CEU Department of Political Science:

One-Year MA Program in Political Science 2019-2020

PERCEPTIONS OF CORRUPTION AND FIRM PERFORMANCE IN POST-COMMUNIST COUNTRIES: INSTITUTIONAL PERSPECTIVE

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Submitted to

Central European University

Department of Political Science

In partial fulfillment of the requirements for the degree of Master of Arts in Political Science

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Budapest, Hungary

2020

ABSTRACT

The thesis investigates the relationship between firm-level perceived corruption, country-level quality of institutional environment, and performance of enterprises in post-communist countries by using the fifth wave of the Business Environment and Enterprise Performance Survey (2012-2014). The theory suggests that corruption can either restrain the firm performance via misallocation of resources and entrepreneurial talent or accelerates it by circumventing the bureaucratic barriers and providing "speed money." The thesis demonstrates that the effect of corruption on micro-economic outcomes at the level of individual enterprises is conditional on the degree to which the rule of law, government effectiveness, and the regulatory quality are strict in the country. The empirical analysis of instrumental variable regression models with the country and economic sector fixed effects shows the positive relationship between perceptions of corruption and labor productivity growth that is statistically mitigated by the quality of the institutional environment. However, a robustness check demonstrates the positive association between perceived corruption and employment growth and a negative association between perceived corruption and sales growth. It means that the results are sensitive to the choice of proxy of firm performance. The study contributes to the literature by revealing that country-level institutional quality statistically matters for the firm-level link between perceptions of corruption and performance of enterprises in post-Communist countries.

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INTRODUCTION

Post-communist countries include "the territory of the USSR [the Union of Soviet Socialist Republics] and the East European communist state system until 1989/1991" (Karklins 2005, 14). Before the collapse of communist regimes, these countries were characterized by similar institutional systems, which opposed them to capitalist countries. One-party political rule, the absence of the independent branches of power, centralization, and the planned regulation of the economies sustained an environment in which the state remained the monopolist actor of political and economic decision making. After the dissolution of the USSR and transitions of former communist countries from socialism to capitalism, the private firms have gained the opportunity to become drivers of economic development, while the emerged parties and civil organizations - of political development. However, all actors had to operate in the context of a profound institutional transformation. The old rules of the game were destroyed, and the new rules were not fixed. This situation of institutional uncertainty forced the existing actors to look for alternative ways for decision making and promotion of their interests. One of these main ways was to create corrupt schemes.

Corruption as "the abuse of public or corporate office for private gain" (Bhargava 2005) includes many forms of illicit behavior from bribery and embezzlement to nepotism, electoral fraud, and vote-buying. It is worth noting that post-communist countries shared a historical legacy that is conducive to corruption: ineffective bureaucracy and clientelist networks around former soviet nomenclature (Batory 2018). Herewith, it is not clear what the economic effects of corruption are. On the one hand, it can "grease the wheels" of firms' economic activity by reducing red tape, delays, and bureaucratic constraints (Lui 1985; Leff 1964). On the other hand, corruption might "sand the wheels" by raising the costs of doing business and promoting misallocation of resources and production factors (Ernste and Helden 2017; Meon and Weill 2010; Kurer 1993).

While some post-communist countries, such as Estonia, have developed effective anti-corruption policies over time, others remain highly corrupt (such as Uzbekistan) or move towards more widespread corruption practices (as in the case of crony capitalism in Hungary (see Toth, Hajdu 2017)). According to the fifth wave of the Business Environment and Enterprise Performance Survey (2012-2014), corruption was called one of the top three obstacles for doing business by firms' representatives in Moldova (the highest score), Romania, Ukraine, Russia, Kyrgyz Republic (the second-highest rating), Albania, Bulgaria, and Kosovo (the third-highest score).

At the same time, after 30 years since the post-Communist transitions, the development of political institutions in the countries under consideration followed different scenarios. Eastern European countries (Slovakia, Slovenia, Poland, the Czech Republic, Romania, Bulgaria) and the Baltic States are developing democratic institutions and increasing the transparency of political processes. Authoritarian regimes are deepening in the former Central Asian Soviet republics. Democratization in Ukraine, Georgia, and Armenia is mixed with authoritarian elements, forming intermediate regimes between anocracies and weak democracies. In turn, stable political institutions either replace corrupt practices, making them unprofitable for public officials and firms, or support them if stakeholders continue to benefit and avoid control. In general, variation in corruption rates and institutional arrangements in post-communist countries provides ample opportunities for empirical investigation of its root causes and consequences.

The research problem behind this study is the lack of understanding of whether the corrupt practices perceived as an obstacle for doing business are detrimental to firm performance or not. On the one hand, corruption reduces the transaction costs of dealing with bureaucracy and rigid laws for firms. On the other hand, it squanders entrepreneurial talent, leads to misallocation of production factors, and prevents the development of effective formal institutions that are necessary for the long-run sustainable economic growth. Hence, it is not clear

is whether corruption is an obstacle to the development of firms in post-communist countries or a driver of their business growth under given institutional constraints.

The corresponding research question that of this thesis can be formulated as follows: what is the relationship between corruption perceived by firms' representatives, institutional environment, and firm performance in post-communist countries? We check between-country differences in the relationship and provide an appropriate explanation for this.

An empirical investigation is conducted by employing ordinary least squares and instrumental variable regression models using data from the fifth wave of the Business Environment and Enterprise Performance Survey (BEEPS) (2012-2014) and Quality of Government dataset. The BEEPS provides unique data with representative samples on firm activity in post-communist countries. The recent fifth wave includes firm-level information provided by representatives of enterprises from 30 post-communist countries.

The central argument of the thesis is that an institutional environment mediates the relationship between perceived corruption and firm performance in post-communist countries. The transitions from centrally planned to the capitalist market economic system and dissolution of the past party-state political system created uncertainty about the rules of the game. In the short run, corruption partially substituted new unconsolidated formal institutions in solving credible commitment problems between old state-owned firms, new private businesses, and public officials. In the long run, the institutional system with weak formal rules incorporates informal corrupt practices. In contrast, strong and consolidated formal institutional system replaces them with transparent mechanisms of sustainable firms' development. We use the concepts of institutional strength, institutional quality, and quality of governance interchangeably in our work since the operationalization of institutions is following the Worldwide Governance

Indicators (World Bank, 2020). In this framework, governance is defined as "as the traditions and institutions by which authority in a country is exercised" (World Bank 2020)

. In the latter scenario, corruption becomes detrimental for enterprises due to the higher costs of detection and punishment, deadweight losses and misallocation of resources.

The thesis contributes to the field of corruption studies by comparing the relationship between perceptions of corruption and firm performance on the large sample of post-communist countries for all five waves of the BEEPS. Previous studies have considered the links between the phenomenon of our interest in statics rather than in dynamics. Little work has investigated how the relationship between corrupt practices and firms' success is mediated by the quality of the institutional environment with proper accounting for the endogeneity problem. This study contributes to the literature by exploring interactions between different measures of institutional quality and perceptions of corruption and their effect on actual firm performance that can be tested for countries from other regions in the future studies.

The first chapter of the research provides a theoretical framework for further empirical analysis, emphasizing the conceptualization of the main term (corruption), reviewing the existing theories and approached to study the causes and effects of corruptive practices and discussing the mediation effect of institutional quality on the association between perceived corruption and firm performance. The second chapter empirically tests the hypothesis by employing a set of ordinary least squares and institutional variable regressions. The robustness check with alternative indicators of firm performance and logit modeling follows the initial empirical investigation.

CHAPTER 1: THEORETICAL FRAMEWORK

1.1. Conceptualization

The thesis focuses on the corrupt practices that involve firms as stakeholders. The firm is defined by Cambridge Dictionary (2020) as "a company that sells goods or services." In turn, corruption, as a highly contested concept, has many definitions that are the subjects of academic debate. Partially, the lack of conceptual clarity is the reason for the controversial results of empirical investigation (Heywood 2017, 31). This thesis follows the operational definition of the World Bank: "the abuse of public or corporate office for private gain" (Bhargava 2005). Without belittling the cultural differences in the meaning of corruption, this conceptualization applies to various contexts. The main feature of corrupt practices included in the World Bank's definition is the hidden use of power by public or corporate officials for pursuing their self-interest.

It is worth noting that the conceptualization of corruption in this thesis is not limited to the "the misuse of public power for private gain" (Karklins 2005, 5) because there is no clear distinction between the public and private sector in post-communist countries. With the development of a "financial-political complex" after the end of the Cold War, representatives of the private sector began to play a more critical role in power (Heywood 2017, 36). Literature on the "revolving door" phenomenon demonstrates the spread of the practice when highly ranked officials switch their activity to the private sector, and vice versa, the businessman, get government positions (Palmer and Schneer 2016; Baturo and Mikhaylov 2016; Bennie and Mause 2013). As a result, the strict distinction between public and private spheres has blurred. Primarily, it is evident for post-Communist countries in the short run after the transition from socialism to capitalism since private business is widely represented in government. Consequently, corrupt practices expanded from the level of "everyday interaction" between state officials and citizens to the level of private influence over political institutions (Karklins 2005, 25). Corruption at the latter level is perpetrated by actors that are connected to so-called "flexians": people who change

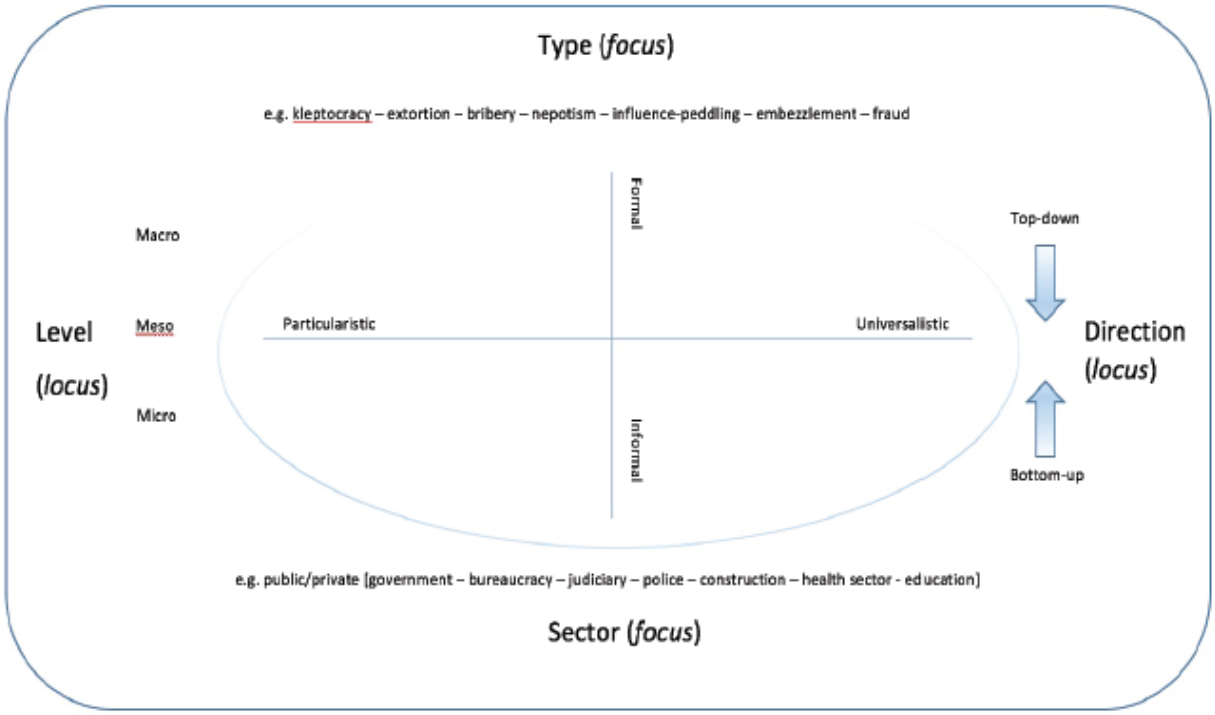
their positions in the social networks from the public to the private sector and vice versa (Heywood 2017, 36).

1.2. Typology of Corruption

Heywood (2017, 47) highlights four dimensions to study corruption (see Figure 1):

- Type: bribery, embezzlement, fraud, extortion, nepotism et cetera
- Sector: public, private
- Level: macro, meso, micro
- Direction: top-down and bottom-up

Figure 1. Dimensions of Corruption (Heywood 2017, 47)



Corruption, as a multifaceted phenomenon, incorporates many types of illegal practices perpetrated by public officials to extract personal revenues from their office: bribery, embezzlement, "deliberate over-regulation, obfuscation of rules, and disorganization," "misuse of

licensing and inspection powers," rent-seeking and "forming secret power networks to collude in corrupt acts" (Karklins 2005, 20-25).

At the macro-level, the focus is on the relatively new forms of transnational corruption networks that emerged as a result of financial and economic globalization. In turn, the meso-level approach is interested in corrupt practices in different public sectors. Finally, the micro-level studies are dedicated to the research question on corruption in a specific context and individual decision-making when engaging in a corrupt act (Heywood 2017, 39-43). The approach used in our thesis is close to the meso-level, and the micro-level since the main object of interest are firms operating in specific country-contexts.

Regarding the scale, corruptive practices can be divided into two groups: petty corruption conducted by individuals and low-ranking representatives of power and grand corruption at the high level of the political system. Karklins (2005, 21) mentions the asymmetry in political consequences of corrupt acts initiated by citizens and public officials. In the former case, bribery indirectly undermines some aspect of public life (for example, public safety if an individual offers a bribe to traffic cop), while in the latter case (for example, when police officer demands bribe for driving license), it imposes both indirect and direct costs jeopardizing public safety and the rule of law.

1.3. Literature Review

The development of the politico-economic studies of corruption from the game-theoretical modeling and principal-agent theory (see Klitgaard 1988; Lui 1985 Rose-Ackerman 1979) to the employment of perception-based indicators in general economic framework (see Fisman and Svensson 2006; Kaufman and Wei 2000; Shleifer and Vishny 1993) and network analysis and construction of objective indicators (see Wachs et al. 2020; Fazekas and Toth 2016) illustrates the full range of possible approaches to study different aspects of corruptive practices.

Previous literature proposed two general theories relating corruption to economic outcomes: "grease in the wheels" and "sand in the wheels." The first theory provides arguments in favor of the positive effects of corruption on the level of economic development and firm performance. The second theory reveals the negative consequences of corruptive practices. The complex institutional landscape in post-Communist countries provides empirical examples for proponents of both theoretical frameworks.

This section discusses, the main arguments of "sanding the wheels" and "greasing the wheels" theories on economic outcomes of corruption, the applications of principal-agent and collective action theories to the modeling of corrupt acts, and institutional explanations of links between rules of the game, the development of entrepreneurship and firm performance.

1.3.1. Theories of Economic Outcomes of Corruption

1.3.1.2. "Sand in the Wheels" Theory

The proponents of the harmful effects of corruption on the country- and firm-level economic outcomes argue that corruption increases the costs of doing business without a guarantee of compensating revenues. Corruption contributes to the higher amount of indirect taxation that is likely to cause concealment of the ventures' incomes and withdrawal of money to offshore companies. Moreover, it increases uncertainty for economic agents that do not have adequate indicators to compare their expected and real benefits from the engagement in corrupt actions (Hanousek and Kochanova 2016, 14). The winners of fraudulent auctions, which receive a privileged position to the public authorities, may not be the most efficient and profitable firms, but firms that make significant concessions in the quality of their products (Rose-Ackerman 1997).

In a highly corrupt environment, businesspeople do not have opportunities to perform without engaging in corrupt practices. Instead of using their revenues for the expansion of

activities and the optimization of the production processes with the new technologies and high-skilled workers, business owners are forced to spend their money on paying bribes, extorting competitors, and participating in kickbacks. These forced activities lead to the significant misallocation of resources. Moreover, corruption negatively affects the investment quality and overall investment climate (Dimant and Tosato 2018, 346). Firms that want to operate fairly or that are limited in growth by the primacy of corrupt practices receive strong incentives to go abroad. At the same time, new potential foreign investors are less likely to choose a corrupt country to invest in.

Furthermore, corruption squanders the entrepreneurial talent of businesspeople who have to spend their resources, including time, to develop strategies for participating in corruption schemes instead of transparent and cost-effective business models. In turn, public officials cause economic distortions and delays preserving corruption to save their source of additional personal revenue (Meon and Veil 2010, 246). Bureaucrats are personally interested in the economically inefficient allocation of firms' resources. As a result, unproductive sectors of the economy become protection from the public officials on behalf of more productive sectors that significantly limits the potential economic growth of countries.

1.3.1.2. "Grease in the Wheels" Theory

The "grease in the wheels" argumentation concerns cases in which systemic corruption provides indirectly benefits economic growth of firms and countries. According to its proponents, the main constrain of sustainable economic development is numerous inefficient bureaucracy that has discretionary power to extract personal rents (Galang 2012, 433). The bureaucracy burdens can be overcome by "grease" money provided via corrupt actions (Meon and Veil 2010, 245-246). In particular, corruption reduces red tape and time costs of queues. As a result, entrepreneurs can develop their business faster, reaching the level of self-sufficiency and increasing profits, which are partially returned to the state Treasury in the form of taxes. It is

worth mentioning that these arguments apply mainly to situations when bureaucratic burdens and delays are exogenous. As it is shown by Kaufmann and Way (1999), if the burdens and delays are endogenous, that is a subject to the choice by bureaucrats themselves, corrupt acts do not reduce the delays.

Besides, corrupt practices help to overcome the inefficient provision of public goods and contradictions of legal norms in countries with a weak institutional environment (Hanousek and Kochanova 2016; Acemoglu and Verdier, 2000; Lui, 1985). In a situation when the public sector does not work correctly, corruption becomes a means to attract investments, contrary to the "sand in the wheels" theory. When investors are interested in the market located in a corrupt country, they can assign their agents in corrupt networks and thus get brokers who would indicate suitable investment strategies. In general, "grease in the wheels" theory seems to be more flexible than the "sand in the wheels" approach by recognizing the various effects of corruption on a firm level. It assumes the broader role of agency and its characteristics that determine the propensity of a firm to gain from systematic corrupt practices in a context of imperfect policy and institutional environment (Mendoza et al. 2015).

Previous cross-country studies find a significant negative effect of corruption on economic growth (Mauro 1995), inequality (Gupta et al. 2002), foreign direct investment (Mathur, Singh 2013), as well as a positive effect on bureaucratic inefficiency (Kaufmann and Wei 1999) and share of the shadow economy (Dreher et al. 2009). At the firm level, the relationship between corruption and sales growth is estimated to be positive (Williams, Martinez-Perez 2017), negative (Athanasouli et al. 2012), or mixed (Sahakyan and Stiegert 2012). Furthermore, empirical research reveals that there is an industry-level variation in the levels of corruption: enterprises in more competitive industries face lower corruption (Clarke and Xu 2004; Nicholson 2007; cit. in Sahakyan and Stiegert 2012). The reason is that economic rents that can be obtained through engagement in corrupt acts are relatively low in an environment of high competitiveness. Hence,

firms and officials have fewer incentives to initiate illegal activities. At the same time, if government officials have enough unconstrained power to artificially create a monopoly for a firm that will assure the source of revenue for them, they will likely do it even in the competitive industry. Sahakyan and Stiegert (2012) find that larger firms that operate on monopoly and oligopoly markets perceive corruption as more favorable for their performance in comparison with smaller firms on competitive markets.

1.3.2. Theories of Corrupt Actions

1.3.2.1. Principal-Agent Theory

Earlier studies rely on the economic framework and employ versions of principal-agent theory to describe corrupt acts (Klitgaard 1988; Rose-Ackerman 1979). According to the theory, three types of actors interact with each other on the delivery of some public good: a principal, an agent, and a client. The theory assumes that the principal is an actor who pursues public interest and holds a primary public office. He or she expresses a set of preferences and delegate their realization to the agent, the civil servant that is not entirely devoted to the public interest. The agent interacts with a client (for example, a taxpayer) on the principals' behalf (Klitgaard 1988, 23-24). In turn, the agent has her private interest that can be satisfied at the expense of the principals' interests. The agent is likely to do it and act corruptly if the expected benefits of betraying public interests are higher than the anticipated costs of being punished. Moreover, limited monitoring ability and asymmetry of information prevent the principal from always imposing sanctions against corrupt agents. The client makes her calculations and decides to pay a bribe if her expected benefits outweigh expected costs.

Klitgaard (1988, 24) asserts that the principal is interested in the appropriate behavior of both the agent and the client and thus introduces corresponding policies. They include a selection mechanism for least corrupt agents, a change of rewards and penalties to the agent and the client, an increase of the likelihood that corruption will be detected, and measures to alter agents'

attitudes toward corruption. The prevalence of corrupt practices depends on monopoly power, discretion power, and accountability of public officials (Klitgaard 1988, 74). This argument can be presented schematically:

$$corruption = monopoly + discretion - accountability$$

The critique of the principal-agent models focuses on its unrealistic assumption that the principal pursues only public interests. For instance, Persson et al. (2013) point out that principals might not monitor agents to prevent corruption practices because of their private interests. In cases of grand corruption and crony capitalist systems, the corrupt acts can be initiated by the principals, which can use their power to avoid prosecution. The examples of public procurement demonstrate that the net beneficiaries of corrupt actions usually have very close connections to the principal who has her reward (see Toth and Hajdu, 2018 for Hungary; Mironov and Zhuravaskaya, 2016 for Russia).

1.3.2.2. Collective Action Theory

Later works on corruption adopt the collective action theory to answer the question of why anti-corruption policies fail. While agents and clients are motivated by their utility-maximization in the framework of principal-agent models, they behave following the strategies of the majority in society in the collective action framework. All actors, including principals, are expected to engage in corrupt actions because this behavior is dominant among the members of their community (Rothstein and Varraich 2017, 20; Persson et al. 2013, 456-457). Furthermore, monitoring agencies in the society where corruption is an expected behavior is inefficient since no actor has an incentive to punish corrupt officials. Even if the members of the community know that they can gain from a situation when they act not corruptly, they do not trust that the other members will follow their changing behavior and thus continue to pay bribes. Persson et al. (2013, 4647) cite Ostrom (1998) calling the described situation "a collective action problem of the 'second order.'"

Both principal-agent and collective action theoretical perspectives do not consider the specific contexts and the outcomes of corrupt actions. Moreover, they do not take into account that institutions can moderate the effects of corruption on the micro-level. Empirical studies include controls on the quality of the institutional environment, but they do not identify the causal mechanisms to explain the variance in the economic outcomes of corruption.

1.4. Institutional Approach to Study Corruption

An alternative approach to study outcomes of corruption is to use provisions of historical and rational choice neo-institutionalism. Institutions as formal and informal rules of the game (North 1990) create incentives for the actors to behave in a particular manner. Strong political institutions sustain an effective system of checks and balances that constrains the decision-making of potentially corrupt public officials. Thus, the positive effect of corruption on economic outcomes is not likely in countries with efficient formal institutions.

Several studies allege that corruption can promote economic development only in countries with weak, ineffective institutions (Méon and Veil 2010; Méon and Sekkat 2005; Mironov 2005). Mironov (2005, 6) differentiates between two types of corruption. Systematic ("bad") corruption is highly correlated with governance indicators representing "poor judiciary system, low government effectiveness, and cumbersome regulation," while residual ("idiosyncratic") corruption is associated with anti-corruption policies. Mironov infers that systematic corruption is detrimental for economic growth, and idiosyncratic corruption is favorable for growth, especially in countries with weak institutions operationalized by the indices of the rule of law, government effectiveness, and the regulatory quality from the World Governance Indicators.

Mendoza et al. (2015) claim that the possible reason for the positive relationship in a weak institutional environment might be that governments do not spend taxpayer revenues for public goods, and enterprises keep more available money for investment and better performance

if they evade taxes. However, it is not clear why the proponents of this argument do no consider the simple fact that corruption plays a role in indirect tax, which might be even higher than the official tax rate. Due to illegal nature, corruptive practices require significant efforts from the bribers to keep their activity secret. It makes corruption more distortionary than direct taxation (Shleifer and Vishny 1993, 612). Moreover, we doubt that the idiosyncratic corruption constitutes a particular type of corrupt activities since Mironov uses the measurement error to operationalize the residual corruption. Besides, the author mentions that the estimated positive relationship between residual corruption and economic growth can be endogenous: more entrepreneurs have incentives to start new businesses in the time of economic growth (Mironov 2005, 13). Consequently, they need more licenses and permissions and offer more bribes, in particular in countries with a poor institutional environment without a threat of legal prosecution. .

1.4.1. Political Institutions and Corruption

Treisman (2000) discusses how political institutions can promote or mitigate the harmful effects of corruption. A legal system that is built around judicial precedent is likely to prevent fraud since its representatives impose credible checks on corrupt authorities in government and parliament. On the other hand, there is a potential of higher corruption, if the precedent-based judicial system is introduced in a country without a tradition of an independent judiciary. In that case, judges obtain a broad discretion power that they can use for their interests. Also, there is some evidence on the U-shaped relationship between the level of judicial independence and the prevalence of corruption (Golden and Mahdavi 2015, 409). When the legal system is entirely dependent on the government, there is a lack of checks on public authorities, but high independence raises the potential for demanding bribes by judges.

Corruption can be limited by federalism since it provides an additional layer of checks and balances to the division of power. Moreover, the federal system promotes an internal competition between law enforcement agencies that stimulates them to look for the prosecution

of more crimes. However, the dispersion of power among many agencies increases the size of bureaucracy and might create additional uncertainty about divisions of responsibilities between federal and regional authorities. If the local government is highly independent of the central government, it provides an opportunity to create corrupt regional networks without a threat of punishment. Russian federal system at the end of the 1990-s – the beginning of the 2000-s represents the negative effect of the division of power between center and regions: authoritarian governors tended to use their authority in the area to create a highly-corrupt system to extract personal revenue. After centralization, which is illustrated by the substitution of governors' elections with appointments made by the president of Russia in 2004, regional heads of governments were limited in their capacity to build their corrupt networks. At the same time, the unitary system impedes a more hierarchical structure of political institutions, which increases the bottom-up accountability of public officials (Golden and Mahdavi 2015, 408).

The role of the form of governance and electoral systems are not prominent. On the one hand, presidentialism is associated with more accountability of elected politicians to the population. It creates more incentives for the prosecution of corrupt public officials (Golden and Mahdavi 2015, 406). On the other hand, parliamentarism is characterized by the less jurisdictional overlap between executive and legislative branches of power. Voters can identify who is responsible for policy outcomes. In presidential systems, the widespread corruption can be associated with the political system in general, while in parliamentarian systems – with current party in government.

In the case of the majoritarian electoral system, there is a closer link between elected officials and voters that reduces her incentives to bribe since she cannot be re-elected in the next election. Nevertheless, if a politician is popular enough and associated with the excellent well-being of the citizens, the fact of corruption might not be detrimental for her political carrier. In turn, proportional electoral systems are argued to be, on average, more favorable for bribery. The

closed party-lists reduce the visibility of elected officials to voters, which disincentivizes them from excellent performance. The open-party lists provide an incentive to incumbents to develop personal relationships with the electorate, which contribute to the tendency for rent-seeking (Golden and Mahdavi 2015, 407).

The previous studies hypothesized about the relationship between institutions and corruption on the side of public officials. However, there is a lack of research that combines in one theoretical framework-specific institutions, corrupt practices, and economic outcomes on the level of firms. It is shown that on the side of enterprises, political institutions affect performance through policy risks and uncertainty (Boubakri et al. 2015, 105). In countries with the developed systems of governmental checks and balances, firms do not have to keep always some amount of the revenue for corrupt activities. Instead, they can invest their resources in a new project that guarantees an additional profit.

Furthermore, a reliable system of checks and balances and corresponding political constraints make firms more reluctant to policy changes. Decision-making in countries with well-functioning governmental restrictions is consensus-based, thus stimulating governments to more stable policies. In turn, policy stability makes expectations of firms more predictable, which encourage more investments. Boubakri et al. (2015) admit the indirect impact of political institutions on firm growth through the constancy of the legal system, the development of the financial market, and the regulation of market imperfections.

1.4.2. Entrepreneurship, Institutions and Corruption

Little work has employed qualitative methods to study the interactions between the development of entrepreneurship, corruption, and firm performance. The exception is a qualitative study of businesspeople in Bulgaria and Romania by Vorley and Williams (2015). The authors demonstrate that weak institutions and underdeveloped entrepreneurial culture make it impossible for enterprises to operate independently from the corrupt environment. Despite the

membership in the European Union, corrupt practices remain a big issue in the countries hindering prospects for business development. The authors clearly show that the corrupt environment limits the entrepreneurial ambitions to expand active businesses from local to regional and national levels. The expected expropriation of business outweighs the potential of higher performance. As a result, entrepreneurs prefer to limit the scopes of their business and remain at the local level where they have guaranteed relatively small profit that is not attractive for state authorities (Sautet 2013).

Vorley and Williams (2015, 799) discover that ventures have to operate in "devils' circle" of corruption from which they cannot merely escape. They arguably emphasize that firms at the different stages of their development face various forms of corruption. At the beginning stage, start-ups have to pay bribes and provide gifts to low-ranking public officials for registration and required licenses to avoid deliberate delays associated with bureaucratic "paperwork." Usually, the size of bribes is small and not harmful for the development of enterprises. As firms grow, they face demands for more substantial bribes and gifts and new types of corruption, for example, extortion from the older firms on the market. At this stage, it becomes visible that demands from corrupt actors increase with the rise of the size and the revenue of a company, and the medium business decides whether to stop further the expansion of business to avoid more significant risks of informal expropriation by the state. If the heads of ventures choose to continue the expansion strategy, the sizes of the previous types of corruption similarly rise, and kickbacks can represent the new forms in public procurement and rent-seeking that might constitute a necessary condition for successful enlargement of an enterprise.

The development of individual firms in post-communist has occurred parallel to the development of entrepreneurship in general. Vorley and Williams (2015, 799) highlight three phases of entrepreneurship after the transition of countries from centralized planned systems to capitalism. During the first phase, firms operate at a low level and explore opportunities for open

markets. Some companies expand to a higher level, accumulate capital, seek for innovations, and develop long-term strategies at the second phase. During the third phase, ventures observe the underdevelopment of efficient institutions and limit their planning horizons and ambitions.

The largest firms at the final stage of entrepreneurship development in transition countries inevitably decide on what type of relationship with the corrupt state to establish. The one option is to regularly make private payments to the public officials to influence the decision-making and obtain the protection of the business from a predatory state. The second option is to exercise influence on the rules of the game without permanent payments by delegating their representatives to the decisive public authorities. Hellman et al. (2003. 743-744) refer to the companies that employ the former strategy as "captor firms" and to the ventures that use the latter approach as "influential firms." In post-communist countries, influential firms in the short term after transitions were represented by the state-owned large enterprises that had close ties with the previous communist regimes and secured property rights. In turn, captor firms mainly include private enterprises established after transitions without guaranteed property rights. Since captor firms had a rarer and farther connection with the state, they had to rely on monetary transfers to preserve their activity as the leading players on the markets. While influential and captor firms benefit from rent-seeking in terms of their performance, the other firms in the economy experience significant negative externalities that hamper their growth.

Blagojevic and Damian (2013, 133-134) cite the works by Shleifer and Vishny (1998) and Shleifer (1998) when they describe the models of interactions between institutions and entrepreneurs that are useful in the theoretical framework of this thesis:

- The invisible-hand model: the government is competent and uncorrupt, providing public goods and leaving market decisions to private ventures. All entrepreneurs operate in a favorable environment. Government officials do not extract personal value from interactions with companies.

- The helping-hand model: the government deliberately uses its power to pursue the interest of some firms on behalf of others. Corruption is organized and limited by the government. Only politically connected firms benefit from this model.
- The grabbing-hand model: the government does not provide any public goods. Its only aim is the extraction of rents. The mafia provides the enforcement of contracts. Corruption is disorganized and widespread. No business benefit in the model. Government officials extract rents from enterprises.

The helping-hand and the grabbing-hand models are typical for countries with the limited political competition. In turn, this environment is favorable for the establishment of so-called "entrenched parties" (Folke et al. 2011) that have opportunities to obtain benefits from rent-seeking, especially in public procurement sphere "due to an amicable relationship with opposition parties, more partisan control over local audits, and lower pressure from the media" (Broms et al. 2019, 1261). The authors (1281) note the following mechanisms that link the political entrenchment and the lower competition in public procurement:

1. The opposition parties are relatively weak and consequently cannot be willing to express their concern with the limited competitiveness of the bidding procedure.
2. Political entrenchment constrains external monitoring by audit agencies.
3. Media are less critical to the entrenched politicians who can control their editorial policy.
4. Established authorities limit the internal critique from the local bureaucracy.
5. The development of political-business networks is slower when one party holds a regional office for a long time.

The embeddedness of corrupt practices in the economy provides a basis for the emergence of crony capitalism: an economic system in which connected groups of government, business, and banks extract personal benefits on behalf of restricting other economic agents (Enderwick

2005, 119-122). The system of crony capitalism allows economic development in a politically unstable environment and the absence of limited government by solving credible commitment problems and some market weaknesses. However, the costs tend to outweigh the mentioned advantages since crony capitalism leads to a significant misallocation of resources in favor of inefficient industries, unequal income distribution, and protection of the power of incumbent elites associated with the lower political competition. Furthermore, the system implies little accountability, low transparency, and reliance on bank financing. It causes underestimation of risks and overinvestment (Enderwick 2005, 124). The extreme case of crony capitalism is the entire state capture by the businesses.

1.5. Institutional Quality, Corruption and Firm Performance

This section discusses how institutional quality influences the association between corruption and firm performance in the context of post-communist countries. Taking into account that the operationalization of the quality of institutional environment differs significantly depending on specific characteristics of institutions, we start with the broad indicators of institutional strength derived from the Worldwide Governance Indicators (WGI). Prima facie, among six aggregated WGI indicators (voice and accountability, political stability and absence of violence, control of corruption, government effectiveness, regulatory quality, the rule of law) the last three ones are the most relevant for the relationship between corruption and firm performance. Control of corruption is also obviously a relevant factor. Still, we do not discuss this indicator because of its endogeneity and self-explanatory value to the perceived corruption.

It is worth noting that the WGI data is based on the opinions of experts and the population so that the potential bias can be presented at the individual level. Moreover, aggregated indices of governance are highly correlated with each other. However, these biases are leveled at the country and cross-country levels, so the final empirical inferences based on the WGI data are expected to be in line with the theoretical argumentation.

1.5.1. Rule of Law, Corruption and Firm Performance

According to the WGI definition, "rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (World Bank 2020). In general, this characteristic of the institutional environment indicates the extent to which the legal rights of the population and businesses are protected against other economic agents, including state (Chadee and Roxas 2013, 23). The strict rule of law involves credible formal political institutions, an independent court system, impartiality of police, and acceptance of institutions by the citizens. If the rule of law in the country is strict enough, the code is the primary source to regulate the relations between different actors effectively. By enforcing property rights, providing financial stability, and increasing mutual trust, it creates a business environment that is favorable for the sustainable development of firms (Chadee and Roxas 2013, 23-24). As a result, corruption is expected to affect the firm performance more negatively with the increase of the rule of law. At the same time, if the rule of law is weak, corruption compensates this by providing a channel for effective interaction of firms with the state officials and can contribute to positive firm performance.

Consequently, the expectations are that the strict rule of law would lower the willingness of state officials and firm stakeholders to initiate and engage in corrupt practices because of the threat of detection and punishment by responsible authorities (police, anti-corruption departments). Furthermore, the strict rule of law transforms corruption from the "necessary evil" for business operations under non-credible formal institutions to the harmful activity that is gradually replaced by the valid legal system of contract enforcement. On the other hand, firms have more chances to perform well without necessarily using corrupt practices when the rule of law is secure in their country. It means that the potential positive relationship between corruption and firm performance under weak formal institutions is replaced by the negative correlation between the two phenomena.

The main channel through which the rule of law influences business is the property rights of entrepreneurs that define the extent to which laws protect the market economy and its agents, government policies and regulations (Chadee and Roxas 2013, 23-24; Haggard et al., 2008).

The empirical study by Meon and Weil (2008) demonstrates that the effect of corruption on economic growth at the macro-level is positive only in countries with weak political institutions and negative in countries with well-functioning institutions. In the first case, the weakness (low quality) of formal institutions contributes to the persistence of corruption as the "necessary evil," which facilitates the growth of both individual firms and economies. Since the institutions impose constraints on the decision-making process of actors and sustain a path-dependent way of development, corruption as a set of informal practices restricts possible exit strategies of entrepreneurs incentivizing them to engage in corrupt practices. The path-dependent nature of institutional development with the rare critical junctures (periods when the significant change is possible) prevents the continence of actors from corruption in a situation when there are no other enforcing and credible rules of the game. Nevertheless, when the formal institutions are developed and well-functioning what is reflected by the strict rule of law, corruption ceases to be the unique institutional channels to achieve firm growth. In countries, regions, and sectors with the weak rule of law, corruption occupies a niche of a tool for growth and indirect benefits maximization. Otherwise, the strict rule of law precludes corruption from being an "institutionally acceptable" channel to maximize utility.

As argued by Aidt (2009, 275), corruption as an illegal activity in the "grey area of the law" is associated with the risk. The level to which the entrepreneurs accept this risk is determined by their subjective characteristics (whether they are more risk-seeking or risk-averse) and the external environment (the institutional structure that minimizes or maximizes the risky nature of corrupt practices). In turn, the perceptions of the risk influence the decisions of firm managers to maximize the benefits of their enterprises). In an environment of the weak rule of

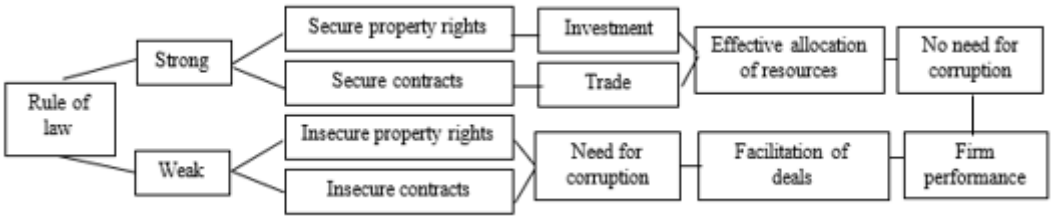
law, firm decision-makers are expected to be riskier by engaging in activities that would be not acceptable by them in an environment of the strict rule of law. The central theoretical question about the place of corruption in institutional systems is "whether such institutions are second-best adaptations to environments characterized by weak formal governance, or whether they constitute an efficient alternative to formal institutions" (Haggard et al. 2008, 246).

In our theoretical framework, firms are organizations "bound by a common purpose to achieve objectives" (North 2016, 74), namely maximizing profit from their economic activity. Enterprises constitute one of the central economic subjects, as well as trade unions, family farms, and cooperatives mentioned by North. They continuously interact with the institutions that are defined as "the humanly devised constraints that structure human interaction" (North 2016, 74). In the economic setting of limited resources, firms have to compete with each other to maximize their revenue. To sustain their competitive advantage, enterprises invest in skills and knowledge. In turn, the specific types of skills and experience are determined by institutional incentives. For instance, if corruption is included in the existing institutional environment as an acceptable form of behavior, firms obtain incentives to invest in knowledge of how they can engage in corrupt practices to maximize their revenue. In the opposite situation, if corruption does nor constitutes an acceptable part of the institutional system, entrepreneurs allocate their resources and talent to get more relevant skills and knowledge, for example, by developing new technologies of production.

In their thorough review, Haggard et al. (2008) point out that the rule of law is connected to economic growth via property rights and contract enforcement. Property rights as "social institutions that define the privileges individuals and other legal entities, such as firms, enjoy concerning a given allocation of resources" (Haggard et al. 2008, 207) constrain the behavior of private and state actors, despite the critique that they are endogenous to the policies and other institutions (see Glaeser et al. 2004). The strict rule of law secures property rights and the

integrity of contracts. It provides incentives for economic agents to invest and make trade deals that facilitate a more effective allocation of resources. As a result, more productive firms obtain more resources and perform well. In this causal chain, there is no need for systemic corruption that is relatively costly for both firms and states in comparison with the reliance on legal forms of operation through secured investment and trade. Otherwise, the weak rule of law creates incentives for economic agents to seek alternative, informal means to achieve the contracts. Corruption becomes one of the main channels to make credible deals in the absence of adequate formal legal institutions. Engagement of the company in corrupt practices increases its bargaining power—consequently, corruption benefits firms by the increasing potential of good performance in a weak institutional environment.

Figure 2. Causal Path from the Rule of Law to Corruption and Firm Performance



The rule of law is an ambiguous concept that is defined not only through the security of property rights and enforcement of contracts, through "the principle of equal treatment and procedural fairness" (Haggard et al. 2008, 210). In countries with the strict rule of law, the law is consistently, and nondiscriminatory applied to all economic agents. In turn, corruption distorts economic growth and firm performance by violating the law. There are three main reasons for the presence of a negative link. First, commercial agents have to use private enforcement because the judicial system becomes a dependable institution, which implies additional costs and prevents firms from investing. Second, corruption increases the risks for producers by incentivizing the allocation of resources to rent-seeking activities. Third, corruption practices imply barriers to long-run growth: "monopolies, restrictions on entry, protectionism, misallocation of government

spending, and private expropriation of assets through managerial malfeasance" (Haggard et al. 2008, 211).

The above discussions demonstrate that the rule of law is an essential characteristic of an institutional environment that affects the relationship between corruption and firm performance via the security of property rights, contract enforcement, and the degree of procedural fairness and equal treatment of the law. In countries and economic sectors with the strict rule of law, corruption is expected to have a negative relationship with firm performance. In contrast, the weak rule of law is expected to have a positive effect or, at least, lower the detrimental effects of corruption on firm performance. Nevertheless, the rule of law is not the unique aspect of an institutional system that mediates the relationship between corruption and firm growth. The next section discusses how government effectiveness affects the link between two phenomena of our interest.

1.5.2. Government Effectiveness, Corruption and Firm Performance

The WGI defines government effectiveness as "the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies" (World Bank 2020). This characteristic of the institutional environment provides certainty to entrepreneurs about the formal rules of the game. In an institutional setting with the weak government effectiveness, firms' managers need to spend their resources to follow inconsistent and contradictory policies instead of allocating them to improve their business operation (Elango and Lahiri 2014, 147). It contributes to the instability of managerial decision-making, additional delays, and non-productive investments. The poor and non-independent public services provide opportunities to establish informal connections with firms that commit to engaging in corrupt practices to omit the barrier of non-effective government. In this kind of situation, government officials have incentives to continue the implementation of contradictory

policies and regulations to make impossible the full compliance with all laws. If the system of checks and balances does not prevent the abuse of public office for private gains, state officials have the power to continue their ineffective operation in terms of provision of public, but useful in terms of extracting their revenue. In turn, firm managers need to spend their time and entrepreneurial talent in day-to-day operations without strategic planning due to the continually changing environment (Elango and Lahiri 2014, 147). Elango and Lahiri suggest that the weak government effectiveness turn economic agents to avoid the interference of state actors in the operation of their organizations by making suboptimal choices that lead to additional delays and costs.

In turn, corruption substitutes the legal regulation of state-business relations. Corruption provides a mechanism to secure the contracts between enterprises and the state. However, the effect of corruption on firm performance is not straightforward. On the one hand, companies that have enough resources to be corrupt tend to be among the most profitable in their markets. It means that they perform well, and corruption preserves their economic performance.

On the other hand, firms that are limited in available resources but have the potential to develop, suffer twofold from corruption. They need to pay bribes because otherwise, they have little chances to continue their operation. However, bribing leads to misallocation of resources that could be used to improve the efficiency of the production process. Moreover, regular payments to corrupt state officials do not guarantee the permanent place on the market if the competitors spend more resources to bribe.

The causality of the relationship between corruption and government effectiveness can be not one-way, as it is shown by the empirical investigation by Montes and Paschoal (2016). The authors demonstrate that the perceptions of decrease in corruption are associated with the perceptions of an increase in government effectiveness. They emphasize the relationship between two indicators with regards to their change and not levels. However, it is insufficient, and our

study looks at the static picture as well. The starting point of the causal chain from corruption and government effectiveness to firm performance depends on the chosen time and specific context. For example, in the first years after the transition of post-communist countries, the government's effectiveness was not very strong because new governments had operated in an environment of economic and political transformation that required time for the adoption of agents. Complex institutional restructuring and related uncertainty created incentives for state officials to use informal practices to extract personal revenue. In former Soviet countries, this was often associated with the building of corrupt networks around high-profile officials and emerging oligarchs. In turn, the widespread corruption leads to misallocation of government expenditures and inadequate provision of public goods. Unless the judicial system becomes independent of punishing the corrupt officials for embezzlement of federal funds, bribery, and rent-seeking behavior, the government has no forcing incentives to increase its effectiveness. In the situation of reduced government effectiveness, an alternative way for entrepreneurs to achieve sustainable development of their business is to engage in corruption networks. As a result, the higher corruption in countries with weak government effectiveness, the higher is potential for bribing firms to perform well. If the government increases its efficacy, corruption becomes a less acceptable and more risky activity, and potentially corrupt politicians and economic agents have stimuli to abstain from misuse of public office for private gains and turn to more transparent means of extracting benefits. Then corruption is expected to be associated with lower firm productivity and growth.

1.5.3. Regulatory Quality, Corruption and Firm Performance

Regulatory quality refers to the indicator of institutional quality that captures the degree to which government policies promote or hinder equal opportunities for the development of business. WGI defines it as "the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development" (World Bank

2020). A good government seeks a balance between regulations and the free market. The optimal regulation contributes to the development of enterprises by setting stable rules of the game. They reduce uncertainty and ensure the protection of fair competition between the market players. In turn, too restrictive and detailed regulatory policies hinder the business activity since the entrepreneurs become also constrained to implement the most effective strategies to sustain long-term economic performance. Potentially well-performing firms need to spend their resources to deal with the harsh regulations instead of allocating them to develop new technologies, expand to new markets, and enhance the general effectiveness of the operation.

The overregulation reflecting the poor regulatory quality provides ample opportunities for bureaucratic delays. Bureaucrats receive incentives to continue imposing additional restrictions on the business and create contradictory rules to the extent that entrepreneurs cannot make a business decision without violating at least one formal law. This situation creates a potential for the establishment of practices bypassing the formal institutions. Market players have incentives to propose a bribe and state officials to agree if the risk of punishment does not credibly threaten them. Corruption becomes a mechanism to "grease the wheels" of commerce by overcoming regulatory burden, increasing decision-making speed, and contributing to the growth of enterprises.

Furthermore, enterprises can face increasing costs of production if the government implements market-unfriendly policies, sets the prices for some goods, and imposes excessive regulations (Ngobo and Fouda 2012). By engaging in corruptive practices, firms achieve efficiency gains when government intervention is economically undesirable (Jiang and Nie, 2014). Djankov et al. (2002) confirm the theoretical expectations by finding that higher regulation is associated with a more significant share of the informal economy and higher corruption.

Frequently, government effectiveness and the regulatory quality are combined into a single concept of governmental capabilities (Elango and Lakhiri 2014) or government capacity

(Ngobo and Fouda 2014). The government, with strong capabilities, is effectively contributing to the macro-economic growth at the country-level and micro-economic growth at the level of individual firms. State officials create transparent rules of the game which do not imply for enterprises high costs of production, promote competition, and intervenes in the market pointwise when it is necessary. As in the case with the strict rule of law, the developed government capabilities make systematic corruption too costly for both state and firm representatives. In sum, the theory has enough ground to predict the relationship between corruption and firm performance is mediated by government capacity, including regulatory quality. In countries with the relatively weaker regulatory quality, the expected positive association between corruption and firm growth would be more pronounced than in countries with the relatively more reliable, but still generally poor institutional quality. At the same time, firms operating in countries with a stable regulatory condition are expected to enhance the negative relationship between corruption and firm performance.

The first chapter provided an overview of the background literature and discussed the theoretical framework of the research. It argues that the link between perceived corruption at the firm level and enterprise performance is mediated by the quality of the institutional environment in which the company operates. In turn, the second chapter tests the theoretically proposed relationship by employing ordinary least-squares and instrumental variable regression models. An analysis of logit models provides the robustness check of the findings.

CHAPTER 2: EMPIRICAL ANALYSIS

2.1. Hypotheses

The thesis tests the following hypotheses that are formulated based on theoretical expectations discusses in detail in the previous chapter:

H1: Firm-level perceptions of corruption as an obstacle for doing business are negatively associated with firm performance in terms of labor productivity growth, sales growth, and employment growth in post-communist countries. We test whether the "sand in the wheels" or the "grease in the wheels" theory is confirmed for firms in post-communist countries.

H2: The firm-level perceptions of corruption are more negatively associated with firm performance in countries with a more robust institutional environment (the rule of law, government effectiveness, and regulation quality). Based on the theoretical discussion of institutional mediating effects (see Section 1.5), we expect to explore whether and how the quality of institutions affects the relationship between firm-level perceived corruption and business performance.

2.2. Data

To test our hypotheses, we employ a set of regression models using data from the BEEPS V (2012-2014) due to its coverage and temporary relevance. Since there are a relatively low number of firms' representatives that participated in more than one wave of the survey and following limited overlap between compositions of respondents, we do not have sufficient grounds to consider an unbalanced panel data structure. Although the first data of the BEEPS VI (2018-2020) is available for analysis, the coverage of post-communist countries is limited in comparison with the previous wave of the survey. To account for important country-level characteristics that can be related to the indicators of firm performance, we combine the BEEPS

data with the Quality of Governance dataset, which contains many institutional, political, and economic variables that are relevant in the context of this research.

2.2.1. Dependent Variable

As the primary dependent variable of our interest, we use labor productivity growth in line with the previous empirical study by Blagojevic and Damian (2013). To construct this variable, the initial indicators of sales and employment in the last fiscal year and three fiscal years before the BEEPS V were derived and used in the following formula:

$$labor\ productivity\ \ growth = \frac{\frac{sales\ in\ the\ last\ fiscal\ year}{employment\ in\ the\ last\ fiscal\ year} - \frac{sales\ 3\ fiscal\ years\ ago}{employment\ 3\ fiscal\ years\ ago}}{\frac{sales\ 3\ fiscal\ years\ ago}{employment\ 3\ fiscal\ years\ ago}}$$

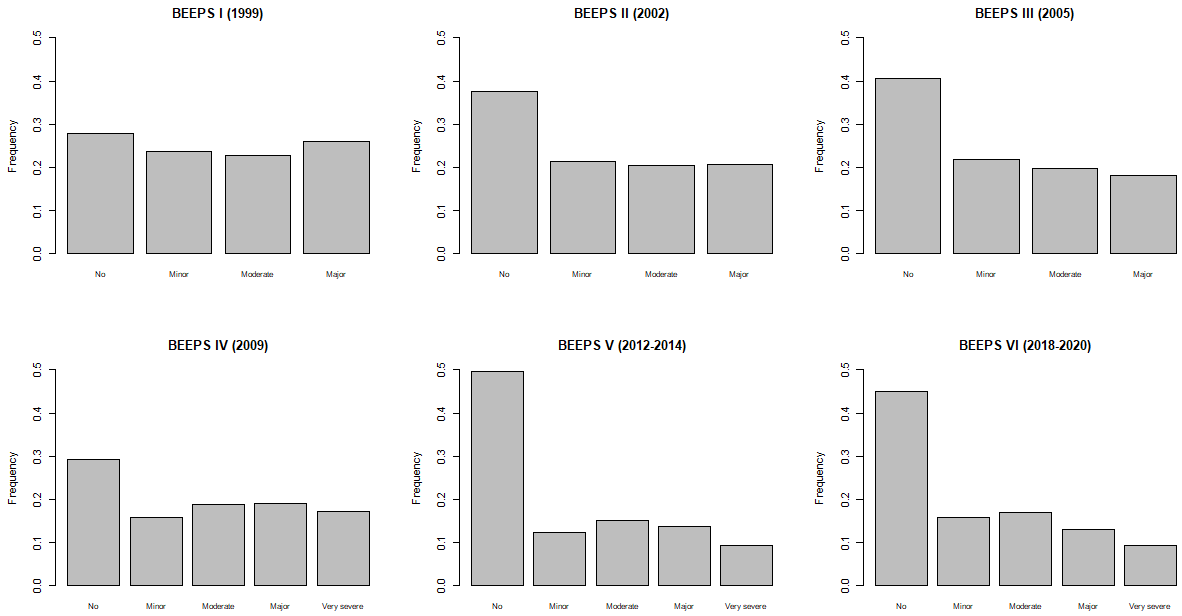
Labor productivity reflects the performance of firms in terms of how efficient employers are used to producing the goods and services to sell them on markets. It corrects the simple measure of sales growth for the scale of the labor force and employment growth for the need of enterprises to guarantee sustainable growth.

2.2.2. Independent Variable

The main independent variable is the perceptions of corruption as an obstacle for doing business, namely the operation and growth of the company. The variable is categorical with five categories for the BEEPS from the fourth to the sixth waves and four categories for the BEEPS from the first to the third waves: no obstacle, minor obstacle, moderate obstacle, major obstacle, and very severe obstacle. The last category is absent for the BEEPS I-III). Figure 3 illustrates the frequency of perceived corruption. On average, there is an increase in the proportion of respondents who viewed corruption as no obstacle for doing business from around 28% in 1999 to 50% in 2012-2014 and 45% in 2018-2020. It is worth mentioning that the gradual increase of the perception of corruption as no obstacle from 1999 to 2005 was interrupted in 2009 with the

drop of the relative frequency to the level of 1999, which can be related to the general economic recession in 2008-2009.

Figure 3. Frequency of the Variable "Corruption as an Obstacle for Doing Business"



2.2.3. Control Variables

A set of the control variables that are included in the main specifications at the firm-level are the following:

- *Age* of the firm constructed with subtracting the values for the variable "the year when the establishment began its operation" from the values of the year when the interviews with firms' representatives were conducted.
- *Foreign ownership* measured as the share of the firm owned by private foreign individuals, companies, or organizations ranging from 0 to 1.
- *Part of a larger firm* indicating whether the enterprise is an asset of another business or on its own.
- *Export orientation* measured as a share of direct and indirect export in the establishment's sales, ranging from 0 to 1.

At the country level, we include controls for the following variables:

- *Polity IV* index value indicates the level of democracy for the political regime of the country where specific firms operate in a range from -10 corresponding to the most authoritarian regime to 10 correspondings to the most democratic regime.
- GDP growth (*GDP_gr*) defined as the "annual percentage growth rate of GDP at market prices based on constant local currency" (Teorell et al. 2020) that is standardly employed in regression models to account for the average level of economic development.
- Rule of Law (*RL*) which "captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence." (World Bank 2020).
- Government Effectiveness (*GE*) that "captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies." (World Bank 2020).
- Regulatory Quality (*RQ*) that "captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development." (World Bank 2020).

To obtain the fitted values of corruption during the estimation of the instrumental variable regression, we use the second set of firm-level control variables proposed by Hellman et al. (2000) and tested by Bondarev (2013) to identify the effect of ownership type on the perceptions of corruption. These controls include the following indicators:

- The size of the firm (*small_size*) with value 1 corresponding to less than 50 workers and value 0 to more than 50 workers. The small firms are expected to suffer more from when

they perceive corruption as a barrier for their operations due to the limited resources that they possess to act corruptly.

- The origin of the firm (*origin*) with 1 indicating that firm was initially established as a private business and 0 otherwise. The performance of privately established firms might be more negatively affected if they perceive corruption as an obstacle in comparison with the state-owned firms.
- Innovativeness of the enterprise (*innovation*), which equals one if the firm spent on research and development activities during the last three years before the survey was conducted. The innovative enterprises are expected to be less affected by corruption and less perceive it as an obstacle because they use the alternative efficient channel to improve their operation and economic gains.
- Perceptions of crime, theft, and disorder as a barrier for the operation of firm (*crime*) with value 1 corresponding to the answers of respondents that these factors were "very severe" or "major obstacle."
- Perceived practices of informal competition as an obstacle to the current operations of the establishment (*infcomp*). If the respondent reported that informal competition was a "very severe" or "major" obstacle, then the value of the indicator is 1 and 0 otherwise.
- Share of workers with university degrees (*eduemp*). The more employees with higher education might be associated with average better performance of business since the labor productivity increases.
- International certification (*certif*) that equals 1 if a firm had an internationally recognized quality certification and 0 otherwise. The high-quality firms are expected to have a relatively higher probability of performing positive sales and employment growth rather than negative in comparison with firms that have no international certification.

- The share of state ownership (*state_own*), which, as with the non-private origin of the firm, maybe negatively associated with the performance growth due to the less market efficiency or positively associated due to the more state protectionism compared to private enterprises.

2.2.4. Descriptive Statistics

The full combined 2012-2014 BEEPS and QOG database contains information for 14256 firm-level observations from 30 countries: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Greece, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Moldova, Mongolia, Montenegro, North Macedonia, Poland, Romania, Russia, Serbia, Slovak Republic, Slovenia, Tajikistan, Ukraine, and Uzbekistan. The descriptive statistics for the main independent, dependent, and control variables are presented in Table 1.

Table 1. Descriptive Statistics

	labor_pr_gr	Corrupt.	age	f_own	larg	exp	polity	GDP_gr	GE	RL	RQ
Min.	-17.074	0,000	0,000	0,000	0,000	0,000	-9,000	-1.132	-1,058	-1,253	-1,603
Mean	-0,189	1,209	14,000	0,049	0,083	0,052	4,815	3.664	-0,158	-0,334	-0,015
Max.	8,208	4,000	174,000	1,000	1,000	1,000	10,000	10.915	1,018	1,198	1,448
Obs.	8450	13867	14332	14459	14459	14459	13896	14256	14256	14256	14256

The main limitations of the employed data are related to the variable sales growth due to the relatively high underreporting of the firm's representatives of annual sales three fiscal years before the BEEPS wave was conducted. The mean values of sales growth and employment growth demonstrate that they are more enterprises that experienced an increase in the capital but decreased or no change in the number of workers. We can suggest that the main operation of firms is aimed at improving the economic output in terms of sales by using a relatively lower amount of labor force that indicated the higher productivity of the enterprise.

The main part of the respondents perceived corruption as no or minor obstacle to their operation. As it was mentioned above, the relative frequency of perceiving corruption as a not significant barrier to the business operation is the highest for the fifth wave of BEEPS in comparison with other waves.

The age of the firms varies from 0 (corresponding to the firms that opened in the same year when the survey was conducted) to 174 years with the mean value of 14. The mean value of foreign ownership is 4,9%, meaning that, on average, the main share of the firm is owned by domestic shareholders. In turn, 8,3% of the firms are part of larger establishments. The average percentage of export in the firm's sales is 5,2%. There is a high variation of different political regimes measured by polity indicator from -9 corresponding to one of the most consolidated autocracies to 10, which indicated the most democratic regime. The mean value of 4,8 demonstrates that the majority of countries in the sample are anocracies which combine democratic and authoritarian institutional features.

To check how the variables in the dataset are related to each other, we conducted a preliminary analysis of pairwise Pearson correlations between the main variables of the interest. Table 7 in Appendix demonstrates the correlations between the main variables except for five measures of institutional quality, which are highly correlated with each other, so we include them only separately in the different specifications of the regression models (see Section 2.3 below). The highest values of the Pearson correlation are measured for country-level GDP per capita Polity score (0,654) and GDP per capita and the rule of law (0,633). In implies the additional adjustment of the regression models to consider the potential problem of multicollinearity (the presence of the relationships between explanatory variables). All the other pairwise correlations between the dependent, independent, and control variables are less than 0,3, meaning that the association between them might be at least not linear and requires additional tests by employing multivariate regression models. Moreover, the small values of correlations can be explained by

the binary (sales growth, employment growth, part of a larger firm) and categorical (corruption) nature of some variables.

Based on the preliminary correlational analysis, we expect to find a positive association between the sales growth and the share of foreign ownership, part of a larger firm and export-orientation and negative association between sales growth and corruption, age, level of democracy, GDP per capita and the rule of law. In turn, the expected relationships between employment growth and all explanatory variables are weakly positive. Nevertheless, the small values of the majority of pairwise correlations are sufficient to claim that the relationships can be different after conducting a multivariate regression analysis.

2.3. OLS Regression

2.3.1. Model

The basic linear models that are employed for the preliminary test of the association between corruption and firm performance is represented by the following specification:

$$labor\_pr\_gr = \beta_0 + \beta_1 * corrupt + \beta_2 * controls_{firm} + \beta_3 * controls_{country} + (country\ FE) + (sector\ FE) + \epsilon,$$

where "labor_pr_gr" indicates the labor productivity growth during the last three fiscal years before BEEPS V was conducted, "corrupt" is perception of corruption by firm representatives as an obstacle for doing business, $controls_{firm}$ is the set of firm-level control variables, $controls_{country}$ is the set of country-level control variables and ϵ is a random error. Furthermore, the unobserved characteristics of firms are controlled by including country- and operating sector-specific fixed effects.

2.3.2. Results

The results of the ordinary least squares estimation of regression models are presented in Table 2. The sample is restricted to the firms that perform no more than 200% percent growth in terms of sales in the last three years to exclude the biased estimation due to the influential variables. It is worth noting that the direction of signs is preserved for the full sample. Still, the values are not very convenient for interpretation because some enterprises performed exceptionally well in terms of sales or employment during the three fiscal years before the BEEPS V survey was conducted.

The model specifications 1-3 includes interaction terms between institutional quality variables (the rule of law, government effectiveness, and regulatory quality consequently) and perceptions of corruption as an obstacle for doing business. Moreover, they include the sets of the main firm-level and country-level control variables. The estimated coefficients for corruption are negative and statistically significant at the 90% confidence level for the models 1 and 2. The institutional quality variables are substantial for all specifications at a 99% confidence level. Contrary to our expectation, the rule of law is negatively associated with labor productivity growth. At the same time, the interaction terms are negative, but only significant for model 3. Substantially, it gives a reason to suggest that perceived corruption and the rule of law are negatively associated with labor productivity growth. In contrast, government effectiveness and regulatory quality are positively associated with labor productivity growth.

The model specifications 4-9 include an additional set of firm-level controls and GDP per capita instead of GDP per capita growth as an indicator of country-level economic development. Besides, models 5, 7, and 9 include sector-specific fixed effects to account for unobserved variation due to the specific nature of industrial areas in which firms operate. For example, entrepreneurs that compete at IT markets can be less engaged in corrupt practices and consequently perceive corruption as a not severe obstacle for their business because they rely on

innovations that guarantee firm growth without a need to use illegal channels. The coefficients for perceived corruption are significant for models 4 and 5 with the rule of law as the institutional quality variable. On average, the more severe obstacle corruption is perceived by senior firm management, the lower is the labor productivity growth of the enterprise. The negative association is also estimated between the rule of law and labor productivity growth. The interaction term between institutional quality variable and perceived corruption is statistically significant for model 4 only that provides a limited ground to conclude about the exacerbating effect of the rule of law on the relationship between corruption and firm performance. For model 4, the negative association between perceived corruption and labor productivity growth is more negative with the increase of the rule of law. However, when the economic sector fixed effects are taking into account, the significance of the interaction term disappears.

The results of the OLS estimation are not conclusive enough to affirm the robust relationship between perceptions of corruption and firm performance in post-communist countries. The statistical significance of the coefficients for variable "corruption" in OLS models 1-9 does not exceed the 90% confidence level (except model 1 with 95% confidence level), which can be regarded as weakly significant in statistical terms. Nevertheless, the OLS regression analysis provides preliminary evidence in favor of "sand in the wheels" theory.

The preliminary OLS results are in line with the empirical findings of Blagojevic and Damijan (2013). They used the BEEPS I-III panel data (2002-2009) and showed that engagement in corruption in the form of state capture and informal payments is positively associated with labor productivity growth of foreign-owned private firms and negatively associated with labor productivity growth of state-owned enterprises. Moreover, we confirm the validity of results obtained for firms in one country (Uganda) by Fisman and Svensson (2005), revealing that the one-percentage-point rise in the bribing rate is associated with the three-percentage point decline of sales growth. Out robustness check (see Section 2.5 below) where we employ the alternative to

labor productivity growth indicators of firm performance (sales growth and employment growth) further validate Fisman and Svensson's research. Moreover, our OLS regression analysis extends the conclusions made by Gaviria (2002) based on World Bank data on Latin American firms. He regressed the sales growth rate on perceptions of firm managers of corruption as an obstacle for operation and a set of firm-level control variables. The estimations of OLS models provided a statistically significant negative relationship between perceived corruption and sales growth. Besides, our OLS regression results support the study conducted by Sahakyan and Stiegert (2012) on 400 Armenian firms. The authors employed probit regression models and revealed that larger enterprises on markets with limited competition are more likely to perceive corruption as a not significant obstacle for their performance in comparison with smaller firms that operate on markets with many competitors.

Even though our OLS regression results may be used to support the "sand in the wheels" theory at the micro-level, they are weak in statistical terms. They can be improved by techniques that address the problems of unobserved heterogeneity and endogeneity, which is the correlation between independent variable and error terms. Inclusion of country and sector-specific fixed effects helped to solve the first problem, but the threat of potential bias in results due to endogeneity remains. While the firm-level controls are relevant for the dependent variable of interest, they affect the dependent variable too, since enterprises with various characteristics tend to perceive corruption as an obstacle for doing business differently. As pointed out by Fisman and Svensson (2005, 65), the size of the bribe "required" by state officials may be determined by the ability of the enterprise to pay: the more productive firms, the higher bribes are demanded by bureaucrats. At the same time, businesses can choose corruption to achieve growth instead of improving the efficiency of the production process. As a result, it is hard to differentiate between the sources of growth empirically. To address the issue with endogeneity and obtain more accurate coefficients of statistical estimation, we employ instrumental variable (IV) regression. The next paragraph discusses the specifications of IV models and provides the results.

Table 2. OLS Regression Results

	Dependent variable:								
	labour productivity growth								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
corruption	-0.013**	-0.011*	-0.008	-0.012*	-0.012*	-0.009	-0.009	-0.005	-0.006
	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.006)	(0.007)	(0.006)	(0.006)
RL	-3.672***			-3.858***	-3.276***				
	(0.292)			(0.301)	(0.341)				
GE		2.761***				2.235***	-0.258		
		(0.307)				(0.323)	(0.557)		
RQ			3.033***					3.497***	2.751***
			(0.757)					(0.818)	(0.843)
log (age)	0.002	0.002	0.006		-0.014		-0.011		-0.011
	(0.013)	(0.013)	(0.013)		(0.016)		(0.016)		(0.016)
f_own	-0.002	0.004	-0.001		0.022		0.028		0.027
	(0.036)	(0.036)	(0.036)		(0.040)		(0.040)		(0.040)
larg	-0.026	-0.020	-0.020		-0.042		-0.042		-0.040
	(0.029)	(0.029)	(0.029)		(0.032)		(0.032)		(0.032)
exp	0.108***	0.110***	0.106***		0.086*		0.083*		0.081*
	(0.040)	(0.040)	(0.041)		(0.046)		(0.047)		(0.047)
p_polity2	-0.018	-0.127	-0.322		-0.032		-0.244		-0.381
	(0.442)	(0.444)	(0.448)		(0.455)		(0.461)		(0.460)
GDP pc growth	-0.005	-0.049***	-0.031***						
	(0.008)	(0.008)	(0.007)						
GDP pc					3.094***		6.839***		6.172***
					(0.780)		(1.209)		(0.711)
small_firm				0.061***	0.081***	0.057***	0.082***	0.058***	0.082***
				(0.020)	(0.022)	(0.021)	(0.022)	(0.021)	(0.022)
private origin				-0.076***	-0.079***	-0.081***	-0.079***	-0.078***	-0.078***
				(0.023)	(0.025)	(0.023)	(0.025)	(0.023)	(0.025)
innovation				0.032	0.034	0.023	0.029	0.021	0.029
				(0.025)	(0.026)	(0.025)	(0.027)	(0.025)	(0.027)
crime				-0.008	-0.004	-0.011	-0.006	-0.014	-0.007
				(0.021)	(0.022)	(0.021)	(0.022)	(0.021)	(0.022)
infcomp				0.007	0.014	0.006	0.012	0.004	0.012
				(0.017)	(0.018)	(0.017)	(0.018)	(0.017)	(0.018)
eduemp				-0.0004	-0.00004	-0.0003	0.00000	-0.0004	0.00001
				(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
certif				0.027	0.016	0.029	0.018	0.032	0.018
				(0.020)	(0.021)	(0.020)	(0.022)	(0.020)	(0.022)
state_own				-0.005	0.036	-0.017	0.025	-0.014	0.029
				(0.100)	(0.104)	(0.101)	(0.105)	(0.101)	(0.105)
corruption*RL	-0.013			-0.017*	-0.015				

	(0.009)			(0.010)	(0.010)				
corruption*GE		-0.014				-0.018*	-0.018		
		(0.010)				(0.011)	(0.011)		
corruption*RQ			-0.018*					-0.023**	-0.022**
			(0.010)					(0.010)	(0.011)
Constant	-1.665	2.143	2.362	-1.883***	-27.178***	0.829***	-55.021***	-0.603***	-48.695***
	(3.982)	(3.998)	(4.023)	(0.169)	(7.365)	(0.122)	(10.527)	(0.185)	(7.022)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector fixed effects	No	No	No	No	Yes	No	Yes	No	Yes
Observations	7,126	7,126	7,126	6,532	6,257	6,532	6,257	6,532	6,257
R^2	0.060	0.049	0.041	0.062	0.073	0.044	0.059	0.041	0.061
F Statistic	13.273*** (df = 34; 7091)	10.832*** (df = 34; 7091)	8.920*** (df = 34; 7091)	11.561*** (df = 37; 6494)	6.548*** (df = 74; 6182)	8.167*** (df = 37; 6494)	5.214*** (df = 74; 6182)	7.415*** (df = 37; 6494)	5.385*** (df = 74; 6182)

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

2.4. Instrumental Variable Regression

This section provides the results of the IV regression models estimation. For an instrument that is exogenous to the dependent variable and explanatory for the endogenous independent variable, we construct the sector-average perceptions of corruption as an obstacle for doing business. A similar instrument was used in the previous studies (Dollar et al. 2005; Commander and Svejnar 2011; Hanousek and Kochanova 2016). While the sector-average perceptions of corruption are correlated with the similar firm-level perceptions since they partially reflect the market environment in which enterprises operate, they are not directly related to individual labor productivity growth that is more due to the specific characteristics of the businesses. As mentioned by Hanousek and Kochanova (2016, 19), finding the appropriate instrument for corruption measures is a difficult task. Still, the existing literature came to the relative consensus by employing the industry-location average measures of corruption as an obstacle for doing business. Moreover, the standard "weak instrument," Wu-Hausman and Sargan tests confirm the validity of the chosen instrument (see Table 3). In addition, the firm-specific exogenous variables proposed by Blagojevic and Damijan (2013) are included in the first-stage specifications of the IV regression models to reduce the endogeneity further.

Table 3. Diagnostic Tests for Instrumental Variable in IV Regression Models

			Model 1		Model 2		Model 3	
Diagnostic test	**df1**	**df2**	**statistic**	**p-value**	**statistic**	**p-value**	**statistic**	**p-value**
Weak instrument	66	6693	4.868***	<2e-16	2.603***	<2e-16	2.349***	<2e-16
Wu-Hausman	1	6756	6.180*	0.0129	4.453*	0.0349	1.419***	0.000166
Sargan	65	NA	2.317***	<2e-16	1.980***	<2e-16	2.100***	<2e-16

The instrumental variable approach helps to address the endogeneity issue by using the fitted values of instruments, which are correlated with the endogenous regressor for the regression analysis at the second stage. The usage of the fitted values reduces the variance of the coefficient and eliminates the systematic correlation between the endogenous variable and the error term. The final results indicate the sign and the value of association between the variables of the main interest that are relatively less unbiased due to the endogeneity of the main regressor in comparison with the simple OLS regression models.

2.4.1. Model

The IV regression model is estimated in two stages with the following specification formulas:

$$labor\_pr\_gr = \beta_0 + \beta_1 * corrupt + \beta_2 * controls_{firm_1} + \beta_3 * controls_{country} + (country\ FE) + (sector\ FE) + \epsilon$$

$$corrupt = \gamma_0 + \gamma_1 * average\ sector\ corrupt + \gamma_2 * controls_{firm_1} + \gamma_3 * controls_{firm_2} + \gamma_4 * controls_{country} + (country\ FE) + (sector\ FE) + u$$

At the first stage, labor productivity growth ("labor_pr_gr" in the formula) is regressed on the indicator of perceived corruption, the main set of firm-level control variables (controlsfirm1), country-level controls used in the basic OLS regression model (see section 2.3.),

and country- and sector-specific fixed effects. In the second stage, labor productivity growth is regressed on fitted values of corruption that are obtained via estimation of a regression model with average sector-level perceptions of corruption as an obstacle for doing business is the independent variable. The coefficients at the second stage eliminate the endogeneity between corruption and unobserved characteristics and provide fewer biases results in comparison with the OLS models.

2.4.2. Results

The results for the second stage of the IV regressions estimation are presented in Table 4. Contrary to the OLS regression results, the coefficients for corruption are positive and statistically significant at the 99% confidence level. At the same time, the coefficients for institutional quality variables are negative and statistically significant at the 99% confidence level for the rule of law and government effectiveness. The interaction term is estimated positively and statistically significantly for corruption and the rule of law. On average, perceived corruption as an obstacle for doing business is positively associated with the labor productivity growth for firms in post-communist countries. The relationship between the rule of law and firm performance is estimated to be negative, meaning that on average, firms in countries with the relatively stricter rule of law perform better in terms of labor productivity growth than firms in countries with the relatively weaker rule of law. The statistically significant positive coefficient for interaction term indicates that with the increase of the rule of law, the relationship between perceived corruption and firm performance increases. It means that the characteristic of the institutional environment, which expresses the quality of property rights protection and contract enforcement, enhances the positive relationship between the perceived corruption and labor productivity growth.

Table 4. IV Regression Results (Second Stage)

	Dependent variable:		
	labour productivity growth		
	(1)	(2)	(3)
corruption	0.071***	0.056**	0.089***
	(0.025)	(0.024)	(0.021)
RL	-0.149***		
	(0.036)		
GE		-0.156***	
		(0.042)	
RQ			-0.018
			(0.041)
exp	-0.135**	-0.139**	-0.154**
	(0.066)	(0.066)	(0.066)
larg	0.020	0.014	0.018
	(0.048)	(0.048)	(0.048)
age	0.003**	0.003**	0.002**
	(0.001)	(0.001)	(0.001)
p_polity2	0.012***	0.013***	0.006
	(0.004)	(0.004)	(0.005)
Log (GDP pc)	0.075***	0.082***	0.056***
	(0.019)	(0.020)	(0.019)
corruption*RL	0.040**		
	(0.020)		
corruption*GE		0.017	
		(0.019)	
corruption*RQ			-0.023
			(0.015)
Constant	-1.068***	-1.104***	-0.857***
	(0.181)	(0.182)	(0.174)
Observations	6,766	6,766	6,766
R^2	0.002	0.004	0.004
Residual Std. Error (df = 6757)	1.039	1.038	1.042
Note:			*p<0.1; **p<0.05; ***p<0.01

2.5. Robustness Check

2.5.1. Model

To test the robustness of the relationship between perceived corruption and firm performance in post-communist countries, we employ logit models and disaggregate the dependent variable from the labor productivity growth to sales growth and employment growth. Logistic regression is used for modeling dichotomous outcomes. It belongs to the class of generalized linear models that are employed to test the association between the linear predictor and categorical dependent variable. The outcome of our interest is a binary indicator of sales growth with the value 1 denoting positive sales or employment growth (the "success" outcome) and 0 indicating negative or zero growth (the "failure" outcome).

We construct the binary variables sales growth and employment growth with the value 1 corresponding to the positive growth in the last three fiscal years before the interview of the firm's representative and the value 0 correspondings to the negative or no increase in the previous three fiscal years. The dichotomous type of variable reduces the high variance of sales and employment, which can lead to biased estimation due to the prevalence of atypical influential observations. Based on the BEEPS V data, the initial variables of sales and employment were derived using the following formula:

$$\frac{(sales\ (empl.)growth\ in\ the\ last\ fiscal\ year - sales\ (empl.)\ growth\ 3\ fiscal\ years\ ago)}{sales\ (empl.)\ growth\ 3\ fiscal\ years\ ago}$$

Intercepts indicate the logarithms of odds ratios of chances that the outcome equals 1 against the chances that outcome equals 0 given all predictors constant. In our case, model intercepts are the ratio of the chances that the firm performed actual sales or employment growth to the chances that it experienced negative or zero growth. In turn, the coefficients of the explanatory variables are interpreted as the change in the odds ration associated with the specific

predictor. For our model, the regression coefficients demonstrate the change of the odds ratio value for one unit increase of the predictor.

The specifications of logit models can be represented by the following formula:

$$Log\left(Odds\ Ratio\ \frac{positive\ growth}{non-positive\ growth}\right) = \beta_0 + \beta_1 * corruption +$$

$$+\ \beta * controls_{firm} + \beta_3 * controls_{country} + \epsilon,$$

where "positive growth" denotes cases of the positive change of sales or employment of enterprises in the last three fiscal years before BEEPS V was conducted, "non-positive growth indicates the cases of negative or zero change of sales or employment, $controls_{firm}$ is the set of firm-level control variables, $controls_{country}$ is the set of country-level control variables and ϵ is a random error. In addition to the previously used institutional quality measures (the rule of law and the government effectiveness) the regression specifications include separately another WGI indicators: control of corruption (CC), political stability and absence of violence (PS) and voice and accountability (VA)

2.5.2. Results

Table 5 reports the estimates for the main model with a binary indicator of sales growth as the dependent variable. The first bivariate specification of the regression model with corruption as a numerical variable (model 1) reveals a statistically significant at a 99% confidence level coefficient for corruption. It means that the one-unit increase of corruption value (corresponding to the transition from one category to another, for example, from "no obstacle" to "minor obstacle") is associated with the expected change of the odds that the firm showed positive sales growth by exponent -0.094 which equals 0.9. On average, a one-unit increase in perception of corruption by firm's representative as an obstacle for doing business is associated with the change of the odds ratio by 0.9, or 10% decrease of a chance to show the positive sales growth in comparison with the chance to show the negative or zero sales growth. It is worth

noting that in model 1 we do not take into account the possible differences in odds ratios changes between different categories.

Model 2 considers the possible differences within categories of corruption by including it as a factor variable. The reference category is 0 (corruption reported as "no obstacle" for doing business). Besides, we added a set of firm-level control variables. The results of estimation demonstrate the higher decrease of the odds ratio change in comparison with the reference category by the transition from one category of corruption to another. For instance, the change of logged odds ratio for the category of corruption as a "minor obstacle" for the firm's operation in comparison with the corruption as "no obstacle" is -0.144 (the exponential value equals 0.87), while the logged odds ratios for the category "very severe obstacle" in comparison with "no obstacle" is -0.414 (the exponent is 0.66). Substantively, the chance that a firm performed positive three-year sales growth is 13% less than negative or zero sales growth when the firm's representative perceived corruption as a minor obstacle in comparison with the firms in which representatives perceived corruption as no obstacle for doing business. At the same time, the chance that a firm which representative perceived corruption as a very severe obstacle for operation is 34% less in comparison with a firm which representative recognized corruption as no obstacle.

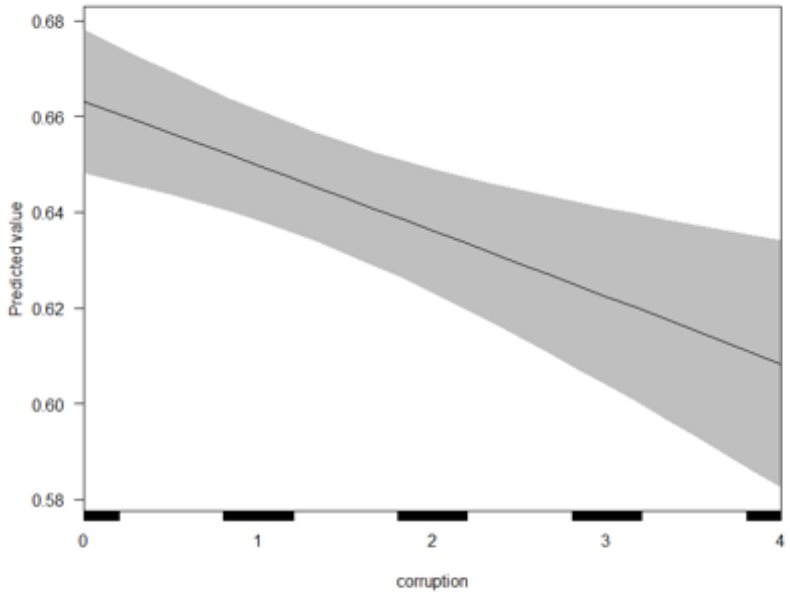
Models 3-8 include firm-level and country-level control variables and specific controls for institutional quality from the World Governance Indicators. We do not run the regression with all institutional variables due to the potentially biased estimates caused by multicollinearity. The significance of the coefficients is preserved in all specifications though the values are relatively smaller compared to the model with only firm-level control parameters. The range is from -0.076 (the exponential value is 0.927) to -0.059 (the exponential value is 0.943). For all specifications, the odds ratio that firm demonstrated positive sales growth decreases with the increase of corruption perceived as an obstacle for doing business.

Table 5. Logit Models 1-8

	Dependent variable: sales growth							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
corruption	-0.094***		-0.059***	-0.075***	-0.073***	-0.070***	-0.073***	-0.076***
	(0.017)		(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
corruption1		-0.144*						
		(0.078)						
corruption2		-0.135*						
		(0.073)						
corruption3		-0.271***						
		(0.073)						
corruption4		-0.414***						
		(0.085)						
age		-0.012***	-0.010***	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
f_own		-0.021	0.009	0.035	0.023	0.024	0.025	0.036
		(0.122)	(0.124)	(0.124)	(0.124)	(0.124)	(0.124)	(0.124)
larg		0.312***	0.289***	0.278***	0.273***	0.278***	0.277***	0.277***
		(0.098)	(0.100)	(0.099)	(0.099)	(0.099)	(0.099)	(0.099)
exp		0.496***	0.692***	0.738***	0.721***	0.715***	0.719***	0.740***
		(0.138)	(0.142)	(0.142)	(0.142)	(0.142)	(0.142)	(0.142)
CC			0.253***					
			(0.055)					
GE				0.091				
				(0.078)				
PS					0.104**			
					(0.046)			
RL						0.175***		
						(0.067)		
VA							0.141**	
							(0.067)	
RQ								0.093
								(0.069)
Polity			-0.072***	-0.060***	-0.061***	-0.067***	-0.073***	-0.063***
			(0.007)	(0.008)	(0.007)	(0.008)	(0.011)	(0.009)
GDP pc			-0.00004***	-0.00003***	-0.00003***	-0.00004***	-0.00003***	-0.00003***
			(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Constant	0.693***	0.820***	1.617***	1.376***	1.396***	1.510***	1.482***	1.365***
	(0.033)	(0.050)	(0.099)	(0.100)	(0.082)	(0.108)	(0.113)	(0.088)
Observations	7,190	7,190	7,190	7,190	7,190	7,190	7,190	7,190
Log Lik	-4,686	-4,659	-4,566	-4,576	-4,574	-4,573	-4,574	-4,576
AIC	9,375	9,336	9,150	9,170	9,166	9,164	9,167	9,169

The predicted values for corruption as an obstacle for doing business in Model 3 are illustrated in Figure 4. The graph demonstrates the gradual decline in the probability that the firm performed positive sales growth by changing the category of corruption perception from the least harmful to the most one. For the category "no obstacle," the predicted probability that the firm demonstrated the positive growth is about 66%, while for the category "very severe obstacle," the expected value is 61%. The 95% lower and upper confidence intervals (grey areas around the line of predicted values on the chart) extend to the right. It implies more reliable predicted values are estimated for the first categories of variable "corruption."

Figure 4. Predicted Values for Variable "Corruption" In Model 3



As a result, the estimation of logit regression models 1-8 demonstrates the negative relationship between the perception of corruption as an obstacle for doing business and the probability that the firm performed positive sales growth. To test whether the same association is present for other indicators of firm performance, which corresponds to the labor as a factor of corruption, we employ similar logit regression models but with the three-year employment growth as the dependent variable. The results of the estimation are presented in Table 6.

Table 6. Logit Models 9-16

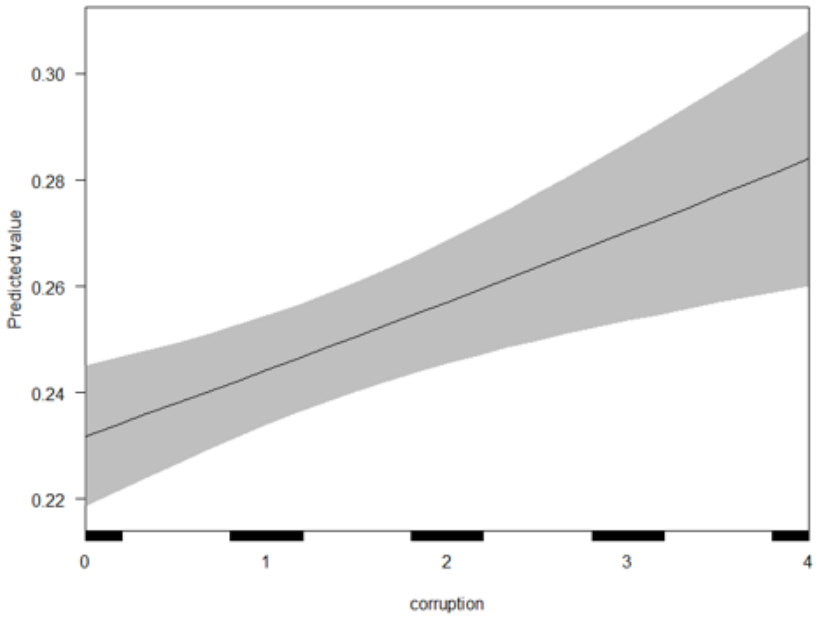
	Dependent variable: employment growth							
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
corruption	0.082***		0.068***	0.072***	0.076***	0.071***	0.077***	0.073***
	(0.019)		(0.020)	(0.020)	(0.019)	(0.020)	(0.020)	(0.019)
corruption1		0.105						
		(0.088)						
corruption2		0.167**						
		(0.081)						
corruption3		0.282***						
		(0.080)						
corruption4		0.357***						
		(0.093)						
age		0.026***	0.026***	0.026***	0.026***	0.026***	0.026***	0.026***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
f_own		0.398***	0.402***	0.394***	0.401***	0.400***	0.395***	0.396***
		(0.126)	(0.127)	(0.127)	(0.127)	(0.127)	(0.127)	(0.127)
larg		-0.146	-0.141	-0.141	-0.130	-0.136	-0.134	-0.139
		(0.106)	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)	(0.107)
exp		0.028	-0.006	-0.022	-0.018	-0.009	-0.021	-0.020
		(0.141)	(0.144)	(0.144)	(0.144)	(0.144)	(0.144)	(0.144)
CC			-0.195***					
			(0.061)					
GE				-0.216**				
				(0.087)				
PS					-0.127**			
					(0.050)			
RL						-0.220***		
						(0.074)		
VA							-0.147**	
							(0.074)	
RQ								-0.261***
								(0.078)
Polity			0.031***	0.031***	0.026***	0.034***	0.037***	0.042***
			(0.007)	(0.008)	(0.007)	(0.008)	(0.011)	(0.009)
GDP pc			0.00002***	0.00002***	0.00001**	0.00002***	0.00001**	0.00002***
			(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Constant	-1.192***	-1.627***	-2.030***	-1.987***	-1.908***	-2.056***	-1.981***	-1.997***
	(0.037)	(0.057)	(0.107)	(0.110)	(0.089)	(0.117)	(0.123)	(0.097)
Observations	7,190	7,190	7,190	7,190	7,190	7,190	7,190	7,190
Log Likelihood	-4,052	-3,979	-3,966	-3,968	-3,967	-3,966	-3,969	-3,965
Akaike Inf. Crit.	8,108	7,976	7,949	7,953	7,953	7,950	7,955	7,948

The simple bivariate logit regression (model 9) reveals a significant positive association between perception of corruption as a barrier for the firm's operation and growth of the number of workers. Given all explanatory variables equal to zero, the logged odds ratio that firm performed positive employment growth during the three years before the survey was conducted is -1.192 (exponential value is 0.3) which means that average firm in the sample has three chances to demonstrate positive growth against ten chances to show the negative or no growth. In turn, the logged odds ratio change is 0.082 (exponential value is 1.1) means the chance of performing positive employment growth is 10% higher than performing negative or zero growth taking into account the perceptions of corruption as an obstacle for doing business. When we estimate the values for each category of perceived corruption separately and add a set of firm-level controls (model 10), the logged odds ratio changes in comparison with the reference category "no obstacle" increases more with the transition from "minor obstacle" to "very severe obstacle." Thus, the logged odds ratio change associated with the perceptions of corruption as "minor obstacle" compared to the perceptions of this factor as "no obstacle" for doing business is 0.105 (exponent is 1.1) while the logged odds ratio for category "very severe obstacle" relatively to "to obstacle" is 0.357 (exponential value is 1.4).

Models 11-16 include control variables both at the firm- and country-level and separate measures on institutional quality from the World Governance Indicators data. All six indicators are negatively associated with the employment growth meaning that with the on-unit increase of institutional quality the chance of performing positive employment growth in comparison with negative or no growth decreases in a range from exponent -0.261 (exponential is 0.77) for regulatory quality (RQ) to -0.127 (exponential is 0.88) for political stability and absence of violence (PS).

Figure 5 shows the predicted values for binary outcome "employment growth" in model 11, the full set of control variables, and control of corruption as an institutional indicator. As can be seen on the graph, the predicted probability that enterprises performed positively in terms of hiring more employees if the firms' representatives perceived corruption as no obstacle for their business is about 23%. At the same time, the probability of positive employment growth associated with the perceptions of corruption as a very severe barrier for the operation of the firm is 28%. In general, the positive trend for predicted values of sales growth is opposite to the negative direction that was indicated for sales growth. However, the initial values were higher than 0.5 in the former case meaning that the probability of positive growth is higher than the likelihood of negative or no growth while in the latter case, the initial values are less than 0.5 which reveals that the probability of performing well in terms of employment expansion is lower than performing poorly.

Figure 5. Predicted Values for Variable "Corruption" in Model 11



In general, regression models 9-16 give us reasons to conclude that, contrary to the result for sales growth, the perception of corruption as an obstacle for doing business is positively associated with the probability that the firm performed positive employment growth than

negative or zero growth. Nevertheless, the estimated odds ratio changes and predicted probabilities indicate that initial values of the three-year change in the number of workers for enterprises in the sample are more likely to be harmful than positive.

We constructed additional specifications of the logit regression models with the different sets of firm-level control that are similar to the second set of firm-level controls used in the instrumental variable regression to obtain the fitted values of endogenous indicators of corruption (controlsfirm2).

Tables 8 and 9 in Appendix present the results of logit regression estimation for the dependent variables sales growth and employment growth accordingly. The empirical investigation with the alternative firm-level control variables provides us a ground to confirm the robustness of our main findings. The negative signs for logged odd ratios of perceived corruption are preserved for sales growth (see Table 5) and positive signs for employment growth (see Table 6). On average, the chances that the firm demonstrated less positive sales growth that is associated with the perceptions of corruption as severe obstacles for doing business are relatively smaller than the chance that the firm showed more positive sales growth. The exponential values of intercepts range from 3.5 (the logarithm is 1.258 in model 18) to 4.4 (the logarithm is 1.491 in model 17). It means that given all explanatory variables equal to zero, the chances that the firm performed positive sales growth are 3.5-4.4 chances to 1 chance that the firm performed negative or no sales growth. With the one-unit change of the perceived corruption as an obstacle for the current operation, the chances increase in a range from -0.063 (the exponential value is 0.94) to -0.048 (the exponential value is 0.95). At the same time, the odds ratios of chances that enterprise performed well in terms of employment growth to the chances that it performed poorly are from 0.33 (the logged value is -1.105 in model 20) to 0.38 (the logged value is -0.946 in model 19). The average change of the odds ration associated with the one-unit increase of the perception of

corruption as an obstacle for operation varies from 1.06 (the logged value is 0.061 in model 23) to 1.07 (the logged value is 0.069 in model 27).

2.6. Discussion

The empirical investigation of OLS and IV regression models supplemented by the robustness check via logit models with alternative measures of firm performance demonstrates that the estimation of regression coefficients is dependent on the choice of the variables and attention paid to the issues of unobserved heterogeneity and endogeneity. IV regression provides the most reliable results since they take into account both mentioned problems. For firms in post-communist countries in which the BEEPS V surveyed senior managers, the perception of corruption as an obstacle for doing business is positively associated with firm performance. Substantially, it means that firms perceiving corruption as more obstacles for their operation perform relatively better in terms of labor productivity growth during the three years than firms that do not perceive corruption as a significant obstacle for their operation. As a result, the primary empirical investigation by IV models provides ground for partial rejection of the first hypothesis of our research. However, the results of logit modeling in the robustness check section demonstrate that the positive relationship is estimated between firm-level perceptions of corruption and employment growth. At the same time, there is a negative association between perceptions of corruption and sales growth. In other words, for sales growth as an indicator of firm performance, our results support the "sand in the wheels" hypothesis. In turn, for employment growth and labor productivity growth, which takes into account employment, the empirical investigation confirms the validity of "grease in the wheels" theory on the link between corruption and firm performance at the micro-level.

Furthermore, the estimated positive association is statistically decreasing for the higher values of the rule of law and government effectiveness (see model 1 and model 2 in Table 5). It reveals that the quality of the institutional environment in which firms operate mitigates the

relationship between firm-level perceptions of corruption and firm performance. In other words, in countries with the more robust rule of law, the positive relationship between perceived corruption and firm performance is less pronounced than in countries with the relatively weaker rule of law. It provides ground for partial confirmation of the second hypothesis of our research.

The results provide a ground to confirm the "greasing-the-wheels" hypothesis on the association between firm-level corruption and business performance. The possible reasons for this type of relationship are the relative average weakness of the institutional environment in transition countries, which is favorable for informal, illegal practices such as corruption to obtain the corporate gains and perform well without a credible threat to be punished. In many post-communist countries, there is a lack of an effective system of checks and balances as well as an independent judicial system. Moreover, the law system is inconsistent and can include a lot of contradictory regulations that are impossible for entrepreneurs to overcome by using existing formal institutional channels. The robustness check demonstrates that the positive association is mainly driven by the positive relationship between perceptions of corruption and employment growth. At the same time, sales growth is negatively affected by the corruption that potentially reduces the extent of the positive link between corruption and labor productivity growth.

Overall, the first and the second hypotheses of our research are partially confirmed since the positive relationship between corruption and firm performance is more reliable in countries with relatively the weaker rule of law. The first hypothesis of the research (H1), which suggests the negative association between the perceived corruption by firm managers and the performance of enterprises has not enough empirical evidence to be fully confirmed based on the results of the most reliable instrumental variable regression models. In turn, the second hypothesis (H2) is partially confirmed because the empirical results demonstrate the significance of the mediating effect of the quality of the institutional environment, but not in the predicted direction.

This paragraph summarized the empirical results of the thesis presented in the second chapter and related them to the theoretical argumentation discussed in the first chapter. The following conclusion outlines the main findings and limitations of the study and indicates prospects for possible future research.

CONCLUSION

The thesis was dedicated to exploring the relationship between perceptions of corruption by firm representatives and the actual performance of the enterprises in post-communist countries. The first chapter provided a theoretical framework for the study by reviewing the relevant theories and approaches to study corruption. Furthermore, it performed a thorough literature review to place the conducted research in the field of corruption studies. The novelty of the theoretical part is the relation of corruption and firm growth to the existing institutional environment in post-communist countries, which was not implicitly linked to the problem of our interest in the previous studies. We proposed a causal path between the quality of the institutional environment that is usually operationalized by the governance indicators, the rule of law, the government effectiveness, and the regulatory quality. The second chapter tested the hypothesis formulated on discussed theoretical prepositions. The instrumental variable approach that takes into account the issue of endogeneity between explanatory and explained variables demonstrates the positive association between perceived corruption in terms of an obstacle for doing business and labor productivity growth, which captures the firm performance from the angle of the effectiveness of resource allocation.

Moreover, the positive relationship is statistically significantly mitigated by the rule of law confirming the theoretical expectations. Contrary to the initial hypothesis (H1), our study demonstrates the relevance of the "greasing-the-wheels" theory in the context of post-communist countries. However, the different results for disaggregated indicators of firm performance in the robustness check part (a positive association between corruption and employment growth and a negative association between corruption and sales growth) suggest that the less reliable in terms of endogeneity estimations partially confirm the opposite "sand-in-the-wheels" theory.

Despite the thorough theoretical framework and employment of the rigorous statistical techniques, the thesis has some limitations. First, the empirical findings of the quantitative regression analysis are not enough to conclude about the causal relationship between perceived corruption and firm performance. The estimated association is statistically significant but limited in explanatory power and robustness to alternative indicators of firm performance. Second, the measure of corruption is based on perceptions of its importance and can be biased toward the experience of engagement of firms in corrupt practices. They are argued to be relatively better than the expert-based indicators such as the Transparency International Corruption Perception Index, but still require caution when interpreting. Third, the results are obtained on the whole sample and represent the average estimations. They take into account the unobserved within-country and within-sector endogeneity but have no insight on the substantial difference in effects for specific countries. Accordingly, future research will be focused on the qualitative assessment of the preliminary quantitative findings by case-studies of the most similar and the most diverged cases.

Moreover, the within-case analysis by using the method of process-tracing can provide exciting results. In turn, the quantitative part of the research will be enhanced by the examination of panel data for the four waves of the BEEPS, which require preliminary merging two datasets by linking the corresponding panel id pairs. Besides, the BEEPS VI (2018-2020) started to be published when this research came to an end so that the future investigation can use the most recent data.

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APPENDIX

Table 7. Correlations between the Main Variables

	lab_pr_gr	corrupt.	age	f_own	larg	exp	polity	GDP_gr	RL	GE	RQ
lab_pr_gr	1										
corrupt	0.031	1									
age	0	-0,026	1								
f_own	-0.001	-0.013	-0,009	1							
larg	-0.008	-0.017	0,02	0.194	1						
exp.	-0.032	-0.03	0,09	0.23	0.053	1					
polity	0.035	0.109	0,1	0.056	-0.03	0.122	1				
GDP gr	-0.017	0.056	0,087	-0.052	0.03	-0.163	-0.39	1			
RL	-0.007	-0.097	0,188	0.104	-0.005	0.212	0.654	-0.538	1		
GE	-0.011	-0.115	0,127	0.094	-0.022	0.201	0.656	-0.558	0.959	1	
RQ	0.011	-0.041	0,087	0.086	-0.022	0.178	0.766	-0.469	0.928	0.921	1

Table 8. Logit models (Robustness Check)

	Dependent variable: sales growth					
	(17)	(18)	(19)	(20)	(21)	(22)
corruption	-0.048**	-0.063***	-0.063***	-0.058***	-0.061***	-0.063***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
small_firm	-0.227***	-0.212***	-0.217***	-0.219***	-0.221***	-0.210***
	(0.072)	(0.072)	(0.072)	(0.072)	(0.072)	(0.071)
origin	0.262***	0.271***	0.267***	0.267***	0.270***	0.265***
	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)	(0.079)
innovation	0.194**	0.190**	0.195**	0.194**	0.194**	0.195**
	(0.085)	(0.085)	(0.085)	(0.085)	(0.085)	(0.086)
crime	0.059	0.047	0.051	0.052	0.050	0.042
	(0.070)	(0.070)	(0.070)	(0.070)	(0.070)	(0.069)
infcomp	-0.249***	-0.237***	-0.235***	-0.241***	-0.240***	-0.241***
	(0.058)	(0.058)	(0.058)	(0.058)	(0.058)	(0.058)
eduemp	0.002**	0.001	0.002*	0.002*	0.002*	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
certif	0.093	0.118*	0.106	0.106	0.102	0.115*
	(0.068)	(0.068)	(0.069)	(0.068)	(0.069)	(0.068)
state_own	0.315	0.395	0.349	0.360	0.368	0.413
	(0.373)	(0.369)	(0.371)	(0.371)	(0.370)	(0.369)
CC	0.284***					
	(0.061)					
GE		0.114				
		(0.085)				
PS			0.114**			
			(0.051)			
RL				0.206***		
				(0.073)		
VA					0.195***	
					(0.074)	
RQ						0.127*
						(0.075)
Polity	-0.074***	-0.062***	-0.062***	-0.070***	-0.080***	-0.067***
	(0.008)	(0.008)	(0.007)	(0.008)	(0.012)	(0.009)
GDP_pc	-0.00004***	-0.00004***	-0.00003***	-0.00004***	-0.00004***	-0.00003***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Constant	1.491***	1.258***	1.254***	1.396***	1.397***	1.261***
	(0.127)	(0.128)	(0.113)	(0.135)	(0.139)	(0.121)
Observations	6,359	6,359	6,359	6,359	6,359	6,359
Log Likelihood	-4,025	-4,035	-4,034	-4,032	-4,033	-4,035
AIC	8,076	8,097	8,094	8,091	8,092	8,096

Table 9. Logit models (Robustness Check)

	Dependent variable: employment growth					
	(23)	(24)	(25)	(26)	(27)	(28)
corruption	0.061***	0.063***	0.069***	0.063***	0.069***	0.064***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
small_firm	-0.129*	-0.132*	-0.131*	-0.129*	-0.131*	-0.137*
	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)	(0.075)
origin	-0.683***	-0.687***	-0.683***	-0.684***	-0.688***	-0.674***
	(0.080)	(0.080)	(0.080)	(0.080)	(0.080)	(0.080)
innovation	-0.129	-0.131	-0.134	-0.132	-0.131	-0.142
	(0.093)	(0.093)	(0.093)	(0.093)	(0.093)	(0.093)
crime	-0.139*	-0.139*	-0.138*	-0.139*	-0.134*	-0.129*
	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)
infcomp	0.327***	0.324***	0.319***	0.326***	0.323***	0.333***
	(0.064)	(0.064)	(0.064)	(0.064)	(0.064)	(0.064)
eduemp	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
certif	0.105	0.101	0.108	0.107	0.103	0.109
	(0.073)	(0.073)	(0.074)	(0.074)	(0.074)	(0.074)
state_own	0.571*	0.533*	0.580*	0.561*	0.535*	0.487
	(0.317)	(0.315)	(0.317)	(0.316)	(0.315)	(0.314)
CE	-0.190***					
	(0.067)					
GE		-0.247***				
		(0.096)				
PS			-0.139**			
			(0.056)			
RL				-0.240***		
				(0.081)		
VA					-0.164**	
					(0.082)	
RQ						-0.288***
						(0.085)
Polity	0.035***	0.038***	0.031***	0.040***	0.045***	0.050***
	(0.008)	(0.009)	(0.007)	(0.009)	(0.012)	(0.010)
GDP_pc	0.00003***	0.00004***	0.00003***	0.00004***	0.00003***	0.00003***
	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)	(0.00001)
Constant	-1.050***	-1.046***	-0.946***	-1.105***	-1.032***	-1.068***
	(0.132)	(0.135)	(0.116)	(0.141)	(0.146)	(0.127)
Observations	6,359	6,359	6,359	6,359	6,359	6,359
Log Likelihood	-3,498	-3,499	-3,499	-3,498	-3,501	-3,497
AIC	7,023	7,024	7,025	7,022	7,027	7,019