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Abstract

We examine the persistence of corporate corruption for a sample of privately-held firms from 12 Central and Eastern European countries over the period 2001 to 2015. Creating a proxy for corporate corruption based on a firm's internal inefficiency, we find that corruption enhances a firm's profitability. A channel analysis further reveals that inflating staff costs is the most common approach by which firms divert funds to finance corruption. We conclude that corruption persists because of its ability to improve a firm's return on assets, which we refer to as the *Corporate Advantage Hypothesis.*

Keywords: corruption; inefficiency; performance; private firms
JEL Classification: G30; F38

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1. Introduction

Corporate corruption exerts a number of adverse influences on a nation's economy (Shleifer and Vishny, 1993; Mauro, 1995; Murphy et al, 2003).[1] For instance, an extensive literature examines the relation between corruption and tax compliance. Studies by Cule and Fulton (2009) and Alm, Martinez-Vazquez and McClellan (2016) find that corruption is a meaningful determinant of tax evasion and national levels of tax compliance. Corruption erodes what Alm and McClellan (2012) refer to as "tax morale", resulting in less total tax revenue collected and a degradation of governmental legitimacy. Similarly, Litina and Palivos (2016) describe how corruption increases the distrust between citizens and their government, ultimately resulting in the social legitimization of tax evasion.

Corruption also affects the nature of a country's shadow, underground, or parallel economies (Choi and Thum, 2005; Levy, 2007). The presence of corruption encourages the growth of these unofficial economies (Tanzi, 1983; Slemrod, 2007) and in general it impedes economic growth (Mo, 2001; Mauro 1995,). Corruption retards innovation in an economy (Murphy et al, 2001, Murphy et al, 2003) as well as the development of market-supporting institutions such as independent legal or regulatory systems (deSoto, 1989; Shleifer and Vishny, 1993; Johnson et al., 2000). Alford and Feige (1989) and Slemrod (2007) describe how a corrupt economy distorts economic data, resulting in flawed analyses and often, in policy failures. Pareto (1896) summarizes the effect of corruption on society by saying " a society in which wealth is achieved only by work, industry and trade, will differ considerably from a society in which wealth is, to a considerable degree, the fruit of fraud and political intrigue". He concludes that corruption plagued societies suffer worse economic prospects than those

[1] A recent survey of corruption's effect on national economies is Dimant and Tosato (2017). Related studies include Tanzi (1998), Rose-Ackerman (1999), Treisman (2000), Jain (2001), Aidt (2003), and Lambsdorff (2006).

which are not. We refer to this negative impact of corruption on the aggregate economy as the *corruption effect.*

But in spite of the widespread recognition of corruption's adverse effects, it continues to persist. Corruption remains a global phenomenon despite increased corporate transparency, expanded international capital flows, and enhanced institutional monitoring. Indeed, E&Y concluded in their 2016 Global Fraud Survey that corruption represents a threat that can lead to "sluggish global growth and fragile financial markets".

Attempts at explaining corruption's persistence include arguments that it can mitigate red tape, circumvent legal rigidities, or provide preferential access for firms (e.g. Leff, 1964; Huntington 1968; Lui, 1985; Meon and Weill, 2010; Beck and Maher 1986). Firms might gain a regulatory advantage, secure accelerated policy decisions, or obtain waivers from administrative requirements by providing side payments to government officials or regulators. Recent research further suggests that corruption in the form of bribery or its associated connections creates value for (particular) firms. Zeume (2017) reports that U.K. firms operating in high corruption countries experience a drop in value after passage of the U.K. Bribery Act of 2010. Cheung, Rau, and Stouraitis (2012) find that a bribe of $1 returned $11 of contract value for a set of firms prosecuted for international bribery. Ferris et al. (2016) report that corporate bidders with political connections are more likely to achieve merger completion and avoid regulatory delay or denial. They further determine that investors recognize that merger bids by politically connected acquirers are more likely to create firm value. O'Donovan, Wagner, and Zeume (2017) argue that firms use offshore legal and accounting entities to enhance their value by promoting illegal or corrupt activities.

Research regarding private equity firms also note certain benefits stemming from corrupt environments. Cummings et al (2010) examine private equity returns in Asia and find that private equity returns are higher in countries with greater levels of corruption. They conclude

that private equity managers are successful in adapting organizational structures to mitigate the negative effects of corruption, but cannot exclude the possibility that private equity fund managers are themselves ‘‘corrupt’’. Johan and Zhang ((2016) examine divestment strategies of private equity firms and show that in countries with higher levels of corruption, investors mitigate corruption’s costs to increase the probability of a success IPO.

Given this evidence, we contend that corruption persists in spite of its drag on the aggregate economy because of the financial advantages it provides to some firms. This view is consistent with Galang (2012) who argues that corruption’s effect on individual firm's performance is heterogeneous, allowing some firms to benefit from it. We refer to this conjecture as the *Corporate Advantage Hypothesis*.

We find that corporate corruption is profitable for firms. Indeed, we observe that corruption is positively associated with a firm’s return on assets (ROA) and return on equity (ROE). To gain a better understanding of how corruption actually improves corporate profitability, we use the DuPont identity to decompose profitability into its turnover and margin components. We find that corruption has its strongest effect on profit margins, while also affecting turnover.

Corruption requires a channel within the firm through which to operate. That is, there must be a mechanism by which a firm can divert capital into illicit or corrupt activities. Our channel analysis reveals that staff costs are positively related to corporate corruption across nearly all of our sample countries and industries. This result is consistent with the use of phantom employees or false invoices to fraudulently transfer wealth from the firm. We also report interesting industry patterns in the use of channels such as materials and inventory costs to redirect capital from the firm. These channels are consistent with the OECD handbook for the detection of foreign bribery (OECD 2017).

The findings in this study make a number of critical contributions to the literature. Perhaps most importantly, we explain why corporate corruption continues to persist in spite of its

profound negative effect on national economic performance. We show that while the aggregate economy suffers, individual firms can benefit. Related to this contribution is our new approach for estimating corruption at the firm level using publicly available data. This new measure will allow new research to probe further the effect of corruption on a variety of corporate behaviors and practices. Our examination of the channels by which corruption occurs identifies a natural target for regulators, law makers, and others who have an interest in eliminating corruption from the greater political economy. Our channel analysis can be very useful for the design and implementation of public policy aimed at stimulating economic growth and efficiency.

We organize our study into nine sections. The following section develops the hypothesis and describes how corruption can generate benefits for the firm. Section 3 derives our measure of corporate corruption from a decomposition of a firm's inefficiencies. Section 4 describes how we use stochastic frontier analysis to empirically estimate corporate corruption. We describe our data and sample in Section 5. In Section 6 we validate our measure of corporate corruption against the proxies that currently exist in the literature. Our major empirical findings regarding the effect of corruption on firm profitability are presented in Section 7. We provide a channel analysis in Section 8 to better understand how firms are able to divert capital into corrupt activities. We conclude with a summary and discussion of the importance of our findings in Section 9.

2. Hypothesis Development

As noted earlier, there exists an extensive literature establishing the adverse effect of corruption on national economies. Mauro (1995) and Mo (2001) report corruption's detrimental impact on investment, Wei (2000) describes its negative effect on foreign capital inflows, while Mauro (1995, 1998) and Mo (2001) explain how national productivity and economic growth is hampered when corruption exists. At the micro level, Shleifer and Vishny

(1993), Bertrand et.al (2007) and Harstad and Svensson (2011) find that corruption negatively influences the allocation of capital within a country. Hanousek et al (2017) discover that corrupt legal and political environments decrease a firm's operating efficiency. Svensson (2003) reports that firms underinvest in tangible assets in corrupt environment to minimize the cost of corporate mobility. Fisman and Svensson (2007) show an inverse relation between corruption and firm growth.

Given this extensive evidence regarding corruption's adverse impact on national economies, the persistence of corruption initially appears puzzling. But other research contends that corruption can provide benefits to the individual firm, viewing corruption as a lubricant to offset the frictions of rigid government policies and procedures (Leff, 1964; Huntington, 1968). Leff (1964), Lui (1985), and Meon and Weill (2010) contend that corruption allows firms to receive preferential treatment and handling by government officials.

Firms operating in corrupt environments often pay bribes, provide gifts, make contributions, or otherwise direct funds to regulators, bureaucrats, and government officials to facilitate their business transactions. By providing these payments, firms can gain privileged access to their regulators, secure accelerated/more favorable administrative decisions, or obtain waivers from burdensome bureaucratic requirements.

A number of studies establish a positive relation between corruption and corporate outcomes. Rock and Bonnett (2004) find a positive relation between corruption and firm growth while Vial and Hanoteau (2010) show increased production output in more corrupt environments. Other studies such as Cheung et al (2012), Ferris et al (2016), O'Donovan et al. (2017), Zeume (2017) and Ferris et al. (2019) discuss how corruption through bribes and preferential political access can generate value for a firm in Western economies. Research in the private equity literature also finds a positive association between corruption and positive firm outcomes. Cummings et al (2010) find that private equity returns are higher in countries

with greater levels of corruption. Johan and Zhang (2016) find that the probability of investor exit through an IPO increases in more corrupt environments.

While corruption is inefficient in the aggregate, the corruption effect, we contend that corporate corruption continues to exist because it provides benefits to some firms. The access to regulators, bureaucratic waivers, and accelerated/more favorable administrative decisions are profitable for firms and encourage them to continue their corrupt practices. In this sense, corporate corruption persists because it is a positive net present value project for some firms. More formally, we hypothesize that corporate corruption persists because it provides financial benefits to some firms. We refer to this as the *Corporate Advantage Hypothesis.*

3. Corporate Inefficiency and Corruption

To examine the persistence of corruption within a firm, we must measure it at that level. But the literature on estimating corruption at the corporate level is essentially non-existent. To study the effect of non-legal business activity, previous studies use either used leaked data (Mironov, 2013, 2015; Mironov and Zhuravskaya, 2016) or anonymous survey data created by the World Bank (i.e. Kaufmann and Wei, 1999; Svensson, 2003; Fisman and Svensson, 2007; Vial and Hanoteau, 2010; Commander and Svejnar, 2011).[2] But both approaches suffer from significant methodological or estimation limitations.[3] Thus, a new approach for estimating corruption/ illegal corporate activities at the individual firm level is needed.

Our approach begins with the concept of firm inefficiency. We define inefficiency as reduced corporate productivity due to the non-optimal use of the firm's labor and capital. We decompose the firm's inefficiency into two components, the first of which is the firm's external

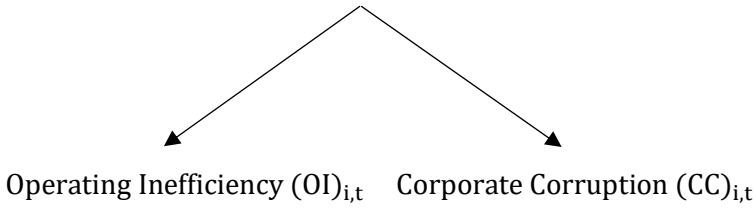
[2] Now known as the Business Environment and Enterprise Performance Survey (BEEPS).

[3] Leaked data regarding corrupt practices in other countries does not exist, while the data obtained from the World Bank has several drawbacks. Besides the fact that it is anonymous, the accounting information is self-reported and unaudited. Responses pertaining to corruption are missing for many firms. Additionally, firms are inclined to provide false positive answers if they operate in politically repressive environments (Jensen et al., 2010). Further the composition of this data changes, with different industry sectors contained in each survey.

inefficiency. This component captures corporate inefficiencies that occur from factors external to the firm, such as inadequate national infrastructure, legal and regulatory rigidities, or resource scarcities. These inefficiencies are common to all firms within an industry and are not easily remedied. The second component is due to inefficiencies that are internal to the firm.

We are able to decompose this internal inefficiency into two separate sub-components. The first of these subcomponents is due to operating inefficiencies such as ineffective administrative policies, insufficient financial oversight, or weak management (Bloom and Van Reenen, 2007). The other sub-component is inefficiency due to the firm's corrupt practices. It is well established in the literature that corrupt activities are usually associated with higher material, labor, and other operating costs. Equation (1) models these inefficiencies for firm *i* at time *t*:

$$\text{Corporate Inefficiency } (CI)_{i,t} = \text{Internal Inefficiency}(II)_{i,t} + \text{External Inefficency}(EI)_{i,t} \quad (1)$$



To isolate CC, the sub-component of internal inefficiency attributable to corrupt practices, we introduce the concept of an "honest" firm. An honest firm is a firm that is headquartered in a country with a low level of corruption as measured by the Corruption Perception Index (CPI) estimated by Transparency International. The CPI measures a country's corruption from its perceived level as determined by expert assessments and opinion surveys. The CPI broadly identifies corruption as the misuse of public power for private benefit. Empirically we define

honest firms as those whose controlling foreign owner originates from a country that appears among the ten least corrupt countries in the world based on the Transparency International Corruption Perception Index (CPI) values for year *t*.

Foreign firms headquartered in countries having low levels of corruption should have a lower propensity to engage in illegal activities, even when operating abroad. This is because such firms tend to adhere to their home cultural and legal practices regardless of their immediate operating environment (Stopford and Strange, 1991; Fisman and Miguel, 2007; Cuervo-Cazurra, 2008). We recognize that even these "honest" firms will engage in some level of corrupt activity, but we contend that whatever corruption these firms might engage in represents a lower bound for such activities within that country. We refer to this group of firms originating from countries with low corruption, measured by the corruption perception index, as "honest firms". All other firms operating within the country are referred to as "non-honest" firms.

Let us now represent the difference in corporate inefficiency between a non-honest and an honest firm within a given country in the same industry during the same year as follows:

$$\text{Diff} = CI^{\text{Non-honest}} - CI^{\text{Honest}} \quad (2)$$

But since CI = EI +(OI +CC) as defined in equation (1), we can express the difference in corporate inefficiency between these two firms as:

$$\text{Diff} = [EI + (OI + CC)]^{\text{Non-honest}} - [EI + (OI + CC)]^{\text{Honest}} \quad (3)$$

We contend that CC is either zero or at least a lower bound for the honest firms, given their high home country ranking for corporate integrity and the practice of firms to adopt home country ethical practices (Stopford and Strange, 1991; Fisman and Miguel, 2007; Cuervo-Cazurra, 2008). Consequently, equation (3) simplifies to the following:

$$\text{Diff} = [EI + (OI + CC)]^{\text{Non-honest}} - (EI + OI)^{\text{Honest}} \quad (4)$$

We contend that firms which operate in the same industry and country in a given year are subject to the same external inefficiencies. That is, both honest and non-honest firms within an industry in a given country will face similar external inefficiencies in a particular year. These firms operate in the same geographical environment with identical logistical, regulatory, and political challenges. Hence equation (4) simplifies to:

$$\text{Diff} = (\text{OI} + \text{CC})^{\text{Non-honest}} - (\text{OI})^{\text{Honest}} \quad (5)$$

But, on average, OI levels tend to approximate each other for the honest and non-honest firm since they operate within the same industry, follow common industry best practices, and often use the same supply and logistics chain. Further, they are likely to employ identical technologies and are monitored by the identical set of investors, analysts, and regulators. The labor market mobility of managerial and engineering talent also narrows the gap in OI between honest and non-honest firms. Hence, Equation (5) can be further reduced to:

$$\text{Diff} \approx \text{CC} \quad (6)$$

Equation (6) shows that the difference in corporate inefficiency between the non-honest and honest firms can capture corporate corruption within the individual firm. We note, however, that if honest firms systematically enjoy stronger governance and better oversight, then this component will also contain an element of inefficiency due to poor governance. XXXXXXXX

It is important to note that we use the term corporate corruption to include a broad range of illegal activities undertaken by firms. These consist of bribery, extortion, kickbacks, sweetheart contracts, tunneling, tax evasion, accounting fraud and a variety of other activities that are prosecutable. These activities are reflected in a firm's internal inefficiency because they increase labor and operating costs. These expenses are often unassociated with any economic purpose and can represent theft, graft, or expropriation of corporate resources. In many cases, these expenses are incurred due to regulators or government administrators exploiting their position for personal financial gain.

The following section describes in detail how we empirically estimate corporate corruption by using a stochastic frontier approach to calculate firm level inefficiency.

4. Estimating Corporate Inefficiency

To estimate corporate inefficiency, we introduce the concept of a production function. A production function relates inputs to output levels and therefore allows the calculation of inefficiency. The use of a production function permits us to estimate the difference in the production levels we observe for a firm from what they should be given the labor and capital inputs. The stochastic frontier model defines the production frontier as the best potential output for a given set of inputs. Hence the edge of the production function defines the set of "best practice" firms. A firm's distance from this "best practices" frontier is defined as a corporate inefficiency.[4]

Thus, to estimate corporate inefficiency, we introduce the following generic production function and an associated efficiency measure:

$$y_{it} = f(x_{it}; \beta) \cdot E_{it} \tag{7}$$

This production function relates output y_t to the vector of inputs x_t. The efficiency of input use by the firm is reflected by E_i,. A firm uses its inputs efficiently if $E_i = 1$ since at this point it achieves maximum output. When $E_i<1$, inefficiency occurs because the firm produces less output with its given inputs.

We now make two standard assumptions to estimate firm efficiency using stochastic frontier analysis. First, the distribution of E_i is common across firms and is denoted as $E_i = \exp(-u_{it})$ where u_{it} is non-negative and measures the distance from the efficiency frontier. That is, it represents inefficiency within the firm. To account for random shocks in production such

[4] For additional details see Aigner et al. (1977) and Meeusen and van den Broeck (1977). A panel data application of the stochastic frontier analysis is discussed in Schmidt and Sickles (1984), Kumbhakar (1990), and Greene (2005). Further, Kumbhakar and Lovell (2000) and Amsler et al (2016) provide literature surveys on this topic.

as capital failure, we label the error term as exp(v_{it}). We now rewrite equation (7) in convenient log form to account for these terms:

$$lny_{it} = \beta_0 + \sum_{j=1}^{k} \beta_{jit}\, lnx_{it} + v_{it} - u_{it} \tag{8}$$

Our choice for the functional form of the production function is Cobb-Douglas (Douglas, 1976). This is because of its standard form, limited restrictions, flexibility, and robust functionality within homogeneous sectors. Specifically, we interact the estimated parameters in the standard Cobb-Douglas production function with 2-digit NACE industry dummies to control for production idiosyncrasies at the industry level as noted by Chirinko et al. (2010). The efficiency frontier model for a set of *I* firms in *J* two-digit NACE sectors over *T* time periods is then specified as:

$$lny_{it} = \sum_{j=1,\dots,J} \left[\beta_{0j} + \beta_{1j} lnc_{it} + \beta_{2j} lnl_{it}\right] \cdot ID_{itj} + \phi_t + v_{it} - u_{it} \tag{9}$$

To estimate firm inefficiency using equation (9) we use the *Value Added* variable from the Amadeus database as the output variable y_{it}. This measure is defined as: Income taxes + Other taxes + Profit/loss for the period + Staff costs + Depreciation + Interest payable on loans. This *Value Added* measure reflects corporate profitability as the aggregation of profit (loss) for the period, minority interest, taxes, employee costs, depreciation and interest paid. *Value Added* has the further advantage of being more comprehensive than accounting profitability. This measure has been used by various researchers, including Beck et al. (2008), Hanousek, Kocenda, and Shamshur (2015) and Faccio, Marchica, and Mura (2016), to capture value created for corporate stakeholders.

As a robustness check we also use *Operating Revenue* (OPRE) to calculate inefficiency. This variable approximates gross sales and provides qualitatively identical results in our empirical analysis. Hence, we do not report them separately.

The input variables for the Cobb-Douglas production function are the log of each firm's capital (i.e., total fixed assets plus working capital) and labor (i.e., number of employees). These variables are included since capital and labor are the fundamental inputs to any production process. $ID_{i,j,t}$ is a vector of industry dummy variables to control for industry-specific effects. The constant term and both inputs into the production (i.e., capital and labor) interact with a 2-digit NACE industry dummy to allow for a flexible functional form. The variable v_{it} is a normally distributed error term while u_{it} represents a firm's inefficiency. Again, u_{it} equals 0 if the firm is fully efficient.

We estimate equation (9) on a rolling window basis, which always contains 3 years. Greene (2005) shows that using shorter time periods for the fixed effect stochastic frontier model reduces potential bias in the estimated parameters. We perform the estimation country-by-country to account for different levels of industry efficiency across our sample countries. We also include year fixed effects to control for time specific events that might occur during our sample period.

5. Data and Sample Characteristics

5.1 Data

This study examines 12 countries from Central and Eastern Europe over the period 2001 to 2015. To determine the extent to which corruption persists across our sample economies, we use the Corruption Perception Index (CPI), constructed by the Transparency International. For ease of interpretation, we modify the CPI to facilitate understanding. Specifically, we construct a reversed CPI which is estimated as *100 – CPI*. With this measure, higher values are associated with a greater perception of corruption

We draw our data from the Amadeus database, which is maintained by Bureau van Dijk (BvD) and contains comprehensive financial and ownership information on private European

companies. We create our dataset from seven bi-annual versions of Amadeus and special historical queries. We do so because BvD eliminates firm data after ten years or for firms which are inactive, merge, or change identification. In addition, the Amadeus database records only the most recent ownership structure with its starting date. Thus, for end-of-the year ownership structures we need to initiate a variety of historical queries. We only use unconsolidated financial statements to avoid double counting subsidiaries or operations abroad. We also exclude the financial services and insurance industries (NACE codes 64–66), due to their extensive oversight by government regulatory authorities and fundamental differences in financial data presentation. Our sample consists of 188,994 firm-year observations which span fifteen years.

5.2 Sample Characteristics

We observe in Table 1 that the values of the reversed CPI range from 36.3 to 75.4, with higher scores indicating greater corruption. The average score for our sample countries is 55.6. The least corrupted countries as of 2016 located on the European continent are Denmark (1), Finland (3), Sweden (4), Norway (6), Netherlands (8), and Germany (10). The average reversed CPI score for these six nations is 14.

Table 1 also shows the persistence of corruption in our sample countries. Indeed, the annual decline in corruption across our sample countries is only 1.6%. This limited decline occurs in spite of EU expansion (i.e., Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Slovenia and Hungary joined in 2004; Bulgaria and Romania in 2007), increased accounting transparency from globalization, and the growth of world capital markets.

Table 2 presents select summary statistics for our sample. Panel A presents various measures of central tendency and dispersion for our variables of interest. We observe that the mean ROA is 7% while the average ROE after tax is 18%. The typical firm has a leverage ratio

of 15%, indicating that equity is the most important source of financing for our sample firms. Our sample firms are profitable, with a median before (after)-tax income margin of 3% (2.2%).

In Panel B we present the distribution of our sample by year and country. The sample averages more than 12,000 observations per year, although the early years of our sample contain many fewer observations. The country with the least observations is Estonia with 108 while the Czech Republic has the most with more than 41,000 observations. Panel D contains an industry distribution of our sample. The highest number of observations occurs in manufacturing, with 80,690. The fewest observations occur in mining and quarrying, with 1,150.

6. Comparison with Existing Measures of Corporate Corruption

To assess our proposed measure of corporate corruption, we examine it in relation to two existing measures of corruption that appear in the literature. These are the country level Corruption Perception Index (CPI) and the more granular business environment corruption proxies created from the anonymous responses to the Business Environment and Enterprise Performance Survey (BEEPS). The BEEPS dataset is administered by the European Bank for Reconstruction and Development (EBRD) and the World Bank. Svensson (2005) contends that this is the best and most granular data by which to measure corruption presently available to researchers. We create three measures of corruption from this dataset based on three different questions that appear in the survey.

The first question we use to construct a BEEPS-based corruption measure is the following:

It is said that establishments are sometimes required to make gifts or informal payments to public officials to "get things done" with regard to customs, taxes, licenses, regulations, services etc. On average, what percent of total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose?

Using survey responses, we create a mean variable for each cluster, which is defined by country, industry (2-digit ISIC rev 3.1), firm size (micro, small, and medium-large firms), urban location (capital, city with more than 1 million inhabitants, city with less than 1 million inhabitants), and the corresponding BEEPs wave (2000–2002, 2003–2005, 2006–2009, and 2010–2013). We label this variable *BEEPS Mean Corruption as % Sales* and it measures the average percentage of sales which is spent on corruption for a particular cluster of firms.

The second question we use to construct a BEEPS corruption measure is:

As you list some factors that can affect the current operations of a business, please look at this card and tell me if you think that each factor is No Obstacle, a Minor Obstacle, a Moderate Obstacle, a Major Obstacle, or a Very Severe Obstacle to the current operations of this establishment.

Corruption is listed as one factor with answers ranging from 0 (No Obstacle) to 4 (Very Severe Obstacle). We normalize the responses and again create clusters.[5] We label this variable *BEEPS Mean Corruption as Obstacle*. A higher mean value of the response to this question indicates that corruption is a greater hinderance to business activity.

The last question we employ is the following:

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

The responses to this question are again scaled from 1 (Never) to 6 (Always). We unit normalize the responses and label this variable *BEEPS Mean Corruption.* Higher values indicate that it is *more common* to bribe to accomplish commercial transactions.

In Table 3 we present the correlations of our inefficiency-based measure of corruption with those already established in the literature. In Panel A, we compute those correlations only

[5] The normalization always takes the following form: (x minus minimum value) / (maximum value). This transforms the responses to an interval between 0 and 1.

for sectors having firms from honest countries. In Panel B, we expand our sample by assuming that corresponding inefficiency for the missing honest firm is zero.

Overall, we conclude that our measure of firm level corruption tracks well with the two measures that currently exist in the literature. The correlations between our measure and the reversed CPI are significantly positive across all subsamples. Further, we observe that our corruption proxy is positively related to the BEEPS measures and is generally statistically significant. Although the levels of the correlations are not high, this is likely due to the construction of these measures. The reversed CPI is represented by one observation per year and country, and hence does not vary across industries and firm size.

7. Corruption's Effect on Profitability

7.1. Multivariate Model of Corporate Profitability

Our model to test for corruption's effect on corporate profitability is based on Mironov (2013, 2015) and is defined as follows:

$$Corporate\ Profitability_{\ i,t} = \alpha_0 + \gamma_1 Internal\ Inefficiency_{i,t} + + \beta\, X_{it} \ + \alpha_i \ + \tau + \varepsilon_{i,t} \quad (10)$$

$Internal\ Inefficiency$ represents the corruption proxy for firm i at time t. Vector X_{it} contains a number of firm characteristics as additional controls. Larger firms tend to enjoy economies of scale which affect profitability (Hall and Weiss, 1967). Hence we include Log*(Total Assets)* as a proxy for size. Tangibility is a measure of collateral which can lower the cost of capital (Berger and Udell, 1990; Bharath et al., 2011) and mitigate agency conflict (Himmelberg et al., 1999). Intangible assets serve as an indicator of future growth opportunities for the firm (Titman and Wessels, 1988). Consequently we include *Log(Fixed Assets),*

Log(Intangible Assets), and the *Log(Tangible Assets)* as regressors.[6] The corporate use of leverage can lower the cost of capital as well as reduce agency costs (Jensen, 1986). We measure leverage as the ratio of long-term liabilities scaled by total assets. We also include firm (α_i) and year fixed effects (τ). The error term is represented as $\varepsilon_{i,t}$.

7.2 Profitability Analysis

In this section we provide the results for our estimation of the profitability model described in equation (10). Table 4 contains our results for those firms that have a corresponding honest firm present within their industry. In Panel A of Table 4, we present regression coefficients of the effect of corporate corruption on the Return on Assets, Before-Tax (BT) Return on Equity, and the After-Tax (AT) Return on Equity. The effect of corruption on the firm's profitability is significantly positive for all variables. Thus, corruption consistently exerts a significantly positive effect on shareholder returns.

In Panel B of Table 4 we examine the marginal effect of corruption on corporate profitability. We observe that the effect at the 75th percentile shows that a one percent increase in corruption increases ROA by about 0.14%. We also examine ROE, which measures the return to a firm's shareholders. We estimate two variants of this measure. One is based on a before-tax measure of income and the other uses an after-tax measure, columns (2) and (3). At the 75th percentile, a 1% increase in corporate corruption is associated with a 0.11% increase in the return to shareholders both before and after taxes.

In Table 5 we expand our sample by replacing missing observations for the mean inefficiency of honest firms in a given industry with zero. The results are virtually unchanged. At the 75th percentile, a 1% increase in corporate corruption is associated with a 0.12% increase in ROA. We observe a 0.09% increase in ROE both before and after taxes.

[6] Note that the logarithmic form of all asset components allows for controlling the size of the component as well as any linear combination of those variables, such as a ratio.

We conclude from Tables 4 and 5 that corporate corruption positively influences a firm's profitability. This result holds whether we examine a firm's return to total invested capital or to the return experienced by shareholders. This result is consistent with the Corporate Advantage Hypothesis. That is, corruption persists because of its ability to improve corporate profitability levels.

7.3 Financial Crisis

It might be that our results are sensitive to the financial crisis of 2007. More specifically, the various changes in financial reporting and the expanded oversight of the financial system following the crisis of 2007 might have made corruption less possible or less capable of generating profitability improvements for the firm. Consequently, we undertake a comparative analysis of corruption's effects before and after the financial crisis of 2007.

In Table 6 we present our empirical findings regarding the effect of the 2007 financial crisis on corruption's ability to enhance corporate profitability. In Panel A we examine the period prior to the crisis and we obtain results that are generally consistent with our original findings i.e. that internal inefficiency has a significantly positive effect on firm profitability. In Panel B we analyze the post-crisis period and observe similar results, in which corruption continues to have a significantly positive effect on the firm's return on assets and shareholder equity.

We conclude from this analysis that the financial crisis of 2007 did not have a meaningful effect on corruption's relation to corporate profitability. It remains persistent and appears invariant to regulatory or disclosure changes mandated following this most recent financial crisis. This result further confirms our Corporate Advantage Hypothesis.

7.4 Decomposition of Corporate Profitability

To gain further insight into how corruption affects corporate profitability, we decompose the ROA and ROE measures into its components. This approach allows us to more clearly determine what elements of corporate profitability are most affected by corruption and how

benefits are actually generated for the firm. Because our decomposition involves a separate analysis of sales turnover it allows us to address us the observation by La Porta et al (2000) that "sales are less dependent on accounting convention, are harder to manipulate or smooth through accounting practices, and are less subject to theft". Our decomposition can also provide an initial indication of which channels most enable corruption to occur.

We begin our analysis with ROA, which can be deconstructed into two components, as per the well-known DuPont equation. The first is margin, and as it increases each dollar of sales adds more to the firm's bottom line profitability. The second is asset turnover, and as it increases each dollar of assets generates more in sales. We model ROA and its decomposition as per equation (11):

$$ROA = EBIT\ Margin \times Asset\ Turnover \tag{11}$$

We estimate these two components of ROA using equation (12) below[7]:

$$ROA = \frac{EBIT(OPPL)}{Sales(OPRE)} \times \frac{Sales(OPRE)}{Assets(TOAS)} \tag{12}$$

In Table 7 we present our findings from our examination of ROA. We observe in Panel A that internal inefficiency positively influences both margin and turnover. We find, however, that the coefficient magnitude is much larger for asset turnover. This suggests that corruption's most important effect on total investment return occurs through asset turnover.

In Panel B of Table 7 we examine the marginal effects of these two components of profitability. Our results suggest that corruption most affects the firm's profit margin. Consider, for example the marginal effect of corruption at the 75th percentile. We observe that a one percent increase is associated with a 0.16% increase in margin, but only a 0.02% increase in asset turnover. Corruption can lower expenses through the waiver of administrative requirements, the acceleration of regulatory decisions, or the reduction of government fees and

[7] In parentheses we provide the Amadeus variable names.

costs. Even though the effect on asset turnover is smaller, it is still significant. Corruption often effects contract awards, new business approvals, operating variances, and import/exporting licenses which directly influences the level of corporate sales. Corruption much less often affects total assets levels, since those are typically the result of capital budgeting decisions.

We continue our analysis of corruption's effect on profitability by examining the return to equity. ROE is decomposed into three components. Similar to the ROA analysis, we include terms for margin and turnover. But financial leverage is added as a third term. We decompose ROE into these three components as shown in equation (13).

$$ROE = \frac{Net\ Income(Before\ tax\ [PLBT];After\ Tax\ [PLAT])}{Sales(OPRE)} \times \frac{Sales(OPRE)}{Assets(TOAS)} \times \frac{Assets(TOAS)}{Equity(SHFD)}$$

$$ROE = Net\ Income\ Margin \times Asset\ Turnover \times Equity\ Multiplier \quad (13)$$

In Table 7 we present our empirical analysis of ROE. In Panel A we examine how corruption influences the components of ROE. We observe that corruption positively effects the margin and turnover components. It is inversely related to the equity multiplier, perhaps due to less leverage by these firms to avoid bank and creditor monitoring. These results are consistent with the findings obtained for ROA, which indicates that corruption enhances profitability by its ability to increase sales and reduce expenses.

In Panel B we examine the marginal effects of corruption. If we consider these effects at the 75th percentile for instance, we discover that the effect is comparable for both margin and turnover. However, it has a small negative effect on the equity multiplier.

We conclude from this analysis that corruption enhances investor returns as suggested by the Corporate Advantage Hypothesis. It appears to accomplish this by improving margins and turnover. These improvements occur through increased sales, or perhaps by reduced expenses. Corruption allows a firm to achieve both. Corruption can increase sales by waiving

regulatory requirements, approving permits, or granting licenses. It can reduce expenses by waiving or reducing fees, accelerating decisions, or authorizing procedural exemptions.

8. Channels for Corporate Corruption

Given that corruption is persistent and is associated with increased profitability, we now examine precisely how this occurs. That is, we investigate exactly what channels firms use to divert capital to fund their corrupt practices. We identify four possible such channels. These candidate channels are partially selected on the basis of Moeller's (2009) observation that poor screening procedures for new employees, frequent related party transactions, close relations to suppliers, and inventory mismanagement are common sources of corporate fraud. These accounting practices are also highlighted OECD handbook for the detection of foreign bribery

8.1 Cost of Employees

A common mechanism for the fraudulent transfer of wealth from the firm is to hire phantom employees who generate salary costs, but are not actually employed. Using this "ghost" employee channel, managers create a stable and predictable flow of funds for extra-legal activities. To examine the frequency and effect of phantom employees as a diverting channel, we calculate the cost of employees and staff (STAF) which consists of wages, salaries, and other employee expenses. We then standardize this cost by the firm's operating revenue.

8.2 Cost of Goods Sold

A firm's cost of goods sold is usually a high percentage of its total sales. Thus, it is relatively easy to camouflage other expenses within it. Consequently, we adjust the COGS by employee and material costs since these costs are accounted for separately. We scale this adjusted cost of goods sold, *AdjCOGS* (i.e., COST- STAF – MATE), by the firm's operating revenue. We contend that it is easier for managers to divert funds from a large cost account than a smaller one. Small accounts tend to have less activity charged against them, with each

transaction representing a much larger percentage of the total. Thus, each transaction attracts greater attention and scrutiny. Smaller accounts also have less capacity to fund re-occurring transactions for the replenishment of off-balance sheet pools.

8.3 Material Costs

The logic for including material costs as a potential source for diverted funds is similar to that for the Cost of Goods Sold. Managers might report higher materials costs in their income statement as a way to divert funds away from the firm. Mironov (2013) describes how this can be accomplished by establishing "intermediary" corporations that increase the reported purchase price and thus allow the extraction of wealth. We scale material costs (MATE) by the firm's operating revenue to arrive at our standardized materials cost variable, *Materials*.

8.4 Inventories

Firms can also overpay for inventory to channel funds outside through "intermediary" corporations (Mironov, 2013). This is an effective technique because inventories is a large account with a high level of transaction activity. Further, some items will require purchases on the spot market, adding further opacity to price discovery. Managers might also sell inventory for cash without a receipt. This generates a stream of income which can easily be diverted from the firm. We scale inventories (STOK) by the firm's operating revenue to obtain our variable of interest, *Inventory*.

8.5 Channel Analysis

To determine whether these channels explain how corporate corruption is funded, we regress them against corruption. In Table 9 we present our findings. Panel A shows the beta regression results by country.[8] We observe that *Staff Cost* is positive and significantly related to corruption in 8 out of 12 countries. *Materials* is positively related for 6 of the 12 sample

[8] Beta coefficients (beta weights) are also called standardized regression coefficients. These coefficients correspond to the regression model in which all variables (dependent and independent) are scaled to have variance equal to 1. The size of the coefficients can then be used to determine which regressor has greater explanatory power for the dependent variable.

countries. The findings for *Inventories* are more mixed. Six of the coefficients are negative, four statistically insignificant, and two have positive effects on corruption. It might be that larger inventories require greater management and control, thus actually reducing the opportunities for executives to divert funds using this channel. The relation between *AdjCOGS* and corruption is mostly insignificant. We conclude that *Materials* and *Staff Cost* appear to be the most effective channels for the diversion of corporate funds to external purposes.

In Panel B we compute beta coefficients by industry. *Staff Cost* is positive and significantly related to corporate corruption in 12 of the 13 industries. This suggests that staff cost is a common and effective way for executives to redirect corporate funds for extra-legal purposes. The effect of *Materials*, however, is not consistent. It is insignificant in 5 cases, positively significant in 2, and negative in 6. It appears most effective as a channel for corruption in the manufacturing, construction and government-related sectors. These industries typically report substantial material costs given their extensive need for real assets. *Inventories* again appear to play only a modest role as a channel for corruption. The *AdjCOGS* demonstrates a selected ability to facilitate the flow of money outside the firm.

9. Summary and Discussion

The existing literature reports that corruption adversely affects national tax practices, contributes to the growth of underground or shadow economies, and introduces a variety of distortions to national economic policies. It persists, however, in spite of attempts to eradicate it by national courts and regulators. It also persists despite the transparency required by international accounting standards and the monitoring of global investors. Attempts at explaining corruption's persistence include arguments that it can waive bureaucratic or regulatory requirements, provide preferential access, and accelerate government approvals.

Given these arguments, we develop a hypothesis based on corruption providing financial advantage to the firm. Our Corporate Advantage Hypothesis contends that corporate corruption persists because of the financial benefits it provides to firms. We test our hypothesis by developing a new measure of firm-level corruption.

To test our Corporate Advantage Hypothesis, we examine the effect that corruption has on the firm's ROA and ROE. We find that corruption influences the returns enjoyed by a firm's investors. To understand how corruption improves profitability, we decompose our return measures into their margin, turnover, and multiplier components. Corruption works its effect on profitability through the improvement of both margins and turnover.

We also find that corruption persists even after the extensive regulatory reforms following the financial crisis of 2007. The additional disclosure requirements and increased monitoring of the global financial system enacted after the 2007 financial crisis appears to have had no effect on the proclivity of firms to engage in corrupt practices.

For corruption to occur, there must be a channel to create the actual off-balance capital accounts from which they can make their payments. Our analysis reveals that materials and staff costs appear to be the most effective channels for the diversion of corporate funds. Our finding regarding staff costs is consistent with the widespread use of phantom employees to fraudulently transfer wealth from firms. Our examination of channels also reveals interesting industry differences in their use. Variable *Staff costs* is a popular channel across all industries, but the use of material costs to divert funds is much less common.

The findings in this study are important for several reasons. First, it establishes that the widely cited gains from corruption do in fact exist and they are present at the individual firm level. We now have a deeper understanding of why corruption persists in spite of so many reasons why it should not. Related to this contribution is our novel approach at estimating firm level corruption and the usefulness of these measures to future studies. Second, our

examination of the channels by which corruption occurs identifies a target for regulators, law makers, and others who have an interest in eliminating corruption from the greater political economy. Our channel analysis could be useful for the design and implementation of public policy aimed at economic growth and efficiency.

Finally, these findings suggest substantial future research. We have examined four separate channels, but it is likely there are other mechanisms for the diversion of corporate funds. Or it might be there is a combination of channels that jointly facilitate the diversion of corporate funds. These results also have important implications for governance research since the monitoring and oversight of executives is the essential charge of corporate governance. The relation between corporate governance processes and the extent to which the firm makes extra-legal payments to secure financial advantage warrants further analysis.

Appendix: Financial Variables Used in the Empirical Analysis

Note that we used two kind of variables: 1) standardized or scaled variables, i.e., the variables that are scaled by total assets (TOAS) , sales (OPRE) or shareholder's equity (SHFD) and 2) Level variables, measured in US dollars.

Source for all financial variables is the Amadeus database (Bureau van Dijk, Moody), as it is standard, they are measured in one currency, here the US dollars. The are primarily used for the size of the assets measured in natural logarithm. The specification used conversion done by the Amadeus database, i.e., using the average annual exchange rate from the national currencies. We follows the common practice and all specifications contains annual dummies to control for unobserved annual idiosyncratic shocks.

Variable Name	**Definition**
Scaled (standardized) variables	
Adj_COGS	Cost of goods sold minus staff costs minus materials costs (COST-STAF-MATE)/ sales (OPRE)
Asset Turnover	Sales (OPRE) / assets (TOAS)
EBIT Margin	EBIT (OPPL) / sales (OPRE)
Equity Multiplier	Assets (TOAS) / shareholder's equity (SHFD)
Inventory	Inventories (STOK) / sales (OPRE)
Leverage	Long-term liabilities (LTDB) /total assets (TOAS)
Materials	Material costs (MATE) / sales (OPRE)
Net Income Margin (After tax)	Income after taxes (PLAT) / sales (OPRE)
Net Income Margin (Before tax)	Income before taxes (PLBT) / sales (OPRE)
Return on Assets (EBIT/ Assets)	EBIT (OPPL) / assets (TOAS)
Return on Equity (ROE) (After tax)	Income after taxes (PLAT) / shareholder's equity (SHFD).
Return on Equity (ROE) (Before tax)	Income before taxes (PLBT) / shareholder's equity (SHFD)
Staff Cost	Cost of employees and staff (STAF) /sales (OPRE)
Level variables measured in US dollars	
Log (Total Assets)	Log of total assets (TOAS).
Log (Fixed Assets)	Log of total fixed assets (FIAS).
Log (Intangible Fixed Assets)	Log of intangible fixed assets (IFAS)
Log (Tangible Fixed Assets)	Log of tangible fixed assets (TFAS)

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Table 1: Corruption Levels across Sample Countries

This table presents the distribution of a country's Corruption Perception Index (CPI). We calculate a reverse CPI to facilitate interpretation, since higher values of the Reverse CPI are associated with higher levels of perceived corruption. Reverse CPI is calculated as 100- CPI. The 'Minimum' and 'Maximum' columns show the minimal and maximal level of the reversed CPI, respectively. In parentheses, we present the particular year(s) in which this minimum or maximum value is reached. The CPI is drawn from the Transparency International database.

Country	**Reversed CPI Mean**	**Minimum** (year)	**Maximum** (year)	**Average Percent Change Over 2001 to 2015**
Belarus	66	58 (2012, 2013)	71 (2005, 2006)	-0.86
Bulgaria	60.7	57 (2014)	67 (2011)	-0.71
Czech Rep	53.7	44 (2015)	63 (2002)	-1.66
Estonia	36.3	30 (2015, 2016)	45 (2003)	-2.43
Hungary	49.2	45 (2012)	54 (2011)	0.3
Latvia	54.8	45 (2016)	66 (2000, 2001)	-2.85
Poland	52.7	38 (2015, 2016)	66 (2005)	-2.87
Romania	64.4	54 (2016)	74 (2002)	-2.06
Serbia	66	58 (2013, 2016)	77 (2003)	-2.26
Slovenia	39	33 (2008)	48 (2001)	-1.17
Slovakia	55.9	49 (2015, 2016)	63 (2000)	-1.9
Ukraine	75.4	72 (2016)	79 (2002)	-1.18
Mean	**55.6**			**-1.64**

Table 2: Sample Summary Statistics

This table provides sample summary statistics. The sample period is 2001 to 2015. Panel A shows the summary statistics for the variables used in our subsequent empirical analysis.. Panel B contains the annual number of observations by both year and country. Panel C presents the number of observations by industry. The variables are defined in the Appendix. Financial data is obtained from the Amadeus database provided by the Bureau van Dijk.

Panel A: Summary Statistics

Variable	*N*	*Mean*	*Median*	*StdDev*	*p25*	*p75*
Internal Inefficiency	188,994	-0.009	0.005	0.119	-0.050	0.052
Log(Total Assets)	188,994	15.435	15.507	1.179	14.713	16.217
Log(Fixed Assets)	188,994	14.379	14.508	1.468	13.483	15.377
Log(Tangible Fixed Assets)	188,994	14.205	14.361	1.534	13.285	15.252
Log(Intangible Fixed Assets)	188,994	9.063	9.011	2.226	7.470	10.600
Leverage	188,994	0.153	0.087	0.223	0.000	0.235
Return on Assets	188,994	0.074	0.058	0.110	0.015	0.123
Return on Equity (Before Tax)	183,959	0.141	0.095	0.323	0.011	0.245
Return on Equity (After Tax)	184,021	0.180	0.119	0.363	0.018	0.299
Net Income Margin (Before Tax)	185,675	0.030	0.024	0.081	0.003	0.064
Net Income Margin (After Tax)	185,353	0.022	0.019	0.074	0.001	0.053
EBIT margin	185,725	0.042	0.035	0.077	0.010	0.076
Sales over Assets	185,231	1.845	1.545	1.248	0.979	2.356
Equity multiplier	183,022	3.575	2.162	5.458	1.479	3.678

Panel B: Observations by Year and by Country

Year	*N*	*Percent*
2001	3,996	2.11
2002	5,190	2.75
2003	9,319	4.93
2004	13,664	7.23
2005	15,270	8.08
2006	16,198	8.57
2007	16,324	8.64
2008	16,102	8.52
2009	16,244	8.59
2010	15,413	8.16
2011	14,653	7.75
2012	10,734	5.68
2013	12,503	6.62
2014	11,647	6.16
2015	11,737	6.21
Total	188,994	100

Country	*N*	*Percent*
Bosnia and Hercegovina	1,570	0.83
Bulgaria	20,937	11.08
Czech Republic	41,617	22.02
Estonia	108	0.06
Hungary	10,671	5.65
Latvia	228	0.12
Poland	35,149	18.6
Romania	14,732	7.79
Serbia	7,007	3.71
Slovenia	4,414	2.34
Slovakia	12,247	6.48
Ukraine	40,314	21.33
Total	188,994	100

Panel C: Observations by Industry

Industry	*Internal Inefficiency*
Agriculture, forestry and fishing	9,591
Mining and quarrying	1,150
Manufacturing	80,690
Electricity, gas, steam and air-conditioning supply	2,130
Water supply, sewerage, waste management and remediation	4,130
Construction	15,852
Wholesale and retail trade, repair of motor vehicles and motorcycles	37,860
Transportation and storage	8,921
Accommodation and food service activities	4,002
Information and communication	4,803
Real estate activities	3,547
Professional, scientific, technical, administration and support service activities	10,609
Public administration, defense, education, human health and social work activities	9,897
Total	188,994

Table 3: Correlations across Corporate Corruption Measures

This table shows the correlation coefficients between our inefficiency-based measure of corporate corruption and the two measures of firm level corruption existing in the literature. In Panel A we show the correlation for sectors which have an honest firm present. In Panel B we estimate correlations in an expanded sample where the mean corruption of missing honest firms is replaced with a zero. Detailed description of the variables appears in the Appendix. *** indicates statistical significance at the one percent level.

Panel A. Correlations within Honest Firm Sample

Corruption Measure	**All Firms**	**Honest firms excluded**	**Foreign firms excluded**
CPI (Reversed)	0.1891*	0.2648*	0.1265*
BEEPS Mean Corruption as % Sales	0.1199*	0.1808*	0.0916*
BEEPS Mean Corruption as Obstacle	0.0664*	0.1087*	0.0664*
BEEPS Mean Corruption Intensity	-0.004	-0.005	0.004

Panel B. Correlations within Expanded Sample

Corruption Measure	**All Firms**	**Honest firms excluded**	**Foreign firms excluded**
CPI (Reversed)	0.1212*	0.1714*	0.2430*
BEEPS Mean Corruption as % Sales	0.0873*	0.1307*	0.0617*
BEEPS Mean Corruption as Obstacle	0.0476*	0.0773*	0.2133*
BEEPS Mean Corruption Intensity	0.0103	0.0172*	0.4376*

Table 4: Corporate Corruption and Profitability: Honest Firms Present

This table presents the effect of corporate corruption on corporate profitability as measured by ROA and ROE. Inefficiency is calculated using stochastic frontier analysis, with Value Added as the dependent variable. In this sample we only keep the observations if an honest firm is present within an industry. Panel A shows the regression coefficients while Panel B contains the marginal effects of corruption. *Return on Assets (ROA)* is calculated as EBIT scaled by total assets. *Return on Equity (ROE)* is calculated as with income before taxes (BT ROE) and after taxes (AT ROE) scaled by shareholder's equity (SHFD). The remaining variables are defined in the Appendix. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Corporate Corruption and Profitability

Independent Variables	**ROA**	**BT ROE**	**AT ROE**
Corruption	0.271***	0.423***	0.493***
	(0.007)	(0.024)	(0.026)
Log(Total Assets)	0.030***	0.074***	0.082***
	(0.002)	(0.006)	(0.007)
Log(Fixed Assets)	-0.021***	-0.045***	-0.053***
	(0.002)	(0.006)	(0.007)
Log(Intangible Fixed Assets)	-0.000	-0.011**	-0.009
	(0.002)	(0.006)	(0.006)
Log(Tangible Fixed Assets)	-0.001***	-0.003**	-0.003**
	(0.000)	(0.001)	(0.001)
Leverage	-0.064***	-0.052***	-0.061***
	(0.003)	(0.011)	(0.011)
Constant	-0.072***	-0.167**	-0.190**
	(0.021)	(0.072)	0.493***
Firm & Year Fixed Effects	Yes	Yes	Yes
Adjusted R^2	0.537	0.429	0.457
N	115,753	114,580	114,650

Panel B: Corruption's Marginal Effects

Independent Variables	**ROA**	**BT ROE**	**AT ROE**
Corruption *(Coefficient)*	0.271***	0.423***	0.493***
Marginal Effect @ Mean	[0.006]	[0.009]	[0.008]
Marginal Effect @ 75%	[0.140]	[0.110]	[0.106]
Controls	Yes	Yes	Yes
Firm and Year FE	Yes	Yes	Yes
Adjusted R^2	0.537	0.429	0.457
N	115,753	114,580	114,650

Table 5: Corporate Corruption and Profitability: Expanded Sample

This table presents the effect of corporate corruption on profitability as measured by ROA and ROE. Inefficiency is calculated using stochastic frontier analysis, with Value Added as the dependent variable. In this sample we replace missing observations for the inefficiency mean of "honest" firms with a zero. Panel A shows the regression coefficients while Panel B contains the marginal effects of corruption. *Return on Assets (ROA)* is calculated as EBIT scaled by total assets. *Return on Equity (ROE)* is calculated as with income before taxes (BT ROE) and after taxes (AT ROE) scaled by shareholder's equity (SHFD). The remaining variables are defined in the Appendix. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Corporate Corruption and Profitability

Independent Variables	**ROA**	**BT ROE**	**AT ROE**
Corruption	0.238***	0.362***	0.416***
	-0.005	-0.016	-0.018
Log(Total Assets)	0.027***	0.060***	0.064***
	-0.001	-0.004	-0.004
Log(Fixed Assets)	-0.021***	-0.054***	-0.065***
	-0.001	-0.005	-0.005
Log(Intangible Fixed Assets)	0	-0.005	-0.004
	-0.001	-0.004	-0.005
Log(Tangible Fixed Assets)	-0.001***	-0.001	-0.001
	0	-0.001	-0.001
Leverage	-0.053***	-0.030***	-0.042***
	-0.002	-0.007	-0.008
Constant	-0.030**	0.06	0.416***
	-0.013	-0.046	-0.018
Firm & Year Fixed Effects	Yes	Yes	Yes
Adjusted R^2	0.497	0.41	0.434
N	188,994	188,967	187,056

Panel B: Corruption's Marginal Effects

Independent Variables	**ROA**	**BT ROE**	**AT ROE**
Corruption *(Coefficient)*	0.238***	0.362***	0.416***
Marginal Effect @ Mean	[0.015]	[0.015]	[0.013]
Marginal Effect @ 75%	[0.122]	[0.092]	[0.086]
Controls	Yes	Yes	Yes
Firm and Year FE	Yes	Yes	Yes
Adjusted R^2	0.497	0.410	0.434
N	188,994	188,967	187,056

Table 6: Financial Crisis, Corruption, and Profitability

This table presents the effect of corporate corruption on profitability and revenue during the pre-crisis (2000-2007) and post-crisis (2011-2015) periods. . The variables and controls are the same as in Tables 4 and 5. For brevity, , we present only the regression coefficients and their marginal effects evaluated at the mean and at the upper quartile (75%). ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Corruption and Profitability, Pre-Crisis Period

Independent Variables	**ROA**	**BT ROE**	**AT ROE**
Corruption (*Coefficient)*	0.189***	0.267***	0.317***
Marginal Effect @ Mean	[0.044]	[0.013]	[0.012]
Marginal Effect @ 75%	[0.220]	[0.059]	[0.056]
Controls	Yes	Yes	Yes
Firm and Year FE	Yes	Yes	Yes
Adjusted R^2	0.558	0.454	0.482
N	96,063	95,067	95,099

Panel B: Corruption and Profitability, Post-Crisis Period

Independent Variables	**ROA**	**BT ROE**	**AT ROE**
Corruption (*Coefficient)*	0.163***	0.251***	0.272***
Marginal Effect @ Mean	[0.009]	[0.009]	[0.008]
Marginal Effect @ 75%	[0.093]	[0.071]	[0.067]
Controls	Yes	Yes	Yes
Firm and Year FE	Yes	Yes	Yes
Adjusted R^2	0.569	0.457	0.484
N	76,687	75,909	75,961

Table 7: Corporate Corruption and ROA Decomposition

This table examines the effect of corporate corruption on profitability as measured by ROA. . Inefficiency is calculated using the stochastic frontier analysis. Panel A shows the regression coefficients while Panel B presents the marginal effects of corruption. We decompose *Return on Assets (ROA)* into: (1) *EBIT Margin*, calculated as EBIT scaled by sales and, (2) *Asset Turnover*, which is calculated as sales scaled by total assets. The remaining variables are defined in the Appendix. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Corporate Corruption and ROA Decomposition

Independent Variables	**EBIT Margin**	**Asset Turnover**
Corruption	0.177***	0.896***
	(0.003)	(0.031)
Log(Total Assets)	0.032***	-0.430***
	(0.001)	(0.008)
Log(Fixed Assets)	-0.009***	-0.224***
	(0.001)	(0.009)
Log(Intangible Fixed Assets)	-0.001	0.062***
	(0.001)	(0.008)
Log(Tangible Fixed Assets)	-0.001***	0.018***
	(0.000)	(0.002)
Leverage	-0.024***	-0.316***
	(0.002)	(0.014)
Constant	-0.297***	10.621***
	(0.010)	(0.088)
Firm and Year Fixed Effects	Yes	Yes
Adjusted R^2	0.511	0.841
N	188,444	188,793

Panel B: Marginal Effects

Independent Variables	**EBIT Margin**	**Asset Turnover**
Corruption (*Coefficient)*	0.177***	0.896***
Marginal Effect @ Mean	[0.022]	[0.003]
Marginal Effect @ 75%	[0.157]	[0.024]
Controls	Yes	Yes
Firm and Year FE	Yes	Yes
Adjusted R^2	0.511	0.841
N	188,444	188,793

Table 8: Corporate Corruption and ROE Decomposition

This table examines the effect of corporate corruption on profitability as measured by ROE. . Inefficiency is calculated using stochastic frontier analysis, with Value Added as the dependent variable. Panel A shows the regression coefficients while B presents the marginal effects of corruption. *Return on Equity (ROE),* which is calculated as income before and after taxes scaled by shareholder's equity is decomposed into: (1) Net *Income Margin*, calculated as income before taxes (BT Margin) or income after taxes scaled by sales (AT Margin), (2) *Asset Turnover*, calculated as sales scaled by total assets, and (3) *Equity Multiplier*, calculated as total assets scaled by equity. The remaining variables are defined in the Appendix. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Corporate Corruption and ROE Decomposition

Independent Variables	**BT Income Margin**	**AT Income Margin**	**Asset Turnover**	**Equity Multiplier**
Corruption	0.203***	0.186***	0.896***	-1.753***
	(0.004)	(0.003)	(0.031)	(0.228)
Log(Total Assets)	0.033***	0.030***	-0.430***	1.014***
	(0.001)	(0.001)	(0.008)	(0.058)
Log(Fixed Assets)	-0.009***	-0.008***	-0.224***	-0.521***
	(0.001)	(0.001)	(0.009)	(0.067)
Log(Intangible Fixed Assets)	-0.003***	-0.004***	0.062***	-0.079
	(0.001)	(0.001)	(0.008)	(0.059)
Log(Tangible Fixed Assets)	-0.001***	-0.001***	0.018***	-0.001
	(0.000)	(0.000)	(0.002)	(0.011)
Leverage	-0.058***	-0.053***	-0.316***	1.686***
	(0.002)	(0.002)	(0.014)	(0.102)
Constant	-0.285***	-0.265***	10.621***	-4.478***
	(0.010)	(0.010)	(0.088)	(0.647)
Firm and Year Fixed Effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.515	0.502	0.841	0.541
N	188,497	188,177	188,793	186,627

Panel B: Marginal Effects

Independent Variables	**BT Income Margin**	**AT Income Margin**	**Asset Turnover**	**Equity Multiplier**
Corruption (*Coefficient)*	0.203***	0.186***	0.896***	-1.753***
Marginal Effect @ Mean	[0.035]	[0.044]	[0.003]	[-0.003]
Marginal Effect @ 75%	[0.199]	[0.226]	[0.024]	[-0.031]
Controls	Yes	Yes	Yes	Yes
Firm and Year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.515	0.502	0.841	0.541
N	188,497	188,177	188,793	186,627

Table 9: Corporate Corruption: Factor Decomposition

This table examines the effect of various proxies of corporate governance constructed from available data on management and supervisory/committee structure and information on auditors from Amadeus database. Dependent variable is the measure of the corporate corruption. Presented factors are dummy (0-1) variables: Foreign=1 if a foreign investor is a shareholder, Female CEO (=1) if the company CEO is female, Audit C (=1) if we found an evidence that firm has an Audit Committee, and/or Nomination and/or Remuneration Committee, MajorityF (=1) if a foreign investor holds majority, Unknown CEO(=1) if there is no information about the company CEO, Big 4 (=1) is when company is audited by one of the big four, No_A_info (=1) if there was if no information on company auditor. Columns (1)-(3) use different set of the fixed effect. The sample is does not contains the "honest firms".

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Independent Variables (Factors)		**(1)**	**(2)**	**(3)**
Foreign (=1)		-0.011***	-0.011***	-0.011***
		(0.001)	(0.001)	(0.001)
Female CEO (=1)		0.001	-0.0003	0.0005
		(0.001)	(0.001)	(0.001)
Audit C (=1)		0.006	0.024	0.006
		(0.028)	(0.028)	(0.028)
MajorityF (=0)	Unknown CEO (=1)	0.019***	-0.002	0.019***
		(0.001)	(0.001)	(0.001)
(=1)	(=0)	0.011**	-0.015***	0.009*
		(0.006)	(0.005)	(0.006)
(=1)	(=1)	0.053***	0.004	0.051***
		(0.006)	(0.006)	(0.006)
MajorityF (=0)	Big 4 (=1)	0.023***	0.024***	0.023***
		(0.001)	(0.004)	(0.004)
(=1)	(=0)	-0.009*	-0.016***	-0.009*
		(0.005)	(0.005)	(0.005)
(=1)	(=1)	(omitted)	(omitted)	(omitted)
MajorityF (=0)	No_A_info (=1)	0.002***	-0.032***	0.002***
		(0.001)	(0.001)	(0.001)
(=1)	(=0)	-0.005***	0.023***	-0.006***
		(0.001)	(0.002)	(0.001)
(=1)	(=1)	(omitted)	(omitted)	(omitted)
Constant		0.024***	0.080***	0.140***
		(0.004)	(0.005)	(0.025)
Industry and Year Fixed Effects		Yes		
Country, Industry and Year Fixed Effects			Yes	
Industry * Year Fixed Effects				Yes
Adjusted R^2		0.012	0.035	0.025
N		141,321	141,321	141,321

Table 10: Channel Beta Regressions by Country and Industry

This table analyzes the channels through which corruption is funded. The dependent variable is corporate corruption as measured by the firm's internal inefficiency. Panel A shows beta regressions by country while Panel B presents beta regressions by industry. Columns in Panel A represents ISO2 country identification, i.e., two-character abbreviations of country names: A = Bosnia and Hercegovina, BG = Bulgaria, CZ = Czech Republic, EE = Estonia, HU = Hungary, LV = Latvia, PL = Poland, RO = Romania, RS = Serbia, SI = Slovenia, SK = Slovakia, UA = Ukraine. *Staff cost*, *Materials*, *Inventory*, and *Adjusted cost of goods sold* (COGS) represents the main firm cost structure collected in the AMADEUS database; all those costs are scaled by the total assets. The variables are defined in the Appendix. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Channels by Country

	Dependent Variable = *Internal Inefficiency*											
Independent Variables	BA	BG	CZ	EE	HU	LV	PL	RO	RS	SI	SK	UA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Staff Cost	0.042	0.120***	0.167***	0.108	0.226***	0.034	0.157***	0.109***	-0.012	0.109***	0.162***	0.930***
Materials	0.152***	0.089***	0.009*	0.144	0.061***	0.075	-0.003	0.056***	0.031	0.002	0.044***	0.037***
Inventory	0.044	-0.100***	-0.037***	-0.165	-0.064***	0.032	-0.039***	-0.037***	0.101***	-0.019	-0.018*	0.012**
Adj_COGS	0.173***	-0.01	0.006	-0.230**	0.029***	0.083	0.009	0.007	0.006	0.057***	0.007	-0.930***
Adjusted R^2	0.058	0.038	0.031	0.017	0.064	-0.003	0.029	0.015	0.011	0.02	0.03	0.038
N	1,531	19,775	40,561	110	10,804	210	34,396	17,156	6,997	4,220	11,702	39,289

Panel B: Channels by Industry

Independent Variables	Agriculture, forestry and fishing (1)	Mining and quarrying (2)	Manufacturing (3)	Electricity, gas, steam and air-conditioning supply (4)	Water supply, sewerage, waste management and remediation (5)	Construction (6)	Wholesale and retail trade, repair of motor vehicles and motorcycles (7)
Staff Cost	0.086***	0.151***	0.151***	0.187***	0.124***	0.036	1.767***
Materials	0.009	0.037	0.036***	-0.023	-0.012	0.074***	-0.073***
Inventory	0.099***	-0.02	-0.018***	-0.022	-0.106***	-0.055***	-0.004
Adj_COGS	-0.020*	0.104***	0.034***	0.087***	-0.013	-0.079***	-1.700***
Adjusted R^2	0.018	0.049	0.029	0.046	0.025	0.005	0.033
N	8,227	1,155	83,003	2,114	4,140	15,782	37,931

Independent Variables	Transportation and storage (8)	Accommodation and food service activities (9)	Information and communication (10)	Real estate activities (11)	Professional, scientific, technical, administration and support service activities (12)	Public administration, defense, education, human health and social work activities (13)
Staff Cost	0.241***	0.172***	0.194***	0.198***	0.187***	0.255***
Materials	-0.026**	-0.005	-0.075***	-0.038**	-0.067***	0.028
Inventory	-0.068***	-0.111***	-0.058***	-0.021	-0.023**	0.065***
Adj_COGS	-0.046***	0.014	0.014	0.01	0.030***	-0.104***
Adjusted R^2	0.059	0.034	0.039	0.039	0.044	0.069
N	8,432	4,106	4,051	3,192	9,247	5,371

Abstrakt

Zkoumáme přetrvávání korupce podniků u vzorku soukromých firem z 12 zemí Střední a Východní Evropy v období 2001 až 2015. V článku vytváříme zástupnou proměnnou pro měření firemní korupce na základě (vnitřní) neefektivnosti firem. Zjišťujeme, že neefektivita a korupce zvyšuje ziskovost firmy. Dekompozice míry korupce a analýza mechanismu přenosu ukazuje, že umělé navyšování osobních nákladů je nejběžnějším postupem, kterým firmy odklánějí finanční prostředky na financování korupce. Dospěli jsme k závěru, že korupce na úrovni podniků nadále přetrvává, protože korupce zvyšuje návratnost aktiv podniku.

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