative corruption and state capture, and how the business believe it is constrained by it.

The extent of corruption can be measured partly through the second question:

***2.*** *It is common for firms in my line of business to have to pay some irregular "additional payments or gifts" to get things done with regard to customs, taxes, licenses, regulations, services etc.?*

The second question is also answered on an ordinal scale by the alternatives "never", "seldom", "sometimes", "frequently", "very frequently" and "always" and is as an indicator of administrative corruption. Unfortunately, the question does neither indicate whether it is bribery of foreign or domestic officials, nor if the bribes are offered or extorted.

## 5.2 Concerns measuring business corruption via BEEPS

Creating a measure of corruption in a country raises several issues. For example, is there a difference between an officer accepting a $100 bribe or another accepting 10 bribes of $10 each for the same purpose? (Méndez & Sepuelveda, 2010). Bribery can also be denoted in several ways, and firms bribe with different frequencies in the same setting. Corruption is also not easily measurable due to its hidden nature and the fact that it is not necessarily monetary. Measurement is therefore imperfect and subjective.

Using a perception based survey like BEEPS might lead to biases in presenting business corruption and bribery in several ways. First of all, since the survey use the opinion of the interviewee, it is subject to response bias. Firms that are identical in observable features and pay the same bribe amounts with the same frequency might respond differently. Respondents may have different perceptions about the definition of corruption and bribery, and might perceive the scale or meaning of the variable differently to the WBG and the EBRD. For example, it might not be clear to the respondent that the first question is meant to cover only corruption in business-government relationships. Additionally, the manager's perception might be different from the owners', or they might not know about their company's involvement in corruption in the first place. It is therefore sensitive to the choice of interview object. Another concern is that the establishments might not be honest for fear of persecution. Due to their sensitivity, the questions are asked in an indirect way and in a certain order to obtain the respondent's confidence. Bias might also arise through phrasing, the interaction between interviewer and respondent, and the general circumstances of the interview. The respondent might not respond according to his perception, but rather what the interviewer wants to hear (Fjeldstad, et al., 2006). Perceptions might also be widely sensitive to information, and as Tanzi (1998, p. 578) points out, a widely reported case of corruption might affect the perception of corruption in a country. Another concern is that through sampling and stratification by industry in BEEPS, the sample of firms might not fully represent the economy.

The firm-level assessment measured by BEEPS might yield different results to expert assessments of corruption. First of all, the BEEPS Survey examines business corruption as an

obstacle to doing business, not the presence of corruption itself. The presence of corruption can partly be measured through responses concerning administrative corruption. Anderson and Gray (2006, pp. 31-32) emphasize that different measures might capture different types of corruption. Implicit corruption, where state resources are diverted to the leader and his entourage, might not be related to corruption within routine activities such as those occurring between firms and the government. With regard to firm-level bribery, the managers in BEEPS might therefore be more accurate than the expert's perceptions. Anderson and Gray (2006, pp. 31-32) further emphasize that the political atmosphere in these countries might frighten the respondents, and hence, discourage them from providing responses about potential involvement or knowledge about corruption. However, if the firm is reluctant to reply that "firms like mine" pay bribes, they might also be reluctant to pay the bribes in the first place. They propose that firms in authoritarian regimes might not interpret routine bribery as corruption to the same extent as firms in more open and competitive economic systems. This might lead us to believe that the experts are right, but the firms may view bribes as routine, and hardly distinguishable from official payments for public services.

# 6. Construction of the data set

To measure the circumstances of corruption, I need a data set that makes different aspects of the business and its environment comparable. From this perspective, the original data set is limited in several ways. The removal of observations and extreme variables are in line with The Enterprise Surveys and economic theory. BEEPS provides responses from 27,551 establishments interviewed in 2009 and 2013. The data are pooled, where the establishment-specific ids represent the cross sectional component, and the waves represent the time component.

## 6.1 Removal of observations

Many of the variables are ordinal on a five- or six-point scale. Further, the options "don't know", "refusal" and "does not apply" are treated as missing values and left out of the analysis. As the number of extreme values are low, and as I have a rather large data set, they are removed to get a uniform and comparable sample. Removing extreme values changes the mean and reduces the standard deviation of the variables. Table 6.6.1 shows the number of removed observations by category. Since The Enterprise Surveys opens up for additional questions on the business environment in different regions, BEEPS covers some countries outside Eastern Europe and Central Asia. Turkey was surveyed as a control group throughout all the waves (Anderson & Gray, 2006), and will be excluded from this thesis. Along with Turkey, Mongolia is removed from the analysis since they are a part of respectively Western and Eastern Asia according to UNSD (United Nations Statistics Division, 2015). Nor are they a part of the transitioning economies after the Former Soviet Union.

*Table 6.6.1 Removed observations*

| Due to: | **2009** | **2013** |
|---|---|---|
| *Country:* | | |
| Turkey | 1,152 | 1,344 |
| Mongolia | 362 | 360 |
| Industry: | 160 | 26 |
| Financial statements: | 352 | 352 |
| Number of employees: | 570 | 532 |
| Not formally registered: | 79 | 67 |
| Missing corruption or bribery data: | 1,267 | 1,509 |
| **Total** | 3,942 | 4,190 |

As the government relations and business environment might differ between industries, it is important to know the industry of operations. Based on the four-digit ISIC Rev.3.1 code, there are thirteen industries represented in the data in 2009 and 2013. However, only six of these industries represented in both waves with a sufficient amount to do empirical research, as The Enterprise Surveys require aggregation of data up to five for confidentiality purposes. Additionally, due to consistent industry affiliation throughout the thesis, establishments with undefined industries are removed. Number of establishments per industry can be found in Appendix 1.

As presented in Section 5, there are some limitations made to the responding establishments across countries. As 2,216 of the remaining establishments are part of a larger firm, observations where these establishments' financial statements are not prepared separately from the HQ statements or other establishments are removed. Further, The Enterprise Surveys seek to interview establishments with five or more full-time employees. To improve comparability between countries, establishments with under five employees are removed. As there is no upper bound in terms of the number of employees, I have removed those above the 99 percentile. The limit is therefore set to 980 employees, as managers have questionable knowledge of close to 1000 employee's encounters with the government. This totals a number of 382 establishments and still leaves a reasonable number of large establishments. Establishments that did not know or were not formally registered when it began operations, and were yet to be, were removed as The Enterprise Surveys are interviews based on the formal sector. Finally, for comparability reasons, only establishments that have answered both questions on corruption and bribery presented in Section 5.1 are included in the analysis.

## 6.2 Sample overview

This process still leaves a sample of 19,419 observations in 28 countries. The number of establishments per country, and the timing of the fieldwork, can be found in Appendix 2. Table 6.2 shows summary statistics of the sampled respondents.

*Table 6.2 Summary statistics of sampled respondents*

| | **Number of respondents** | **% of respondents** |
|---|---|---|
| **Sector** | 19,419 | |
| Hotels and restaurants | 851 | 4 % |
| Construction | 1,845 | 10 % |
| Wholesale and retail trade | 7,713 | 40 % |
| Manufacturing | 7,569 | 39 % |
| Transport, storage and communications | 1,054 | 5 % |
| Real estate, renting and business activities | 387 | 2 % |
| **Region** | 19,419 | |
| Baltics | 1,293 | 7 % |
| Eastern Europe | 9,996 | 51 % |
| Southern Europe | 3,672 | 19 % |
| Caucasus | 1,835 | 9 % |
| Central Asia | 2,623 | 14 % |

# 7. Corruption in Eastern European and Central Asia

As shown by Figure 4.1 in Section 4, country of operation is one of the factors affective corporate exposure to bribery. Eastern Europe and Central Asia (represented by the countries in the BEEPS Survey) have been through a transition from being centrally planned to (mostly) free market economies. The transitions focused on price and trade liberalization, privatization, stabilization and legal foundations. Less attention being paid to institutional reforms to ensure accountability, transparency and effectiveness in the public sector created opportunities for corruption to grow (Anderson & Gray, 2006). For example, individuals had opportunities to make decisions, as political parties were formerly financed by state or public enterprises in some countries. Privatization of government owned companies gave the leaders of enterprises who funded these parties opportunity to gain stakes in these companies, while others benefited from inside information (Tanzi, 1998). Quickly changing economic rules and social norms left possibilities for corruption in the delivery of public services and in public functions such as licensing, inspections and customs administration (Anderson & Gray, 2006, p. 3).

Kochan and Goodyear (2011) argue that the economic or political situation of a country will directly influence the degree of tolerance of corruption. Countries in a state of severe flux are likely to exercise weaker control over standards of business ethics than those countries whose politics are stable. Corruption is not strictly a transition phenomenon, but can have "wide-ranging impacts on legitimacy and credibility of governments during the decisive times of building new political and economic institutions" (Nowak, 2001, p. 1). Tanzi (2002) points to the quality of bureaucracy and the level of public sector wages as other contributing factors of corruption in the public sector of a country. In particular, countries with poorly paid public officials may overlook or encourage corrupt practices (Kochan & Goodyear, 2011).

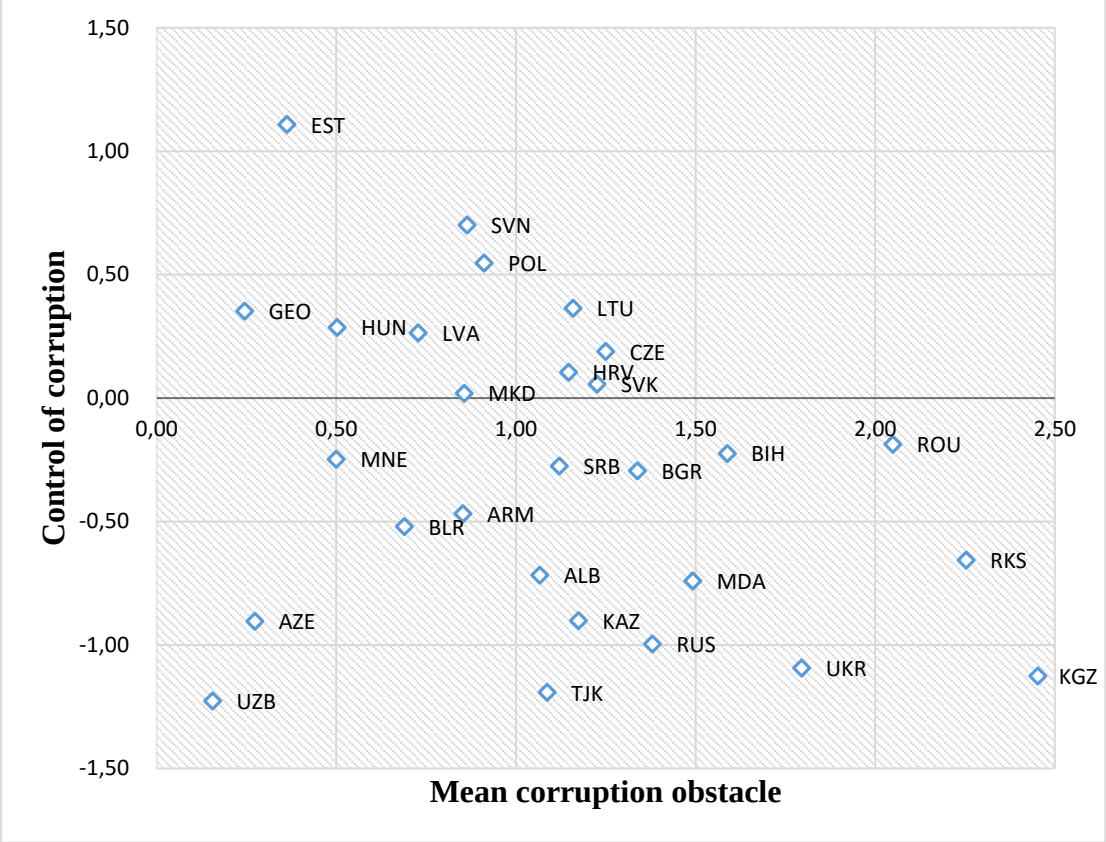
However, it is important to note that the level of corruption is different amongst these countries both before and after transition, together with different starting points in terms of politics and the economic environment (Nowak, 2001, p. 3). Another important point is that corruption might be endemic in some countries, where all levels of government are involved. The World Governance Indicators (WGI) map the perceived level of corruption in each country. The WGI is created by The WBG, where one of the six key dimensions of governance is Control of Corruption. The Control of Corruption indicate or reflects the extent to which

public power is exercised for private gain, including both petty and grand forms of corruption, as well as state capture (The World Bank Group, 2015a). The indicator scores Control of Corruption on a scale from approximately -2.5 to 2.5, where a low score represents a high level of corruption (The World Bank Group, 2016), and covers all the countries in BEEPS. As seen in Appendix 3, the perceived levels of corruption for 2009 and 2013 for these 28 countries in Eastern Europe and Central Asia vary substantially, both between and within regions, even if regions tend to have the same traits. Despite some differences in the Control of Corruption dimension, the problem of corruption is perceived to be common in all sub-regions except the Baltics. All the countries have improved their Control of Corruption score, except Moldova, Ukraine, Slovenia and Uzbekistan. Although it has varied slightly between the years, the situation seems to be largely unchanged in Kyrgyzstan and Albania.

Mapping the Control of Corruption indicator against BEEPS-responses on how corruption constrains establishments gives us an indication of how establishments see and handle corruption in relations with the public sector. Even if a number of establishments report being highly constrained by corruption, it does not necessarily indicate widespread corruption in the country. It mainly gives us reason to believe that it represents a problem for the establishments in the country. Conversely, if establishments report that corruption is not an obstacle, this does not mean an absence of corruption in its business environment; rather, it may just mean that it is easy to work around it. A comparison by country for 2013 is found in Figure 7.1.

So a high Control of Corruption and low mean value of establishments hindered by corruption together indicate a consensus that there is a relatively low level of business corruption in the country. This seems to be the case in Estonia, se Figure 7.1. In Georgia the Control of Corruption seems to be lower, and hence the level of corruption higher, but even fewer companies seem to let existing levels influence them negatively. One explanation might be that levels of corruption in the country does not concern pure business-government interactions.

*Figure 7.1 How establishments see Corruption against Control of Corruption in 2013*




*The mean of corruption is based on the scores 0 to 4 with 4 as "very severe obstacle" (n=11,693). The Control of Corruption score ranges from -2.5 to 2.5 where 2.5 would represent no presence of corruption.*

As we would hope to find, the degree of corruption constraint is not high in any of the countries with high Control of Corruption. This indicates that the two measurements are somewhat coherent. Interestingly though, there are some countries where establishments report corruption to be a low obstacle, but experts nonetheless report a low Control of Corruption and a perceived highly corrupt public sector. This distinction can be due to the fact that it has become the norm for the local establishments. Or, that corruption is seen as beneficial, and might be the case in Uzbekistan and Azerbaijan. Corruption in the government might also be found at other levels than in interactions with businesses. Finally, a high mean and a low Control of Corruption indicate that there is corruption in the country, and that establishments in the country have difficulties when interacting with the government. This seems to be the case in Kosovo, Kyrgyzstan, Romania and Ukraine. Overall, we can say that a high Control of Corruption is sufficient to prevent corruption being a constraint on business as there is no country with a high mean and a high Control of Corruption. However, this is not necessarily the case as we see countries that have a low mean and a low Control of Corruption.

## 7.1 Legislation of corruption in Eastern Europe and Central Asia

The risk of facing criminal liability should influence both business corruption and bribery within a country. The countries in the BEEPS Survey are signatories to different conventions, which may indicate the legislation that the establishments face. The Organisation for Economic Co-operation and Development's (OECD) Anti-Corruption Network for Eastern Europe and Central Asia is a framework for the Anti-Corruption Action Plan for Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Russia, Tajikistan and Ukraine that was endorsed in September 2003 in Istanbul. Recommendations for each country cover anti-corruption policies and institutions, criminalization and anti-corruption legislation, and preventive measures for the civil service. The countries are required to reform national legislation to meet the following international standards set by the conventions (OECD, 2008, p. 9):

- *The OECD Convention on Combatting Bribery of Foreign Public Officials in International Business Transactions*: imposes liability for active bribery of foreign public officials in international business transactions.

- *The Council of Europe's Criminal Law Convention on Corruption*: includes active and passive bribery of domestic and foreign public officials, bribery in the private sector and trading in influence (OECD, 2008, pp. 12-13).

- *The United Nation's Convention Against Corruption*: includes both mandatory and optional standards on active and passive bribery of domestic and foreign public officials, obstruction of justice, illicit enrichment, and embezzlement.

During implementation, the countries have to identify how domestic legislation falls below these standards and thereafter rectify the shortfalls (OECD, 2008, pp. 14-15). A summary of the conventions can be found in Appendix 4, and ratification or entry into force for all three conventions can be found in Appendix 5 for all of the countries in the survey. Some are signatories even if not part of the Anti-Corruption Action Plan. Naturally, the degree of implementation differs and is likely to affect the way establishments considers bribing and corruption. Granted, signing the different conventions does not necessary indicate that legislation in the countries are fully compliant, and corruption laws could also include offences not covered in the conventions.

With regard to the Istanbul Anti-Corruption Plan, several countries have developed anti-corruption and criminal laws, and some might appear to meet international standards even if no criminal offences are created. Prohibited conduct can be punishable under 'relevant criminal codes', without further details, and might not result in criminal prosecutions. Since the conventions do not define corruption, but establish offences of corrupt behavior, some countries that have signed the Istanbul Anti-Corruption Plan define corruption as a specific crime that is often too general or vague from a criminal law perspective. Hence, even fewer offences lead to prosecutions or convictions. Some laws distinguish between bribery of foreign and domestic officials; Offering and receiving bribes may also treated differently (OECD, 2008, p. 15-22).

Sanctions available to punish corruption in the region include fines, confiscation, exclusion, supervision, publication or closure (KPMG in Central and Eastern Asia, 2011). Criminal liability for individuals can occur whether they are directly or indirectly involved, or in a position of authority. A company can further be criminally liable through its employees, their agents, related companies or business partners, or even if they simply have turned a "blind eye" (Global Infrastructure Anti-Corruption Crime Centre, 2015a).

# 8. Industry-specific corruption risks

Figure 4.1 points out that exposure to corruption also depends on industry. Business activities in the industries in question vary substantially, and the contact with the government and industry participants will vary according to the nature of the industry. For example, as public procurement is sensitive to corruption, companies in business with the public sector, such as construction companies, might use corrupt practices more often. Additionally, establishments that are more dependent on infrastructure conditions and other services provided by the government might be more likely to bribe to get access. Even, firms that operate in industries with low corruption and have low risk of corruption in their business activities might engage in high risk activities occasionally (Transparency International, 2010, p. 2).

Highly regulated industries such as extractive industries, financial services and pharmaceuticals are known to have high corruption risk and therefore have been given most attention by anti-bribery and corruption authorities. While some industries have focused on having a robust anti-corruption compliance program, others have not considered their potential risk as much (Taylor, et al., 2011). Different industries might also have different anti-corruption organizations preventing corruption within the industry, such as The Global Infrastructure Anti-Corruption Centre. As the nature of business is different between industries, firms might also have different incentives for corruption or bribery. Construction firms might compete more for government contracts or there might be collusion to gain government contracts. Firms in other industries might be more sensitive to the scarcity of natural resources. Industry-specific risks in three of the industries in BEEPS are presented below.

***Construction***

In preparing, renovating or building infrastructure or facilities, the construction industry often involves projects with long time spans where many parties are involved. Consultants, engineers, architects, financiers, insurers, contractors and subcontractors are in play. It is widely reported as one of the most corrupt sectors in the world with 20-30 % of the project value expected to be lost through corruption (Wells, 2014), and government regulations are many, as for example in zoning requirements. Kenny (2009) points out that there is also a

lot of public investment in construction, so governments have significant interests in overseeing the quality and safety of the construction process and outputs. Taylor, et al, (2011, p. 312) point to several increased corruption risks in the construction industry. Firstly, there is a perception that fraud is endemic in the industry, and the industry is constantly combatting theft and fraudulent practices such as ghost employees or bad workmanship. Further, government or public and private partnerships often fund infrastructure projects within a country. As the government is a large customer, this creates many government contacts. In many countries, the long planning and zoning process might be open to corrupt officials' abuse. Additionally, large contract sizes leave the industry vulnerable to corruption if political power is concentrated with a few politicians. Lastly, industry use of subcontractors or third parties opens up opportunities for more parties to make or solicit bribes.

***Real estate, renting and business activities***

Real estate is closely related to construction, and is also a lengthy process with many parties involved. Architects, city planners, landscape architects, attorneys, inspectors, contractors and environmental consultants all have a say. Some of the same risks of corruption can therefore also be found for real estate and business activities as for construction. The range activities - from purchase of land to renovation to releasing existing buildings - leaves firms vulnerable in many business-government interactions, such as obtaining necessary approvals and financing.

Taylor, et al., (2011, pp. 312-317) point to specific risk factors the real estate industry faces, similar to the construction industry. First, the industry consists of a substantial amount of joint ventures. In some jurisdictions, legal requirements or commercial reasons make use of joint ventures necessary. In joint ventures lies the risk that the third party is involved in corruption or bribery. Second, in obtaining planning permissions, the company might face delays and roadblocks where corrupt officials solicit bribes. As this involves dealing with multiple government officials, local committees and state authorities over a long time span, companies often employ local consultants to help them through the process, thus making them more vulnerable to the risk of corruption. Thirdly, layers of subcontractors and use of consultants creates opportunities for corrupt practices. Fourth, contracts using contingent amounts for cost overruns, or additional items, are vulnerable to corruption. Additionally, in

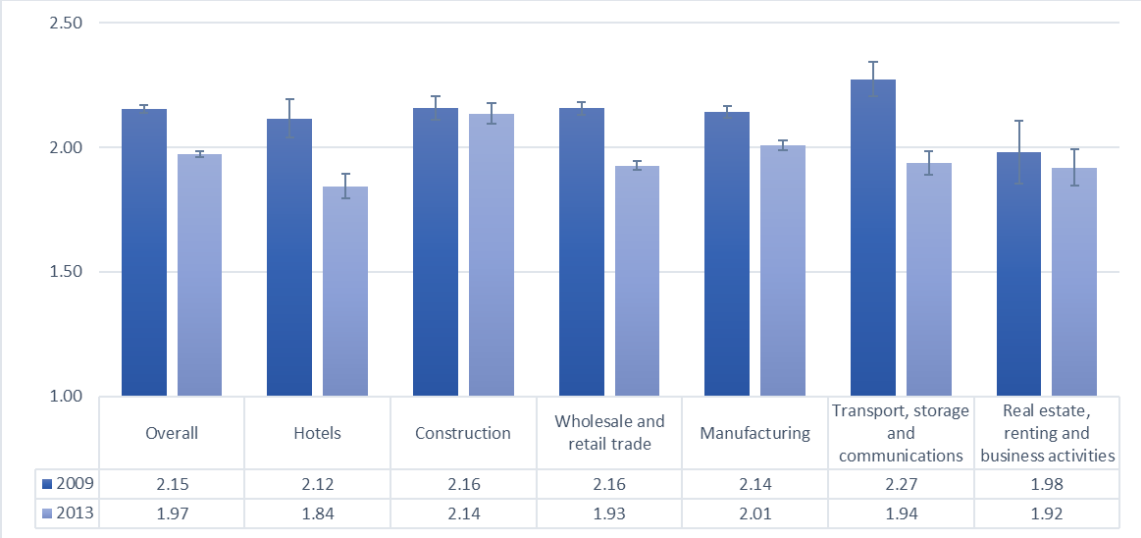
negotiating cost overruns or payments on additional job requests, some consultants or clients can attempt leveraging payments. Further, ghost employees have been a mechanism for making corrupt payments in the industry through paying nonexistent employees or friends of government officials. Or they employ off-duty government security personnel to conduct security. In addition, travel and entertainment expenses are often misstated. Lastly, the percentage-of completion method is often used to recognize revenue. If a bribe is recorded as a contract-related expense then the amount will be factored into the percentage of completion calculation, and thereby create a recognition of revenues. Further, registering these corruption amounts into accumulated cost accounts gets them into the balance sheet in an opaque way. The lack of detail makes it difficult for the auditor to catch these errors.

***Transport, storage and communications***

Most kinds of transport involve daily interaction with public officials such as getting docking permits at ports, meeting customs personnel or obtaining air-landing slots. Taylor, et. al., (2011, pp. 374-377) point to several key drivers that tend to increase corruption within the transportation industry. First, customs official possesses discretion as to whether a shipment may enter the country and the fees associated with it. The geographic areas of operation provide different degrees of corruption risk. Cross-border transactions in free-trade zones lower risks of corruption, while intrastate shipments might face frequent checkpoints and strict regulation. The corruption risk might also depend of the type of product that is transported, as some products are heavily taxed or regulated and have substantial documentation standards. As customs officials are responsible for enforcing these rules, these might be more prone to corruption. An increased risk of corruption is the increased pressure on speed of shipments. The emphasis on timing might also increase corruption risks as the product might be crucial for further production, and hence this increases the motivation for bribery. Similarly, during certain periods of the year some commercial transport services face increased demands. And limited capacity might increase improper payments to secure first rights. The risk of corruption might also increase with the use of third parties such as customs brokers, since they do not have control over the broker’s actions.

With regard to bribery in Eastern Europe and Central Asia, Figure 8.1 shows an overall decrease in bribes. There is a consistent decrease in all industries. Measured on a scale from 1 to 6, the overall frequency of bribes has decreased from 2.15 to 1.97. This decrease is unevenly distributed across industries, with the highest improvement in transport, storage and communications. The hotel and restaurant industry, as well as the wholesale and retail trade industry, have also had a substantial decline. The construction industry, however, has seen no improvement and still report a high frequency of bribery. The construction industry deals a great deal with the government, in terms of public procurement contracts, and has many participants involved. The real estate and business activities industry has not changed much, either, over the course of the four years and faces some of the same issues with the government as the construction industry, in gaining land access and permits.

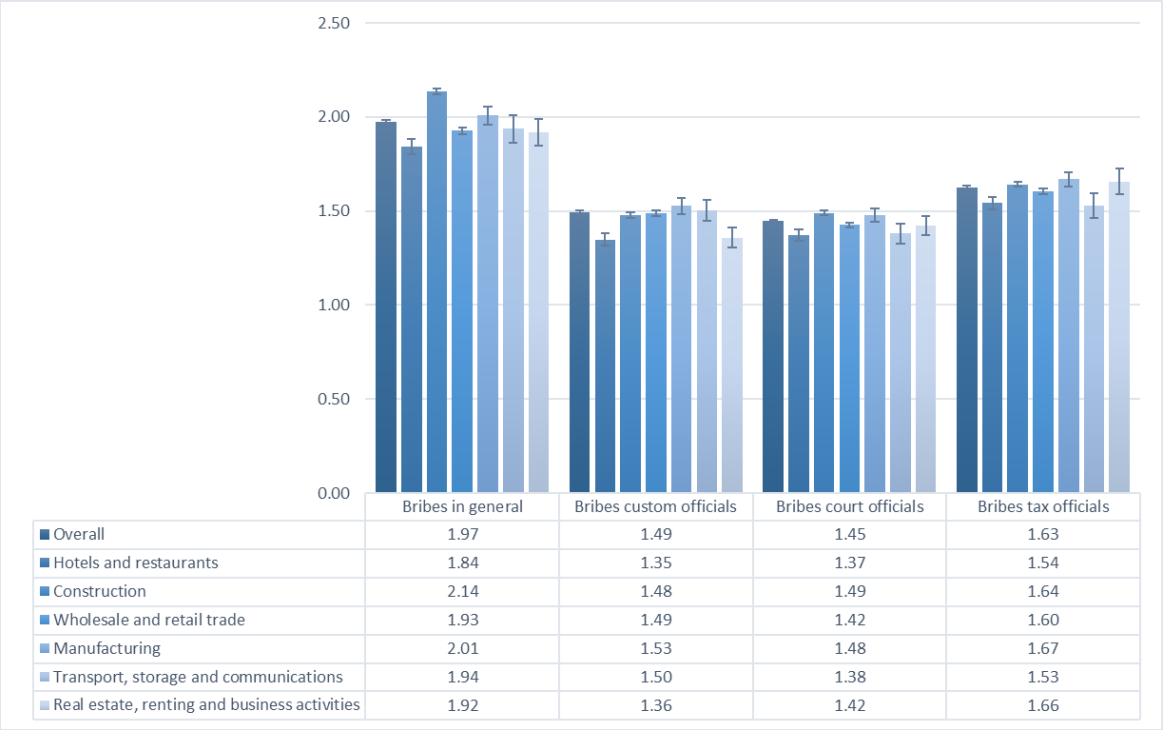
*Figure 8.1 Industry differences in bribery in 2009 and 2013*




| | Overall | Hotels | Construction | Wholesale and retail trade | Manufacturing | Transport, storage and communications | Real estate, renting and business activities |
|---|---|---|---|---|---|---|---|
| 2009 | 2.15 | 2.12 | 2.16 | 2.16 | 2.14 | 2.27 | 1.98 |
| 2013 | 1.97 | 1.84 | 2.14 | 1.93 | 2.01 | 1.94 | 1.92 |

The mean of bribes is based on the scores 1 to 6 with 6 as “always”. Standard errors are reported in brackets.
Source: The Enterprise Surveys, The World Bank.

*Figure 8.2 Bribery in different contact points with the government in 2013*




| | Bribes in general | Bribes custom officials | Bribes court officials | Bribes tax officials |
|---|---|---|---|---|
| Overall | 1.97 | 1.49 | 1.45 | 1.63 |
| Hotels and restaurants | 1.84 | 1.35 | 1.37 | 1.54 |
| Construction | 2.14 | 1.48 | 1.49 | 1.64 |
| Wholesale and retail trade | 1.93 | 1.49 | 1.42 | 1.60 |
| Manufacturing | 2.01 | 1.53 | 1.48 | 1.67 |
| Transport, storage and communications | 1.94 | 1.50 | 1.38 | 1.53 |
| Real estate, renting and business activities | 1.92 | 1.36 | 1.42 | 1.66 |

The mean of bribes is based on the scores 1 to 6 with 6 as "always". Standard errors are reported as brackets. Bribery in general: n=11,693, bribery to deal with customs: n=10,729, bribery to deal with court officials: n=10,783 and bribery of tax officials: n=11,051. Source: The Enterprise Surveys, The World Bank.

A closer look at different interactions with public officials in 2013, presented in Figure 8.2, shows that the frequency of bribery varies in different interactions with the government. The interactions represented in BEEPS are bribery in dealings with tax authorities, courts and customs. Naturally, hotels and restaurants - as well as the real estate, renting and business activities - tend to bribe less in dealings with customs; establishments in transport, storage and communications bribe the most. When it comes to dealings with courts officials, the hotel and restaurant industry are still the ones that bribe less, followed by the transport, storage and communications industry. As the transport industry more often deals with customs than courts, lower level of bribery in courts are expected. All industry means suggests that, on average, all industries bribe more in dealing with tax officials. As the mean is calculated on a scale from 1 to 6, note that the establishments do not report bribing very often.

# 9. Methodology

To capture the complexity of the research questions, and to adapt to the limitation of the survey, I will be using probit to examine the circumstances under which establishments feel constrained by corruption and when they participate by bribing. Similar results using the logit framework can be found in Appendix 11.

## 9.1 Making binary dependent variables

To analyze the probability that an establishment risks suffering from business corruption, and the likelihood that they will participate in bribery, binary response variables are created from the two questions described in Section 5.1. The response variables "major obstacle" and "very severe obstacle" are collated into a to binary response variable of corruption being a constraint in the first set of regressions. Some information is lost by making the dependent variable binary, but this will simplify the interpretation and better fit the research questions. Correspondingly, the response alternatives "very frequently", "usually" and "always" are collated into a response variable representing firms who bribe in the second set of regressions. Table 9.9.1 shows the percentages of firms that report corruption being an obstacle and bribery starring in the business environment. The table displays a drop in both from 2009 to 2013.

*Table 9.9.1 Firms constrained by corruption and firms that bribe, n=10,159*

| | **Corruption is constrictive** | | **Bribes** | | |
|---|---|---|---|---|---|
| **Wave** | **Number of establishments** | **Percent** | **Number of establishments** | **Percent** | **Total number of establishments** |
| **2009** | 1,475 | 34.6% | 643 | 15.1% | 7,726 |
| **2013** | 1,341 | 22.8 % | 664 | 11.3% | 11,693 |

## 9.2 Probit and logit

Binary response variables necessitate analyzing the data with binary outcome models. When modelling a binary outcome, the dependent variable $y$ is limited to taking the values 0 or 1.

$$y = \{^{0\ if\ no}_{1\ if\ yes}$$

The probability that $y = 1$ is estimated as a function of the independent variables. In general, the response probability is assumed to be (Wooldridge, 2014, p. 202):

$$P(y = 1|x) = \beta_0 + \beta_1 x_1 + \cdots + \beta_k x_k = \beta_0 + x\beta$$

where $x\beta = \beta_0 + \beta_1 x_1 + \cdots + \beta_k x_k$ .

Even if the linear probability model (LPM) would be easy to estimate, and the results easy to interpret, it has some limitations. First, the LPM model does not limit the probability of the dependent variable between zero and one. Related, it is impossible that all the independent are linearly related to the probability for all of their values. Since the partial effect of the explanatory variables are constant, the probability would then exceed one or go below zero which makes little sense mathematically. However, it is still useful if the values of the independent variables are close to the sample average. Second, the residuals in LPM are heteroskedastic (Wooldridge, 2014, p. 205), although this can be solved by obtaining residuals that are robust to heteroscedasticity.

Instead, using nonlinear binary response models, probit or logit, overcomes some of these drawbacks. The interest lies in the response probability

$$P(y = 1|x) = P(y = 1|x_1, x_2, \dots, x_k)$$

to analyze the dependent variable (Wooldridge, 2014, pp. 459-460).

The nonlinear binary response model is assumed to be:

$$P(y = 1|x) = G(\beta_0 + \beta_1 x_1 + \cdots + \beta_k x_k) = G(\beta_0 + x\beta)$$

Where $x\beta = \beta_1 x_1 + \cdots + \beta_k x_k$ and G is a function that, for all real numbers $z$, strictly varies between zero and one: $0 < G(z) < 1$.

Standard normal distribution is assumed when using a probit model, and a logistic distribution when using a logit model. The probit model uses the standard normal cumulative distribution function expressed as an integral:

$$G(z) = \phi(z) = \int_{-\infty}^{z} \phi(v)\, dv$$

where

$$\phi(z) = \frac{1}{\sqrt{2\pi}} exp\left(-\frac{z^2}{2}\right)$$

is the standard normal density function. Here, $G$ returns a value between zero and one.

The probit and logit models both increase in $x\beta$. They increase rapidly at $x\beta = 0$, but the effect on G at extreme values of $x\beta$ tends to zero. As $z$ approaches infinity, the limit of G(z) is one. As $z$ approaches negative infinity, the limit of $G(z)$ is zero (Wooldridge, 2014, p. 461).

Probit and logit models give us the opportunity to use a latent variable model approach to analyze the dependent variable. A latent variable model is traditionally used for estimating parameters of interest when the dependent variable is not fully observed, as for example the motivation behind bribing or the culture embedded in the country. If $y_{it}^*$ is a latent, or unobserved, variable then we suppose that

$$y_{it}^* = \beta_0 + \beta x_{it} + e_i + u_{it}, \qquad y_{it} = 1[y_{it}^* > 0]$$

In the binary outcome model, $y_{it}$ is assumed to equal one if $y_{it}^{*} > 0$ and to equal zero if $y_{it}^{*} \leq 0$. Further, the error term $e_i$ is assumed to be independent of $x$ and either standard logistically distributed or standard normally distributed. In any case, the residual is symmetrically distributed around zero so $1 - G(-z) = G(z)$ for all real numbers $z$. For logit and probit, the direction of the effect of $x_j$ on $E(y^{*}|x) = \beta_o + x\beta$ is always the same as the effect on $E(y|x) = E(y = 1|x) = G(\beta_o + x\beta)$. However, as the latent variable $y^{*}$ is not necessarily measurable, the magnitude of each $B_j$ is not necessarily useful (Wooldridge, 2014, pp. 461-462).

Maximum likelihood estimation (MLE) is the usual method of estimation for the probit and logit models. Since these are based on the distribution of $y$ given $x$, there is automatically heteroscedasticity in $Var(y|x)$ (Wooldridge, 2014, p. 463). MLE chooses the parameters of the model that maximize the log-likelihood function. We need the log-likelihood function for each $i$. The density of $y$ given $x_i$is

$$f(y|x_i;\beta) = [G(x_i\beta)]^{y}[1 - G(x_i\beta)]^{1-y}, \qquad y = 0,1$$

The intercept, is for simplicity, absorbed into the vector $x_i$. When $y$ equals one or zero, we get respectively $G(x_i\beta)$ or $1 - G(x_i\beta)$. The log-likelihood function for observation $i$ is obtained by taking the log of this density function for $y$.

$$\ell_i(\beta) = y_i \log[G(x_i\beta)] + (1 - y_i)\log[1 - G(x_i\beta)]$$

Thereafter, for a sample size of n, the log-likelihood is obtained by summation of all observations:

$$\mathcal{L}(\beta) = \sum_{i=1}^{n} \ell_i(\beta)$$

β maximizes the log-likelihood through an iterative process, and is consistent and asymptotically normal (Wooldridge, 2010, p. 568).

### 9.2.1 Interpretation of regressors

As a non-linear function, the interpretation of the probit and logit model is different from LPM. The partial-effect of a change in one of the independent variables must be calculated, but only the direction of the coefficient is possible to directly interpret. A positive effect in the coefficient implies a higher probability of $y_i = 1$, and a negative coefficient a lower probability of $y_i = 0$ (Wooldridge, 2009). The marginal effects of the explanatory values are calculated either at mean of the explanatory variable or as the average marginal effect. This thesis will use the average marginal effect, as many of the explanatory variables are ordinal and therefore have irrational means.

It is unproblematic to include standard functional forms through the explanatory variables (Wooldridge, 2014, p. 463) if one is aware of the difference in interpretation of the partial effects. The partial effect of $x_j$ on $P(y = 1|x)$ depends on all $x$. $\widehat{\beta_0}$ is the predicted probability of success when each $x_j$ is set to zero (Wooldridge, 2010, p. 561). The partial effects relevant to the thesis will be discussed below.

**Dummy variables**

If $x_j$ is a binary (dummy) variable, then the partial effect is obtained by holding all others fixed and changing $x_j$ from zero to one.

$$G(\beta_0 + \beta_1 + \beta_2 x_2 + \cdots + \beta_k x_k) - G(\beta_0 + \beta_2 x_2 + \cdots + \beta_k x_k)$$

**Discrete variables**

Similarly, for a discrete variable $x_j$, the effect of the probability to go from $c_k$ to $c_k + 1$ is

$$G(\beta_0 + \beta_1 + \beta_2 x_2 + \cdots + \beta_k (c_k + 1)) - G(\beta_0 + \beta_{21} x_2 + \cdots + \beta_k c_k)$$

**Continuous variables**

If $x_j$ is a continuous variable, the partial effect on $p(x) = P(y = 1|x)$ is obtained from the partial derivative:

$$\frac{\partial p(x)}{\partial x_j} = g(\beta_0 + x\beta)\beta_j$$

Where $g(z) = \frac{dG}{dz}(z)$ is the probability density function. As $G$(z) is a strictly increasing cumulative distribution function, $g(z) > 0$ for all $z$. The partial effect of $x_j$ on $P(y = 1|x)$ depends on $x$ via the positive quantity $g(\beta_0 + x\beta)$. Hence, the partial effect always has the same sign as $\beta_j$ (Wooldridge, 2014).

**Logarithms**

As a logarithm, the growth of the variable is normally presumed to decline as the value of the variable increases. If the independent term is a logarithm, the following marginal effect would be (Wooldridge, 2010, p. 567):

$$\frac{\partial P(y = 1|z)}{\partial \log(z_j)} = g(x\beta)\beta_j$$

where the change in $P(y = 1|z)$ given a 1 percent increase in $z_j$ is approximately $g(x\beta)(\frac{\beta_j}{100})$.

**Interaction terms**

According to Norton, et al., (2004), the full interaction effect for an interaction term $x_1x_2$ is given by

$$\frac{\partial^2 \Phi(u)}{\partial x_1 \partial x_2} = \beta_{12}\Phi'(u) + (\beta_1\beta_{12}x_3)(\beta_2\beta_{12}x_1)\Phi''(u)$$

Where $\Phi$ is the standard cumulative distribution function and $u$ is the index $\beta_1x_1 + \beta_2x_2 + \beta_{12}x_1x_2 + x\beta$. Hence, the difference from the linear interaction effect has several

implications for nonlinear models. First, even if $\beta_{12} = 0$, the interaction effect can be different from zero. Additionally, the t-test on the coefficient of the interaction term is not sufficient to test the statistical significance of the interaction term. The statistical significance of the entire cross derivative has to be calculated. As with continuous variables and logarithms, the interaction effect is conditional on the independent variables. Since the interaction effect depends on two additive variables that can be both positive or negative, the interaction effect may have different signs for different values of covariates. Hence, the sign of $\beta_{12}$ does not necessarily indicate the sign of the interaction effect (Norton, et al., 2004).

### 9.2.2 Specification tests

The Lagrange Multiplier Test, the Likelihood Ratio (LR) test and the Wald test are the tests commonly used to test exclusion restrictions in probit and logit models. In running my regressions, I make use of the last two.

The Wald test requires a test of the unrestricted model, and thereafter tests restrictions compared to the unrestricted (base) case. It uses an asymptotic chi-square distribution, with $df$ equal to the number of restrictions being tested (Wooldridge, 2014).

The LR test is based on differences in log-likelihood in an unrestricted and a restricted model. As the MLE is maximizing the log-likelihood function, dismissing variables would have the potential effect of yielding a lower log-likelihood value (Wooldridge, 2014). We therefore test if the magnitude of this potential drop in log-likelihood is big enough to conclude that these dropped values are important.

The likelihood ratio statistic is given by:

$$LR = 2(\mathcal{L}_{ur} - \mathcal{L}_r)$$

Where $\mathcal{L}_{ur}$ is the log-likelihood of the unrestricted model and $\mathcal{L}_r$ is the log-likelihood for the restricted model. As the log-likelihood is always negative, this is a nonnegative and strictly

positive number as $\mathcal{L}_{ur} \geq \mathcal{L}_{r}$. The LR is also chi-square distributed with q degrees of freedom equal to the number of restrictions. The null hypothesis is rejected when LR exceeds a critical value (Wooldridge, 2014).

$$LR \overset{a}{\sim} \chi_q^2$$

# 10. Choice of independent variables

Coverage of the BEEPS Survey, and measurability of situation in general, limits the selection of independent variables. Individual motivation behind corruption is not reflected the survey. However, the BEEPS Survey may be used to examine the effect of internal and external factors affecting establishment likelihood of bribing. To examine external governmental factors in business-governmental corruption, the analysis includes some country-level indicators from WGI. Other relevant variables are generated using variables in the data set. Many of the independent variables are actually measured as constraints on business activities as an ordinal variable; but these are treated as continuous here for convenience. Appendix 7 presents a description of the variables used. The first set of regressions examines the constraint of corruption through variables representing the government, the interaction of time with government, the perceived stability in the government, establishment factors, and factors of the business environment. In addition to including some variables, the second set of regressions use the same variables to see when establishments participate in corruption.

## 10.1 World Governance Indicators

The WGI is based on country of operations, and created from six key dimensions of governance (World Bank Institute, 2009). Four of these are interesting in relation to corruption and bribery: Control of Corruption, Government Effectiveness, Rule of Law and Regulatory Quality. All of the WGIs are country-level indicators measured on a scale from approximately -2.5 to 2.5, where higher values represent better governance (The World Bank Group, 2016).

*WGI – Control of Corruption*: The Control of Corruption dimension, presented in Section 7, indicates the level of corruption in a country. As the survey does not measure business corruption itself, but rather how they feel constrained by it, the Control of Corruption score control for levels of corruption in the market. The risk of being constrained by business corruption should be higher if corruption is known to be present in the country. By extension, firms will also be more likely to bribe.

*WGI – Government Effectiveness*: Government Effectiveness measures public service quality, civil service capacity, independence from political pressures and quality of policy formulation (World Bank Institute, 2009). To the extent that they imply more bureaucracy and red tape, higher levels should leave establishments more vulnerable to corruption.

*WGI - Rule of Law:* The Rule of Law measures the likelihood of crime and violence and the extent to which government agents abide by the rules of society, with emphasis on quality of contract enforcement, property rights, police and courts (The World Bank Group, 2015b). This dimension represents a proxy for the discretionary power of government officials, and indirectly covers the legislation on corruption and bribery. Rule of law should impact bribery negatively, and high scores should intuitively show that fewer establishments are constrained by corruption. In the case of low levels of rule of law, the establishment may be more likely to bribe, given the opportunity, as the briber perceives a low risk of getting caught.

WGI – *Regulatory Quality*: The Regulatory Quality measures how well the government provides sound policies and regulations that enhances private sector development (World Bank Institute, 2009). In the case of poor regulatory quality, corruption might be higher and bribery more prevalent in business-government relations.

## 10.2 Variables in the survey

**Relations with institutions**

The length of time that the manager (the respondent) is exposed to a potentially corrupt situation is measured in the BEEPS Survey. Hence, *regulationstime* is used as a proxy for meetings with the government. Consistent with the control rights hypothesis, time spent facing these institutions affects how corruption and bribery influence the enterprise. A business that spends more time in dealings or applying for certificates are more likely to pay bribes and participate in corruption to circumvent this and save time. This is measured through how large a percentage of the senior management's time is spent in dealing with requirements imposed by government regulations. Of course, this fails to take into account that corrupt acts might

be done by individual workers rather than the leaders of the establishment. But then again, as this is a perception based study, the perception of the business involvement in corruption is perhaps adequately captured by the manager's experience. *Regulationstime* is also interacted with Control of Corruption. This will capture whether or not the risk of corruption, and participation through bribery, increases as senior manager spend more time dealing with government regulations implemented by more corrupt officials.

*Political instability:* As indicated by Kochan and Goodyear (2011), instability in a country can lead to lower control over standards of business ethics, and the political situation of a country will directly influence its tolerance of corruption. As discussed in Section 7, countries in severe flux are more likely to exercise weaker control over business ethics.

*Bribery* and *corruption*: In the first set of regressions, participation in bribery is used as a measure of administrative corruption so increased participation should increase the probability of facing the risk of damaging business corruption. Conversely, the corruption constraint variable is included to see if it increases the probability of bribing in the second set of regressions.

*European Union:* As we can see in Appendix 6, ten of the countries were a part of the EU when the BEEPS Survey was conducted. To look at differences within the EU, this variables is interacted with industry of operation.

**Firm characteristics**

*Size: S*ize of the establishment influences how enterprises face and deal with corruption. In general, as the size of an establishment increases, it becomes more challenging to control the employees' actions. If the company is engaged in corruption, the same job might also require more employees. Instead of running the business and focusing on innovation or development, firms have to assign human, financial and time resources to handling corruption (Budak & Rajh, 2011). Corruption can be more damaging for smaller firms, and they might benefit from working in the informal sector instead. Larger firms, on the other hand, might have captured regulators and policies and do not see corruption as an obstacle (Forgues-Puccio, 2013). Large companies have more capacity to cope and protect their own

interests. In many countries, small companies might be especially targeted by public officials to pay to make things happen, or even to keep bad things from happening (Tanzi, 1998).

Small and medium-sized enterprises (SMEs) are usually the first to suffer in a corrupt environment and are more vulnerable to corruption (United Nations, 2007). Based on the number of full-time employees in the last fiscal year, a variable for size divides firm into the categories micro, small, medium and large enterprises according to the SME-definition given by the EU Commission (European Commision, 2015). Establishments exceeding the SME definition is represented by a dummy variable Non-SME, representing large establishments with over 250 employees.

*Firm growth:* Corruption is believed to hamper business performance, as discussed in Section 3.1.1, which can be proxied through growth in employment. Establishments are likely to get involved to gain advantages and increase performance. Annual growth is measured on the basis of the number of employees last fiscal year ($l1$) and three years ago ($l2$). Annual growth is calculated based on the formula suggested by The Enterprise Surveys (2015b):

$$\left(\frac{1}{t}\right) * \frac{l1 - l2}{(l1 + l2)/2}$$

where $t$ represents the number of years.

*Age:* Establishments that have recently formally registered might see corruption as a higher obstacle, since they have necessarily just gone through an additional application process. Younger companies might also be more vulnerable to corruption and less robust in facing corrupt officials. On the other hand, the cost of leaving the country, location or industry might be lower. However, the longer an establishment has been in a country, the more connections it has with public officials. Therefore, the year the interview began minus the year the establishment began operations in this country will represent number of years operating in the industry and is a proxy for age. Age is included as a logarithm, and used to

see how an increase in age affects both constraint of corruption and bribery.

*Ownership:* Establishments that are 100 % government owned are not included in the data set, but nevertheless establishments with some degree of relationship to the government might possibly handle corruption better, or even bribe less. Since foreign firms are likely to have local partners in corrupt countries, foreign-owned firms might see corruption as more restrictive to business; they may also be likely bribe more often. Ownership by *government* and by *foreign shareholders* is calculated as a percentage in BEEPS, and measured as dummy variables in the regressions (where 50 % or more of ownership by government or foreign shareholders = 1).

**Competitive environment**

*Practices of informal competitors:* As discussed in Section 3.1.2, the existence of an informal sector might emerge or increase due to corruption, as corruption might be a barrier to entry. Practices of informal competitors can thereby help to cast light on corruption in the competitive environment. If a high enough number of informal competitors exists to cause a problem then there might be more motivation to engage in corruption. As the competitive environment differs between industries, interaction terms with each industry dummy are included in the regressions. The respondents in the BEEPS Survey are all formal firms.

With regard to s*ize of location,* corruption can be a bigger constraint the smaller the location of operations. In bigger locations, the companies have other alternatives and higher possibilities of changing business activities or turning to other government officials. However, competition - and therefore the temptation of bribery - can be greater.

**Financial situation**

*Audited:* Auditing of an establishment's financial records makes bribery more risky (Kochan & Goodyear, 2011, p. 171). However, as mentioned in Section 3, bribes can be internalized

and therefore harder to detect. As argued in reference to Figure 4.2, corruption is more likely in circumstances of lower transparency and accountability.

*Subsidized:* As mentioned in Section 2.2, some establishments might bribe to get subsidies. Including this variable in the last regression enables an analysis of whether the companies that get governmental subsidies are more likely to bribe.

*Access to finance:* If a firm lacks access to capital the it might bribe to get subsidies or loans from government-owned banks. On the other hand, corruption might lead to less access to capital. *Finance-access* therefore examines the importance of financial constraints when looking at the probability of bribery.

**Constraints**

The BEEPS Survey gives several opportunities to examine how likely establishments are to bribe when facing constraints in their contacts with the government. If these interactions pose an obstacle, then the company might be more compelled to bribe. Some sectors might be more struck by obstacles than others. Constraints proposed by the government might be a*ccess to land* via property rights, meetings with *courts*, meetings with *tax administration*, *regulations in customs and trade* or *business licensing.*

**Additional variables in 2013**

Additional variables collected in 2013 enables extra regressions to be run for that year. The number of competitors and the intensity of competition allow us to check for how corruption is affected by intensity of competitors in the market place. On the question on number of competitors, each respondent is given the alternative “too many to count”. Therefore, a dummy variable *high competition* is created by using these responses and responses exceeding 10 competitors, representing responses above the 75 percentile. More competitors might increase the possibility of participation in corruption, as they might bribe to get advantages, to win market share or because they face a prisoner’s dilemma.

In 2013, the BEEPS Survey added three questions on state capture and its effect on the establishments. The first covers how they are affected by private payments or benefits to affect *Parliamentarians* votes. The second examines how private payments or benefits affect the content of government decrees set by *Governmental* officials. The third looks at how payments to *local or regional government officials* affect their votes or the content of government decrees. These variables are included to examine how state capture effects the level of corruption. Along with establishments' participation through administrative corruption, both forms of business corruption are therefore covered.

## 10.3 Summary of independent variables

Table 10.1, 10.2 and 10.3 summarizes the independent variables when all missing values are excluded.

*Table 10.1 Independent variables*[3]

| Variable | Number | Mean | Standard Deviation | Min | Max |
|---|---|---|---|---|---|
| Regulationstime | 10 159 | 14.74 | 19.17 | 0 | 100 |
| Political instability | 10 159 | 1.53 | 1.45 | 0 | 4 |
| Bribery | 10 159 | 2.03 | 1.28 | 1 | 6 |
| Corruption | 10 159 | 1.42 | 1.45 | 0 | 4 |
| Non-SME | 10 159 | 0.06 | 0.24 | 0 | 1 |
| Ln(age) | 10 159 | 2.51 | 0.65 | 0 | 5.21 |
| Firm growth | 10 159 | 0.04 | 0.17 | -0.842 | 1 |
| Government | 10 159 | 1.35 | 9.14 | 0 | 99 |
| Foreign | 10 159 | 5.70 | 21.40 | 0 | 100 |
| Practices of informal competitors | 10 159 | 1.26 | 1.38 | 0 | 4 |
| Audited | 10 159 | 0.38 | 0.49 | 0 | 1 |
| Subsidized | 10 159 | 0.10 | 0.30 | 0 | 1 |
| Access to finance | 10 159 | 1.31 | 1.34 | 0 | 4 |
| Access to land | 10 159 | 0.82 | 1.30 | 0 | 4 |
| Business licensing and permits | 10 159 | 0.82 | 1.17 | 0 | 4 |

[3] Description of the variables are available in Appendix 6.

| | | | | | |
|---|---|---|---|---|---|
| Tax administration | 10 159 | 1.26 | 1.28 | 0 | 4 |
| Courts | 10 159 | 0.83 | 1.22 | 0 | 4 |
| Customs and trade regulations | 10 159 | 0.73 | 1.17 | 0 | 4 |

*Table 10.2 Summary statistics for size of location*[4]

| **Size of location** | 10 159 | |
|---|---|---|
| Less than 50,000 | 3 659 | 36 % |
| 50.000 to 250.000 | 2 248 | 22 % |
| Over 250.000 to 1 million | 8 826 | 28 % |
| population over 1 million | 1 426 | 14 % |

*Table 10.3 Independent variables available only in 2013*

| **Variable** | **Number of establishments** | **Mean** | **Std. Dev.** | **Min** | **Max** |
|---|---|---|---|---|---|
| High Competition | 4 819 | 0.49 | 0.50 | 0 | 1 |
| Parliamentarians | 4 819 | 0.41 | 0.89 | 0 | 4 |
| Government officials | 4 819 | 0.43 | 0.91 | 0 | 4 |
| Local official | 4 819 | 0.47 | 0.93 | 0 | 4 |

[4] From 2009 to 2013, the size of locality where the establishment holds its main operations changed from a 5 point scale to a 4 point scale. As the fifth option in 2009 was “Capital city”, it is changed to fit the measurement in From 2009 to 2013, the size of locality where the establishment holds its main operations changed from a 5 point scale to a 4 point scale. As the fifth option in 2009 was “Capital city”, it is changed to fit the measurement in 2013 according to the UN Statistics Division.

# 11. Descriptive analysis

To get a perspective on how respondents perceive corruption, and changes between the 2009 and 2013, some additional descriptive statistics are presented here.

## 11.1 Business corruption constraint

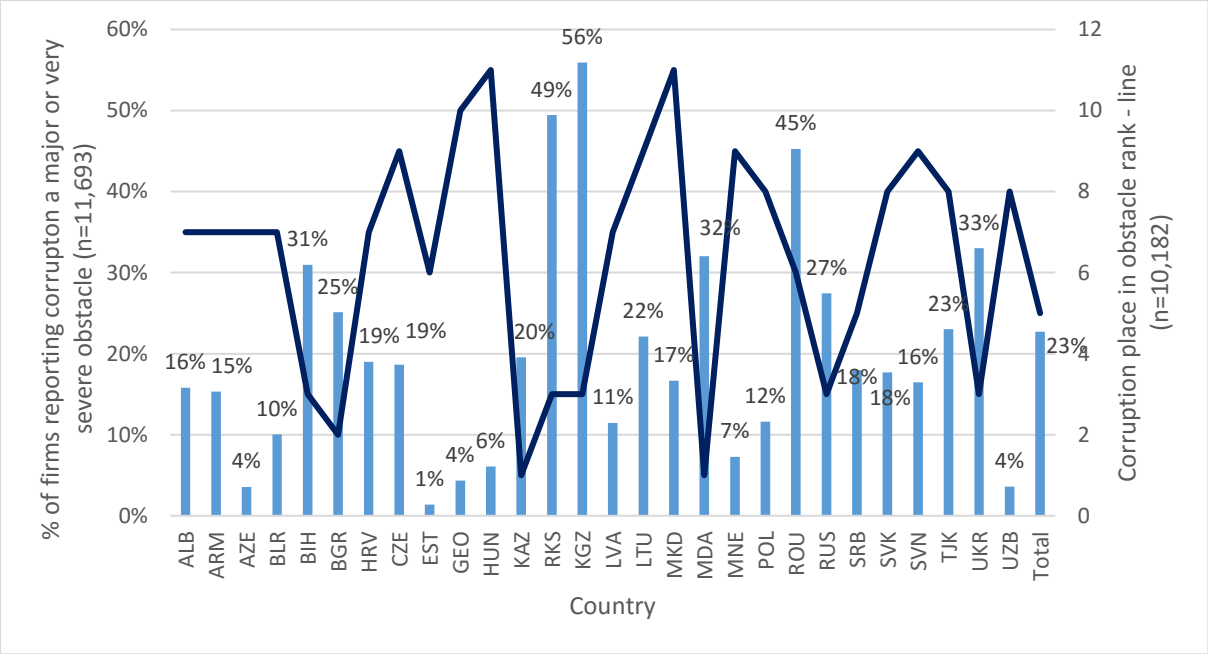
As illustrated in Section 7, firms do not necessarily suffer, or feel constrained, if corruption is present in business-government interactions. As discussed in Section 3, other obstacles might also affect managers' perceptions of corruption. The BEEPS Survey indicates that only 8.23% of the firms surveyed in 2009 and 7.79% of the firms in 2013 see corruption as their biggest obstacle of doing business.[5]

Overall, the biggest obstacles to doing business are financial, such as tax rates and access to finance. The presence of several obstacles does not necessarily mean that corruption is lower, just that other obstacles might affect the perceived importance of corruption. As shown in Figure 11.1, using 2013 numbers, the percentage of firms seeing corruption as a constraint is quite different from country to country. A total of 23% see it as a constraint to business, and it is overall measured as the fifth biggest obstacle to doing business. The most striking is that only 1% of the establishments in Estonia see business corruption constrictive. This indicates a low level of corruption in the country, consistent with the WGI Control of Corruption indicator presented in Appendix 3. In fact, in Azerbaijan, Estonia, Georgia, Hungary, Montenegro and Uzbekistan, less than 10% of establishments reported corruption to be a major or severe obstacle. At the other end of the scale, over 45 % of establishments report it to be constrictive in Kosovo, Kyrgyzstan and Romania. A startling 56% of establishments find it a constraint in Kyrgyzstan, and it is the second biggest obstacle to business activities. Even though the percentage is low in some countries, corruption can still be the biggest obstacle that constrains most establishments. In Kazakhstan, only 20% of establishments report it as a

[5] Answered by 17 141 among the 15 alternatives: 1) Access to finance; 2) Access to land; 3) Business licensing and permits; 4) Corruption; 5) Courts; 6) Crime, theft and disorder; 7) Customs and trade regulations; 8) Electricity; 9) Inadequately educated workforce; 10) Labor regulations; 11) Political instability; 12) Practices of competitors in the informal sector; 13) Tax administration; 14) Tax rates; and 15) Transport.

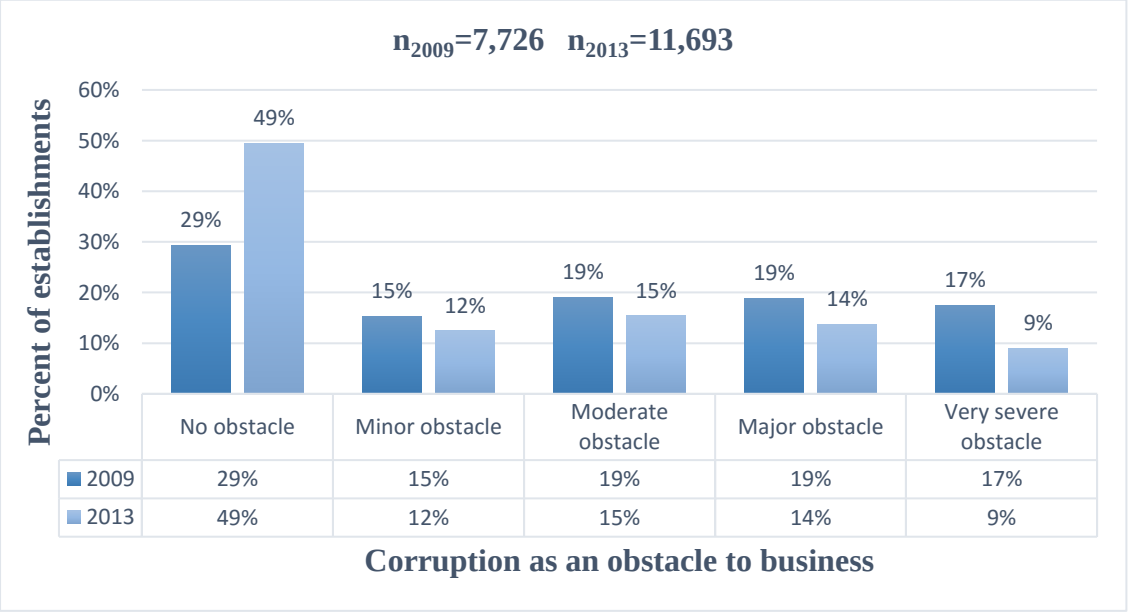
major or very severe obstacle, but it is nonetheless the obstacle seen as most constrictive by most establishments.

*Figure 11.1 Corruption as an obstacle to conducting business in 2013*




Source: The Enterprise Surveys, The World Bank.

*Figure 11.2 Corruption as an obstacle 2009 and 2013*

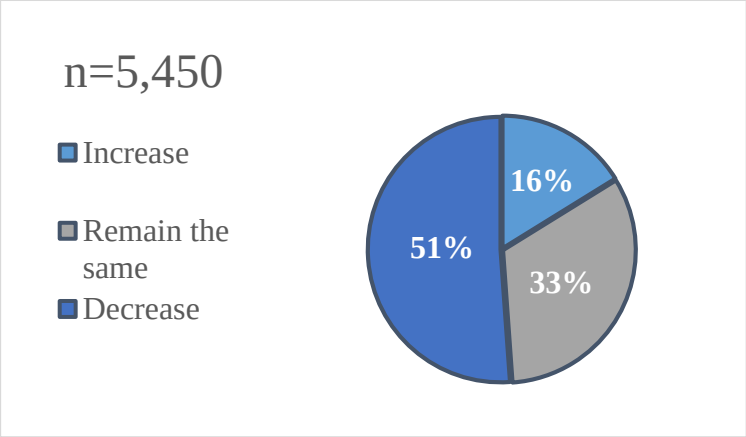



Source: The Enterprise Surveys, The World Bank.

The total frequency of establishments feeling constrained by corruption declined from 2009 to 2013. As Figure 11.2 shows, there is an improvement in firms responding that corruption

is not an obstacle, up to 49%. Relative to 2009, all the different degrees of obstacles report lower percentages, and 20% more companies do not see corruption as an obstacle of doing business at all. Most notable is the fall in corruption as a very severe obstacle from 17% to 9%. For a region of the world where corruption is known to be quite embedded in the public sector, this is quite an accomplishment. The relaxed view of corruption might be due to improvements in the level of corruption in the countries (also shown by the WGI Control of Corruption in Appendix 3) due to for example increased legislation, or alternatively that corruption has become the norm. So the decrease in reported constraint does not necessarily indicate a decrease in corruption levels. It can be due to reforms in the market place, privatization, less revelation of corruption cases in the business environment, more emphasis on corruption and preventative measures, or even successful company or sector growth. It might be because laws and corporate liability are further implemented and better serve their purpose, or that other obstacles have become more severe. On the other hand, the responses in 2009 might have been elevated as a reaction to the financial crisis.

*Figure 11.3 Change in total annual costs if corruption were not an obstacle in 2013*



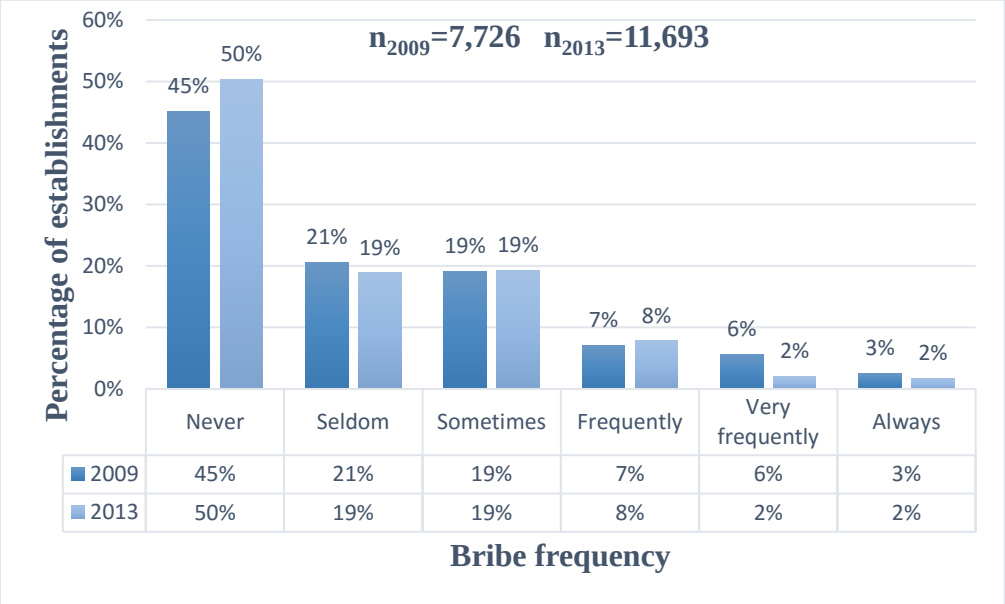

Source: The Enterprise Surveys, The World Bank.

Establishments that believed corruption to be some degree of constraint were asked in 2013 subsequently asked if they believed their total annual costs would decrease, remain the same or increase if corruption were no longer was an issue. As presented in Figure 11.3, 16% of the 5,450 respondents replied that they believed total annual costs would increase if corruption no were longer were an option. Conversely, 51% of the respondents believe that the total cost

would decrease if corruption were nonexistent in relations with the government. This points to firms either being negatively affected by corruption in the environment, or neccesarily participation without getting any net cost benefits. However: they might have to do so to gain a competitive advantage or to level the playing field. They might feel that bribes are simply being extorted. Surprisingly, as many as 33% do not believe that corruption impacts their costs, and indicate no financial constraint due to corruption. Maybe the benefits can equal costs, they are not involved themselves or corruption has become the norm. The variation of costs across countries are shown in Appendix 8, and reveals many differences. On one end of the scale, a total of 63% of Moldovan establishments believe that their costs will increase, which without corrupt payments that Moldovan establishments bribe to get cost benefits; by contrast, no establishments in Belarus believe that there would be an increase in their total cost, which implies that none of these enterprises benefit from reduced costs through corruption.

## 11.2 Participating through bribery

*Figure 11.4 How often establishments pay bribes*




Source: The Enterprise Surveys, The World Bank.

Figure 11.4 shows how all firms report that firms like theirs participate through administrative corruption in 2009 and 2013. Reasons for differences in bribe frequency may lay with the firm

itself, law enforcement, meetings with public officials or change in its business environment. Less establishments seem to bribe very frequently or always in 2013 relative to 2009. The decline in the dependent variable shows an improvement as 15.3% report bribing in 2009 and 11.5% in 2013.

## 11.3 Does the obstacle of corruption lead firms to bribe?

*Table 11.1 Constraint proposed by corruption against bribery*

| | **No obstacle** | **Minor obstacle** | **Moderate obstacle** | **Major obstacle** | **Very severe obstacle** |
|---|---|---|---|---|---|
| Never | 69.2% | 41.4% | 32.8% | 30.6% | 29.2% |
| Seldom | 16.2% | 29.4% | 23.5% | 19.3% | 14.7% |
| Sometimes | 10.8% | 21.5% | 30.0% | 25.5% | 22.0% |
| Frequently | 2.5% | 5.4% | 9.6% | 14.8% | 14.5% |
| Very frequently | 0.8% | 1.7% | 3.1% | 6.4% | 11.0% |
| Always | 0.4% | 0.6% | 1.1% | 3.3% | 8.6% |
| Total percentage | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

Pearson chi (20) = 4100, p=0.000
N= 19,419
Source: The Enterprise Surveys, The World Bank.

Exploring the relationship between by the constraint imposed by business corruption and the frequency of bribery reveals whether firms bribe more according to the degree of constraint proposed by corruption. A Pearson Chi test shows that the variables covary significantly. However, this does not indicate causality: some establishments may be bribing to overcome corruption constraint, while others might believe that corruption constrains the business activities owing to the need to bribe.

There is a tendency that an increase in the size of the obstacle leads to higher percentage of establishments reporting a higher bribe frequency. When corruption represents a very severe obstacle, 8.6 % of the establishments reply that they always bribe to get things done with regard to customs, taxes, licenses, regulations, services etc. Even though bribe frequency tends to increase as the obstacle of corruption increases, 29.2% of the firms that find corruption a very severe obstacle nonetheless report that they never bribe. This might be due to corruption being defined more widely than bribery (such as extortion and graft). On the other hand, some establishments that see corruption as no obstacle still bribe or say that similar firms bribe to some degree.

# 12. Findings

My first set of regressions seeks to measure the circumstances under which establishments feel weakened by business corruption, and includes governmental, competitive and firm characteristics. The dependent variable is analyzed through the use of pooled data for 2009 and 2013, with additional regressions for 2013 to expand the analysis to include competition and the influence of state capture. The second set of regressions examines circumstances when firms bribe and get involved in business corruption through administrative corruption. The second set of regression adds some financial characteristics and some constraints in government contact to further examine the likelihood of bribery. Both probit and logit estimators are conditional on the other predictors, and to study significant effects all independent variables are included in the first regression. The independent variables are thereafter reduced through statistical inference methods applicable to the probit and logit framework to get a parsimonious model.

Time dummies absorb year effects of 2009 versus 2013. Country dummies are introduced to capture country-specific circumstances that are not reflected in any of the other variables, such as differences in economic activity. Further, I control for industry effects. The reference dummies are based on the country and industry with the highest amount of observations, respectively Russia and the manufacturing industry. The location size is examined relative to locations with less than 50,000 inhabitants, which has the lowest percentage of establishments constrained by corruption. Additionally, SMEs report the lowest percentages of establishments both when it comes to corruption constraint and bribery. All standard errors are robust to heteroscedasticity and clustered on countries.

## 12.1 Hindered by business corruption

For business corruption to inhibit normal business activities, I presume that corruption is present in relations with the government. As discussed in Section 7, none of the countries seem to be free of corruption. The corruption in the government is therefore measured by the Control of Corruption indicator, and potential participation through administrative corruption is measured by bribe frequency as an ordinal variable.

### 12.1.1 Probability of restrictive business corruption in 2009 and 2013

The probit analysis in Table 12.1, shows the characteristics within the establishment and its environment that makes the establishment more likely to be constrained by business corruption. Probit (1) shows the full model with all theoretical variable. Further tests show that show that only some of the country dummies are significant. First the country dummies are reduced to leave the significant country effects. Tests show that rule of law is highly correlated with the other variables, and is therefore left out of the regressions. A correlation matrix can be found in A1 in Appendix 9. Some collinearity is left between the remaining WGIs, and, in accepting this collinearity, probit (2) shows that the three remaining WGIs have a significant impact on the likelihood of being constrained by corruption.

Removing the variables where the coefficients did not meet the 10 % significance level requirement, or showed increased explanation when running Wald and LR restriction test, yields probit (3) where all variables are significant. The results from the parsimonious model further shows that there is no governmental ownership, foreign ownership effect, nor is there any effect of firm growth or change in location size. The only significant firm characteristic is size. A large, Non-SME establishment is 3.64% less likely to be constrained by corruption then a micro establishment. As expected, corruption can be more damaging for smaller firms and larger companies can have captured regulations and have more capacity to cope.

The establishments that participate through bribery are more likely to believe that corruption is hampering their business activities or vice versa. On average, an increase in bribery by one level would yield a probability of finding corruption constrictive by 6.41%. This participation through administrative corruption is highly significant through limiting the model. As causality cannot be measured, we keep in mind that an increased bribe frequency can be due to the establishment trying to overcome the constrictive nature of corruption. As the obstacle of political instability increases, likeliness of corruption constraint increases by 9.75% on average. As political instability leaves more opportunities for corruption and weaker control of business ethics, corruption is more likely to weaken the establishment.

*Table 12.1 Probit estimates of corruption constraint*

| Dependent variable: Corruption is constrictive | | | | |
|---|---|---|---|---|
| Independent variables | (1) | | (2) | |
| | Full model | | Parsimonious model | |
| year2013 | -0.0481*** | (0.0128) | -0.0533*** | (0.00958) |
| Albania | -0.00438 | (0.0640) | | |
| Armenia | -0.0647 | (0.0736) | -0.0463*** | (0.00541) |
| Azerbaijan | -0.00708 | (0.0199) | | |
| Belarus | -0.0720 | (0.156) | -0.0866** | (0.0369) |
| Bosnia & Herzegovina | 0.0875 | (0.0705) | 0.0710*** | (0.0221) |
| Bulgaria | 0.0257 | (0.128) | 0.0348*** | (0.00736) |
| Croatia | 0.0351 | (0.137) | | |
| Czech Republic | 0.0432 | (0.299) | | |
| Estonia | -0.0566 | (0.283) | -0.0813*** | (0.0129) |
| Georgia | -0.00380 | (0.237) | | |
| Hungary | -0.133*** | (0.0242) | -0.152*** | (0.00673) |
| Kazakhstan | 0.0918** | (0.0419) | 0.108*** | (0.0118) |
| Kosovo | 0.179*** | (0.0579) | 0.221*** | (0.00933) |
| Kyrgyzstan | 0.187 | (0.265) | 0.143*** | (0.0119) |
| Latvia | 0.0777 | (0.252) | 0.0326*** | (0.0102) |
| Lithuania | 0.0313 | (0.0697) | | |
| F.Y.R. of Macedonia | -0.0579 | (0.103) | -0.0345*** | (0.00571) |
| Moldova | 0.0142 | (0.0565) | | |
| Montenegro | -0.0416 | (0.0993) | -0.0827*** | (0.0124) |
| Poland | 0.0289 | (0.224) | | |
| Romania | 0.165 | (0.162) | 0.150*** | (0.0145) |
| Serbia | -0.0923** | (0.0386) | -0.0869*** | (0.0119) |
| Slovakia | 0.0632 | (0.214) | 0.0476*** | (0.0108) |
| Slovenia | 0.0470 | (0.220) | | |
| Tajikistan | -0.0397 | (0.122) | -0.0437** | (0.0211) |
| Ukraine | -0.00525 | (0.0316) | | |
| Uzbekistan | -0.151 | (0.181) | -0.176*** | (0.0261) |
| *Industry* | | | | |
| Construction | 0.0195 | (0.0175) | 0.0319*** | (0.0117) |
| Wholesale and retail trade | 0.00394 | (0.00870) | | |
| Hotels and restaurants | 0.0258 | (0.0304) | | |
| Transport, storage and comm. | 0.0110 | (0.0295) | | |
| Real estate, renting and b.a. | 0.0473* | (0.0273) | | |
| *WGIs* | | | | |
| Control of Corruption | -0.0234 | (0.108) | -0.0647** | (0.0272) |
| Government Effectivenes | 0.0931 | (0.0698) | 0.0864*** | (0.0284) |
| Rule of Law | -0.110 | (0.168) | | |
| Regulatory Quality | -0.0350 | (0.134) | -0.0899*** | (0.0211) |
| *EU Membership* | | | | |
| EU x Construction | -0.0568* | (0.0304) | -0.0446** | (0.0215) |
| EU x Wholesale and retail trade | -0.00565 | (0.0208) | | |
| EU x Hotels | 0.0412 | (0.0498) | | |
| EU x Transport | -0.0843*** | (0.0305) | -0.0581*** | (0.0194) |
| EU x Real estate, renting and b.a. | -0.0955 | (0.0701) | | |
| Regulationstime | 0.000936*** | (0.000251) | 0.00103*** | (0.000246) |
| Regulationstime x Control of Corruption | 0.000295 | (0.000227) | 0.000382* | (0.000223) |
| Political instability | 0.0975*** | (0.00356) | 0.0975*** | (0.00331) |
| Bribe frequency | 0.0644*** | (0.00353) | 0.0641*** | (0.00366) |
| nonSME | -0.0348** | (0.0148) | -0.0364** | (0.0148) |

| | | | | |
|---|---|---|---|---|
| Firm growth | -0.0300* | (0.0180) | | |
| Ln(age) | 0.00500 | (0.00563) | | |
| *Ownership* | | | | |
| Government | -0.0576 | (0.0355) | | |
| Foreign | -0.0125 | (0.0219) | | |
| *Practices of informal competitors* | 0.0296*** | (0.00492) | 0.0284*** | (0.00298) |
| Construction | 0.00885 | (0.00731) | | |
| Wholesale and retail trade | -0.00377 | (0.00596) | | |
| Hotels and restaurants | -0.0272** | (0.0135) | | |
| Transport, storage and comm. | 0.00491 | (0.0164) | | |
| Real estate, renting and b.a. | -0.00923 | (0.0151) | | |
| *Size of location* | | | | |
| 50,000 to 250,000 | 0.00551 | (0.0106) | | |
| Over 250,000 to 1 million | 0.00311 | (0.0106) | | |
| Over 1 million | 0.0157 | (0.0125) | | |
| Number of observations | | 10,159 | | 10,159 |
| Percent correctly predicted | | 80.45% | | 80.45% |
| Log-likelihood value | | -4201 | | -4215 |
| Pseudo R-squared | | 0.299 | | 0.297 |
| McFadden's Adjusted R-squared | | 0.289 | | 0.292 |

Source: Enterprise Surveys, The World Bank Group
Reported numbers are based on average marginal effects of the explanatory variable.
Standard errors are reported in brackets
Significance: *** p<0.01, ** p<0.05, * p<0.1, based on standard errors of standardized coefficients
Standard errors are robust to heteroscedasticity and clustered on country.

The existence of practices of informal competitors has an overall impact on whether corruption is a constraint. Further, a closer look at the differences between industries shows that, relative to the manufacturing industry, establishments are affected differently by the industry they operate. These industrial differences can be due to differences in legal requirements. The construction industry is in fact 3.19% more likely to be constricted by corruption than the manufacturing industry.

Again eliminating insignificant regressors, logit(2) in Table 0.1 found in the Appendix 10 yields a coherent model. The logit analysis yields similar results as the probit analysis. However, as logit have flatter tails and follows a different distribution, the coefficients, marginal effects and standard deviations differ. Appendix 10 reports comparable results for logit estimation, which are virtually identical to the probit model. Increased participation through administrative corruption again on average increases the probability of reporting corruption as a constraint by 6.34%. Political instability is also still significant, and an increase on average increases the probability of corruption constraint by 9.85%. As for firm characteristics, using the logit framework shows a large company is 3.56% less likely to be constrained by corruption.

Both probit and logit model show that construction industry, Control of Corruption, government Effectiveness, Regulatory quality, construction and transport industries within the EU, political instability, bribe frequency, large and practices of informal competitors by sector have a significant impact on the probability of an establishment being constrained by corruption.

In terms of overall percent correctly predicted, the models do quite well, with a rate of 80%. The McFadden pseudo R-square uses the log-likelihoods of the estimated model and the log-likelihood for a model with only one intercept to estimate the explanatory power of the model (Wooldridge, 2014, pp. 466-467). The pseudo R-Squared are almost 0.3. And the McFadden Adjusted R-square shows a slight increase in both the models increase the probit models, suggesting that we can safely remove the insignificant variables. These restrictions can further be explored by conducting an LR test between the first and second models for both probit and logit. Testing the restrictions made in Table 12.1 yields a LR value that keeps the null hypothesis that the restricted variables are simultaneously equal to zero, and add no value to the regression, cannot be rejected. Probit (3) seems to yield a better model.

### 12.1.2 Probability of restrictive business corruption in 2013

Running separate regressions for only 2013 allows us to check how different measurements of state capture affect the impact of corruption, and similarly for the number of competitors in the market place. The WGIs are unfortunately omitted due to collinearity, and measured by the country dummies. However, control of corruption is represented through its interaction with time spent in dealing with regulations. Uzbekistan is also left out of the analysis as none of the companies report corruption being an obstacle for 2013.

**Error! Reference source not found.** shows that regulationstime still has a significant effect on the probability of corruption being perceived as restrictive. The term with control of corruption is not significant, however, and left out of probit (1) and (2). As before, the probability of corruption being a constraint on the company increases with political instability, bribe frequency. When it comes to practices of informal competitors, the wholesale and retail trade more likely to be adversely affected by greater informal competition, relative to the manufacturing industry. In an analysis based solely on 2013, non-SME is no longer significant; government ownership, foreign ownership remains insignificant.

As a form of state capture, an increased impact of payments to local officials has an effect on the way corruption is perceived by the establishment. On average, an increase in this variable increases the probability that establishments feel constricted by corruption by 2.42%. Compared to an average increase of 5.54% following from an increase in administrative corruption, this indicates that establishment suffers more severely from administrative corruption than state capture. As payments made to local officials show a significant impact, rather than government officials or parliamentarians, this indicates that the establishments believe they suffer more from petty corruption than grand or political corruption.

*Table 12.2 Probit estimates for corruption constraint 2013*

Probit
Dependent variable: Corruption is constrictive

| Independent variables | (1) Full model | | (2) Parsimonious model | |
|---|---|---|---|---|
| Albania | -0.0523*** | (0.0100) | -0.0629*** | (0.00340) |
| Armenia | -0.0741*** | (0.0268) | -0.0597*** | (0.00388) |
| Azerbaijan | -0.0830** | (0.0345) | -0.0693*** | (0.0166) |
| Belarus | -0.172*** | (0.0115) | -0.163*** | (0.00966) |
| Bosnia & Herzegovina | -0.0251 | (0.0172) | | |
| Bulgaria | -0.0656*** | (0.0143) | -0.0496*** | (0.00416) |
| Croatia | -0.0263 | (0.0197) | | |
| Czech Republic | -0.124*** | (0.0180) | -0.105*** | (0.00373) |
| Estonia | -0.297*** | (0.0255) | -0.279*** | (0.0101) |
| Georgia | -0.217*** | (0.0175) | -0.208*** | (0.00681) |
| Hungary | -0.174*** | (0.0229) | -0.163*** | (0.00624) |
| Kazakhstan | 0.0111** | (0.00556) | 0.0193*** | (0.00661) |
| Kosovo | 0.148*** | (0.0146) | 0.152*** | (0.00790) |
| Kyrgyzstan | 2.87e-05 | (0.0157) | | |
| Latvia | -0.127*** | (0.0215) | -0.112*** | (0.00844) |
| Lithuania | -0.0853*** | (0.0166) | -0.0701*** | (0.00736) |
| F.Y.R. of Macedonia | -0.102*** | (0.0187) | -0.0918*** | (0.00501) |
| Moldova | -0.118*** | (0.0208) | -0.103*** | (0.00484) |
| Montenegro | -0.0766*** | (0.0209) | -0.0677*** | (0.00771) |
| Poland | -0.143*** | (0.0281) | -0.112*** | (0.00487) |
| Romania | 0.0607*** | (0.0137) | 0.0738*** | (0.00611) |
| Serbia | -0.154*** | (0.0113) | -0.144*** | (0.00320) |
| Slovakia | -0.0252 | (0.0204) | | |
| Slovenia | -0.0782*** | (0.0256) | -0.0509*** | (0.00609) |
| Tajikistan | -0.0514*** | (0.0109) | -0.0533*** | (0.00413) |
| Ukraine | -0.0252*** | (0.00566) | -0.0217*** | (0.00269) |
| *Industry* | | | | |
| Construction | 0.00369 | (0.0180) | | |
| Wholesale and retail trade | -0.00212 | (0.0101) | | |
| Hotels and restaurants | 0.0339 | (0.0496) | | |
| Transport, storage and comm. | 0.0113 | (0.0347) | | |
| Real estate, renting and b.a. | 0.0320 | (0.0260) | 0.0488*** | (0.0184) |
| *EU Membership* | | | | |
| EU x Construction | -0.0868** | (0.0325) | -0.0646** | (0.0252) |
| EU x Wholesale and retail trade | 0.0137 | (0.0184) | | |
| EU x Hotels | -0.165** | (0.0751) | -0.195*** | (0.0683) |
| EU x Transport | -0.139*** | (0.0523) | -0.0968** | (0.0394) |

| | | | | |
|---|---|---|---|---|
| EU x Real estate, renting and b.a. | 0.00206 | (0.0736) | | |
| Regulationstime | 0.000973** | (0.000390) | 0.000772*** | (0.000218) |
| Regulationstime x Control of Corruption | 0.000358 | (0.000375) | | |
| Political instability | 0.0837*** | (0.00436) | 0.0841*** | (0.00400) |
| Bribe frequency | 0.0546*** | (0.00431) | 0.0554*** | (0.00422) |
| nonSME | -0.0144 | (0.0237) | | |
| Firm growth | -0.0215 | (0.0256) | | |
| Ln(age) | 0.00948 | (0.00699) | | |
| *Ownership* | | | | |
| Government | 0.0206 | (0.0779) | | |
| Foreign | -0.00276 | (0.0292) | | |
| *Practices of informal competitors* | 0.0280*** | (0.00433) | 0.0336*** | (0.00385) |
| Construction | 0.0163** | (0.00723) | | |
| Wholesale and retail trade | -0.00857 | (0.00753) | -0.0131*** | (0.00509) |
| Hotels and restaurants | -0.0370 | (0.0264) | | |
| Transport, storage and comm. | 0.0224 | (0.0207) | | |
| Real estate, renting and b.a. | 0.0215 | (0.0230) | | |
| *Size of location* | | | | |
| 50,000 to 250,000 | -0.00982 | (0.0146) | | |
| Over 250,000 to 1 million | -0.00311 | (0.0251) | | |
| Over 1 million | 0.00639 | (0.0200) | | |
| High competition | 0.00857 | (0.0146) | | |
| *State capture* | | | | |
| Parliamentarians | 0.00354 | (0.00793) | | |
| Government officials | -0.00288 | (0.0128) | | |
| Local or regional officials | 0.0244** | (0.00998) | 0.0248*** | (0.00648) |
| Number of observations | | 4,819 | | 4,819 |
| Percent correctly predicted | | 82.69% | | 82.71% |
| Log-likelihood value | | -1857 | | -1866 |
| Pseudo R-squared | | 0.284 | | 0.281 |
| McFadden's Adjusted R-squared | | 0.261 | | 0.268 |

Source: Enterprise Surveys, The World Bank Group
Reported numbers are based on average marginal effects of the explanatory variable.
Standard errors are reported in brackets
Significance: *** p<0.01, ** p<0.05, * p<0.1, based on standard errors of standardized coefficients
Standard errors are robust to heteroscedasticity and clustered on country.

All regressions for 2013 show a percent of correctly predicted of around 82%. As the number of variables is reduced, the McFadden Adjusted R-squares have a higher value implying that the models improve following the restrictions. For the probit models, removing variables from the first to the second model gives a LR value for which we cannot reject the null hypothesis that the restricted variables are simultaneously equal to zero and add no value to the regression.

## 12.2 Engaging in bribery

To examine circumstances where establishments are more likely to bribe, the decision to bribe can be examined through a latent variable framework. An underlying, unobserved, variable can be the establishment's utility function of bribing. This can be influenced by a number of unmeasurable factors such as culture, motivation, profit maximization, perceived risk of getting caught, risk aversion or strategic situation. In the previous set of regressions, we used participation in bribery as an explanitor of the degree to which corruption is perceived as an constraint on business. So here we test whether corruption being a constraint is a cause of engaging in bribery.

### 12.2.1 Egaging in bribery in 2009 and 2013

Neither firm growth, nor foreign ownership seems to have an impact on the probability of bribing for these establishments. The only firm characteristic that seems to have an effect is the size of the company. Even if the larger the companies might face difficulty in controlling activities of the employees, a large company is 2.19% less likely to bribe than a micro company in probit (2).

*Table 12.3 Probit estimates of bribery in 2009 and 2013*

| Probit<br>Dependent variable: Bribes | | | | |
|---|---|---|---|---|
| Independent variables | (1) | | (2) | |
| | Full model | | Parsimonious model | |
| year2013 | 0.0176 | (0.0127) | 0.0272*** | (0.0101) |
| Albania | -0.000270 | (0.0645) | | |
| Armenia | -0.000768 | (0.0714) | | |
| Azerbaijan | 0.00496 | (0.0342) | | |
| Belarus | -0.182 | (0.164) | -0.0695*** | (0.0146) |
| Bosnia & Herzegovina | -0.0905 | (0.119) | | |
| Bulgaria | 0.00889 | (0.108) | | |
| Croatia | -0.120 | (0.141) | -0.0587*** | (0.0113) |
| Czech Republic | -0.0872 | (0.237) | | |
| Estonia | -0.177 | (0.243) | -0.0582*** | (0.0114) |
| Georgia | -0.151 | (0.196) | -0.0732*** | (0.00619) |
| Hungary | -0.120*** | (0.0296) | -0.0866*** | (0.00864) |
| Kazakhstan | 0.0138 | (0.0554) | | |
| Kosovo | -0.172** | (0.0676) | -0.227*** | (0.0107) |
| Kyrgyzstan | -0.0703 | (0.210) | | |
| Latvia | -0.138 | (0.204) | -0.0581*** | (0.00721) |
| Lithuania | -0.234*** | (0.0771) | -0.189*** | (0.0106) |
| F.Y.R. of Macedonia | -0.0234 | (0.115) | | |
| Moldova | -0.0486 | (0.0724) | | |
| Montenegro | -0.119 | (0.0918) | -0.0179*** | (0.00654) |
| Poland | -0.154 | (0.190) | -0.0724*** | (0.00729) |
| Romania | -0.0414 | (0.136) | | |

| | | | | |
|---|---|---|---|---|
| Serbia | -0.0508 | (0.0464) | | |
| Slovakia | -0.101 | (0.191) | -0.0627*** | (0.0105) |
| Slovenia | -0.348 | (0.212) | -0.182*** | (0.0132) |
| Tajikistan | -0.0569 | (0.125) | -0.0140* | (0.00760) |
| Ukraine | -0.0918 | (0.0658) | -0.0580*** | (0.00707) |
| Uzbekistan | -0.0846 | (0.132) | | |
| *Industry* | | | | |
| Construction | 0.00524 | (0.0169) | | |
| Wholesale and retail trade | 0.00603 | (0.0150) | | |
| Hotels and restaurants | -0.0384 | (0.0258) | | |
| Transport, storage and comm. | -0.0383 | (0.0377) | -0.0438** | (0.0219) |
| Real estate, renting and b.a. | -0.0972*** | (0.0335) | -0.112*** | (0.0270) |
| *WGIs* | | | | |
| Control of Corruption | 0.0374 | (0.0830) | -0.0299** | (0.0131) |
| Government Effectivenes | 0.0615 | (0.183) | 0.0827*** | (0.0227) |
| Rule of Law | 0.163 | (0.156) | 0.0475** | (0.0230) |
| Regulatory Quality | -0.235** | (0.112) | -0.117*** | (0.00762) |
| *EU Membership* | | | | |
| EU x Construction | 0.0733** | (0.0298) | 0.0732*** | (0.0199) |
| EU x Wholesale and retail trade | 0.00546 | (0.0181) | | |
| EU x Hotels | 0.00779 | (0.0362) | | |
| EU x Transport | 0.000261 | (0.0298) | | |
| EU x Real estate, renting and b.a. | 0.0915** | (0.0437) | 0.0845** | (0.0430) |
| Regulationstime | 0.000205 | (0.000234) | 0.000404*** | (0.000132) |
| Regulationstime x Control of Corruption | -0.000340 | (0.000225) | | |
| Political instability | -0.00657* | (0.00360) | -0.00762** | (0.00349) |
| Degree of corruption constraint | 0.0425*** | (0.00287) | 0.0431*** | (0.00310) |
| nonSME | -0.0259** | (0.0108) | -0.0219** | (0.00907) |
| Firm growth | -0.00608 | (0.0251) | | |
| Ln(age) | -0.00595 | (0.00537) | | |
| *Ownership* | | | | |
| Government | -0.0220 | (0.0260) | | |
| Foreign | 0.0194 | (0.0173) | | |
| *Practices of informal competitors* | 0.0115*** | (0.00283) | 0.0146*** | (0.00280) |
| Construction | 0.00915 | (0.00671) | | |
| Wholesale and retail trade | 0.00233 | (0.00530) | | |
| Hotels and restaurants | 0.0212 | (0.0128) | | |
| Transport, storage and comm. | 0.00976 | (0.0100) | | |
| Real estate, renting and b.a. | 0.0231* | (0.0127) | 0.0181* | (0.0102) |
| *Size of location* | | | | |
| 50,000 to 250,000 | 0.0138* | (0.00792) | 0.0118* | (0.00672) |
| Over 250,000 to 1 million | 0.0431*** | (0.0112) | 0.0440*** | (0.00995) |
| Over 1 million | 0.0492*** | (0.00981) | 0.0521*** | (0.00966) |
| Audited | 0.0143 | (0.00966) | | |
| Subsidized | -0.00518 | (0.0114) | | |
| Access to finance | 0.00840*** | (0.00281) | 0.00749*** | (0.00279) |
| *Access to land* | 0.0138*** | (0.00309) | 0.0116*** | (0.00250) |
| Construction | -0.000390 | (0.00545) | | |
| Wholesale and retail trade | -0.00568 | (0.00493) | | |
| Hotels and restaurants | -0.0135* | (0.00816) | | |
| Transport, storage and comm. | 0.000452 | (0.00993) | | |
| Real estate, renting and b.a. | 0.00918 | (0.0215) | | |
| *Business licensing and permits* | 0.0101** | (0.00408) | 0.0107*** | (0.00215) |
| Construction | 0.000939 | (0.0105) | | |
| Wholesale and retail trade | -0.00166 | (0.00629) | | |
| Hotels and restaurants | 0.0142 | (0.0128) | | |
| Transport, storage and comm. | 0.0288*** | (0.0111) | 0.0223** | (0.00965) |

| | | | | |
|---|---|---|---|---|
| Real estate, renting and b.a. | -0.0111 | (0.0147) | | |
| Tax administration | 0.0151*** | (0.00336) | 0.0150*** | (0.00329) |
| *Courts* | 0.0160*** | (0.00359) | 0.0136*** | (0.00269) |
| Construction | -0.00664 | (0.00693) | | |
| Wholesale and retail trade | -0.00338 | (0.00452) | | |
| Hotels and restaurants | 0.000743 | (0.0124) | | |
| Transport, storage and comm. | -0.0143 | (0.0109) | | |
| Real estate, renting and b.a. | 0.0280** | (0.0109) | 0.0255*** | (0.00924) |
| *Customs and trade regulations* | 0.00758 | (0.00469) | 0.00719** | (0.00304) |
| Construction | -0.0136* | (0.00744) | | |
| Wholesale and retail trade | 0.00404 | (0.00617) | | |
| Hotels and restaurants | -0.00346 | (0.0172) | | |
| Transport, storage and comm. | -0.00917 | (0.0114) | | |
| Real estate, renting and b.a. | -0.0312* | (0.0165) | | |
| Number of observations | | 10,159 | 10,159 | 10,159 |
| Percent correctly predicted | | 88.28% | | 80.17% |
| Log-likelihood value | | -2920 | | -2939 |
| Pseudo R-squared | | 0.251 | | 0.246 |
| McFadden's Adjusted R-squared | | 0.228 | | 0.235 |

Source: Enterprise Surveys, The World Bank Group
Reported numbers are based on average marginal effects of the explanatory variable.
Standard errors are reported in brackets
Significance: *** p<0.01, ** p<0.05, * p<0.1, based on standard errors of standardized coefficients
Standard errors are robust to heteroscedasticity and clustered on country.

## 12.2.2 Likelihood of engaging in bribery in 2013

Table 12.4 Probit estimates of bribery in 2009

| Probit<br>Dependent variable: Bribes | | | | |
|---|---|---|---|---|
| Independent variables | (1) | | (2) | |
| | Full model | | Parsimonious model | |
| Albania | -0.0933*** | (0.0110) | -0.0791*** | (0.00580) |
| Armenia | -0.0164 | (0.0157) | | |
| Azerbaijan | 0.00592 | (0.0104) | | |
| Belarus | -0.0378*** | (0.00632) | -0.0404*** | (0.00398) |
| Bosnia & Herzegovina | -0.0398*** | (0.00733) | -0.0392*** | (0.00659) |
| Bulgaria | -0.0543*** | (0.0168) | -0.0326*** | (0.00668) |
| Croatia | -0.0574*** | (0.0102) | -0.0541*** | (0.00497) |
| Czech Republic | -0.0174 | (0.0164) | | |
| Estonia | -0.137*** | (0.0199) | -0.117*** | (0.00643) |
| Georgia | -0.0504*** | (0.00977) | -0.0531*** | (0.00629) |
| Hungary | -0.0699*** | (0.0141) | -0.0467*** | (0.00517) |
| Kazakhstan | 0.00332 | (0.00806) | | |
| Kosovo | -0.326*** | (0.0100) | -0.318*** | (0.00801) |
| Kyrgyzstan | -0.0439*** | (0.0111) | -0.0508*** | (0.00755) |
| Latvia | -0.0989*** | (0.0177) | -0.0824*** | (0.00622) |
| Lithuania | -0.154*** | (0.0208) | -0.137*** | (0.00724) |
| F.Y.R. of Macedonia | -0.0931*** | (0.00914) | -0.101*** | (0.00525) |
| Moldova | -0.0779*** | (0.00695) | -0.0721*** | (0.00530) |
| Montenegro | -0.0269*** | (0.00941) | -0.0314*** | (0.00636) |

| | | | | |
|---|---|---|---|---|
| Poland | -0.113*** | (0.0202) | -0.0985*** | (0.00519) |
| Romania | -0.159*** | (0.0166) | -0.134*** | (0.00534) |
| Serbia | -0.00760 | (0.00736) | | |
| Slovakia | -0.125*** | (0.0126) | -0.114*** | (0.00456) |
| Slovenia | -0.187*** | (0.0205) | -0.166*** | (0.00763) |
| Tajikistan | -0.0546*** | (0.0120) | -0.0451*** | (0.00395) |
| Ukraine | -0.100*** | (0.00743) | -0.0991*** | (0.00262) |
| *Industry* | | | | |
| Construction | 0.0237 | (0.0198) | | |
| Wholesale and retail trade | -0.00153 | (0.0135) | | |
| Hotels and restaurants | 0.00870 | (0.0333) | | |
| Transport, storage and comm. | -0.0664** | (0.0311) | -0.0794** | (0.0316) |
| Real estate, renting and b.a. | -0.0796*** | (0.0181) | -0.0547*** | (0.0162) |
| *EU Membership* | | | | |
| EU x Construction | 0.0276 | (0.0370) | | |
| EU x Wholesale and retail trade | 0.0249 | (0.0193) | | |
| EU x Hotels | 0.0628 | (0.0576) | | |
| EU x Transport | 0.0475 | (0.0327) | | |
| EU x Real estate, renting and b.a. | 0.123*** | (0.0250) | 0.103*** | (0.0280) |
| Regulationstime | 0.000106 | (0.000292) | 0.000300** | (0.000147) |
| Regulationstime x Control of Corruption | -0.000234 | (0.000320) | | |
| Political instability | -0.00557 | (0.00367) | -0.00560* | (0.00330) |
| Degree of corruption constraint | 0.0414*** | (0.00342) | 0.0429*** | (0.00312) |
| nonSME | -0.0117 | (0.0277) | | |
| Firm growth | 0.0104 | (0.0202) | | |
| Ln(age) | 0.00438 | (0.00871) | | |
| *Ownership* | | | | |
| Government | -0.0186 | (0.0572) | | |
| Foreign | 0.0245 | (0.0195) | | |
| *Practices of informal competitors* | 0.0133*** | (0.00485) | 0.0129*** | (0.00484) |
| Construction | -0.00250 | (0.00579) | | |
| Wholesale and retail trade | -0.00176 | (0.00706) | | |
| Hotels and restaurants | -0.00698 | (0.0159) | | |
| Transport, storage and comm. | 0.0205* | (0.0119) | 0.0207** | (0.00817) |
| Real estate, renting and b.a. | 0.0192* | (0.0107) | | |
| *Size of location* | | | | |
| 50,000 to 250,000 | 0.000498 | (0.0109) | | |
| Over 250,000 to 1 million | 0.0194 | (0.0123) | 0.0195*** | (0.00742) |
| Over 1 million | 0.0245 | (0.0171) | 0.0265*** | (0.00915) |
| Audited | 0.00305 | (0.0153) | | |
| Subsidized | -0.00697 | (0.0167) | | |
| Access to finance | 0.00980* | (0.00582) | 0.0102* | (0.00536) |
| *Access to land* | 0.0165*** | (0.00363) | 0.0110*** | (0.00267) |
| Construction | -0.00981 | (0.00596) | | |
| Wholesale and retail trade | -0.00795 | (0.00767) | | |
| Hotels and restaurants | -0.0596** | (0.0233) | -0.0395* | (0.0234) |
| Transport, storage and comm. | -0.0116 | (0.0112) | | |
| Real estate, renting and b.a. | -0.0185 | (0.0360) | | |
| *Business licensing and permits* | 0.0104 | (0.00776) | 0.0126*** | (0.00206) |
| Construction | 0.00415 | (0.0107) | | |
| Wholesale and retail trade | -0.00122 | (0.0108) | | |
| Hotels and restaurants | 0.00149 | (0.0188) | | |
| Transport, storage and comm. | 0.0504*** | (0.0156) | 0.0428*** | (0.0141) |
| Real estate, renting and b.a. | -0.0414*** | (0.00798) | -0.0419*** | (0.00777) |
| Tax administration | 0.00813 | (0.00742) | | |
| *Courts* | 0.0234*** | (0.00333) | 0.0282*** | (0.00333) |
| Construction | 0.00370 | (0.0117) | | |

| | | | | |
|---|---|---|---|---|
| Wholesale and retail trade | -0.0171*** | (0.00581) | -0.0231*** | (0.00551) |
| Hotels and restaurants | -0.119*** | (0.0369) | -0.0987*** | (0.0222) |
| Transport, storage and comm. | -0.0322*** | (0.0122) | -0.0387*** | (0.0127) |
| Real estate, renting and b.a. | 0.0150 | (0.0224) | | |
| *Customs and trade regulations* | 0.000597 | (0.00433) | | |
| Construction | -0.00994 | (0.00833) | | |
| Wholesale and retail trade | 0.0152** | (0.00692) | 0.0150*** | (0.00485) |
| Hotels and restaurants | 0.0326 | (0.0280) | | |
| Transport, storage and comm. | -0.0286* | (0.0163) | | |
| Real estate, renting and b.a. | -0.0897*** | (0.0328) | -0.0844** | (0.0414) |
| High competition | 0.0227*** | (0.00879) | 0.0227** | (0.00902) |
| Number of observations | | 4,819 | | 4,819 |
| Percent correctly predicted | | 89.19% | | 89.17% |
| Log-likelihood value | | -1299 | | -1310 |
| Pseudo R-squared | | 0.245 | | 0.239 |
| McFadden's Adjusted R-squared | | 0.196 | | 0.213 |

Source: Enterprise Surveys, The World Bank Group
Reported numbers are based on average marginal effects of the explanatory variable.
Standard errors are reported in brackets
Significance: *** p<0.01, ** p<0.05, * p<0.1, based on standard errors of standardized coefficients
Standard errors are robust to heteroscedasticity and clustered on country.

# 13. Concluding remarks

Relative to the theories presented, the empirical analyses show that business corruption depends on the situation of the establishment. My analysis suggests that the risk of facing and being constrained by corruption, and the likelihood of paying a bribe lies with the interactions with the government and governmental characteristics, not with the characteristics of the company.

Running the regressions in different frameworks and for pooled or purely cross-sectional yields different results, an interesting finding is that the only firm characteristic that has a significant effect on bribery is size. Size seems to decrease the probability that the firm feel they suffer by corruption.

The different businesses are prone to corruption according to the countries they are operating in. In looking at BEEPS, the common for the countries in the ECA is that they have all gone through transitions. An analysis of the BEEPS Survey in two waves of 2009 and 2013 show that different circumstances create a negative impact of corruption and when they participate via bribery. First of all, the time spent in dealing with regulations increase the possibility of corruption constraint and the likeliness of bribery. Po1litical instability increases the likelihood that corruption is constrictive, and decreases the probability of administrative corruption. Indicating that the establishments see political instability relative to state capture. The only state capture that is constrictive is influence on local officials, so there is reason to believe that establishments seem to be hindered by corruption of officials in lower levels of the government.

# 14. Limitations and criticism

This thesis naturally has some limitations. First of all, it concentrates on corruption between the government and the private sector. This attempted isolation is constraining because the as causes, consequences and degree are related to all the aspects of business. Secondly, I have focused more on administrative corruption than state capture. But if administrative corruption is present in a country, then there is also likely to be state capture.

## 14.1 Limitations and criticism of the model

Several aspects of the demand side of corruption are not taken into consideration, such as the variety of government officials the firms meet or the diversity in laws and liabilities. Many things are not measured in the BEEPS Survey, like the attitude of the workforce, the atmosphere in the workplace, morale and culture. Nor is the employee's self-interest or ambitions. Additionally, historical or current actions to prevent corruption are not taken into account such as internal controls or restructuring. And the thesis is further limited by looking at only six specific industries with the countries.

Imposing a binary response model based on an ordinal variable causes loss of information. Excluding some observations may also affect the model. Additionally, using a dummy variable for size further limits the interpretation of the model. When it comes to the methods, the marginal effects are calculated at the average of means instead of at means of variables. This could yield different results. Additionally, categorical data are treated as continuous. imposing assumptions of equal space between responses. Furthermore, the cut-offs used for both size and the dependent variables, corruption obstacle and bribery, can be debated.

Finally, as discussed in Section 5.2, the model is subject to perception bias because perception of corruption depends on the level of experience of the interviewee, as the interviewee is not necessarily involved in corruption himself. Although strategically phrased and asked, the

respondent might think of other types of corruption than the one occurring between government and its own business.

## 14.2 Limitations and criticism of the paper

Due to the complex phenomenon of corruption, I have met some limitations. The definition of business-government corruption is clear in some aspects of the thesis, but has met its limitations in other areas as pertinent data are hard to find. Following the BEEPS, I have focused on specific industries of the economy. This might be subject to criticism as some of the most corrupt industries are excluded. Also, theories on corruption and bribery are not necessarily clearly defined.

The analysis is also based on the answers by the formal sector, when corruption is one of the causes of a large informal sector. Further, this thesis does not answer how several companies manage to survive in a corrupt environment. Nor does it offer a guide to reducing corruption.

# Appendix

## Appendix 1: ISIC Rev.3.1

| | 2009 | 2013 | Total |
|---|---|---|---|
| **D - Manufacturing** | **3,273** | **4,296** | **7,569** |
| 15 - Manufacture of food products and beverages | | | |
| 16 - Manufacture of tobacco products | | | |
| 17 - Manufacture of textiles | | | |
| 18 - Manufacture of wearing apparel; dressing and dyeing of fur | | | |
| 19 - Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear | | | |
| 20 - Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials | | | |
| 21 - Manufacture of paper and paper products | | | |
| 22 - Publishing, printing and reproduction of recorded media | | | |
| 23 - Manufacture of coke, refined petroleum products and nuclear fuel | | | |
| 24 - Manufacture of chemicals and chemical products | | | |
| 25 - Manufacture of rubber and plastics products | | | |
| 26 - Manufacture of other non-metallic mineral products | | | |
| 27 - Manufacture of basic metals | | | |
| 28 - Manufacture of fabricated metal products, except machinery and equipment | | | |
| 29 - Manufacture of machinery and equipment n.e.c. | | | |
| 30 - Manufacture of office, accounting and computing machinery | | | |
| 31 - Manufacture of electrical machinery and apparatus n.e.c. | | | |
| 32 - Manufacture of radio, television and communication equipment and apparatus | | | |
| 33 - Manufacture of medical, precision and optical instruments, watches and clocks | | | |
| 34 - Manufacture of motor vehicles, trailers and semi-trailers | | | |
| 35 - Manufacture of other transport equipment | | | |
| 36 - Manufacture of furniture; manufacturing n.e.c. | | | |
| 37 – Recycling | | | |
| **F – Construction** | **780** | **1,065** | **1,845** |
| 45 – Construction | | | |
| **G - Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods** | **2,794** | **4,919** | **7,713** |
| 50 - Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel | | | |
| 51 - Wholesale trade and commission trade, except of motor vehicles and motorcycles | | | |
| 52 - Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods | | | |

| | | | |
|---|---|---|---|
| **H - Hotels and restaurants** | **338** | **513** | **851** |
| 55 - Hotels and restaurants | | | |
| **I - Transport, storage and communications** | **435** | **619** | **1,054** |
| 60 - Land transport; transport via pipelines | | | |
| 61 - Water transport | | | |
| 62 - Air transport | | | |
| 63 - Supporting and auxiliary transport activities; activities of travel agencies | | | |
| 64 - Post and telecommunications | | | |
| **K - Real estate, renting and business activities** | **106** | **281** | **387** |
| 70 - Real estate activities | | | |
| 71 - Renting of machinery and equipment without operator | | | |
| and of personal and household goods | | | |
| 72 - Computer and related activities | | | |
| 73 - Research and development | | | |
| 74 - Other business activities | | | |

Source: (United Nations Statistics Division, 2016)
The Enterprise Surveys, The World Bank.

# Appendix 2: Number of establishments by country

| | Wave (Duration of fieldwork) | | | | |
|---|---|---|---|---|---|
| **Country** | **2009** | | **2013** | | **Total** |
| Albania | 148 | (9/2007-3/2008) | 272 | (3/2013-7/2013) | 420 |
| Armenia | 315 | (10/2008 - 2/2009) | 326 | (11/2012 - 7/2013) | 641 |
| Azerbaijan | 267 | (9/2008 - 2/2009) | 337 | (7/2012 - 12/2013) | 604 |
| Belarus | 192 | (4/2008 - 8/2008) | 309 | (7/2012 - 8/2013) | 501 |
| Bosnia & Herzegovina | 250 | (9/2008 - 3/2009) | 323 | (11/2012 - 10/2013) | 573 |
| Bulgaria | 179 | (9/2008 - 12/2008) | 219 | (11/2012 - 10/2013) | 398 |
| Croatia | 110 | (9/2007 - 3/2008) | 321 | (2/2013 - 10/2013) | 431 |
| Czech Republic | 185 | (9/2008 - 3/2009) | 220 | (1/2013 - 4/2014) | 405 |
| Estonia | 194 | (4/2008 - 10/2008) | 218 | (2/2013 - 7/2013) | 412 |
| Georgia | 267 | (4/2008 - 12/2008) | 323 | (7/2012 - 12/2013) | 590 |
| Hungary | 224 | (8/2008 - 2/2009) | 231 | (2/2013 - 8/2013) | 455 |
| Kazakhstan | 457 | (9/2008 - 1/2009) | 506 | (7/2012 - 12/2013) | 963 |
| Kosovo | 248 | (10/2008 - 2/2009) | 178 | (1/2013 - 11/2013) | 426 |
| Kyrgyzstan | 201 | (9/2008 - 3/2009) | 245 | (7/2012 - 12/2013) | 446 |
| Latvia | 196 | (9/2008 - 11/2008) | 253 | (1/2013 - 12/2013) | 449 |
| Lithuania | 224 | (9/2008 - 3/2009) | 208 | (1/2013 - 10/2013) | 432 |
| F.Y.R of Macedonia | 272 | (9/2008 - 1/2009) | 306 | (11/2012 - 5/2013) | 578 |
| Moldova | 285 | (9/2008 - 2/2009) | 309 | (11/2012 - 12/2013) | 594 |
| Montenegro | 94 | (9/2008 - 2/2009) | 110 | (2/2013 - 6/2013) | 204 |
| Poland | 244 | (8/2008 - 3/2009) | 396 | (2/2013 - 11/2013) | 640 |
| Romania | 372 | (9/2008 - 12/2008) | 444 | (12/2012 - 10/2013) | 816 |
| Russia | 806 | (9/2008 - 3/2009) | 3,500 | (8/2011 - 6/2012) | 4,306 |
| Serbia | 293 | (9/2008 -12/2008) | 273 | (1/2013 - 8/2013) | 566 |
| Slovakia | 174 | (9/2008 - 3/2009) | 226 | (1/2013 - 3/2014) | 400 |
| Slovenia | 231 | (9/2008 - 3/2009) | 243 | (3/2013 - 9/2013) | 474 |
| Tajikistan | 290 | (5/2008 - 8/2008) | 265 | (2/2013 - 4/2014) | 555 |
| Ukraine | 684 | (6/2008 - 8/2008) | 797 | (1/2013 - 11/2013) | 1481 |
| Uzbekistan | 324 | (4/2008 - 8/2008) | 335 | (1/2013 - 10/2013) | 659 |
| Total number of establishments | 7,726 | | 11,693 | | 19,419 |

Source: The Enterprise Surveys, The World Bank.

# Appendix 3: World Governance Indicators

| | *Control of Corruption* | | *Government Effectiveness* | | *Rule of Law* | | *Regulatory Quality* | |
|---|---|---|---|---|---|---|---|---|
| | **2009** | **2013** | **2009** | **2013** | **2009** | **2013** | **2009** | **2013** |
| **Eastern Europe** | | | | | | | | |
| Belarus (BLR ) | -0.64 | -0.52 | -1.15 | -0.94 | -1.00 | -0.89 | -1.15 | -1.09 |
| Bulgaria (BGR) | -0.25 | -0.29 | 0.16 | 0.15 | -0.07 | -0.14 | 0.66 | 0.52 |
| Czech Republic (CZE) | 0.33 | 0.19 | 0.89 | 0.88 | 0.94 | 1.00 | 1.32 | 1.08 |
| Hungary (HUN) | 0.34 | 0.29 | 0.68 | 0.64 | 0.76 | 0.56 | 1.08 | 0.88 |
| Moldova (MDA) | -0.66 | -0.74 | -0.57 | -0.40 | -0.47 | -0.41 | -0.13 | -0.09 |
| Poland (POL) | 0.37 | 0.55 | 0.52 | 0.71 | 0.60 | 0.79 | 0.95 | 1.04 |
| Romania (ROU) | -0.27 | -0.19 | -0.36 | -0.07 | 0.03 | 0.11 | 0.60 | 0.60 |
| Russia (RUS) | -1.09 | -1.00 | -0.40 | -0.36 | -0.77 | -0.78 | -0.35 | -0.37 |
| Slovakia (SVK) | 0.23 | 0.06 | 0.86 | 0.78 | 0.50 | 0.45 | 1.06 | 0.91 |
| Ukraine (UKR) | -1.01 | -1.09 | -0.80 | -0.65 | -0.77 | -0.83 | -0.57 | -0.64 |
| **Northern Europe** | | | | | | | | |
| Estonia (EST) | 0.91 | 1.11 | 1.03 | 0.98 | 1.09 | 1.16 | 1.41 | 1.43 |
| Latvia (LVA) | 0.13 | 0.26 | 0.63 | 0.88 | 0.80 | 0.75 | 0.99 | 1.03 |
| Lithuania (LTU) | 0.12 | 0.36 | 0.70 | 0.82 | 0.70 | 0.79 | 0.95 | 1.13 |
| **Southern Europe** | | | | | | | | |
| Albania (ALB) | -0.49 | -0.72 | -0.24 | -0.33 | -0.53 | -0.57 | 0.25 | 0.18 |
| Bosnia & Herzegovina (BIH) | -0.37 | -0.22 | -0.70 | -0.45 | -0.36 | -0.17 | -0.10 | -0.08 |
| Croatia (HRV) | -0.10 | 0.11 | 0.61 | 0.69 | 0.14 | 0.26 | 0.56 | 0.44 |
| F.Y.R. of Macedonia (MKD) | -0.10 | 0.02 | -0.09 | -0.06 | -0.27 | -0.20 | 0.26 | 0.32 |
| Kosovo (RKS) | -0.56 | -0.66 | -0.42 | -0.41 | -0.63 | -0.57 | 0.12 | -0.04 |
| Montenegro (MNE) | -0.16 | -0.25 | -0.00 | 0.16 | 0.07 | 0.02 | -0.04 | 0.05 |
| Serbia (SRB) | -0.31 | -0.27 | -0.04 | -0.10 | -0.44 | -0.34 | -0.12 | -0.08 |
| Slovenia (SVN) | 1.02 | 0.70 | 1.16 | 1.00 | 1.06 | 0.97 | 0.92 | 0.61 |
| **Western Asia** | | | | | | | | |
| Armenia (ARM) | -0.56 | -0.47 | -0.02 | 0.07 | -0.45 | -0.31 | 0.28 | 0.23 |
| Azerbaijan (AZE) | -1.11 | -0.90 | -0.63 | -0.45 | -0.83 | -0.67 | -0.30 | -0.43 |
| Georgia (GEO) | -0.22 | 0.35 | 0.28 | 0.53 | -0.21 | -0.02 | 0.52 | 0.74 |
| **Central Asia** | | | | | | | | |
| Kazakhstan (KAZ) | -0.88 | -0.90 | -0.36 | -0.54 | -0.63 | -0.67 | -0.32 | -0.38 |
| Kyrgyzstan (KGZ) | -1.23 | -1.12 | -0.95 | -0.69 | -1.32 | -1.14 | -0.32 | -0.33 |
| Tajikistan (TJK) | -1.13 | -1.19 | -1.08 | -1.08 | -1.23 | -1.24 | -1.06 | -1.07 |
| Uzbekistan (UZB) | -1.22 | -1.23 | -0.65 | -0.94 | -1.27 | -1.20 | -1.49 | -1.63 |

Source: The World Governance Indicators, The World Bank

# Appendix 4: Summary of conventions on corruption and bribery

| Standard | OECD Convention | Council of Europe Convention | UN Convention |
|---|---|---|---|
| Bribery offences | Active bribery of a foreign and international public official (mandatory) | Active and passive bribery of national public officials (mandatory) | Active and passive bribery of national public officials (mandatory) |
| | | Active bribery of a foreign and international public official (mandatory) | Active bribery of a foreign and international public official (mandatory) |
| | | Active and passive bribing judges and officials of international courts (mandatory) | Passive bribery of foreign and international public officials (optional) |
| | | Passive bribery of foreign and international public officials (reservation is possible) | Active and passive bribery in the private sector (optional) |
| | | Active and passive bribery in the private sector (reservation is possible for passive) | |
| Other corruption related offences (1) | Money laundering with bribery of a foreign public official as a predicate offence where bribery of a domestic official is a predicate offence (mandatory) | Money laundering (mandatory) | Money laundering (mandatory) |
| | Accounting offences for the purpose of bribing foreign public officials or of hiding such bribery (mandatory) | Accounting offences (reservation is possible) | Embezzlement, misappropriation or other diversion of property by a public official (mandatory) |
| | | Trading in influence (reservation is possible) | Obstruction of justice (mandatory) |
| | | | Trading in influence (optional)<br>Abuse of functions (optional)<br>Illicit enrichment, embezzlement of property in the private sector (optional)<br>Concealment (optional) |
| Responsibility of legal persons | For active bribery of a foreign and international public official criminal, administrative or civil | Criminal offences of active bribery, trading in influence and money laundering committed by legal persons | Criminal, civil or administrative liability of legal persons for the offences established by the Convention |
| Sanctions | Effective, proportionate and dissuasive criminal penalties, monetary and other sanctions | Effective, proportionate and dissuasive penalties, criminal or non-criminal, including monetary | Sanctions should take into account the gravity of the offence |

| | | | |
|---|---|---|---|
| Other standards | | | Preventive measures in public and private sectors<br><br>Asset recovery<br><br>International cooperation |
| Monitoring | Article 12 states that Parties shall cooperate in carrying out a programme of systematic follow-up to monitor and promote full implementation of the Convention | Council of Europe's GRECO (Group of States against Corruption) monitors the implementation of the Convention through rounds of peer reviews on selected issues | Article 63 (e) states that the State Parties shall agree upon activities, procedures and methods of work for reviewing periodically the implementation of the Convention by state parties. |
| | OECD Working Group on Bribery monitors the implementation of the Convention through Phase 1 and Phase 2 peer reviews. The Group is discussing the need to extend the monitoring process beyond its current mandate, which is due to expire at the end of 2007. | | The nature of the review mechanisms to be adopted is under discussion. |

(1) Many Istanbul Action Plan countries have established some of these criminal offences, such as embezzlement, private bribery and abuse of office. One exception is illicit enrichment, i.e. when there is a significant increase in the assets of a public official that he/she cannot reasonably explain in the relation to his/her lawful income. Nevertheless, the reviews of these countries did not identify these offences as immediate priorities.

Source: OECD, 2008

# Appendix 5: Ratification and entry into force of the three Conventions by country

| Country | OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions (Entry into the force of the Convention) | Criminal law convention of Europe (Entry into force) | United Nations Convention against Corruption, Ratification, Accession (a), Succession (d) |
|---|---|---|---|
| Albania | | 01.07.2002 | 25.05.2006 |
| Armenia | | 01.05.2006 | 08.03.2007 |
| Azerbaijan | | 01.06.2004 | 01.11.2005 |
| Belarus | | 01.03.2008 | 17.02.2005 |
| Bosnia & Herzegovina | | 01.07.2002 | 26.10.2006 |
| Bulgaria | 15.02.1999 | 01.07.2002 | 20.09.2006 |
| Croatia | | 01.07.2002 | 24.04.2005 |
| Czech Republic | 21.03.2000 | 01.07.2002 | 29.11.2013 |
| Estonia | 12.02.2005 | 01.07.2002 | 12.04.2010 a |
| F.Y.R. of Macedonia | | 01.07.2002 | 13.04.2007 |
| Georgia | | 01.05.2008 | 4.11.2008 a |
| Hungary | 15.02.1999 | 01.07.2002 | 19.04.2005 |
| Kazakhstan | | | 18.06.2008 a |
| Kosovo | | | |
| Kyrgyzstan | | | 16.09.2005 |
| Latvia | 30.05.2014 | 01.07.2002 | 04.01.2006 |
| Lithuania | | 01.07.2002 | 21.12.2006 |
| Moldova | | 01.05.2004 | 01.10.2007 |
| Montenegro | | | 23.10.2006 d |
| Poland | 07.11.2000 | 01.04.2003 | 15.09.2006 |
| Romania | | 01.11.2002 | 02.11.2004 |
| Russia | 17.04.2012 | 01.02.2007 | 09.05.2006 |
| Serbia | | 01.04.2003 | 20.12.2005 |
| Slovakia | 23.11.1999 | 01.07.2002 | 01.06.2006 |
| Slovenia | 05.11.2001 | 01.07.2002 | 1.04.2008 a |
| Tajikistan | | | 25.09.2006 a |
| Ukraine | | 01.03.2010 | 02.12.2009 |
| Uzbekistan | | | 29.07.2008 a |

Source: (OECD, 2014) (Council of Europe, 2016) (OECD, 2016)

# Appendix 6: Membership countries in the European Union

| Country | Year of entry into the European Union |
|---|---|
| Bulgaria | 2007 |
| Croatia | 2013[6] |
| Czech Republic | 2004 |
| Estonia | 2004 |
| Hungary | 2004 |
| Latvia | 2004 |
| Lithuania | 2004 |
| Poland | 2004 |
| Romania | 2007 |
| Slovakia | 2004 |
| Slovenia | 2004 |
| | |
| *On the road to EU membership* | |
| ***Candidate countries:*** | |
| Albania | 2003 |
| Montenegro | 2008 |
| Serbia | 2003 |
| F.Y.R. of Macedonia | 2003 |
| ***Potential candidates:*** | |
| Bosnia Herzegovina | 2003 |
| Kosovo | 2008 |

Source: (The European Union, 2016a)

[6] Croatia has been a EU member country since 1 July 2013 (The European Union, 2016b), and is not included as a EU membership country in the regressions as the timing of fieldwork from 2013 was between February and October of 2013 (see Appendix 2).

# Appendix 7: Description of variables

| Variable | Variable description |
|---|---|
| year2013 | Year dummy. |
| Country | Translated into country dummies. |
| Industry | (D – Manufacturing, F – Construction, G – Wholesale and retail trade, H – Hotel and restaurants, I – Transport, storage and communications sector, K – Real estate renting and business activities). Translated into industry dummies. |
| Non-SME | Dummy for establishments with over 250 employees. |
| Size of location | Size of location where the establishment has its main operations (1- Less than 50,000 inhabitants 2 - from 50,000 to 250,000 inhabitants, Over 250,000 to 1million inhabitants, 4- City with population over 1 million). |
| Control of Corruption | The extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. |
| Rule of Law | The extent to which agents have confidence in and abide by the rules of society, including the quality of contract enforcement and property rights, the police, and the courts, as well as the likelihood of crime and violence. |
| Regulatory Quality | The ability of the government to provide sound policies and regulations that enable and promote private sector development. |
| Government Effectiveness | The quality of public services, the capacity of the civil service and its independence from political pressures; and the quality of policy formulation. |
| EU Membership x Industry dummies | Manufacturing industry as reference category. Interaction dummies take the value 1 if the establishment operates within a sector in a EU Membership State. |
| Regulations time | Measured as percentage of senior management's time spent in dealing with government regulations. Some examples of government regulations are taxes, customs, labor regulations, licensing and registration, including dealings with officials and completing forms. |
| Regulations time x Control of Corruption | Time spent with regulations conditioned on different levels of corruption in the government. |
| Political instability obstacle | Political instability is seen as an obstacle to current operations (0 – No obstacle, 1 – Minor obstacle, 2 – Moderate obstacle, 3 – Major obstacle, 4 – Very severe obstacle). |

| | |
|---|---|
| Bribe frequency | Common for similar firms to have to pay some irregular "additional payments or gifts" to get things done. Mainly concerning customs, taxes, licenses, regulations, services and similar interactions with the government (1 - Never, 2 - Seldom, 3 - Sometimes, 4 - Frequently, 5 - Very Frequently, 6 - Always). |
| Corruption obstacle | Corruption is seen as an obstacle to current operations (0 – No obstacle, 1 – Minor obstacle, 2 – Moderate obstacle, 3 – Major obstacle, 4 – Very severe obstacle). |
| Ln(age) | Based on the year of the survey minus the year the establishment began operations in the country.<br>Denoted as a logarithm. |
| Firm growth | Growth in number of employees the last three years prior to the survey. |
| Government | Fifty percent or more of the establishment owned by government or state. |
| Foreign | Fifty percent or more of the establishment owned by private foreign individuals, companies or organizations. |
| Informal competitors obstacle | Practices of competitors in the informal sector are seen as an obstacle to current operations (0 – No obstacle, 1 – Minor obstacle, 2 – Moderate obstacle, 3 – Major obstacle, 4 – Very severe obstacle). |
| Audited | Dummy based on whether the financial statements where checked and audited by external auditor the year before (1-yes, 0 – No). Used as a measure of transparency. |
| Subsidized | If the establishment has received any subsidies from the national, regional or local governments or European Union sources. |
| Access to finance obstacle | Access to finance is seen as an obstacle to current operations (0 – No obstacle, 1 – Minor obstacle, 2 – Moderate obstacle, 3 – Major obstacle, 4 – Very severe obstacle). |
| Access to land obstacle | Access to land is seen as an obstacle to current operations (0 – No obstacle, 1 – Minor obstacle, 2 – Moderate obstacle, 3 – Major obstacle, 4 – Very severe obstacle). |
| Business licensing and permits obstacle | Business licensing and permits are seen as an obstacle to current operations (0 – No obstacle, 1 – Minor obstacle, 2 – Moderate obstacle, 3 – Major obstacle, 4 – Very severe obstacle) |
| Tax administration obstacle | Tax administration is seen as an obstacle to current operations (0 – No obstacle, 1 – Minor obstacle, 2 – Moderate obstacle, 3 – Major obstacle, 4 – Very severe obstacle). |
| Courts obstacle | The court system is seen as an obstacle to current operations (0 – No obstacle, 1 – Minor obstacle, 2 – Moderate obstacle, 3 – Major obstacle, 4 – Very severe obstacle). |

| | |
|---|---|
| Customs and Trade Regulations obstacle | Customs and Trade Regulations are seen as an obstacle to current operations (0 – No obstacle, 1 – Minor obstacle, 2 – Moderate obstacle, 3 – Major obstacle, 4 – Very severe obstacle). |
| High competition (2013) | Establishments with “too many to count” or over 10 competitors for the main product/service in the main market. |
| Parliamentarians (2013) | Private payments/gifts or other benefits to Parliamentarians to affect their votes has had a direct impact on the establishment (0 - No impact, 1 - Minor impact, 2 - Moderate impact, 3 - Major impact, 4 - Decisive impact). |
| Government officials (2013) | Private payments/gifts or other benefits to Government officials to affect the content of government decrees has had a direct impact on the establishment (0 - No impact, 1 - Minor impact, 2 - Moderate impact, 3 - Major impact, 4 - Decisive impact). |
| Local official (2013) | Private payments/gifts or other benefits to local or regional government officials to affect their votes or content of government decrees has had a direct impact on the establishment (0 - No impact, 1 - Minor impact, 2 - Moderate impact, 3 - Major impact, 4 - Decisive impact). |

# Appendix 8: Change in costs without corruption, per country (2013)

| Country | Increase | Remain the same | Decrease | Number of establishments |
|---|---|---|---|---|
| Albania | 28 % | 33 % | 39 % | 126 |
| Armenia | 19 % | 41 % | 40 % | 115 |
| Azerbaijan | 69 % | 31 % | 0 % | 42 |
| Belarus | 0 % | 37 % | 63 % | 95 |
| Bosnia & Herzegovina | 5 % | 19 % | 76 % | 196 |
| Bulgaria | 8 % | 33 % | 59 % | 111 |
| Croatia | 11 % | 31 % | 58 % | 160 |
| Czech Republic | 12 % | 51 % | 37 % | 125 |
| Estonia | 27 % | 33 % | 40 % | 45 |
| Georgia | 29 % | 44 % | 26 % | 34 |
| Hungary | 22 % | 68 % | 10 % | 59 |
| Kazakhstan | 8 % | 28 % | 64 % | 262 |
| Kosovo | 27 % | 11 % | 62 % | 131 |
| Kyrgyzstan | 6 % | 17 % | 77 % | 187 |
| Latvia | 20 % | 49 % | 31 % | 65 |
| Lithuania | 40 % | 28 % | 33 % | 98 |
| F.Y.R of Macedonia | 14 % | 29 % | 57 % | 113 |
| Moldova | 64 % | 18 % | 18 % | 133 |
| Montenegro | 13 % | 43 % | 43 % | 30 |
| Poland | 13 % | 66 % | 21 % | 169 |
| Romania | 15 % | 25 % | 61 % | 314 |
| Russia | 9 % | 32 % | 59 % | 1,824 |
| Serbia | 15 % | 39 % | 46 % | 145 |
| Slovakia | 28 % | 50 % | 22 % | 118 |
| Slovenia | 4 % | 35 % | 61 % | 92 |
| Tajikistan | 45 % | 24 % | 31 % | 106 |
| Ukraine | 27 % | 35 % | 39 % | 533 |
| Uzbekistan | 45 % | 32 % | 23 % | 22 |
| Total number of establishments | 16 % | 33 % | 51 % | 5450 |

# Appendix 9: Correlation of independent variables

*Table A 1 Correlation between variables, corruption constraint, n=10,159*

| n=10,159 | Control of Corruption | Rule of Law | Regulatory Quality | Government Effectiveness | Regulationstime | x Control of Corruption | Bribe frequency | Political Instability | Ln(age) | Firm growth | informal competitors | Access to finance | Access to land | Business licensing | Tax administration | Courts | trade regulations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control of Corruption | 1.0000 | | | | | | | | | | | | | | | | |
| Rule of Law | 0.9503 | 1.0000 | | | | | | | | | | | | | | | |
| Regulatory Quality | 0.8775 | 0.9237 | 1.0000 | | | | | | | | | | | | | | |
| Effectiveness | 0.8912 | 0.9324 | 0.8926 | 1.0000 | | | | | | | | | | | | | |
| Regulationstime | -0.1019 | -0.0944 | -0.1037 | -0.0729 | 1.0000 | | | | | | | | | | | | |
| Regulationstime x Control of Corruption | 0.5134 | 0.4798 | 0.4638 | 0.4364 | -0.6549 | 1.0000 | | | | | | | | | | | |
| Bribe frequency | -0.1334 | -0.1068 | -0.0440 | -0.1322 | 0.0896 | -0.0958 | 1.0000 | | | | | | | | | | |
| Political Instability | -0.0137 | 0.0063 | 0.0467 | -0.0354 | 0.0769 | -0.0319 | 0.5521 | 1.0000 | | | | | | | | | |
| Ln(age) | 0.2088 | 0.1943 | 0.1311 | 0.1648 | 0.0255 | 0.0923 | -0.0057 | 0.0333 | 1.0000 | | | | | | | | |
| Firm growth | 0.0093 | 0.0028 | 0.0392 | 0.0048 | -0.0103 | -0.0006 | 0.0023 | -0.0023 | -0.2514 | 1.0000 | | | | | | | |
| Practice of informal competitors | 0.0146 | 0.0158 | 0.0595 | 0.0022 | 0.0347 | -0.0034 | 0.3005 | 0.2465 | 0.0262 | 0.0013 | 1.0000 | | | | | | |
| Access to finance | -0.0463 | -0.0415 | -0.0161 | -0.0476 | 0.0474 | -0.0310 | 0.2967 | 0.2597 | 0.0126 | -0.0016 | 0.2355 | 1.0000 | | | | | |
| Access to land | -0.0745 | -0.0656 | -0.0421 | -0.0846 | 0.0379 | -0.0544 | 0.2927 | 0.1978 | -0.0291 | 0.0473 | 0.2303 | 0.3063 | 1.0000 | | | | |
| Business licensing | -0.0597 | -0.0468 | -0.0280 | -0.0869 | 0.0786 | -0.0637 | 0.3722 | 0.2764 | -0.0029 | 0.0098 | 0.2097 | 0.2815 | 0.3117 | 1.0000 | | | |
| Tax administration | 0.0050 | 0.0305 | 0.0448 | -0.0169 | 0.0912 | 0.0004 | 0.4019 | 0.3429 | 0.0149 | 0.0166 | 0.2253 | 0.2900 | 0.2463 | 0.4077 | 1.0000 | | |
| Courts | 0.0189 | 0.0238 | 0.0412 | -0.0031 | 0.0714 | -0.0046 | 0.4921 | 0.3917 | 0.0570 | -0.0095 | 0.2548 | 0.2781 | 0.3024 | 0.3924 | 0.4006 | 1.0000 | |
| Customs and trade regulations | -0.0429 | -0.0397 | -0.0123 | -0.0586 | 0.0386 | -0.0229 | 0.2918 | 0.2302 | 0.0021 | 0.0735 | 0.2316 | 0.2519 | 0.2744 | 0.2941 | 0.2902 | 0.2857 | 1.0000 |

*Table A 2 Correlation between variables, n= 4,819*

| n=4,819 | Control of Corruption | Rule of Law | Regulatory Quality | Government Effectiveness | Regulationstime | x Control of Corruption | Bribe frequency | Political Instability | Ln(age) | Firm growth | informal competitors | Parliamentarians | Government officials | Local officials |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Control of Corruption | 1 | | | | | | | | | | | | | |
| Rule of Law | 0.9486 | 1 | | | | | | | | | | | | |
| Regulatory Quality | 0.8959 | 0.9336 | 1 | | | | | | | | | | | |
| Effectiveness | 0.8897 | 0.9346 | 0.9217 | 1 | | | | | | | | | | |
| Regulationstime | -0.0699 | -0.0591 | -0.0612 | -0.0429 | 1 | | | | | | | | | |
| Regulationstime x Control of Corruption | 0.5303 | 0.4982 | 0.4736 | 0.459 | -0.5997 | 1 | | | | | | | | |
| Bribe frequency | -0.1943 | -0.1683 | -0.154 | -0.151 | 0.0734 | -0.1388 | 1 | | | | | | | |
| Political Instability | 0.0189 | 0.041 | 0.0342 | 0.0158 | 0.1029 | -0.0437 | 0.1737 | 1 | | | | | | |
| Ln(age) | 0.319 | 0.3079 | 0.2512 | 0.245 | -0.0019 | 0.162 | -0.0491 | 0.0597 | 1 | | | | | |
| Firm growth | -0.0228 | -0.0383 | -0.0147 | -0.0159 | 0.0091 | -0.0324 | -0.0008 | -0.0478 | -0.2535 | 1 | | | | |
| Practice of informal competitors | 0.0463 | 0.0379 | 0.0856 | 0.0347 | 0.0403 | 0.0252 | 0.1821 | 0.2158 | 0.046 | -0.0348 | 1 | | | |
| Parliamentarians | -0.0868 | -0.0762 | -0.0413 | -0.0767 | 0.001 | -0.0173 | 0.3418 | 0.0962 | -0.0211 | 0.0155 | 0.1456 | 1 | | |
| Government officials | -0.0942 | -0.0861 | -0.0509 | -0.0851 | 0 | -0.0072 | 0.3278 | 0.0962 | -0.0262 | 0.0143 | 0.1466 | 0.8917 | 1 | |
| Local officials | -0.093 | -0.0796 | -0.0488 | -0.0768 | 0.0246 | -0.0315 | 0.3644 | 0.1023 | -0.0292 | 0.0066 | 0.156 | 0.8408 | 0.8634 | 1 |

# Appendix 10: Results using the logit framework

Similar to the probit methodology, the logit framework estimated by Maximum Likelihood Methods and applicable to the Wald, Lagrange Multiplier and LR test.

Instead of using a standard normal distribution, the logit framework uses a logistic distribution. The cumulative distribution function for a logistic random variable is:

$$G(z) = \frac{\exp(z)}{1 + \exp(z)} = \Lambda(z)$$

where G take on values between zero and one for any real number z.

*Table 0.1 Logit estimates of corruption as constrictive in 2009 and 2013*

| Logit<br>Dependent variable: Corruption is constrictive | | | | |
|---|---|---|---|---|
| Independent variables | (1) | | (2) | |
| | Full model | | Parsimonious model | |
| year2013 | -0.0469*** | (0.0132) | -0.0501*** | (0.00878) |
| Albania | -0.00895 | (0.0627) | | |
| Armenia | -0.0753 | (0.0727) | -0.0662*** | (0.0243) |
| Azerbaijan | -0.00216 | (0.0217) | | |
| Belarus | -0.0533 | (0.162) | | |
| Bosnia & Herzegovina | 0.0874 | (0.0754) | 0.0859*** | (0.0218) |
| Bulgaria | 0.0171 | (0.127) | | |
| Croatia | 0.0231 | (0.137) | | |
| Czech Republic | 0.00745 | (0.296) | | |
| Estonia | -0.107 | (0.281) | -0.130*** | (0.0503) |
| Georgia | -0.0198 | (0.234) | -0.0557* | (0.0300) |
| Hungary | -0.135*** | (0.0246) | -0.150*** | (0.0270) |
| Kazakhstan | 0.0903** | (0.0419) | 0.104*** | (0.0179) |
| Kosovo | 0.180*** | (0.0594) | 0.212*** | (0.0258) |
| Kyrgyzstan | 0.160 | (0.262) | 0.108*** | (0.0227) |
| Latvia | 0.0542 | (0.249) | | |
| Lithuania | 0.0284 | (0.0704) | | |
| F.Y.R. of Macedonia | -0.0650 | (0.103) | -0.0439* | (0.0235) |
| Moldova | 0.0129 | (0.0563) | | |
| Montenegro | -0.0398 | (0.101) | -0.0642 | (0.0536) |
| Poland | 0.00908 | (0.221) | | |
| Romania | 0.148 | (0.159) | 0.128*** | (0.0232) |
| Serbia | -0.0888** | (0.0418) | -0.0697*** | (0.0201) |
| Slovakia | 0.0427 | (0.212) | | |
| Slovenia | 0.0321 | (0.221) | | |
| Tajikistan | -0.0248 | (0.124) | | |
| Ukraine | -0.000428 | (0.0351) | | |
| Uzbekistan | -0.126 | (0.181) | -0.115*** | (0.0332) |
| *Industry* | | | | |
| Construction | 0.0186 | (0.0178) | 0.0317** | (0.0142) |

| | | | | |
|---|---|---|---|---|
| Wholesale and retail trade | 0.00201 | (0.00918) | | |
| Hotels and restaurants | 0.0267 | (0.0304) | | |
| Transport, storage and comm. | 0.00669 | (0.0291) | | |
| Real estate, renting and b.a. | 0.0425* | (0.0252) | | |
| *WGIs* | | | | |
| Control of Corruption | -0.0326 | (0.111) | -0.100*** | (0.0189) |
| Government Effectivenes | 0.0934 | (0.0764) | 0.0889*** | (0.0283) |
| Rule of Law | -0.102 | (0.170) | | |
| Regulatory Quality | -0.0200 | (0.136) | -0.0349 | (0.0247) |
| *EU Membership* | | | | |
| EU x Construction | -0.0512* | (0.0305) | -0.0421 | (0.0270) |
| EU x Wholesale and retail trade | -0.00285 | (0.0214) | | |
| EU x Hotels | 0.0448 | (0.0504) | | |
| EU x Transport | -0.0854*** | (0.0298) | -0.0563* | (0.0318) |
| EU x Real estate, renting and b.a. | -0.0944 | (0.0694) | | |
| Regulationstime | 0.000915*** | (0.000256) | 0.000733*** | (0.000189) |
| Regulationstime x Control of Corruption | 0.000297 | (0.000224) | | |
| Political instability | 0.0979*** | (0.00374) | 0.0985*** | (0.00223) |
| Bribe frequency | 0.0639*** | (0.00353) | 0.0634*** | (0.00271) |
| nonSME | -0.0345** | (0.0149) | -0.0356** | (0.0159) |
| Firm growth | -0.0297 | (0.0202) | | |
| Ln(age) | 0.00514 | (0.00586) | | |
| *Ownership* | | | | |
| Government | -0.0596 | (0.0382) | | |
| Foreign | -0.00944 | (0.0225) | | |
| *Practices of informal competitors* | 0.0289*** | (0.00486) | 0.0276*** | (0.00262) |
| Construction | 0.00828 | (0.00705) | | |
| Wholesale and retail trade | -0.00349 | (0.00577) | | |
| Hotels and restaurants | -0.0274** | (0.0133) | | |
| Transport, storage and comm. | 0.00668 | (0.0165) | | |
| Real estate, renting and b.a. | -0.0125 | (0.0154) | | |
| *Size of location* | | | | |
| 50,000 to 250,000 | 0.00686 | (0.0108) | | |
| Over 250,000 to 1 million | 0.00485 | (0.0107) | | |
| Over 1 million | 0.0174 | (0.0125) | | |
| Number of observations | | 10,159 | | 10,159 |
| Percent correctly predicted | | 80.51% | | 80.46% |
| Log-likelihood value | | -4204 | | -4221 |
| Pseudo R-squared | | 0.299 | | 0.296 |
| McFadden's Adjusted R-squared | | 0.289 | | 0.292 |

Source: Enterprise Surveys, The World Bank Group
Reported numbers are based on average marginal effects of the explanatory variable.
Standard errors are reported in brackets
Significance: *** p<0.01, ** p<0.05, * p<0.1, based on standard errors of standardized coefficients
Standard errors are robust to heteroscedasticity and clustered on country.

*Table 0.2 Logit estimates of corruption as constrictive in 2013*

Logit
Dependent variable: Corruption is constrictive

| Independent variables | (1) Full model | | (2) Parsimonious model | |
|---|---|---|---|---|
| Albania | -0.0557*** | (0.0112) | -0.0586*** | (0.00329) |
| Armenia | -0.0707*** | (0.0277) | -0.0553*** | (0.00383) |
| Azerbaijan | -0.0996*** | (0.0386) | -0.0852*** | (0.0209) |
| Belarus | -0.180*** | (0.0108) | -0.172*** | (0.0120) |

| | | | | |
|---|---|---|---|---|
| Bosnia & Herzegovina | -0.0250 | (0.0177) | | |
| Bulgaria | -0.0635*** | (0.0161) | -0.0456*** | (0.00493) |
| Croatia | -0.0251 | (0.0208) | | |
| Czech Republic | -0.129*** | (0.0185) | -0.108*** | (0.00381) |
| Estonia | -0.336*** | (0.0318) | -0.315*** | (0.0160) |
| Georgia | -0.215*** | (0.0207) | -0.208*** | (0.00853) |
| Hungary | -0.181*** | (0.0248) | -0.168*** | (0.00751) |
| Kazakhstan | 0.0126*** | (0.00498) | 0.0200*** | (0.00716) |
| Kosovo | 0.153*** | (0.0141) | 0.154*** | (0.00592) |
| Kyrgyzstan | -0.00911 | (0.0151) | | |
| Latvia | -0.133*** | (0.0226) | -0.116*** | (0.00713) |
| Lithuania | -0.0767*** | (0.0182) | -0.0604*** | (0.00777) |
| F.Y.R. of Macedonia | -0.0952*** | (0.0194) | -0.0815*** | (0.00489) |
| Moldova | -0.118*** | (0.0212) | -0.102*** | (0.00530) |
| Montenegro | -0.0647*** | (0.0247) | -0.0554*** | (0.0103) |
| Poland | -0.138*** | (0.0299) | -0.107*** | (0.00584) |
| Romania | 0.0572*** | (0.0143) | 0.0721*** | (0.00610) |
| Serbia | -0.148*** | (0.0122) | -0.138*** | (0.00352) |
| Slovakia | -0.0295 | (0.0213) | | |
| Slovenia | -0.0777*** | (0.0265) | -0.0504*** | (0.00706) |
| Tajikistan | -0.0446*** | (0.0115) | -0.0464*** | (0.00396) |
| Ukraine | -0.0223*** | (0.00615) | -0.0194*** | (0.00268) |
| *Industry* | | | | |
| Construction | 0.00453 | (0.0189) | | |
| Wholesale and retail trade | -0.00547 | (0.0110) | | |
| Hotels and restaurants | 0.0312 | (0.0499) | | |
| Transport, storage and comm. | 0.00943 | (0.0360) | | |
| Real estate, renting and b.a. | 0.0239 | (0.0253) | 0.0417** | (0.0188) |
| *EU Membership* | | | | |
| EU x Construction | -0.0799** | (0.0312) | -0.0626*** | (0.0238) |
| EU x Wholesale and retail trade | 0.0186 | (0.0192) | | |
| EU x Hotels | -0.171** | (0.0718) | -0.159** | (0.0693) |
| EU x Transport | -0.136*** | (0.0521) | -0.0925** | (0.0375) |
| EU x Real estate, renting and b.a. | 0.00864 | (0.0746) | | |
| Regulationstime | 0.000906** | (0.000389) | 0.000730*** | (0.000219) |
| Regulationstime x Control of Corruption | 0.000312 | (0.000368) | | |
| Political instability | 0.0841*** | (0.00475) | 0.0843*** | (0.00430) |
| Bribe frequency | 0.0539*** | (0.00448) | 0.0547*** | (0.00437) |
| nonSME | -0.0129 | (0.0241) | | |
| Firm growth | -0.0211 | (0.0277) | | |
| Ln(age) | 0.00871 | (0.00728) | | |
| *Ownership* | | | | |
| Government | 0.00911 | (0.0869) | | |
| Foreign | -0.00172 | (0.0298) | | |
| *Practices of informal competitors* | 0.0273*** | (0.00427) | 0.0345*** | (0.00375) |
| Construction | 0.0150** | (0.00678) | | |
| Wholesale and retail trade | -0.00804 | (0.00724) | -0.0148*** | (0.00526) |
| Hotels and restaurants | -0.0364 | (0.0256) | -0.0305** | (0.0125) |
| Transport, storage and comm. | 0.0252 | (0.0208) | | |
| Real estate, renting and b.a. | 0.0222 | (0.0242) | | |
| *Size of location* | | | | |
| 50,000 to 250,000 | -0.0108 | (0.0149) | | |
| Over 250,000 to 1 million | -0.00458 | (0.0257) | | |
| Over 1 million | 0.00600 | (0.0206) | | |
| High competition | 0.00763 | (0.0145) | | |
| *State capture* | | | | |
| Parliamentarians | 0.00417 | (0.00793) | | |

| | | | | |
|---|---|---|---|---|
| Government officials | -0.000866 | (0.0126) | | |
| Local or regional officials | 0.0225** | (0.0105) | 0.0248*** | (0.00650) |
| Number of observations | | 4,819 | | 4,819 |
| Percent correctly predicted | | 82.86% | | 82.82% |
| Log-likelihood value | | -1860 | | -1867 |
| Pseudo R-squared | | 0.283 | | 0.281 |
| McFadden's Adjusted R-squared | | 0.260 | | 0.267 |

Source: Enterprise Surveys, The World Bank Group
Reported numbers are based on average marginal effects of the explanatory variable.
Standard errors are reported in brackets
Significance: *** p<0.01, ** p<0.05, * p<0.1, based on standard errors of standardized coefficients
Standard errors are robust to heteroscedasticity and clustered on country.

*Table 0.3 Logit estmates of bribery in 2009 and 2013*

Logit
Dependent variable: Bribes

| Independent variables | (1) | | (2) | |
|---|---|---|---|---|
| | Full model | | Parsimonious model | |
| year2013 | 0.0215* | (0.0129) | 0.0288*** | (0.0101) |
| Albania | -0.0120 | (0.0668) | | |
| Armenia | -0.00876 | (0.0750) | | |
| Azerbaijan | 0.00533 | (0.0318) | | |
| Belarus | -0.146 | (0.167) | -0.0649*** | (0.0142) |
| Bosnia & Herzegovina | -0.0899 | (0.114) | | |
| Bulgaria | -0.0121 | (0.115) | | |
| Croatia | -0.122 | (0.149) | -0.0619*** | (0.0116) |
| Czech Republic | -0.125 | (0.253) | -0.0281*** | (0.00803) |
| Estonia | -0.217 | (0.258) | -0.0894*** | (0.0145) |
| Georgia | -0.213 | (0.211) | -0.122*** | (0.00599) |
| Hungary | -0.127*** | (0.0291) | -0.0971*** | (0.0103) |
| Kazakhstan | 0.00789 | (0.0564) | | |
| Kosovo | -0.191*** | (0.0737) | -0.233*** | (0.00884) |
| Kyrgyzstan | -0.0934 | (0.225) | | |
| Latvia | -0.163 | (0.218) | -0.0731*** | (0.00736) |
| Lithuania | -0.258*** | (0.0788) | -0.208*** | (0.0107) |
| F.Y.R. of Macedonia | -0.0331 | (0.120) | | |
| Moldova | -0.0552 | (0.0694) | | |
| Montenegro | -0.119 | (0.0965) | -0.0282*** | (0.00742) |
| Poland | -0.171 | (0.200) | -0.0762*** | (0.00945) |
| Romania | -0.0607 | (0.137) | | |
| Serbia | -0.0395 | (0.0493) | | |
| Slovakia | -0.122 | (0.203) | -0.0711*** | (0.0117) |
| Slovenia | -0.347 | (0.227) | -0.193*** | (0.0146) |
| Tajikistan | -0.0357 | (0.130) | | |
| Ukraine | -0.0841 | (0.0644) | -0.0523*** | (0.00770) |
| Uzbekistan | -0.0375 | (0.138) | | |
| *Industry* | | | | |
| Construction | 0.00391 | (0.0165) | | |
| Wholesale and retail trade | 0.00334 | (0.0159) | | |
| Hotels and restaurants | -0.0403 | (0.0272) | | |
| Transport, storage and comm. | -0.0408 | (0.0398) | -0.0470** | (0.0226) |
| Real estate, renting and b.a. | -0.118*** | (0.0431) | -0.127*** | (0.0347) |
| *WGIs* | | | | |
| Control of Corruption | 0.00907 | (0.0893) | -0.0352** | (0.0162) |

| | | | | |
|---|---|---|---|---|
| Government Effectivenes | 0.0495 | (0.176) | 0.0865*** | (0.0226) |
| Rule of Law | 0.178 | (0.162) | 0.0610*** | (0.0236) |
| Regulatory Quality | -0.197* | (0.116) | -0.122*** | (0.00742) |
| *EU Membership* | | | | |
| EU x Construction | 0.0745** | (0.0309) | 0.0754*** | (0.0211) |
| EU x Wholesale and retail trade | 0.00363 | (0.0191) | | |
| EU x Hotels | 0.00951 | (0.0364) | | |
| EU x Transport | 0.00181 | (0.0322) | | |
| EU x Real estate, renting and b.a. | 0.0934** | (0.0421) | 0.0962** | (0.0436) |
| Regulationstime | 0.000250 | (0.000242) | 0.000413*** | (0.000128) |
| Regulationstime x Control of Corruption | -0.000265 | (0.000231) | | |
| Political instability | -0.00704* | (0.00367) | -0.00825** | (0.00351) |
| Degree of corruption constraint | 0.0433*** | (0.00284) | 0.0437*** | (0.00308) |
| nonSME | -0.0246** | (0.0111) | -0.0221** | (0.0104) |
| Firm growth | -0.00504 | (0.0243) | | |
| Ln(age) | -0.00778 | (0.00557) | -0.00821* | (0.00446) |
| *Ownership* | | | | |
| Government | -0.0242 | (0.0270) | | |
| Foreign | 0.0197 | (0.0172) | | |
| *Practices of informal competitors* | 0.0113*** | (0.00253) | 0.0146*** | (0.00266) |
| Construction | 0.00917 | (0.00659) | | |
| Wholesale and retail trade | 0.00298 | (0.00546) | | |
| Hotels and restaurants | 0.0222* | (0.0132) | | |
| Transport, storage and comm. | 0.00868 | (0.0106) | | |
| Real estate, renting and b.a. | 0.0292** | (0.0126) | 0.0222* | (0.0117) |
| *Size of location* | | | | |
| 50,000 to 250,000 | 0.0157* | (0.00801) | 0.0129* | (0.00700) |
| Over 250,000 to 1 million | 0.0456*** | (0.0107) | 0.0464*** | (0.0101) |
| Over 1 million | 0.0492*** | (0.00927) | 0.0531*** | (0.00915) |
| Audited | 0.0183* | (0.00931) | 0.0182* | (0.00982) |
| Subsidized | -0.00353 | (0.0113) | | |
| Access to finance | 0.00757*** | (0.00266) | 0.00682*** | (0.00260) |
| *Access to land* | 0.0131*** | (0.00310) | 0.0112*** | (0.00242) |
| Construction | -0.000274 | (0.00514) | | |
| Wholesale and retail trade | -0.00550 | (0.00472) | | |
| Hotels and restaurants | -0.0162* | (0.00843) | | |
| Transport, storage and comm. | 0.00189 | (0.0101) | | |
| Real estate, renting and b.a. | 0.0103 | (0.0240) | | |
| *Business licensing and permits* | 0.00854** | (0.00380) | 0.0101*** | (0.00207) |
| Construction | 0.00262 | (0.00989) | | |
| Wholesale and retail trade | 0.000574 | (0.00564) | | |
| Hotels and restaurants | 0.0148 | (0.0119) | | |
| Transport, storage and comm. | 0.0295*** | (0.0112) | 0.0224** | (0.00937) |
| Real estate, renting and b.a. | -0.00581 | (0.0180) | | |
| Tax administration | 0.0149*** | (0.00319) | 0.0147*** | (0.00307) |
| *Courts* | 0.0163*** | (0.00328) | 0.0135*** | (0.00247) |
| Construction | -0.00677 | (0.00643) | | |
| Wholesale and retail trade | -0.00440 | (0.00410) | | |
| Hotels and restaurants | 0.00463 | (0.0122) | | |
| Transport, storage and comm. | -0.0148 | (0.0113) | | |
| Real estate, renting and b.a. | 0.0242** | (0.0117) | 0.0234*** | (0.00883) |
| *Customs and trade regulations* | 0.00715 | (0.00475) | 0.00681** | (0.00318) |
| Construction | -0.0134* | (0.00717) | | |
| Wholesale and retail trade | 0.00452 | (0.00611) | | |
| Hotels and restaurants | -0.00703 | (0.0155) | | |
| Transport, storage and comm. | -0.00842 | (0.0117) | | |
| Real estate, renting and b.a. | -0.0293* | (0.0156) | | |

| | | | |
|---|---|---|---|
| Number of observations | 10,159 | 10,159 | 10,159 |
| Percent correctly predicted | 88.27% | | 88.21% |
| Log-likelihood value | -2918 | | -2934 |
| Pseudo R-squared | 0.252 | | 0.247 |
| McFadden's Adjusted R-squared | 0.229 | | 0.236 |

Source: Enterprise Surveys, The World Bank Group

Reported numbers are based on average marginal effects of the explanatory variable.

Standard errors are reported in brackets

Significance: *** p<0.01, ** p<0.05, * p<0.1, based on standard errors of standardized coefficients

Standard errors are robust to heteroscedasticity and clustered on country.

*Table 0.4 Logit estimates of bribery in 2013*

Logit

Dependent variable: Bribes

| Independent variables | (1) | | (2) | |
|---|---|---|---|---|
| | Full model | | Parsimonious model | |
| Albania | -0.0977*** | (0.0107) | -0.0886* | (0.0535) |
| Armenia | -0.00634 | (0.0154) | | |
| Azerbaijan | 0.00351 | (0.0143) | | |
| Belarus | -0.0339*** | (0.00740) | -0.0391 | (0.0335) |
| BosniaHerzegovina | -0.0385*** | (0.00888) | -0.0461** | (0.0215) |
| Bulgaria | -0.0620*** | (0.0206) | -0.0433 | (0.0268) |
| Croatia | -0.0566*** | (0.0129) | -0.0526** | (0.0208) |
| Czech | -0.0224 | (0.0200) | | |
| Estonia | -0.177*** | (0.0225) | -0.160* | (0.0820) |
| Georgia | -0.0630*** | (0.00907) | -0.0701 | (0.0594) |
| Hungary | -0.0793*** | (0.0163) | -0.0614 | (0.0423) |
| Kazakhstan | 0.00401 | (0.00958) | | |
| Kosovo | -0.332*** | (0.00829) | -0.326*** | (0.0825) |
| Kyrgyzstan | -0.0351*** | (0.0105) | -0.0570* | (0.0310) |
| Latvia | -0.0972*** | (0.0196) | -0.0833 | (0.0632) |
| Lithuania | -0.161*** | (0.0229) | -0.152** | (0.0617) |
| Macedonia | -0.103*** | (0.0104) | -0.119*** | (0.0343) |
| Moldova | -0.0752*** | (0.00797) | -0.0753* | (0.0431) |
| Montenegro | -0.0285** | (0.0115) | -0.0349 | (0.0545) |
| Poland | -0.110*** | (0.0222) | -0.0970*** | (0.0254) |
| Romania | -0.155*** | (0.0174) | -0.132*** | (0.0236) |
| Serbia | 0.00197 | (0.00902) | | |
| Slovakia | -0.131*** | (0.0129) | -0.121*** | (0.0396) |
| Slovenia | -0.189*** | (0.0207) | -0.173*** | (0.0487) |
| Tajikistan | -0.0535*** | (0.0131) | -0.0526 | (0.0398) |
| Ukraine | -0.0971*** | (0.00620) | -0.1000*** | (0.0211) |
| *Industry* | | | | |
| Construction | 0.0222 | (0.0190) | | |
| Wholesale and retail trade | -0.00323 | (0.0145) | | |
| Hotels and restaurants | 0.00882 | (0.0364) | | |
| Transport, storage and comm. | -0.0676* | (0.0405) | -0.0790* | (0.0407) |
| Real estate, renting and b.a. | -0.0814*** | (0.0224) | -0.0871** | (0.0404) |
| *EU Membership* | | | | |

| | | | | |
|---|---|---|---|---|
| EU x Construction | 0.0321 | (0.0374) | | |
| EU x Wholesale and retail trade | 0.0269 | (0.0213) | | |
| EU x Hotels | 0.0747 | (0.0731) | | |
| EU x Transport | 0.0430 | (0.0355) | | |
| EU x Real estate, renting and b.a. | 0.0941*** | (0.0329) | 0.0825 | (0.0792) |
| Regulationstime | 0.000149 | (0.000289) | 0.000300 | (0.000197) |
| Regulationstime x Control of Corruption | -0.000179 | (0.000331) | | |
| Political instability | -0.00646* | (0.00387) | | |
| Degree of corruption constraint | 0.0411*** | (0.00346) | 0.0413*** | (0.00314) |
| nonSME | -0.0130 | (0.0288) | | |
| Firm growth | 0.0129 | (0.0190) | | |
| Ln(age) | 0.00330 | (0.00881) | | |
| *Ownership* | | | | |
| Government | -0.0250 | (0.0559) | | |
| Foreign | 0.0224 | (0.0199) | | |
| *Practices of informal competitors* | 0.0136*** | (0.00440) | 0.0134*** | (0.00319) |
| Construction | -0.00324 | (0.00514) | | |
| Wholesale and retail trade | -0.00189 | (0.00796) | | |
| Hotels and restaurants | -0.00919 | (0.0173) | | |
| Transport, storage and comm. | 0.0197 | (0.0142) | 0.0197 | (0.0129) |
| Real estate, renting and b.a. | 0.0198* | (0.0111) | | |
| *Size of location* | | | | |
| 50,000 to 250,000 | 0.00309 | (0.0119) | | |
| Over 250,000 to 1 million | 0.0230* | (0.0123) | 0.0207* | (0.0107) |
| Over 1 million | 0.0265 | (0.0179) | 0.0260* | (0.0141) |
| Audited | 0.00799 | (0.0158) | | |
| Subsidized | -0.00590 | (0.0169) | | |
| Access to finance | 0.00853 | (0.00619) | | |
| *Access to land* | 0.0161*** | (0.00335) | 0.0124*** | (0.00320) |
| Construction | -0.00879 | (0.00563) | | |
| Wholesale and retail trade | -0.00787 | (0.00759) | | |
| Hotels and restaurants | -0.0632** | (0.0280) | -0.0460 | (0.0311) |
| Transport, storage and comm. | -0.00851 | (0.0106) | | |
| Real estate, renting and b.a. | -0.0230 | (0.0452) | | |
| *Business licensing and permits* | 0.00909 | (0.00741) | 0.0128*** | (0.00354) |
| Construction | 0.00509 | (0.0101) | | |
| Wholesale and retail trade | 0.000422 | (0.0103) | | |
| Hotels and restaurants | 0.00438 | (0.0181) | | |
| Transport, storage and comm. | 0.0502*** | (0.0173) | 0.0425*** | (0.0140) |
| Real estate, renting and b.a. | -0.0378*** | (0.00774) | -0.0353 | (0.0291) |
| Tax administration | 0.00856 | (0.00719) | | |
| *Courts* | 0.0240*** | (0.00331) | 0.0286*** | (0.00450) |
| Construction | 0.00255 | (0.0110) | | |
| Wholesale and retail trade | -0.0184*** | (0.00548) | -0.0245*** | (0.00642) |
| Hotels and restaurants | -0.124** | (0.0501) | -0.0993 | (0.0670) |
| Transport, storage and comm. | -0.0329*** | (0.0123) | -0.0395** | (0.0158) |
| Real estate, renting and b.a. | 0.0179 | (0.0283) | | |
| *Customs and trade regulations* | -0.000124 | (0.00408) | | |
| Construction | -0.00981 | (0.00866) | | |
| Wholesale and retail trade | 0.0162** | (0.00631) | 0.0156*** | (0.00477) |
| Hotels and restaurants | 0.0296 | (0.0294) | | |
| Transport, storage and comm. | -0.0279 | (0.0172) | | |
| Real estate, renting and b.a. | -0.105 | (0.0861) | | |
| High competition | 0.0246*** | (0.00894) | 0.0245*** | (0.00839) |
| Number of observations | | 4,819 | | 4,819 |
| Percent correctly predicted | | 89.35% | | 89.19% |

| | | |
|---|---|---|
| Log-likelihood value | -1301 | -1721 |
| Pseudo R-squared | 0.244 | 0.234 |
| McFadden's Adjusted R-squared | 0.195 | 0.210 |

Source: Enterprise Surveys, The World Bank Group
Reported numbers are based on average marginal effects of the explanatory variable.
Standard errors are reported in brackets
Significance: *** p<0.01, ** p<0.05, * p<0.1, based on standard errors of standardized coefficients
Standard errors are robust to heteroscedasticity and clustered on country.

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