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Economic uncertainty and corruption: Evidence from public and private firms*

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Economic uncertainty and corruption: Evidence from public and private firms

Abstract

We study the influence of policy uncertainty on the moral behavior of firms. When facing uncertainty, managers perceive various socioeconomic obstacles as more severe and disruptive to their business. Using data from policy uncertainty spouts in 93 countries, we document that some firms engage in norm-deviant behavior by cheating on taxes and paying more bribes. While private firms prefer to cheat on taxes, public firms choose bribery as a favorite tool to “grease the wheels” during periods of uncertainty. Strong social capital (local trust and religiosity) breaks this link between uncertainty and corruption.

JEL classification: D80, F30; G38; O43; P48

Keywords: economic policy uncertainty; private firms; corruption; bribery; cheating on taxes; trust; religiosity

1. Introduction

Political and regulatory authorities generate uncertainty through their decision-making process, and this uncertainty can influence firms' business operations (Bloom 2009). Several recent studies have linked policy-related economic uncertainty (policy uncertainty) to various managerial decisions by public firms. Julio and Yook (2012), Gulen and Ion (2016), and Jens (2017) show that policy uncertainty has a substantial impact on firms' investment decisions, and Bhattacharya et al., (2017) report that it affects firms' innovativeness. This uncertainty also affects public corporations' decisions on external financing (Ashraf and Shen, 2019; Chan et al., 2021; Colak et al., 2017; Datta et al., 2019; Francis et al., 2014; Gungoraydinoglu et al., 2017), acquisition activity (Bonaime et al., 2018; Nguyen and Phan, 2017), and cash holdings (Phan et al., 2019).

Most of this research, however, focuses on publicly traded large corporations. We add to this literature by studying the influence of policy uncertainty on small firms throughout the world, most of which are private firms.¹ While we analyze both private and public firms, we try to shed more light on private enterprises since they make up more than 99 percent of the business entities in most countries, and they have in aggregate four times as many employees, three times the revenues, and twice as many assets as listed firms (Chen et al., 2011). For instance, the privately held firms in the United States produce 51% of the gross national output and employ more than half of the labor force (Nagar et al., 2011). In the European Union, small firms with less than 250 employees, employ more than 66% of the labor force (Airaksinen et al., 2016). While researchers have examined financing and growth constraints in private firms (for instance, Beck et al., 2005; D'Souza et al., 2017; Hope et al., 2011; Mertzanis, 2019), we

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¹ The link between privately held (non-publicly trading) firms and political uncertainty has been analyzed within specific countries. Amore and Minichilli (2018), for instance, analyze the investment behavior of family firms in Italy that are exposed to economic uncertainty. An, Chen, Luo, and Zhang (2016) analyze the investments of private vs. state-owned enterprises in China, although the term "private firms" in the context of China encompasses those listed on the exchange that are not owned by the local or federal government.

do not know how these small and relatively more fragile firms cope with the pressure generated by the rising uncertainty.

The main obstacle in studying private firms' reaction to policy uncertainty is the lack of data on them in many smaller countries and the unavailability of a proper policy uncertainty measure in those countries. Using the enterprise-level data from the World Bank Enterprise Survey (henceforth WBES), we study how policy uncertainty affects private firms in various countries. This data not only provides detailed information on the structure and financials of both private and public firms, but the survey also seeks the managers' opinions on the main obstacles (inefficiencies) in the business environment. This survey data is available for around 146,000 firms in 143 countries.²

The unavailability of a local measure of policy uncertainty for many countries around the world has been a major challenge for researchers. While the news-based index of Baker, Bloom, and Davis (2016) is widely used to capture economic policy uncertainty, it is predominantly available for the developed or the large developing nations.³ To address this challenge, Ahir, Bloom, and Furceri (2019) develop a world uncertainty index for 143 countries for each quarter since 1996Q1. Their method relies on textual analysis of the Economist Intelligence Unit's (EIU) quarterly country reports, and it is designed in a similar fashion to Baker et al.'s (2016) economic policy uncertainty index.⁴

We combine this world uncertainty index (WUI) with the WBES data for the period of 2002–2018 to get a large sample of 96,769 firm-year observations for small business firms

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² See <https://www.enterprisesurveys.org/en/data>

³ As of January 2020, the measure was available for only 23 countries: Australia, Brazil, Canada, Chile, China, Colombia, France, Germany, Greece, Hong Kong, India, Ireland, Italy, Japan, Mexico, Netherlands, Russia, Singapore, South Korea, Spain, Sweden, the United Kingdom, and the United States.

⁴ In this study, we use the concepts of *economic uncertainty* and *policy uncertainty* as close substitute for each other. While conceptually there can be certain differences between these uncertainties, due to lack of separate country-level measures for each type of uncertainty, we work with the WUI, which is referred to by its creators (Ahir et al, 2019) with the generic name of “world uncertainty index.”

from 93 countries that cover 16 regions within Africa, Americas, Asia, and Europe. Using this sample, we assess how economic uncertainty influences the business environment that firms operate in. Since our data is survey based, our goal is not to establish a causal link between uncertainty and business constraints but rather to provide evidence that uncertainty alters managerial perception of the severity of the business constraints that are prevalent in a country. We find that as policy uncertainty rises, the managerial opinion (measured by the responses to survey questions) about the severity of business obstacles increases. These obstacles include, a dysfunctional court system, high crime levels (theft and disorder), various forms of public sector corruption, high tax rates, ineffective tax administration, anti-competitive behavior of informal businesses, reduced access to finance, and political instability.

This relationship between uncertainty and managerial opinion is to be expected because individuals (firm managers) tend to perceive increased uncertainty as a threat to their livelihood (Hogg, 2007). As studies have shown that uncertainty amplifies people's reactions to negative events (Arenas et al., 2006), managers are likely to react more negatively to existing market frictions and business obstacles. That is, the unpredictability of future economic and political outcomes induces an environment of uncertainty and inefficiency. Leff (1964), Acemoglu and Verdier (2000), and Mendoza et al. (2015) argue that when economic agents think that a country's institutions are ineffective, they tend to engage in corruption in order to "grease the wheels" of their businesses. Similarly, Husted (1999) claim that when uncertainty avoidance (à la Hofstede, 1980) in a country is high, firms engage more in corrupt behavior. Rodriguez et al. (2005) note that corrupt economies are often characterized by widespread uncertainties. When faced with uncertainty, managers will rationalize their norm-deviant behavior and will even make it part of the corporate culture (Anand et al., 2004; Ashforth and Anand, 2003). In light of these findings, we hypothesize that most firms from around the world will reduce their exposure to economic uncertainty shocks by engaging in corruption.

To test this prediction, we examine two aspects of business activity that pertain to corruption. These include, cheating on taxes and paying bribes. We show that during times of high policy uncertainty, small businesses cheat more on taxes and pay more bribes (both measured as percent of sales). All of these results are statistically significant at the 1% level and are robust to the inclusion of several firm-level and country-specific characteristics as well as industry, country, and year fixed effects. The results are economically significant too; for instance, a one standard deviation increase in our economic uncertainty measure translates to 3.5% less sales reported to the government for tax purposes. We also document an interesting divergence between private versus public firms' reaction to economic uncertainty. Private firms' preferred form of corruption is cheating on taxes, probably because they find it easier to fudge their actual sales numbers subject to taxes. Public firms, on the other hand, are relatively less likely to cheat on taxes and instead prefer to cope with uncertainty by paying more bribes. This is a novel finding for the literatures on corruption and policy uncertainty.

To improve identification and to increase the reliability of our findings, we use instrumental variable (IV) regressions, where election closeness and the proportion of seats held by the largest opposition party in the legislature serve as instruments for uncertainty. We continue to find higher levels of corruption after using these proxies and IV regressions. Using a carefully balanced sample obtained by applying propensity score matching, where we match on all firm and country-level characteristics, produces similar results. To further improve the robustness of our results and to reduce the effects of measurement error in our estimations, we employ four alternative measures of economic policy uncertainty. First, using the voting outcomes from the national elections in each country (as in Julio and Yook, 2012), we construct a measure (*Election closeness*) to capture the uncertainty generated around contested elections. Second, we construct the orthogonalized measure of policy uncertainty by running a regression of country-level index (country-specific WUI) on the aggregate global uncertainty (available in

Ahir et al. (2019)) and use the residuals from this regression as our uncertainty measure in the second stage. Third, we calculate stock market volatility by estimating the standard deviation in returns on the main stock index in each country. Fourth, we use the news-based index of Baker et al. (2016) for countries with available data on electronic news articles. These four alternative measures do not alter our qualitative conclusions.

Policy uncertainty can directly affect corruption by inducing external conditions that incentivize norm-deviant behavior in firms. It can also affect corruption indirectly by changing managerial perception regarding obstacles facing their businesses that in turn can trigger corrupt managerial actions. To test this indirect affect, we perform a formal mediation analysis (Baron and Kenny, 1986). Our mediation tests show that worsened perception of managers regarding business obstacles explains 4.2% of the relationship between economic uncertainty and cheating on taxes. The indirect effect of paying bribes explains about 18.5% of the total effect. Thus, economic uncertainty affects corrupt behavior both directly and indirectly through the mediating role of managerial perception.

We next explore how cross-country heterogeneity affects the relationship between policy uncertainty and corruption. We first look at the constitutional framework of the country. A parliamentary system is characterized by simultaneous changes in the control of the government's executive branch and the legislative branch that thereby increases the freedom of politicians when trying to consolidate democracy (Stepan and Skach, 1993). A presidential system, on the other hand, is characterized by a high degree of checks and balances that often minimize policy fluctuations and imposes constraints on the adoption of new laws and regulations. Julio and Yook (2012) and Gungoraydinoglu et al. (2017) argue that in general, presidential systems have less political uncertainty; that is, parliamentary systems are more likely to experience greater policy-related economic uncertainty. We therefore predict the relationship between policy uncertainty and corruption to be more significant in countries with

a parliamentary system of government. To test this prediction, we interact our main uncertainty measure (WUI) with an indicator variable for a country with a parliamentary system of government. We find that firms located in these countries cheat more on taxes. However, we do not find any statistically significant differences between the levels of bribes under the two systems. We also explore whether this uncertainty-corruption relationship is influenced by the economic conditions in a country. We predict that this relationship will be stronger in low-income regions due to the general lack of oversight and transparency. Consistent with our prediction, private firms located in low-income countries have a greater tendency to engage in cheating on taxes and paying bribes when economic uncertainty increases.

Studies have indicated that cultural and sociological norms in the country can mitigate norm-deviant behavior. For instance, Kanagaretnam et al. (2018) use a sample of firms from 25 countries to show that societal trust is negatively correlated with corporate tax avoidance. Aghion et al. (2010) claim that trust is vital when country-level governance institutions are weak. Similarly, studies have shown that religiosity affects corporate outcomes (Callen and Fang, 2015; Jiang et al., 2018; McGuire et al., 2012). Therefore, we examine how societal trust and religious norms affect the link between uncertainty and corruption. To measure trust and civic norms (social capital), we follow Knack and Keefer (1997) and use the World Values Survey (WVS). Specifically, we define social capital as the average of trust in others and norms of civic cooperation. Our religiosity measure is an indicator variable equal to one if more than 70% of the country's residents replied "yes" when asked, "Is religion important in your daily life?" in a Gallop Poll in 2009, and zero otherwise. Using these measures, we show that both societal norms and religiosity mitigate the uncertainty-corruption relationship.

We contribute to the literature in several ways. First, we extend the literature on policy uncertainty to private firms. Due to lack of data on private firms, most of the literature about policy uncertainty focuses on publicly traded firms. For instance, Nagar et al. (2019) assert that

policy uncertainty contributes to increasing information asymmetry between public firms and their investors. Boutchkova et al. (2012) claim that local policy uncertainty translates into higher systematic (stock market) risk, while global shocks result in higher firm-specific return volatility. Politically motivated local (state level) fiscal shocks also tend to reduce the productivity and the output of local public firms (Cohen et al., 2011). Furthermore, heightened policy debates slow down the public firm's ability to adjust to the optimal capital structure by using stock issuances (Colak et al. 2018). We contribute to this line of research by showing that policy uncertainty can induce corrupt business practices such as bribery and tax cheating in both public and private firms.

We are the first to link policy uncertainty to corruption in private firms. While some studies have linked uncertainty to corruption (e.g., Braun and Di Tella 2004; Goel and Ram 2013; Treisman 2007), they largely confine their empirical evidence to cross-country analyses using macro-level corruption indices. We fill this gap by studying how policy uncertainty effects the behavior of small firms. During times of high economic uncertainty, firms face more severe obstacles that impede their business, and they respond by engaging in norm-deviant behavior. While private firms cheat through underreporting sales and paying lower taxes, the public firms prefer to “grease the wheels” through bribery. Further, our results also indicate that societal norms such as trust in others and religiosity reduce such corruption. Overall, these results are consistent with the idea that uncertainty induces an environment where norm-deviant behavior prevails, and a country's social capital ameliorates this negative effect.

2. Theoretical Motivation and Hypotheses Development

Studies like Bernanke (1983), Bloom (2009), and Pastor and Veronesi (2012) have set the theoretical foundations of the literature on the consequences of economic policy uncertainty. As predicted by these studies, empirical tests confirm that economic policy uncertainty has broad macroeconomic and financial implications (Bernanke 1983; Bloom et al. 2007; Leahy

and Whited 1996). Similarly, reports prepared after the 2008 financial crisis show that the period of high economic uncertainty that followed the recession created business obstacles and impeded growth and recovery (International Monetary Fund 2012). In particular, policy uncertainty lowers investment and delays the implementation of projects (Dixit and Pindyck, 2012; Drobetz et al., 2018), reduces employment growth (Bentolila and Bertola, 1990), boosts interest rates (Ashraf and Shen 2019), and suppresses asset valuations (Brogaard and Detzel, 2015; Kelly et al., 2016; Kim et al., 2012; Pástor and Veronesi, 2013, 2012).

The above findings imply that policy uncertainty can disrupt firms' regular business activities and in turn can create new impediments or can exacerbate existing frictions in the economy. Thus, we first analyze how policy uncertainty affects managers' perceptions about the efficient functioning of the regulatory authorities, the governmental agencies, and various other socioeconomic institutions within a country. The research in different studies indicates that individuals perceive various types of uncertainties as a threat to themselves (Hogg, 2007). Uncertainty further intensifies people's reactions to negative events (Arenas et al., 2006; Van Den Bos et al., 2007). Thus, managers should react more negatively to existing economic frictions and business obstacles when the uncertainty about their firms' future increases. On the basis of the above arguments, we formulate our first hypothesis:

Hypothesis 1: Policy uncertainty worsens managers' perception about the severity of the business obstacles prevalent in a country.

If business obstacles are perceived to be more severe by the firm managers during periods of high uncertainty, then these managers should take precautionary action to ameliorate the effects of such obstacles on their businesses. Put differently, the unpredictability of economic and political outcomes can create an uncertain environment in which firms constantly look for ways to mitigate their exposure to these uncertainties. One such remedy is engaging in corruption and other illegal practices. Husted (1999) and Rodriguez et al. (2005) argue that

firms engage in corruption to reduce the uncertainty in their business dealings with government officials. Using data from India, Collins et al. (2009) show that corruption can be costly to the society but vital in reducing regulatory uncertainty for firms, especially when the managers perceive corruption as increasing their firms' survival chances. Managers then rationalize their norm-deviant behaviors, and corruption becomes part of the corporate culture (Anand et al., 2004; Ashforth and Anand, 2003).

Consistent with this view, we argue that uncertainty increases the unpredictability of future economic and political outcomes that explains why firms engage in shady behavior to reduce their exposure to the potentially detrimental consequences of uncertainty. For instance, high policy uncertainty can induce firms to engage in more aggressive political lobbying activities (Shang et al., 2019). Kaufmann and Wei (2000) claim that firms engage in corruption to reduce various inefficiencies.⁵ At the country level, there is some evidence that macroeconomic uncertainty has a positive association with corruption; Braun and Tella (2004) and Treisman (2007) find that countries with high variability in inflation have higher levels of corruption. Cohen and Malloy (2014) show that political favoritism (a form of corruption) is prevalent within US Senate as alumni's network connections to powerful Senate committee chairmen help those ex-senators secure additional discretionary earmark funding for local constituents.

Many studies have pointed to the costs and benefits of corruption when widespread inefficiency prevails and creates serious economic frictions (Huntington, 1968; Méon and Sekkat, 2005; Shleifer and Vishny, 1993). For instance, corruption can facilitate trade and improve efficiency by allowing private sector agents to circumvent cumbersome regulations (Bardhan, 1997; Leff, 1964; Mauro, 1995). Furthermore, Leff (1964), Acemoglu and Verdier (2000), Méon and Weill (2010), and Mendoza et al. (2015) theorize that when a country's

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⁵ Kaufmann and Wei (2000) also provide evidence that when firms pay more bribes, they spend more, not less time, with the governmental authorities. In untabulated results, we find results consistent with this argument.

institutions are ineffective, corruption is a useful tool to “grease the wheels”, especially at the small firm level.

We build on this literature and argue that a country’s economic uncertainty increases the severity of business constraints for all firms (Hypothesis 1). We further predict that these conditions induce an environment of inefficiency. To reduce this inefficiency, some managers can engage in paying bribes and cheating on taxes. This idea is largely consistent with the theoretical models of Aguilera and Vadera (2008) in which they argue that corruption occurs when there is a context or environment that makes such actions feasible and there are factors that encourage agents to act in such ways.

Hypothesis 2: Higher policy uncertainty is associated with more severe corruption in the form of cheating on taxes or paying more bribes by firms.

Studies have shown well that policy uncertainty can influence a manager’s decisions at the firm level. For instance, Julio and Yook (2012), Gulen and Ion (2016), and Jens (2017) show that policy uncertainty influences a firm’s investment decisions. Political uncertainty can also affect the financing of projects by delaying the decision to go public (Colak et al. 2017) or by impeding equity or bond issuance (Colak et al. 2018; Francis et al. 2014; Gungoraydinoglu et al. 2017; Chan et al. 2021; Datta et al. 2019). Policy uncertainty is also shown to affect technological innovation (Bhattacharya et al. 2017) and cash holdings (Phan et al., 2019). However, almost everything we know about the relationship between policy uncertainty and managerial decisions is based on the behavior of publicly listed firms that are in the US.

In this study, we focus on private firms across the world and their managerial decisions under uncertainty.⁶ We contrast their behavior to the behavior of public firms. How exactly

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⁶ The literature on private firms’ decision-making is growing. Caballero et al. (1995), Cooper and Haltiwanger (2006), and Asker et al. (2011) claim that private firms’ investment policies are different than public firms. Michaely and Roberts (2012) show that private firms smooth dividends less than public firms. Gao and Li (2015) report that private firms’ CEO compensation is less sensitive to performance; however, Edgerton (2012) shows

small private firms cope with uncertainty is still unclear. There is some scant evidence that indicates private firms react somewhat differently to policy uncertainty than public firms. A study by Amore and Minichilli (2018), for instance, focuses on a single country (Italy) and shows that family firms are more likely to invest during periods of high uncertainty. Colak et al. (2017) shows that when facing policy uncertainty, about 15% of private firms delay their decision to raise new equity capital. However, the rest of the private firms proceed with their IPO events and are willing to accept lower price-to-value ratios for their equity.

In view of the differences in the nature of public and private firms, the assumption that they may adopt different norm-deviant behavior when faced with high economic uncertainty is a reasonable one. Typically, compared with public firms, private firms have less pressure from the capital market and are therefore more likely to actively reduce taxes by deliberately reporting lower financial earnings (Slemrod, 2007). Conversely, because public firms need to disclose their activities through financial reports or discussions with analysts, the perceived benefits of tax evasion may be less than the perceived costs of putting themselves in a disadvantaged position (Cloyd et al., 1996). Additionally, due to the high concentration of ownership, private firms generally have lower costs for financial reporting that are associated with reducing taxes and are more likely to conduct transactions that generate tax savings (Klassen, 1997). Therefore, we predict that private firms will be more willing to cheat through taxation to deal with economic uncertainties.

Although both tax evasion and bribery are corrupt practices, their penalty functions are different. In the process of tax evasion, the firm may be held liable for the fraudulent acts of its internal accountant. But in the process of bribery, individuals may be liable (e.g.,

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that public firms overuse corporate jets compared to private firms. Financing options, growth constraints, and capital structure policies are also different in private firms (Beck et al., 2005; Brav, 2009; D'Souza et al., 2017; Hope et al., 2011; Mertzanis, 2019; Saunders and Steffen, 2011).

imprisonment) if involved in any corrupt payment scheme. As the ownership of private firms is more concentrated, their managers will increase their efforts to control bribery to avoid responsibility (Clarke and Xu, 2002). The scale of bribery can also vary with firm's bargaining power (Svensson, 2003). Given that public firms and public officials may have a closer relationship, bribery by public firms may be more cost effective than that by private firms. Our next hypothesis focuses on such differences between public and private firms:

Hypothesis 3: High policy uncertainty induces a different norm-deviant behavior in private firms than in public firms; private firms prefer cheating through taxes and public firms prefer paying more bribes.

The social norm theory argues that social constructs such as trust and civic norms reduce norm-deviant behavior among all economic agents. Based on the findings of Putnam et al. (1994), La Porta et al. (1997), and Fisman and Miguel (2007), we argue that societal trust is a reliable deterrent of corruption. For instance, Kanagaretnam et al. (2018) show that societal trust is negatively associated with corporate tax avoidance. Consistent with Adelopo and Rufai (2020), we argue that trust inhibits corruption. Furthermore, following the arguments in Aghion et al. (2010), we predict that trust becomes vital when country-level governance institutions are weak.⁷ Similarly, society's religiosity can reduce corporate misconduct such as financial reporting fraud (McGuire et al., 2012). Mensah (2014) also argues that religion reduces the levels of perceived corruption in the country. Thus, we hypothesize that societal trust and religiosity will break the link between policy uncertainty and corruption for all firms:

Hypothesis 4: Societal norms such as trust and religiosity will ameliorate the corruptive

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⁷ Different dimensions of social capital can have different effects on the level of corruption (Pena López and Sánchez Santos (2014)). In particular, strong bonds between individuals can positively relate to corruption. On the other hand, linking and bridging social capital can inhibit individuals or groups from engaging in corruption. Recent evidence, however, shows that both civic norms and dense social networks can mitigate norm deviance and reduce transaction costs (Hasan et al., 2017b, 2017a). In our analysis, we measure trust using the civic norm (linking and bridging) component of social capital and expect a negative link between trust and corruption.

effects of higher policy uncertainty on managerial behavior in all firms.

3. Research Design and Sample Selection

In this section, we describe the measures for economic policy uncertainty, the details of our empirical design, and the sample selection procedure. We also present the summary statistics.

3.1. World economic uncertainty index

We define economic policy uncertainty using the newly developed world uncertainty index (WUI) of Ahir et al., (2019). The WUI utilizes the Economist Intelligence Unit's (EIU) quarterly country reports to capture the economic, political, and financial trends in a country by using a five-step comprehensive process that is developed by experienced analysts within each country. Ahir et al. (2019) construct the index for each country by counting the frequency of the word “uncertainty” and its variants in the EIU reports. To make the index comparable, they divide the word count by the total number of words used in the report. The uncertainty index does well in capturing important global events and is positively correlated with the index for economic uncertainty and the volatility in the stock market. To further smooth the idiosyncratic usage of the word “uncertainty” in a particular quarterly report and to remove idiosyncratic spikes in economic uncertainty that may not last long enough to change managers' behavior, we use the three-quarter weighted moving average of this index as our main uncertainty measure. To reduce potential measurement problems related to the WUI, we use three alternative measures of uncertainty in a series of robustness checks (see Section 5). These alternative measures are available for a smaller set of countries.

3.2. World Bank's Enterprise Surveys (WBES)

The World Bank's Enterprise Survey (WBES) covers a wide range of topics related to a country's business environment, such as access to financing, gender, corruption, infrastructure, innovation, competition, informality, and performance indicators. The survey asks a series of questions and allows business owners and top managers to express their views on the business

environment, growth opportunities, financial and legal barriers, and corruption issues that help to identify the obstacles that hinder the performance and growth of firms. It is considered to have the most comprehensive firm-level data on emerging markets and developing economies from all over the world. While this survey is conducted in several waves, the World Bank conveniently provides combined datasets for several countries for the periods of 2002–2005 and 2006–2019. Despite some differences, the two datasets are largely the same and compatible with each other.⁸

The financial accounting studies have used the WBES data before. They have used it to study growth (Beck et al., 2005; D’Souza et al., 2017), financing constraints (Hope et al., 2011; Mertzanis, 2019; Wellalage et al., 2019), and product innovation (Lederman, 2010; Xie et al., 2019) for firms as well as the association between auditing infrastructure and bribery mitigation (Khalil et al., 2015), recovery of SMEs from a financial crisis (Lawless et al., 2015), and the link between investment efficiency and financial reporting quality (Chen et al., 2011).

From the WBES data we identify eight major obstacles (inefficiencies) for which all private firms have sufficient data. These obstacles are the court system, crime, corruption, tax rate, tax administration, anticompetitive behavior of the informal sector, financing, and political instability. The severity of an obstacle is measured by the survey, and thus it reflects managers’ opinions and perceptions about the seriousness of the obstacle.

3.3. Sample selection

We start with the raw firm-level data from the WBES. This initial sample has 104,638 firm-years of which 4,897 (or 4.7% of the sample) belong to publicly listed firms. Since in WBES all values of sales are in local currency units, we convert these values to US dollars using the

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⁸ We merge the two datasets on all required identification variables. The industries are defined slightly differently in the two datasets, and so we manually adjust the industry names in the 2002–2005 dataset to correspond to the 2006–2019 dataset. After combining the datasets, we remove the duplicates based on the unique identification number and year of the firm.

exchange rate at the end of the month in which the survey was conducted. Consistent with the “grease the wheels” hypothesis (Acemoglu and Verdier, 2000; Mendoza et al. 2015), we focus on small and medium-level firms. We, thus, screen out the very large firms, as well as the firms whose sales are missing or negative.⁹ These screening only affects about 1.9% of our original sample of firms.

We then match the data from this survey with the uncertainty index. This index is constructed for each quarter, and we therefore take the timing into consideration when matching. Using the date of the interview we are able to precisely match the firm data (WBES) to the WUI measure using country, year, and quarter.¹⁰ We remove any country with fewer than 50 observations per year (affects only 184 firm-years). Our final sample contains 103,738 firm-year observations from 93 countries that cover the period from 2002–2018.

Table 1 provides the sample composition with the number of observations for each country, the number of surveys of each country, and the mean uncertainty index. The sample is highly inclusive with gross domestic product (GDP) per capita ranging from \$225 in Burundi to \$27,698 in Greece. The largest number of observations comes from India (10,322), followed by the Russian Federation (3,004), and Chile (2,721). The mean policy uncertainty index is higher in the Central Asian countries, the Middle East, and Africa. For majority of our sample countries, the survey is conducted two or more times. We can therefore use country and year fixed effects that should increase the identification strength of our tests.¹¹

[Table 1 around here]

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⁹ According to WBES guidelines, negative sales values indicate that the firm did not report their sales during the survey. We also exclude all firms with sales equal to zero since they are likely to be micro firms with no activity during the year. To focus on small firms, we place an upper limit of \$100 million in sales.

¹⁰ WBES does not provide the exact date of the interview for the 2002–2005 sample. We therefore assume that the interview was conducted in the fourth quarter of the year. In robustness checks, we change this to the first, second, and third quarters. Our baseline results remain qualitatively unchanged.

¹¹ If countries appeared only once in the sample, our results could simply reflect the cross-country differences. For instance, firms in countries with higher uncertainty are also likely to face more obstacles. In our analyses, this issue is of little concern since we apply country and year fixed effects. We also control for several other macro-level variables which further reduce the probability that we capture mere cross-country differences.

The survey data from WBES are well populated for the question(s) related to bribery and are used to create our left-hand side variable that measures the percentage of sales paid as bribes during a given year. However, the survey data related to firms' cheating on taxes is available for 68 out of 93 countries in our sample.¹² Thus, when analyzing the tax cheating behavior of firms, our sample size is reduced to 30,032 firm-year observations.

The data on macro-level variables for each country are obtained from the World Bank. The country-level governance data is from Kaufmann et al. (2009). These data consist of several hundred individual variables that measure six different governance categories: political stability, government effectiveness, regulatory quality, law enforcement, and corruption as well as the extent to which a country's citizens are able to participate in selecting their government. We follow Kaufmann et al. (2009) and Beltratti and Stulz (2012) and create a composite index (by extracting the principal component) of these six variables for each country.

3.4. Baseline model

To assess the relationship between the severity of business obstacles and economic uncertainty, we estimate the following model:

$$\begin{aligned} Obstacle_{i,j,t} = & \alpha + \beta_1 Uncertainty_{j,t} + \beta_2 Size_{i,j,t} + \beta_3 Age_{i,j,t} + \beta_4 Exporter_{i,j,t} + \\ & \beta_5 Government_{i,j,t} + \beta_6 Foreign_{i,j,t} + \beta_7 GDP_{j,t} + \beta_8 \Delta GDP_{j,t} + \\ & \beta_9 Inflation_{j,t} + \beta_{10} Country\ Governance_{j,t} + \sum_k Industry + \quad (1) \\ & \sum_t Year + \sum_j Country + \varepsilon_{i,j,t} \end{aligned}$$

where *Obstacle* indicates the perceived severity of one of the eight obstacles facing private firms. Management's responses range from zero (not an obstacle) to four (a very severe

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¹² Information on cheating on taxes is available for Albania, Angola, Argentina, Armenia, Belarus, Benin, Bolivia, Bosnia-Herzegovina, Botswana, Brazil, Bulgaria, Burundi, Cambodia, Chile, Colombia, Croatia, Czech Republic, Dominican Republic, Ecuador, El Salvador, Georgia, Ghana, Greece, Guatemala, Guinea, Honduras, Hungary, India, Indonesia, Jamaica, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Latvia, Lebanon, Liberia, Lithuania, Madagascar, Malawi, Mali, Mauritania, Mexico, Moldova, Mongolia, Namibia, Nicaragua, Panama, Paraguay, Peru, Poland, Republic of North Macedonia, Romania, Russian Federation, Rwanda, Senegal, Slovakia, Slovenia, South Africa, Tajikistan, Tanzania, Turkey, Uganda, Ukraine, Uruguay, Uzbekistan, Vietnam, and Zambia.

obstacle). *Uncertainty* is the country-level measure of policy uncertainty (WUI). Subscripts i , j , and t indicate firm, country, and time. Since *Obstacle* is a count variable between zero and four, we run count regressions that assume a Poisson distribution. Assuming a negative binomial distribution or implementing a pooled OLS does not alter our qualitative conclusions.

Following other studies (e.g., Beck et al., 2005), we add the firm's size (*Size*) that is defined as the natural logarithm of total sales and its age (*Age*) that is defined as the natural logarithm of one plus the difference between the survey year and the year of incorporation; and our control variables are an indicator for firms that export more than 10% of their sales (*Exporter*), indicators for when the government (*Government*) or a foreign entity (*Foreign*) own more than 10% of the firm, gross domestic product per capita (*GDP*) and its growth rate (ΔGDP), and country-level inflation (*Inflation*). Additionally, we control for country-level governance as in Beltratti and Stulz (2012) by using the first principal component of six indicators of governance in the country (*Country Governance*). Following Hope et al. (2011), we also add industry, year, and country fixed effects. The standard errors are heteroscedasticity-robust and clustered at the industry level. All variables are defined in Table 13 of the appendix.

To examine how economic uncertainty affects managerial behavior and corruption, we look at two measures. First, we calculate the fraction of sales not reported to the tax authorities (*Cheating on taxes*). The survey specifically asks the interviewee what percentage of sales were reported for taxation. Although the variable is not available for all countries, it is well populated for vast majority of the countries (68 out of 93). This is a direct measure of corruption as firms are required to report all sales for tax purposes. Our second measure, *Bribes*, is the fraction of sales paid as “unofficial payments” to the government authorities. This measure captures corrupt behavior on the part of private firms as well as the government authorities. Following these definitions, we modify Eq. (1) as follows:

$$\begin{aligned}
Corrupt_{i,j,t} = & \alpha + \beta_1 Uncertainty_{j,t} + \beta_2 Size_{i,j,t} + \beta_3 Age_{i,j,t} + \beta_4 Exporter_{i,j,t} + \\
& \beta_5 Government_{i,j,t} + \beta_6 Foreign_{i,j,t} + \beta_7 GDP_{j,t} + \\
& \beta_8 \Delta GDP_{j,t} + \beta_9 Inflation_{j,t} + \beta_{10} Governance_{j,t} + \\
& \sum_k Industry + \sum_t Year + \sum_j Country + \varepsilon_{i,j,t}
\end{aligned} \tag{2}$$

Corrupt is either *Cheating on taxes* or *Bribes* and other specifications are as in Eq. (1).

Some studies argue that endogeneity problem (in the form of simultaneity bias) may arise when an economic outcome is regressed on a news-based measure of policy uncertainty (see the discussion in Gulen and Ion (2016)). In light of this concern, we implement an instrumental variable (IV) regression in which we use the closeness of national elections (*Election closeness*) and the proportion of seats in the national parliament held by the largest opposition party (*Opposition seats*) as instruments for *Uncertainty* in the first stage.

For our first instrument¹³, *Election closeness*, we rely on the findings in Julio and Yook (2012), Boutchkova et al. (2012), and Gungoraydinoglu et al. (2017) who claim that when a country's national elections are very close, the policy uncertainty spikes. Thus, this instrument should be a reliable as our *Uncertainty* variable. We obtain data on all national elections from the Database of Political Institutions (Scartascini et al., 2018), and then we supplement it with a manual data verification procedure that closely follows the guidelines in Gungoraydinoglu et al. (2017). Our *Election closeness* variable uses the distribution of party votes in the national elections to capture the uncertainty created due to competitive and contested elections. Jens (2017) argues that election closeness can be attributed to poor economic performance by the

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¹³ Note that using several instruments for one endogenous variable is an acceptable practice in instrumental variable regressions, because it creates over-identified conditions. Even if one of the instruments is deemed irrelevant, the remaining instruments are sufficient for proper identification (please refer to the discussions in Section 5.1.2 of Wooldridge (2002)).

previous administration and that it is indicative of higher economic uncertainty in the pre-election period. As such, this variable captures the uncertainty leading up to the election date.

Our second instrument (*Opposition seats*), on the other hand, captures the post-election uncertainty prevalent in a country. Our motivation for its use comes from the divided government hypothesis (Cutler, 1988; Kelly, 1993; Sundquist, 1988) which argues that the legislation is less likely to be enacted if the executive branch's party does not also hold the majority in the legislative branches of the government. Since divided governments are likely to give rise to disagreements between the legislature and the executive branches, we predict that a larger proportion of opposition seats in the legislative branches will be positively related with policy uncertainty. Arguably, such political gridlock can affect our dependent variable, *Corrupt*, only by increasing the uncertainty (*Uncertainty*) which means that the exclusivity criterion for this instrument should also be satisfied. To calculate *Opposition seats*, we obtain data on the composition of the legislative branches in each country in a given year from the Database of Political Institutions. We then divide the total seats of the largest opposition party by the total seats in the house to obtain the proportion of seats held by the largest opposition party. The higher the proportion of opposition seats, the more likely is the gridlock.

To formally test the quality of our instruments, we apply Stock and Yogo's (2005) weak instrument test. We also report the F -statistics from the test of under-identification (instruments are irrelevant) and follow the instrument assessment guidelines proposed in Staiger and Stock (1997). Formally, our instrumental variable (IV) regression is summarized as:

$$Uncertainty_{j,t} = \delta_0 + \delta_1 Instruments\ for\ Corrupt_{i,j,t} + \delta_2 Controls_{i,j,t} + \mu_{i,j,t} \quad (3a)$$

$$Corrupt_{i,j,t} = \gamma_0 + \gamma_1 Uncertainty_{i,j,t} + \gamma_2 Controls_{i,j,t} + \omega_{i,j,t} \quad (3b)$$

where the *Instrument for Corrupt* vector consists of *Election closeness* and *Opposition seats*, and the *Controls* vector consists of all the control variables from Eq. (2). All the other specifications in Eq. (3b) are as in Eq. (2).

3.5. Summary statistics

Panel A of Table 2 provides the summary statistics for our pooled public and private sample. The first heading of the panel displays the opinion of business managers on the severity of the obstacles they face. The responses range from zero (not an obstacle) to four (very severe obstacle). On average, managers identify obstacles as less severe when the average response for all obstacles is below two (moderate obstacle). The average and median for tax rate indicates that it is a more severe concern for firms than other obstacles. The summary statistics for size indicate that the average private firm in the sample has sales of \$10.67 million; however, the median value (\$149.03 thousand) indicates positive sample skewness. The sample also has some micro firms with sales in the 25th percentile at approximately \$558,000. The mean (median) age is approximately 19 (14) years. Around 16.1% of the firms are exporters while only 2.2% have over 10% government ownership. Similarly, around 10.5% of the firms in the sample have some foreign ownership. Focusing on country characteristics; the mean (median) uncertainty index is 0.067 (0.057) that roughly translates to about 6.7% (5.7%) word counts for “uncertainty” (or its variants) for each 1,000 words in the quarterly EIU reports. The mean (median) GDP is around \$5023.1 (\$2979.0) that indicates considerable variation in the economy of the sample countries. The mean and median GDP growth are around 5%. The mean (median) inflation in the sample countries is 7.1% (5.3%). Average governance in the countries is on the lower side which is expected given that our sample is mostly comprised of underdeveloped or developing countries with weaker governance mechanisms.

Further, the norm-deviant behavior of the firms is presented separately for the pooled sample (bottom of Panel A), for the private firms’ sample (Panel B), and for the public firms’ sample (Panel C). At least 25% of firms who respond to the tax question engage in cheating (75th percentile value is non-zero) and, on average, they underreport 17.9% of their sales to the authorities. At the mean annual sales level of \$10.67 million, this number corresponds to an

average of \$2.34 million unreported sales per firm. On average, the firms pay 1.4% of their sales as bribes to government officials that corresponds to an average illegal payment of about \$149,352 per firm per year.

[Table 2 around here]

4. Empirical Results

4.1. Univariate results

Table 3 displays the univariate tests for private and public firms (in Panels A and B, respectively). We define high (low) economic uncertainty as countries belonging to the top (bottom) quintiles of economic uncertainty in a given year. Panel A indicates that private firms' managers identify all the obstacles as more severe when economic uncertainty is higher. Public firms (Panel B) also report a worsening business environment due to uncertainty except for tax rates. Thus, both private and public firms perceive uncertainty as the cause of worsening business obstacles.

However, in both panels there are considerable firm- and country-level differences between firms in the low versus high uncertainty subsamples. Therefore, we cannot reach a conclusion based on these results that economic uncertainty really increases business obstacles. It is possible that the firms just perceive it as such. Nevertheless, as the variable under the norm-deviant headings show, firms cheat more on taxes and pay more bribes during high economic uncertainty. Regardless of whether the increase in obstacles is real or perceived, both the private and the public firms react with increased corruption. Specifically, during the high uncertainty periods, the incremental underreporting of sales by private firms is about 2.6% of total sales that if evaluated at the mean sales of \$9.97 million (from Table 2), indicates that roughly \$259,220 additional sales went underreported to the government authorities on top of the mean underreported sales of around \$2.20 million ($=22.1\% * \$9.97$; from Table 2). Similarly, during high uncertainty periods, the private firms pay 0.4% more in bribes than they

do during low uncertainty periods (1.8% vs. 1.4%). For most small private firms from around the world, these numbers are not economically negligible. For public firms, on the other hand, these univariate results are quite different. As Panel B of Table 3 shows, public firms actually reduce the amount of cheating through taxes during high uncertainty periods (7% versus 17.3% of the sales go underreported). However, these public firms substantially increase the amount of bribes they pay (3.9% versus 1% of the sales). These results are broadly consistent with our first three hypotheses: while both private and public firms accelerate their corrupt behavior when faced with uncertainty, public firms focus more on bribery than cheating on taxes.

[Table 3 around here]

4.2. Policy uncertainty and obstacles facing private firms

To corroborate the findings from our univariate analysis, we conduct various multivariate tests. Using our pooled sample of 103,738 firm-years, we estimate Eq. (1) to examine the effects of economic uncertainty on the obstacles facing all firms. After controlling for both firm and country-level variables, our univariate results persist. The results reported in Panels A and B of Table 4 show that the coefficient for the main uncertainty measure is positive and statistically significant in all specifications. All the coefficients from the Poisson regression are statistically significant at less than the 1% level. The estimates are also economically significant. In Panel B, a one standard deviation increase in economic uncertainty, *ceteris paribus*, results in a 9.6% ($1.626 \times 0.055 \div 1.074$) increase in the severity of crime, theft, and disorder and a 4.1% ($0.545 \times 0.055 \div 1.372$) increase in the severity of anti-competitive practices. These results are in line with our prediction in *Hypothesis 1* – economic uncertainty worsens managers’ perception about the severity of the business obstacles prevalent in a country.

[Table 4 around here]

Further, the reported severities of the obstacles increase as the size of the firm increases, except for access to financing. These two results are understandable since firms are more likely

to encounter challenges as the size of their business grows and are more likely to face financing issues if they are young and small. Beck et al. (2005) also find this size effect in relationship to financing. Among other variables, foreign ownership reduces many of the constraints. This reduction can be attributed to the potentially better management and access to resources that foreign ownership brings. The coefficient for GDP is consistently negative and highly significant in all eight regression results. This coefficient means that firms located in low-income countries face more severe obstacles than those in middle or high-income countries.

4.3. Policy uncertainty and corruption in firms

We next estimate Eq. (2) with our two main dependent variables to capture corruption by using a pooled sample of private and public firms. Panels A and B in Table 5 provide these results. The regressions in panel A indicate that during high economic uncertainty, all firms cheat more on taxes and pay more bribes. Both of these results are statistically significant at the 1% level. The results are also economically significant. For instance, a one standard deviation increase in economic uncertainty results in about 3.01% (0.548×0.055) less sales reported to the government authorities for tax purposes. Similarly, a one standard deviation increase in economic uncertainty translates to about 0.17% (0.031×0.055) increase in bribe payments as a percentage of sales. Overall, these findings are consistent with *Hypothesis 2* in that the small firms behave more corruptly when there is higher economic uncertainty.¹⁴

[Table 5 around here]

To enhance the robustness of our results with regards to standard error clustering, in panel B of Table 5 we apply both country-industry (interacted) fixed effects and cluster the standard

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¹⁴ We report heteroscedasticity-robust standard errors clustered at the industry level in all our specifications. Following Lederman (2010) and bootstrapping the standard errors does not alter our results.

errors at the same level as suggested by Petersen (2009). We continue to find a positive relationship between firms' tendency to engage in corrupt behavior and economic uncertainty.

Among the control variables, size, age, GDP, and GDP growth negatively affect corrupt behavior in private firms. This is consistent with the idea that younger and smaller firms are riskier. Country-level inflation also induces cheating on taxes and paying more bribes. While governance can mitigate bribery problem, it contributes to cheating on taxes. One explanation for this cheating could be the higher tax rate in these countries that could induce an environment where firms are more likely to avoid taxes (Kanagaretnam et al., 2018).

Columns (3) and (4) of Table 5 provide the results from Tobit regressions. Since a majority of the firms do not cheat on taxes or pay bribes (median values are zero; see Table 2), a Tobit regression with left censoring at zero is an appropriate estimation method in our context. The Tobit results are similar to those reported using pooled OLSs.

Columns (5) and (6) display the results from propensity score matching. The treated firms are the ones exposed to high uncertainty. We define high (low) economic uncertainty as countries in the top (bottom) quintile of economic uncertainty in a given year. We implement the matching by first matching treated and control firms based on all characteristics in column (1) and by applying a caliper of 0.05. This process results in an equal sample of firms belonging to high (treated sample) and low (control sample) uncertainty countries. Using a pooled sample of treated and control observations, we run our OLS tests. The coefficient for cheating on taxes and bribes is again positive and statistically significant at the 5% level. Taken together, these findings are consistent with our baseline results and show that even after matching firms on several firm and country characteristics, the uncertainty-corruption relationship prevails.

4.4. Private versus public firms: preference for different forms of corruption

Next, we make an important distinction between small firms based on whether they are subject to monitoring by institutional shareholders and other stockholders or whether they are tightly

held with limited dissemination of information. Small private firms are subject to very little monitoring. Thus, as expressed in *Hypothesis 3*, they are likely to engage in a different form of corruption than the more closely watched and larger public firms.

First, we check whether private firms feel differently about business obstacles than public firms. We run the regression described in Eq. (1) but instead use an interaction term for private firms (*Private* dummy). As displayed in Table 6, the interaction term, *Uncertainty*×*Private*, is statistically insignificant which indicates there are no major differences among the managers of public and private firms on whether they perceive economic uncertainty as an amplifier of business obstacles in the economy. A possible exception is their perception of financing constraints (column (7)). The managers of private firms feel that the financing constraints are much stronger for them which, in light of the findings by Beck et al. (2005) and Hope et al. (2011), is to be expected given that private firms are smaller in size (see Table 2) and the uncertainty likely affects their sources of financing more severely.

[Tables 6 & 7 around here]

Second, we analyse whether there are differences between private and public firms with regards to the uncertainty-corruption relationship. Table 7 shows an important behavioral difference between private and public firms. Because they are more closely monitored, public firms tend to cheat less on taxes than private firms (the coefficient for *Uncertainty*×*Private* is significantly positive). Put differently, the small private firms find it easier to underreport sales for tax purposes than public ones, who are subject to more regulations and more scrutiny from governmental authorities (Hope et al, 2011). However, the public firms pay a higher percentage of their sales in bribes than the private firms. In untabulated results¹⁵, we find that private firms do indeed increase their bribes when subjected to economic uncertainty; however, the negative

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¹⁵ We basically rerun the results from Table 5 but using only the sample of private firms.

sign of the interaction term in Table 7 (see columns (2), (4), and (6)) indicates that private firms cannot increase the magnitude of their bribes as much as public firms. Either private firms run out of cash, as indicated by the result in column (7) of Table 6, or they find it easier to lie about their sales and resort to cheating on taxes as a way to cope with economic hardship. This contrast in preferred forms of corruption among private and public firms that are subject to economic uncertainty is a novel finding for both the “greasing the wheels” (Huntington, 1968; Leff, 1964) hypothesis and the policy uncertainty (see, among others, Bloom (2009)).

4.5. Identification through instrumental variable regression

To improve the identification of our tests, we turn to an instrumental variable regression, whereby we represent uncertainty with the two instruments described in subsection 3.4. We predict a positive relationship between these instruments and economic uncertainty. The results from the IV regressions in Eqs. (3a) and (3b) are displayed in Table 8. As in Table 5, the sample has both private and public firms. Columns (1) and (3) show that both the proportion of opposition seats in the legislature and election closeness are indeed significantly and positively associated with economic uncertainty (with the possible exception being *Opposition seats* in column (3)). The Cragg-Donald F -statistic indicates that the instruments are not weak since the values are higher than the traditional threshold of 10 used by Stock and Yogo (2005). The Hansen’s j -statistic shows that the instruments do not overidentify the estimation model.

The second stage results in columns (2) and (4) lead to qualitatively similar conclusions to the OLS and Tobit specifications in Table 5. Again, the IV regression results support our *Hypothesis 2* – higher economic uncertainty results in more corrupt behavior by firms in the form of cheating on taxes and paying bribes.

[Table 8 around here]

4.6. Mediation analysis: Measuring the direct and indirect effects of policy uncertainty

Thus far, we show a positive association between rising economic uncertainty and the worsening of managerial perception regarding business obstacles. We also show that high economic uncertainty induces corrupt behavior. However, a worsened managerial perception may also affect managerial behavior towards cheating on taxes and paying bribes. Therefore, to further corroborate the association between economic uncertainty, managerial perception, and corruption, we perform a mediation analysis (Baron and Kenny, 1986). This analysis allows us to isolate the direct and indirect effects of economic uncertainty on corrupt behavior. Specifically, mediation takes place if economic uncertainty affects cheating on taxes and paying bribes through another variable. In our case, the mediator variables are the managerial perceptions regarding the eight business obstacles identified in Table 4.

[Figure 1 around here]

Figure 1 depicts the structural equations in the mediation analysis. Based on the standardized coefficients in the figure, managerial perception regarding dysfunctional court system; crime, theft, and disorder; prevalent corruption; anti-competitive practices; and political instability have a positive and indirect effect on tax cheating through rising economic uncertainty. Similarly, for paying bribes, almost all factors have positive and indirect effects. Table 9 shows that the factors that are related to managerial perception explain about 4.2% of the total effect of economic uncertainty on tax cheating and 18.5% of the effect on paying bribes.¹⁶ While the indirect effects are both statistically significant, the indirect economic effect of a worse managerial perception is higher on paying bribes.

[Table 9 around here]

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¹⁶ The indirect effects are calculated using the following formula: (indirect effect of managerial perception/total effect of uncertainty)*100. For *Cheating on taxes*: $(0.004/0.096)*100=4.2\%$ and for *Bribes*: $(0.005/0.027)*100=18.5\%$

5. Further Analyses

5.1. Alternative measures of policy uncertainty

To reduce the measurement error issues with our uncertainty variables, we use four additional measures of economic uncertainty. Our first alternative measure, *Election closeness*, was described in subsection 3.4. In this subsection, rather than using *Election closeness* as an instrument for the WUI variable, we instead use it as a direct measure of economic uncertainty (like in Julio and Yook, 2012). This use facilitates a robustness check related to any possible measurement error bias that originates from the construction of WUI by Ahir et al. (2019).

In our second measure, we isolate only the local component of a country's economic uncertainty by orthogonalizing the country-level uncertainty index to the global aggregate uncertainty index available in Ahir et al. (2019). We run a simple OLS estimate with no constant term where a country-level measure is the dependent variable and global aggregate uncertainty is the only explanatory variable. To isolate only the orthogonal component of local measures of policy uncertainty, we extract the residual values from this regression and use them as our second uncertainty measure. We carry out this orthogonalization procedure to obtain the portion of country-level uncertainty that corresponds only to the uncertainties pertaining to economic, political, and financial aspects of the country itself instead of the global uncertainty that affects all countries at that time.¹⁷

Our third measure uses a country's stock market volatility. This measure is widely used as a proxy for economic uncertainty and correlates positively with the news-based index (Baker et al., 2016) as well as with the world uncertainty index (Ahir et al., 2019). To calculate the stock market volatility, we measure the standard deviation of the major stock index of each

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¹⁷ Orthogonalization is implemented by running the following OLS: $WUI_{j,t} = \beta_{j,t}GlobalWUI_t + \epsilon_{j,t}$, where $WUI_{j,t}$ is the world uncertainty index of a country j during time t , and $GlobalWUI_t$ during time t is represented by the unweighted average of countries' WUIs. Ahir et al. (2019) refer to this global index as the unweighted *Global WUI* during that period t (see their Figure 1B). Note that the above regression has no constant term. The local component of WUI for a country j in time t is the residual term, $\epsilon_{j,t}$.

country. We obtain data on stock index values from Compustat's Global Index Prices dataset that is available at a monthly frequency for only 32 countries in our sample.¹⁸ We then estimate a moving 12-month standard deviation for each index. Further, we combine this information with WBES data using the month and year of the interview. Since not all countries have a stock market in our sample, this results in a large reduction in the sample.

For the fourth measure, we use the natural logarithm of the news-based index available for a subset of sampled countries. In our sample, we are able to obtain this information for Brazil, Chile, Colombia, Greece, India, Mexico, and the Russian Federation. Additionally, we use the European index for countries in Europe to increase our sample size (this adds 16 more countries to our sample). We calculate the natural logarithm of the 3-month moving average news-based economic policy uncertainty for these countries. Using this measure also causes a large reduction in the sample.

The results from using these four measures¹⁹ are provided in Table 10. The coefficients in all our specifications are positive and statistically significant at the 1% level. Hence, our results are not driven by the worldwide changes in the economic uncertainty or the measurement error in our main uncertainty variable.²⁰ These robustness tests further corroborate our claim that

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¹⁸ Since we choose only one index per country (the largest stock index in terms of market capitalization), our final sample has one entry per country, month, and year. The 32 countries with both bribery data and stock index data at the time of the survey are Argentina, Bangladesh, Brazil, Bulgaria, Chile, Croatia, Czech Republic, Ecuador, Egypt, Greece, Hungary, India, Indonesia, Jamaica, Jordan, Kenya, Lithuania, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Russian Federation, Slovakia, Slovenia, Sri Lanka, Thailand, Turkey, and Venezuela.

¹⁹ The three alternative uncertainty measures and our original economic uncertainty measure (WUI) are strongly and positively correlated with each other. This is consistent with the findings of Ahir et al., (2019), who test their measure of uncertainty index against news-based economic policy uncertainty of Baker et al., (2016) and the stock market volatility and they report significantly positive correlations.

²⁰ Another widely used measure of policy uncertainty is national elections (see for instance, Julio and Yook, 2012). Election-based policy uncertainty indicators have the advantage of capturing the exogenous variation in economic uncertainty, however they do not tell us how much election uncertainty (relative to other countries' elections) exists at the time of a given country's election. Also, these measures assume absence of uncertainty during non-election years; yet our sample is comprised of primarily low-income and underdeveloped countries, where policy uncertainty is presumably very high even in the absence of elections. Furthermore, using election-based indicators (which are in the form of dummies that take a value of one every 4-5 years during the election year) leads to large attrition of our sample, which is based on surveys that are not conducted every year (see Table 1). Therefore, in our context, using non-election-based proxies for economic uncertainty seems more appropriate.

rising economic uncertainty induces many private firms around the Globe to cheat on taxes and pay more bribes. These findings also confirm that the link between uncertainty and corruption exists even for the larger and more visible countries that are calculated by Baker et al.'s (2016) economic uncertainty index (the above-mentioned 23 countries that are either located in Europe or are among the largest emerging markets). Thus, the negative externality of rising economic uncertainty affects all countries regardless of their size and geographic location.

[Table 10 around here]

5.2. *Political and societal factors and the uncertainty-corruption relationship*

Next, we explore the heterogeneity of our sample and examine how different political, economic, and societal factors enhance or reduce the uncertainty-corruption relationship.

5.2.1. *Political and economic dimensions*

First, we focus on the political and economic differences across countries. Previous evidence indicates that parliamentary systems are more likely to have large policy swings and to create a more uncertain environment for the economic agents (Julio and Yook, 2012). We therefore predict that the uncertainty-corruption relationship will be stronger in countries with a parliamentary system of government. We test this prediction by interacting a dummy variable that equals one if the country in which the firm is located in has a parliamentary system of government, and zero otherwise. The results for this specification are provided in columns (1) and (2) of Table 11. The interaction term is positive and statistically significant only for cheating on taxes. During high economic uncertainty, the firms located in countries with parliamentary systems cheat more on taxes but do not pay more bribes relative to firms located in countries with presidential systems. This is consistent with our prediction.

[Table 11 around here]

We also analyze how the level of economic development (i.e., per-capita income) of each country influences the uncertainty-corruption relationship. We obtain country-level income

groupings from the World Bank. We predict that the private firms located in low-income countries will engage more in cheating on taxes and paying bribes due to the lack of oversight and transparency by well-funded and sophisticated regulatory authorities. We, therefore, interact an indicator variable which equals one if the firm is located in a low-income country, and zero otherwise. The results provided in columns (3) and (4) of Table 11 are consistent with our predictions. The coefficient for the interaction term is positive and statistically significant in both specifications that indicates the marginal effect of economic uncertainty on corrupt behavior in private firms is higher in low-income and underdeveloped countries. Thus, economic underdevelopment of a country amplifies the corruptive effects that higher policy uncertainty has on small private firms.

5.2.2. The role of societal norms

Previous evidence indicates that societal norms reduce norm-deviant behavior. Based on the findings of Putnam et al. (1994), La Porta et al. (1997), and Fisman and Miguel (2007), we argue that societal norms are a strong determinant of whether corruption exists. Similarly, Kanagaretnam et al., (2018) and Hasan et al. (2017b) show that societal trust and social capital are negatively associated with corporate tax avoidance. Jin et al. (2017) show that banks in high social capital regions in the US were less prone to financial failures in the recent global financial crisis due to their higher transparency. Furthermore, following the arguments in Aghion et al. (2010), we predict that trust becomes vital when country-level governance institutions are weak. Consistent with this prediction, we argue that civic norms in the form of trust and civic cooperation negatively influence the uncertainty-corruption relationship.

To test this prediction, we collect data from the World Values Survey (WVS) and follow the methodology in Knack and Keefer (1997) to calculate country-level trust and norms of civic cooperation measures. We then rerun our baseline model with an interaction term. The results reported in columns (1) and (2) of Table 12, show that firms located in countries with higher

levels of civic norms engage in less cheating on taxes, but civic norms do not mitigate bribery. This mixed result indicates that civic norms, as a replacement for a country's governance institutions, reduces corrupt behavior to some extent when faced with higher economic uncertainty. These results are largely consistent with the literature on trust (Aghion et al., 2010; Kanagaretnam et al., 2018) and *Hypothesis 4*.

Next, we look at how religiosity can affect the uncertainty-corruption relationship. We obtain data on country-level religiosity from a Gallup poll conducted in 2009 that asked individuals in each country about the importance of religion in their lives. Using this information, we create a dummy variable that equals one if more than 70% of the residents in a country replied "yes" when asked, "Is religion important in your daily life?", and zero otherwise. Religion is shown to reduce levels of perceived corruption (Mensah, 2014) as well as mitigate corporate misconduct such as financial reporting fraud (McGuire et al., 2012). We, therefore, predict that the religiosity of a country's residents can break, or at least mitigate, the uncertainty-corruption relationship. The results for this specification are provided in columns (3) and (4) of Table 12. The interaction terms are once again negative and statistically significant. These results are also consistent with *Hypothesis 4* that when country-level regulatory agencies start becoming ineffective (i.e., corruption in private firms starts rising together with the economic uncertainty), religiosity as a social norm can have a certain ameliorating effect in reducing cheating and bribery.

[Table 12 around here]

5.2.3. Other socioeconomic dimensions

In addition to the above dimensions, we consider several other socioeconomic, political, and geographic aspects of a society (or a country). We conduct a series of cross-country tests (untabulated) to understand what influences the relationship between policy uncertainty and

corruption.²¹ First, we test how cultural aspects of a society can influence the uncertainty-corruption relationship. We obtain data on cultural dimensions from Hofstede (1980). Consistent with Husted (1999), we find that societies at higher levels in the uncertainty avoidance index (UAI) pay more bribes during high economic uncertainty. For cheating on taxes, the cross-country results split according to the UAI and are not statistically significant at conventional levels.

Second, we find that there are some differences between the countries located in different continents (Africa, Asia, Europe, and North and South Americas) in terms of cheating on taxes and paying bribes. For instance, cheating is more prevalent in Africa and Europe, while bribery is more common in Asia. However, regardless of the continent they are located on, the private firms react to policy uncertainty by engaging in one form of norm-deviant behavior or the other. Furthermore, as we demonstrated earlier, regardless of the continent, a country's socioeconomic features and various political institutions do make a difference in breaking the link between economic uncertainty and firm-level corruption.

5.3. An alternative measure of corruption: time spent with government authorities

In an untabulated test, we also analyze whether the management spends more time with government authorities. This measure may not directly relate to corruption, but it still reflects the overall inefficiency of the firm in its involvement with the government. While the WBES survey does not provide the reason for the time spent with government authorities, we can safely assume that any excessive or unnecessary time spent with government authorities is a sign of norm-deviant behavior in the form of lobbying or another such activity.

To explore this association, we use the amount of time that management spends with the government authorities in a given year as a percentage of their total working hours. The mean

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²¹ While these tests are untabulated, they are available from the authors on request.

(median) percentage time spent with the government is 10.44% (4.00%) of the management's total working hours during a year. Our regression analyses estimate that during high economic uncertainty, firms' management spends more time with the government. The coefficient for our uncertainty measure is statistically significant at the 5% level and its economic impact is as follows: A one standard deviation increase in our WUI measure translates into about 0.49% more time spent with the government, which roughly corresponds to two additional days.

We also test whether firms get more frequent visits from tax authorities during higher uncertainty periods. We find that tax authorities visit firms less frequently during such times. This infrequency further indicates that the time spent with government authorities is not due to taxes, but perhaps due to another activity such as lobbying. Less oversight from authorities during uncertain times paves the way for norm-deviant behavior like cheating on taxes.

6. Conclusion

We study how policy uncertainty contributes to the severity of the obstacles that face private firms in 93 countries. The firms report that they face more severe constraints and higher socioeconomic inefficiencies when policy uncertainty is higher. We argue that the higher unpredictability of future economic and political outcomes and more severe business obstacles induce an environment of uncertainty and inefficiency. When facing an uncertain environment, firm managers become more worried about their own future (Hogg, 2007) and pay more attention to negative events and obstacles (Arenas et al., 2006). Some of them ultimately resort to corruption to cope with the high uncertainty and the perceived or real inefficiencies it brings. As predicted by “the greasing the wheels” hypothesis (Acemoglu and Verdier, 2000; Leff, 1964; Mendoza et al., 2015), firms engage in corrupt behavior to reduce the inefficiencies associated with the elevated policy uncertainty that originates from political and governmental activities. We report empirical evidence consistent with this argument. Specifically, we show that firms pay more bribes and cheat more often on taxes in the presence of higher economic

policy uncertainty. These results are robust to endogeneity bias; industry, year, and country fixed effects; and alternative measures of policy uncertainty.

We use the heterogeneity of our sample to find that when facing policy uncertainty, private firms' corruption is different from that of public firms; the former cheats by underreporting taxes and the latter pays more bribes. Different political, legal, and societal factors also affect the uncertainty-corruption relationship. Since a parliamentary system of government is more prone to large economic policy swings, we find that firms located in such countries are more likely to cheat on taxes. The uncertainty-corruption relationship is stronger in firms located in low-income countries. On the other hand, societal factors such as civic norms and religion mitigate the uncertainty-corruption relationship. These results provide new insights on how policy uncertainty influences corporate practices of small firms around the world.

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Figure 1

Mediation analysis: Isolating the direct and indirect effects of policy uncertainty

This figure presents the structural equation modeling of the mediation analysis to assess the direct and indirect effects of economic policy uncertainty on cheating on taxes and paying bribes. *Uncertainty* is the country-level World Uncertainty Index (WUI) developed by Ahir et al. (2019) using the country reports prepared by Economist Intelligence Unit (EIU). Standardized coefficients are reported next to each line.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Table 1

Sample Composition

Country	Obs.	No. of surveys	Uncertainty index	Country	Obs.	No. of surveys	Uncertainty index
Afghanistan	425	2	0.15	Liberia	258	2	0.06
Albania	609	3	0.07	Lithuania	693	4	0.04
Angola	647	2	0.00	Madagascar	525	2	0.05
Argentina	2,654	3	0.15	Malawi	584	3	0.08
Armenia	711	3	0.02	Malaysia	708	1	0.08
Azerbaijan	402	2	0.00	Mali	930	4	0.08
Bangladesh	2,537	2	0.07	Mauritania	327	2	0.00
Belarus	986	4	0.02	Mexico	2,646	2	0.09
Benin	380	3	0.07	Moldova	705	4	0.09
Bolivia	980	3	0.07	Mongolia	602	3	0.08
Bosnia and Herzegovina	642	3	0.07	Morocco	239	1	0.06
Botswana	541	2	0.03	Mozambique	1,031	2	0.12
Brazil	2,575	2	0.09	Namibia	604	2	0.02
Bulgaria	1,312	4	0.07	Nepal	682	2	0.05
Burundi	403	2	0.04	Nicaragua	1,433	4	0.11
Cambodia	506	2	0.08	Niger	175	2	0.08
Cameroon	576	2	0.10	Nigeria	1,953	1	0.08
Chad	266	2	0.06	Pakistan	532	1	0.02
Chile	2,721	3	0.04	Panama	638	2	0.01
Colombia	2,619	3	0.06	Paraguay	1,077	3	0.06
Croatia	889	3	0.05	Peru	2,309	3	0.06
Czech Republic	620	3	0.04	Philippines	1,763	2	0.07
Côte d'Ivoire	580	2	0.08	Poland	1,230	4	0.08
Dominican Republic	626	3	0.03	Macedonia	660	3	0.03
Ecuador	1,558	4	0.10	Romania	1,031	3	0.08
Egypt	2,441	2	0.08	Russian Federation	3,004	3	0.05
El Salvador	1,945	4	0.07	Rwanda	361	2	0.05
Eritrea	117	1	0.00	Senegal	1,047	3	0.04
Ethiopia	857	2	0.00	Slovakia	454	3	0.04
Georgia	534	3	0.04	Slovenia	661	3	0.06
Ghana	942	2	0.07	South Africa	1,502	2	0.10
Greece	959	2	0.05	Sri Lanka	460	1	0.04
Guatemala	1,602	4	0.09	Tajikistan	521	3	0.03
Guinea	275	2	0.22	Tanzania	990	3	0.03
Honduras	1,277	4	0.04	Thailand	768	1	0.15
Hungary	830	3	0.09	Togo	224	2	0.09
India	10,322	2	0.04	Turkey	2,606	4	0.10
Indonesia	2,696	3	0.04	Uganda	1,023	2	0.02
Jamaica	305	2	0.05	Ukraine	1,368	3	0.07
Jordan	901	2	0.01	Uruguay	1,179	3	0.05
Kazakhstan	1,054	3	0.01	Uzbekistan	846	4	0.07
Kenya	2,047	3	0.13	Venezuela	173	1	0.03
Kyrgyzstan	580	4	0.08	Viet Nam	2,138	3	0.04
Lao PDR	642	3	0.01	Yemen	456	2	0.02
Latvia	570	3	0.05	Zambia	1,219	3	0.10
Lebanon	493	2	0.19	Zimbabwe	1,123	2	0.22
Lesotho	126	1	0.08				

This table presents the sample composition with number of observations, years of survey, and the average uncertainty index for each country. Uncertainty is the country-level World Uncertainty Index (WUI) developed by Ahir et al. (2019) using the country reports prepared by Economist Intelligence Unit (EIU).

Table 2							
Descriptive statistics							
	Countries	Obs.	Mean	Std. Dev.	P25	Median	P75
Panel A: Pooled summary statistics							
Business obstacles							
<i>Dysfunctional court system</i>	93	103,738	0.921	1.222	0.000	0.000	2.000
<i>Crime, theft, disorder</i>	93	103,738	1.074	1.276	0.000	1.000	2.000
<i>Prevalent corruption</i>	93	103,738	1.566	1.486	0.000	1.000	3.000
<i>High tax rates</i>	93	103,738	1.655	1.369	0.000	2.000	3.000
<i>Ineffective tax administration</i>	93	103,738	1.320	1.292	0.000	1.000	2.000
<i>Anti-competitive practices</i>	93	103,738	1.372	1.368	0.000	1.000	2.000
<i>Reduced access to finance</i>	93	103,738	1.376	1.354	0.000	1.000	2.000
<i>Political instability</i>	93	103,738	1.462	1.449	0.000	1.000	3.000
Enterprise characteristics							
<i>Size (thousands of USD)</i>	93	103,738	10,668.250	58,333.986	5.579	149.031	1,319.697
<i>Age</i>	93	103,738	19.461	17.429	8.000	14.000	24.000
<i>Exporter</i>	93	103,738	0.161	0.368	0.000	0.000	0.000
<i>Government</i>	93	103,738	0.022	0.146	0.000	0.000	0.000
<i>Foreign</i>	93	103,738	0.105	0.307	0.000	0.000	0.000
Country characteristics							
<i>Uncertainty</i>	93	103,738	0.067	0.055	0.030	0.057	0.088
<i>GDP</i>	93	103,738	5,023.057	4,785.750	1,369.184	2,979.005	8,573.708
<i>ΔGDP</i>	93	103,738	4.969	3.613	3.050	5.118	7.410
<i>Inflation</i>	93	103,738	7.128	8.060	3.332	5.349	8.778
<i>Governance</i>	93	103,738	-0.754	1.362	-1.682	-0.711	-0.253
<i>Civic norms</i>	59	82,498	0.243	0.112	0.180	0.220	0.282
<i>Religion</i>	90	102,893	0.774	0.419	1.000	1.000	1.000
Norm-deviant behavior							
<i>Cheating on taxes</i>	68	30,032	0.219	0.311	0.000	0.000	0.400
<i>Bribes</i>	93	72,704	0.014	0.057	0.000	0.000	0.000
Panel B: Summary statistics for private firms							
<i>Size (thousands of USD)</i>	93	98,865	9,970.044	5,6691.797	5.020	140.234	1,197.605
<i>Cheating on taxes</i>	68	29,024	0.221	0.311	0.000	0.000	0.400
<i>Bribes</i>	93	69,525	0.014	0.056	0.000	0.000	0.000
Panel C: Summary statistics for public firms							
<i>Size (thousands of USD)</i>	93	4,873	24,833.675	83,821.550	38.687	797.575	7,619.794
<i>Cheating on taxes</i>	45	1,008	0.163	0.288	0.000	0.000	0.200
<i>Bribes</i>	88	3,179	0.018	0.078	0.000	0.000	0.000

This table presents the descriptive statistics for the variables used in this study. Panel A presents the results for our main sample (pooled private and public firms). Panel B (Panel C) presents the summary statistics from the private (public) firms' samples; included are a few statistics for only a few key variables that are referred in the text. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019) using the quarterly reports prepared by Economist Intelligence Unit (EIU) about each country. All variables pertaining to business obstacles indicate the severity of an obstacle and range between zero and four, where zero indicates no obstacle and four indicates very severe obstacle. All other variables are defined in Appendix in Table 13.

Table 3

Univariate results

	Countries	High <i>Uncertainty</i>	Low <i>Uncertainty</i>	Difference	<i>t</i> -statistic
Panel A: Univariate results for private firms					
Business obstacles					
<i>Dysfunctional court system</i>	93	0.954	0.786	0.168***	13.73
<i>Crime, theft, disorder</i>	93	1.269	0.980	0.289***	22.13
<i>Prevalent corruption</i>	93	1.651	1.412	0.239***	15.93
<i>High tax rates</i>	93	1.540	1.599	-0.059***	-4.25
<i>Ineffective tax administration</i>	93	1.278	1.222	0.056***	4.33
<i>Anti-competitive practices</i>	93	1.472	1.293	0.179***	12.94
<i>Reduced access to finance</i>	93	1.328	1.376	-0.048***	-3.48
<i>Political instability</i>	93	1.649	1.198	0.451***	31.07
Enterprise characteristics					
<i>Size (thousands of USD)</i>	93	7363.621	18865.655	-11502.034***	-15.89
<i>Age</i>	93	20.344	17.805	2.539***	14.67
<i>Exporter</i>	93	0.166	0.129	0.037***	10.31
<i>Government</i>	93	0.016	0.011	0.005***	3.99
<i>Foreign</i>	93	0.117	0.099	0.018***	5.90
Country characteristics					
<i>Uncertainty</i>	93	0.153	0.019	0.135***	323.19
<i>GDP</i>	93	5018.214	4710.491	307.723***	6.35
<i>ΔGDP</i>	93	4.280	5.668	-1.389***	-41.56
<i>Inflation</i>	93	8.052	7.469	0.583***	6.14
<i>Governance</i>	93	-1.001	-0.801	-0.200***	-13.82
<i>Civic norms</i>	59	0.199	0.254	-0.055***	-46.12
<i>Religion</i>	90	0.881	0.770	0.111***	28.48
Norm-deviant behavior					
<i>Cheating on taxes</i>	68	0.251	0.225	0.026***	4.55
<i>Bribes</i>	93	0.018	0.014	0.004***	5.80
Panel B: Univariate results for public firms					
Business obstacles					
<i>Dysfunctional court system</i>	91	1.256	1.030	0.226***	3.88
<i>Crime, theft, disorder</i>	91	1.362	1.128	0.234***	4.01
<i>Prevalent corruption</i>	91	1.814	1.558	0.256***	3.84
<i>High tax rates</i>	91	1.715	1.742	-0.026	-0.44
<i>Ineffective tax administration</i>	91	1.505	1.256	0.250***	4.46
<i>Anti-competitive practices</i>	91	1.597	1.328	0.269***	4.34
<i>Reduced access to finance</i>	91	1.444	1.312	0.132**	2.22
<i>Political instability</i>	91	1.820	1.411	0.409***	6.49
Enterprise characteristics					
<i>Size (thousands of USD)</i>	91	19744.426	35164.440	-15420.015***	-3.51
<i>Age</i>	91	29.452	27.095	2.357**	2.18
<i>Exporter</i>	91	0.272	0.186	0.085***	4.51
<i>Government</i>	91	0.238	0.190	0.048***	2.58
<i>Foreign</i>	91	0.256	0.176	0.079***	4.27
Country characteristics					
<i>Uncertainty</i>	91	0.142	0.018	0.124***	68.91
<i>GDP</i>	91	4377.387	5494.168	-1116.782***	-5.72
<i>ΔGDP</i>	91	3.755	5.393	-1.638***	-10.50
<i>Inflation</i>	91	6.286	6.442	-0.156	-0.42
<i>Governance</i>	91	-1.171	-0.918	-0.253***	-3.95
<i>Civic norms</i>	59	0.191	0.240	-0.049***	-15.73
<i>Religion</i>	91	0.839	0.615	0.223***	11.06

Table 3 (continued)**Norm-deviant behavior**

<i>Cheating on taxes</i>	45	0.070	0.173	-0.103***	-3.91
<i>Bribes</i>	88	0.039	0.010	0.029***	5.73

This table presents the univariate analysis based on high and low economic uncertainty in the country. Results for private and public firms are presented separately in Panels A and B, respectively. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019), where high (low) indicates top (bottom) quintile of uncertainty in a given year. All variables pertaining to business obstacles indicate the severity of an obstacle and range between zero and four, where zero indicates no obstacle and four indicates very severe obstacle. All other variables are defined in Appendix in Table 13.

Table 4								
Economic uncertainty and managerial perception								
Panel A: Poisson regression results								
Dependent variable	<i>Managerial perception of severity of business obstacles</i>							
Obstacle	<i>Dysfunctional court system</i>	<i>Crime, theft, disorder</i>	<i>Prevalent corruption</i>	<i>High tax rates</i>	<i>Ineffective tax admin.</i>	<i>Anti-competitive practices</i>	<i>Reduced access to finance</i>	<i>Political instability</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Uncertainty	0.638*** (4.26)	1.704*** (12.99)	0.826*** (9.60)	0.579*** (4.34)	0.535*** (3.65)	0.566*** (5.52)	0.589*** (6.28)	0.727*** (5.92)
Size	0.039*** (11.94)	0.027*** (6.35)	0.026*** (11.55)	0.028*** (12.26)	0.028*** (14.60)	0.004** (2.02)	-0.002 (-0.75)	0.024*** (11.23)
Age	0.035*** (5.58)	-0.007 (-1.20)	0.001 (0.18)	0.003 (0.67)	0.004 (0.70)	0.023*** (3.99)	-0.052*** (-8.79)	0.013*** (2.82)
Exporter	0.064*** (4.70)	-0.066*** (-3.60)	-0.013 (-0.98)	-0.032*** (-3.25)	0.034*** (3.32)	-0.142*** (-7.10)	-0.049*** (-2.66)	0.007 (0.61)
Government	-0.086* (-1.82)	-0.094*** (-3.68)	-0.140*** (-3.06)	-0.158*** (-5.72)	-0.180*** (-5.08)	-0.145*** (-3.53)	0.015 (0.61)	-0.057** (-2.35)
Foreign	0.003 (0.35)	-0.056*** (-3.76)	-0.038*** (-4.61)	-0.078*** (-11.51)	-0.039*** (-3.49)	-0.139*** (-13.38)	-0.238*** (-17.70)	-0.009 (-1.08)
GDP	-1.477*** (-9.74)	-1.074*** (-7.33)	-1.176*** (-12.70)	-1.361*** (-10.48)	-1.551*** (-12.41)	-0.238* (-1.95)	-0.760*** (-3.98)	-0.997*** (-8.03)
ΔGDP	0.008* (1.95)	0.004 (0.79)	0.007** (2.33)	0.009* (1.84)	0.011*** (2.76)	0.006** (2.05)	0.003 (0.92)	-0.005** (-2.14)
Inflation	0.002 (0.91)	-0.000 (-0.20)	0.004* (1.80)	0.004** (2.26)	0.007*** (5.08)	-0.000 (-0.29)	0.001 (0.53)	0.005*** (3.09)
Country Governance	-0.057 (-1.12)	0.079* (1.80)	-0.002 (-0.05)	0.151*** (5.65)	0.117*** (4.83)	0.151*** (4.02)	0.182*** (4.01)	-0.075 (-1.48)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.128	0.119	0.123	0.105	0.104	0.090	0.084	0.160
Observations	103,738	103,738	103,738	103,738	103,738	103,738	103,738	103,738
Panel B: Pooled OLS regression results								
Obstacle	<i>Dysfunctional court system</i>	<i>Crime, theft, disorder</i>	<i>Prevalent corruption</i>	<i>High tax rates</i>	<i>Ineffective tax admin.</i>	<i>Anti-competitive practices</i>	<i>Reduced access to finance</i>	<i>Political instability</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Uncertainty	0.646*** (3.55)	1.626*** (12.83)	0.627** (2.67)	0.451** (2.42)	0.328** (2.25)	0.545*** (3.36)	0.373* (1.87)	0.836*** (3.83)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.199	0.228	0.259	0.267	0.224	0.195	0.189	0.348
Observations	103,738	103,738	103,738	103,738	103,738	103,738	103,738	103,738

This table presents the results from regressing the severity of obstacles faced by all enterprises (private and public) on the level of economic uncertainty in the country and other explanatory variables. Panel A presents Poisson regression results while Panel B displays OLS regression results. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019). All variables pertaining to business obstacles indicate the interviewee's opinion about the severity of an obstacle and range between zero and four, where zero indicates no obstacle and four indicates very severe obstacle. Country, industry, and year fixed effects are included. All other variables are defined in Appendix in Table 13. The *t*-statistics based on industry clustered robust standard errors are shown in parentheses.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Table 5

Economic uncertainty and corruption

Panel A: Industry, country, and year fixed effects with industry clustered standard errors.

Estimation model	Pooled OLS		Tobit with left censoring		Propensity score-matching	
Dependent variable	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Uncertainty</i>	0.548*** (4.84)	0.031*** (5.62)	0.747*** (4.68)	0.121*** (3.93)	7.992** (2.33)	0.127*** (2.96)
<i>Size</i>	-0.012*** (-7.98)	-0.001*** (-8.41)	-0.026*** (-8.64)	-0.003*** (-4.49)	-0.037*** (-11.87)	-0.002*** (-2.88)
<i>Age</i>	-0.011*** (-4.65)	-0.001 (-1.51)	-0.020*** (-4.25)	-0.001 (-1.27)	-0.001 (-0.09)	-0.000 (-0.13)
<i>Exporter</i>	-0.005 (-0.83)	0.001 (1.29)	-0.020* (-1.87)	0.009*** (2.69)	-0.012 (-0.72)	0.012*** (3.13)
<i>Government</i>	-0.020** (-2.17)	0.005** (2.24)	-0.146*** (-5.57)	-0.000 (-0.03)	-0.150*** (-3.15)	-0.005 (-0.51)
<i>Foreign</i>	-0.022*** (-4.68)	0.001 (1.04)	-0.069*** (-6.22)	-0.002 (-0.57)	-0.072*** (-3.26)	0.001 (0.15)
<i>GDP</i>	-0.354 (-0.64)	-0.009 (-1.49)	-0.401 (-0.45)	-0.005 (-0.14)	-19.148** (-2.42)	-0.017 (-0.69)
<i>ΔGDP</i>	-0.029** (-2.13)	-0.001*** (-6.56)	-0.055** (-2.31)	-0.006*** (-7.96)	0.047** (2.31)	-0.002 (-1.42)
<i>Inflation</i>	0.007 (1.41)	0.000* (1.92)	0.018*** (3.18)	0.001* (1.68)	-0.174* (-1.69)	0.001* (1.88)
<i>Country Governance</i>	0.265*** (5.46)	-0.001 (-0.56)	0.317*** (4.52)	-0.011 (-1.52)	4.575** (2.04)	0.032*** (2.72)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted/Pseudo R ²	0.209	0.070	0.150	0.393	0.171	0.440
Observations	30,032	72,704	30,032	72,704	10,704	25,922

Panel B: Industry-country and year fixed effects with industry-country clustered standard errors.

Estimation model	Pooled OLS		Tobit with left censoring		Propensity score-matching	
Dependent variable	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Uncertainty</i>	0.685*** (3.75)	0.037** (2.50)	0.981*** (3.30)	0.126** (2.07)	4.869*** (3.66)	0.147** (2.22)
<i>Size</i>	-0.013*** (-10.10)	-0.001*** (-6.38)	-0.029*** (-11.19)	-0.003*** (-4.26)	-0.017*** (-7.07)	-0.002*** (-2.69)
<i>Age</i>	-0.009*** (-2.65)	-0.000 (-1.43)	-0.016*** (-2.66)	-0.001 (-0.95)	-0.003 (-0.49)	0.000 (0.09)
<i>Exporter</i>	-0.003 (-0.60)	0.002** (2.18)	-0.019 (-1.56)	0.011*** (3.51)	-0.001 (-0.10)	0.014*** (3.04)
<i>Government</i>	-0.011 (-1.24)	0.005** (2.09)	-0.130*** (-4.90)	-0.001 (-0.16)	-0.020 (-1.31)	0.000 (0.04)
<i>Foreign</i>	-0.015** (-2.40)	0.001 (1.43)	-0.056*** (-4.02)	-0.001 (-0.15)	-0.023** (-2.05)	0.001 (0.27)
<i>GDP</i>	1.526* (1.70)	-0.014 (-1.15)	2.092* (1.69)	-0.016 (-0.24)	-15.210*** (-4.18)	-0.044 (-0.57)
<i>ΔGDP</i>	-0.034* (-1.83)	-0.002*** (-4.00)	-0.058* (-1.84)	-0.009*** (-5.65)	0.038*** (2.60)	-0.002 (-0.83)
<i>Inflation</i>	0.011 (1.08)	0.000* (1.72)	0.025 (1.54)	0.001** (2.03)	-0.132*** (-2.92)	-0.002 (-1.34)

<i>Country Governance</i>	0.486*** (3.68)	-0.000 (-0.06)	0.658*** (3.40)	-0.008 (-0.55)	2.575*** (3.10)	-0.016 (-0.62)
Industry-country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted/Pseudo R^2	0.224	0.086	0.180	0.476	0.228	0.527
Observations	30,032	72,704	30,032	72,704	10,704	25,922

This table presents the results from regressing the enterprise-level norm-deviant behavior on the level of economic uncertainty in the country and on other explanatory variables. Private and public firms are pooled together. Columns (1) and (2) present pooled OLS regression results. Columns (3) and (4) present Tobit regression results with left censoring at 0 (many of our private firms do not cheat on taxes or pay bribes). Columns (5) and (6) present propensity score-matching regression results using a symmetrical sample constituted of only the treated firms and their matches; the matching is one-to-one and it is based on all control variables and a caliper of 0.05. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019). *Cheating on taxes* is the fraction of sales not reported to the tax authorities. *Bribes* is the fraction of sales paid in informal payments to the government authorities. Country, industry, and year fixed effects are included. All other variables are defined in Appendix in Table 13. In Panel A the t -statistics (shown in parentheses) are based on industry clustered robust standard errors and in Panel B they are based on industry-country clustered robust standard errors.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Table 6

Economic uncertainty and managerial perception: Private versus public firms

Panel A: Poisson regression results

Obstacle	<i>Managerial perception of severity of business obstacles</i>							
	<i>Dysfunctional court system</i>	<i>Crime, theft, disorder</i>	<i>Prevalent corruption</i>	<i>High tax rates</i>	<i>Ineffective tax admin.</i>	<i>Anti-competitive practices</i>	<i>Reduced access to finance</i>	<i>Political instability</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Uncertainty</i>	0.598*	1.718***	0.493	0.518	0.468	0.511	1.218***	0.441
	(1.88)	(5.72)	(1.62)	(1.57)	(1.51)	(1.64)	(4.85)	(1.50)
<i>Private</i>	-0.030	-0.020	0.027	0.050*	0.037	0.016	0.076***	0.026
	(-1.15)	(-0.84)	(0.93)	(1.84)	(1.61)	(0.66)	(2.58)	(1.05)
<i>Uncertainty × Private</i>	0.038	-0.018	0.363	0.074	0.079	0.061	-0.660***	0.312
	(0.13)	(-0.07)	(1.22)	(0.25)	(0.31)	(0.21)	(-2.58)	(1.26)
<i>Size</i>	0.039***	0.027***	0.027***	0.029***	0.028***	0.005**	-0.002	0.025***
	(11.77)	(6.19)	(11.63)	(12.56)	(14.67)	(2.07)	(-0.69)	(11.24)
<i>Age</i>	0.035***	-0.007	0.002	0.005	0.005	0.024***	-0.051***	0.014***
	(5.57)	(-1.31)	(0.40)	(0.97)	(0.87)	(4.06)	(-8.73)	(3.24)
<i>Exporter</i>	0.064***	-0.066***	-0.013	-0.032***	0.035***	-0.142***	-0.049***	0.007
	(4.66)	(-3.61)	(-0.94)	(-3.18)	(3.35)	(-7.11)	(-2.66)	(0.66)
<i>Government</i>	-0.096*	-0.101***	-0.124***	-0.139***	-0.165***	-0.139***	0.026	-0.040*
	(-1.95)	(-3.93)	(-2.76)	(-5.19)	(-4.77)	(-3.38)	(1.01)	(-1.79)
<i>Foreign</i>	0.002	-0.056***	-0.036***	-0.076***	-0.037***	-0.138***	-0.238***	-0.007
	(0.25)	(-3.84)	(-4.41)	(-11.10)	(-3.36)	(-13.16)	(-17.42)	(-0.83)
<i>GDP</i>	-1.473***	-1.071***	-1.184***	-1.366***	-1.556***	-0.240**	-0.759***	-1.004***
	(-9.74)	(-7.35)	(-12.85)	(-10.57)	(-12.52)	(-1.96)	(-3.97)	(-8.17)
<i>ΔGDP</i>	0.008*	0.004	0.007**	0.009*	0.011***	0.006**	0.003	-0.005**
	(1.94)	(0.78)	(2.34)	(1.85)	(2.77)	(2.06)	(0.94)	(-2.11)
<i>Inflation</i>	0.002	-0.000	0.004*	0.004**	0.007***	-0.000	0.001	0.005***
	(0.91)	(-0.18)	(1.78)	(2.26)	(5.07)	(-0.31)	(0.54)	(3.03)
<i>Country Governance</i>	-0.059	0.077*	0.001	0.154***	0.119***	0.152***	0.182***	-0.072
	(-1.15)	(1.78)	(0.02)	(5.80)	(4.95)	(4.04)	(4.06)	(-1.40)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.128	0.119	0.123	0.105	0.104	0.090	0.084	0.160
Observations	103,738	103,738	103,738	103,738	103,738	103,738	103,738	103,738

This table analyses whether the severity of obstacles faced by the enterprises is perceived differently by private and public firms. Panel A presents Poisson regression results while Panel B displays OLS regression results. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019). *Private* indicates that the firm is a small private enterprise. All variables pertaining to business obstacles indicate the interviewee's opinion about the severity of an obstacle and range between zero and four, where zero indicates no obstacle and four indicates very severe obstacle. Country, industry, and year fixed effects are included. All other variables are defined in Appendix in Table 13. The *t*-statistics based on industry clustered robust standard errors are shown in parentheses.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Table 7

Economic uncertainty and corruption: Private versus public firms

Estimation model	Pooled OLS		Tobit with left censoring		Propensity score-matching	
Dependent variable	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Uncertainty</i>	-0.155 (-0.44)	0.086*** (2.91)	-0.374 (-0.47)	0.368*** (5.23)	6.947* (1.94)	0.376*** (4.54)
<i>Private</i>	-0.001 (-0.06)	-0.001 (-0.38)	0.023 (0.51)	0.012 (1.36)	0.038 (0.54)	0.016 (1.52)
<i>Uncertainty × Private</i>	0.735** (2.52)	-0.058* (-1.92)	1.195* (1.70)	-0.262*** (-3.14)	1.097 (1.32)	-0.265*** (-3.20)
<i>Size</i>	-0.012*** (-7.62)	-0.001*** (-8.48)	-0.026*** (-8.34)	-0.003*** (-4.58)	-0.037*** (-11.49)	-0.002*** (-2.93)
<i>Age</i>	-0.010*** (-4.55)	-0.001* (-1.79)	-0.019*** (-4.08)	-0.001 (-1.39)	-0.000 (-0.01)	-0.000 (-0.14)
<i>Exporter</i>	-0.005 (-0.84)	0.001 (1.24)	-0.020* (-1.89)	0.009*** (2.66)	-0.013 (-0.74)	0.012*** (3.12)
<i>Government</i>	-0.002 (-0.25)	0.003 (1.39)	-0.106*** (-4.87)	-0.002 (-0.27)	-0.083* (-1.93)	-0.006 (-0.60)
<i>Foreign</i>	-0.022*** (-4.65)	0.001 (0.89)	-0.069*** (-6.28)	-0.002 (-0.68)	-0.073*** (-3.37)	0.000 (0.06)
<i>GDP</i>	-0.468 (-0.87)	-0.009 (-1.41)	-0.598 (-0.68)	-0.003 (-0.10)	-19.222** (-2.40)	-0.015 (-0.62)
<i>ΔGDP</i>	-0.027* (-1.98)	-0.001*** (-6.63)	-0.051** (-2.10)	-0.006*** (-8.07)	0.045** (2.21)	-0.002 (-1.39)
<i>Inflation</i>	0.009* (1.84)	0.000* (1.99)	0.022*** (3.88)	0.001* (1.70)	-0.175* (-1.68)	0.001* (1.82)
<i>Country Governance</i>	0.284*** (5.92)	-0.001 (-0.64)	0.365*** (5.28)	-0.011 (-1.57)	4.618** (2.04)	0.033*** (2.87)
Country fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted/Pseudo R^2	0.210	0.070	0.150	0.394	0.172	0.441
Observations	30,032	72,704	30,032	72,704	10,704	25,922

This table analyses whether corrupt behavior by the enterprises is different for private and public firms. Columns (1) and (2) present pooled OLS regression results. Columns (3) and (4) present Tobit regression results with left censoring at 0 (many of our private firms do not cheat on taxes or pay bribes). Columns (5) and (6) present propensity score-matching regression results using a symmetrical sample constituted of only the treated firms and their matches; the matching is one-to-one and it is based on all control variables and a caliper of 0.05. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019). *Private* indicates that the firm is a small private enterprise. *Cheating on taxes* is the fraction of sales not reported to the tax authorities. *Bribes* is the fraction of sales paid in informal payments to the government authorities. Country, industry, and year fixed effects are included. All other variables are defined in Appendix in Table 13. The *t*-statistics based on industry clustered robust standard errors are shown in parentheses.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Table 8

Economic uncertainty and corruption: Instrumental variable regressions

Estimation model	IV first stage	IV second stage	IV first stage	IV second stage
Dependent variable	<i>Uncertainty</i>	<i>Cheating on taxes</i>	<i>Uncertainty</i>	<i>Bribes</i>
	(1)	(2)	(3)	(4)
<i>Election closeness</i>	0.010*** (8.17)		0.009*** (4.91)	
<i>Opposition seats</i>	0.032* (1.74)		0.014 (0.87)	
<i>Uncertainty</i>		2.309*** (3.98)		0.150*** (2.61)
<i>Size</i>	-0.000 (-0.24)	0.009*** (3.91)	-0.001* (-1.67)	-0.001*** (-4.08)
<i>Age</i>	-0.001 (-1.59)	-0.026*** (-5.48)	0.003*** (4.30)	-0.002*** (-4.02)
<i>Exporter</i>	0.003** (2.20)	-0.044*** (-4.88)	0.005*** (3.08)	0.001 (1.04)
<i>Government</i>	0.006** (2.28)	-0.087*** (-6.67)	0.000 (0.14)	0.006** (2.56)
<i>Foreign</i>	-0.000 (-0.20)	-0.049*** (-5.55)	0.003** (2.04)	0.002 (1.15)
<i>GDP</i>	0.013*** (5.86)	-0.015 (-1.16)	0.014*** (4.72)	-0.004*** (-2.94)
<i>ΔGDP</i>	-0.006*** (-7.63)	0.024*** (4.02)	-0.002** (-2.20)	-0.000** (-1.98)
<i>Inflation</i>	0.001*** (3.30)	-0.000 (-0.34)	0.001*** (4.62)	-0.000 (-1.10)
<i>Country Governance</i>	-0.018*** (-9.90)	0.010 (0.89)	-0.015*** (-7.95)	0.000 (0.02)
Industry fixed effects	Yes	No	Yes	No
Year fixed effects	Yes	No	Yes	No
Adjusted R^2	0.394	-0.028	0.200	-0.008
Observations	29,376	29,376	68,305	68,305
Cragg-Donald F -statistic	1123.461		1070.313	
Hansen j -statistic		0.831		0.998
p -value		0.362		0.318

This table presents the instrumental variable (IV) regression results from regressing the enterprise-level norm-deviant behavior on the level of economic uncertainty in the country and on other explanatory variables. Private and public firms are pooled together. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019). Our instruments for *Uncertainty* are: *Election closeness*, which is the degree of competitiveness of the most recent national election (for executive branch) in the country and *Opposition seats*, which is the proportion of seats held by the largest opposition party in the given country and year. *Cheating on taxes* is the fraction of sales not reported to the tax authorities. *Bribes* is the fraction of sales paid in informal payments to the government authorities. Country, industry, and year fixed effects are included. All other variables are defined in Appendix in Table 13. The t -statistics based on industry clustered robust standard errors are shown in parentheses.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Table 9

Economic uncertainty and corruption: Mediation analysis

Dependent variable	<i>Cheating on taxes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Bribes</i>
	(1)	(2)	(3)	(4)
Total effect of <i>Uncertainty</i>	0.096*** (4.84)		0.031*** (5.62)	
Direct effect of <i>Uncertainty</i>		0.101*** (5.13)		0.027*** (4.73)
Mediating effect of <i>Managerial perception</i>		0.004** (2.28)		0.005*** (3.89)
<i>Size</i>	-0.143*** (-7.98)	-0.150*** (-8.00)	-0.070*** (-8.41)	-0.078*** (-9.48)
<i>Age</i>	-0.027*** (-4.65)	-0.027*** (-4.64)	-0.007 (-1.51)	-0.008* (-1.71)
<i>Exporter</i>	-0.006 (-0.83)	-0.006 (-0.81)	0.008 (1.29)	0.007 (1.19)
<i>Government</i>	-0.012** (-2.17)	-0.009* (-1.78)	0.013** (2.24)	0.015*** (2.75)
<i>Foreign</i>	-0.023*** (-4.68)	-0.023*** (-4.89)	0.006 (1.04)	0.006 (1.13)
<i>GDP</i>	-1.223 (-0.64)	-1.608 (-0.86)	-0.169 (-1.49)	-0.064 (-0.55)
<i>ΔGDP</i>	-0.267** (-2.13)	-0.240** (-1.99)	-0.064*** (-6.56)	-0.062*** (-6.23)
<i>Inflation</i>	0.226 (1.41)	0.243 (1.53)	0.029* (1.92)	0.025 (1.61)
<i>Country Governance</i>	1.231*** (5.46)	1.245*** (5.43)	-0.026 (-0.56)	-0.021 (-0.45)
Percent of total effect mediated		4.2%		18.5%
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Adjusted/Overall R^2	0.209	0.221	0.070	0.110
Observations	30,032	30,032	30,032	30,032

This table presents the mediation analysis results from regressing the enterprise-level norm-deviant behavior on the level of economic uncertainty in the country and on other explanatory variables. Private and public firms are pooled together. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019). *Cheating on taxes* is the fraction of sales not reported to the tax authorities. *Bribes* is the fraction of sales paid in informal payments to the government authorities. *Managerial perception* is the total effect of all variables pertaining to business obstacles indicating the interviewee's opinion about the severity of an obstacle. Country, industry, and year fixed effects are included. All other variables are defined in Appendix in Table 13. The *t*-statistics based on industry clustered robust standard errors are shown in parentheses.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Table 10

Economic uncertainty and corruption: Alternative measure of economic uncertainty

Uncertainty measure	<i>Election closeness</i>		<i>Orthogonalized uncertainty</i>		<i>Stock market volatility</i>		<i>News-based uncertainty (EPUI)</i>	
Dependent variable	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Uncertainty</i>	0.020*** (4.53)	0.001*** (3.74)	0.678*** (4.12)	0.128*** (4.29)	0.254*** (4.20)	0.030*** (4.55)	0.307*** (2.97)	0.036*** (3.10)
<i>Size</i>	0.009*** (5.43)	-0.001*** (-5.32)	-0.026*** (-8.58)	-0.003*** (-4.48)	-0.028*** (-10.53)	-0.003*** (-3.29)	-0.024*** (-7.39)	-0.004*** (-3.88)
<i>Age</i>	-0.026*** (-7.58)	-0.001*** (-3.19)	-0.020*** (-4.26)	-0.001 (-1.28)	-0.022** (-2.41)	-0.002 (-1.15)	-0.022*** (-3.05)	0.001 (0.51)
<i>Exporter</i>	-0.036*** (-4.16)	0.002 (1.67)	-0.020* (-1.89)	0.009*** (2.68)	-0.018 (-0.81)	0.012*** (3.33)	0.006 (0.45)	-0.001 (-0.30)
<i>Government</i>	-0.082*** (-9.58)	0.006** (2.38)	-0.147*** (-5.58)	-0.000 (-0.04)	-0.173*** (-2.86)	0.019 (1.37)	-0.187*** (-5.45)	-0.021** (-1.97)
<i>Foreign</i>	-0.051*** (-7.00)	0.002 (1.51)	-0.070*** (-6.26)	-0.002 (-0.57)	-0.054*** (-3.18)	0.011 (1.60)	-0.110*** (-5.17)	0.006 (1.47)
<i>GDP</i>	0.014* (1.85)	-0.002*** (-3.76)	-0.372 (-0.42)	-0.005 (-0.15)	-0.635*** (-3.69)	-0.104** (-2.20)	0.096 (0.75)	-0.314*** (-9.16)
<i>ΔGDP</i>	0.009*** (4.02)	-0.001*** (-8.64)	-0.056** (-2.36)	-0.006*** (-7.95)	0.140** (2.35)	-0.004* (-1.94)	-0.532* (-1.76)	0.002* (1.65)
<i>Inflation</i>	0.002*** (3.35)	0.000 (1.59)	0.018*** (3.16)	0.001* (1.65)	-0.187*** (-3.29)	-0.001 (-0.68)	-0.086** (-2.15)	-0.002*** (-3.63)
<i>Country Governance</i>	-0.028*** (-5.58)	-0.002*** (-5.49)	0.302*** (4.31)	-0.011 (-1.51)	-0.853*** (-3.44)	-0.025 (-1.04)	-1.392* (-1.76)	-0.003 (-0.34)
Country fixed effects	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.089	0.032	0.150	0.393	0.116	0.406	0.148	0.735
Observations	29,598	69,549	30,032	72,704	12,656	35,711	11,481	24,717

This table presents the relationship between the enterprise-level norm-deviant behavior and the level of economic uncertainty when alternative measures of uncertainty are used. In columns (1) and (2), the economic uncertainty measure is *Election closeness*, which is the degree of competitiveness of the most recent national election (for executive branch) in the country. In columns (3) and (4), the economic uncertainty measure is the orthogonalized measure of uncertainty (i.e., country-specific WUI orthogonalized by the aggregated uncertainty index for the whole World provided in Ahir et al. (2019)). In columns (5) and (6), the measure is stock market volatility, calculated as the standard deviation of the major stock index in the given country over the past 12 months. This index can be calculated for only 20 countries in our sample. In columns (7) and (8) the measure is the weighted three-month moving average of the news-based economic policy uncertainty index (EPUI) created by Baker et al., (2016), which is available only for 23 out of 93 countries in our sample. Private and public firms are pooled together. *Cheating on taxes* is the fraction of sales not reported to the tax authorities. *Bribes* is the fraction of sales paid in informal payments to the government authorities. Country, industry, and year fixed effects are included. All other variables are defined in Appendix in Table 13. The *t*-statistics based on industry clustered robust standard errors are shown in parentheses.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Table 11

Economic uncertainty and corruption: Do country's political system and income level matter?

Dependent variable	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>
Country Characteristic	Parliamentary system of government	Parliamentary system of government	Low-income countries	Low-income countries
	(1)	(2)	(3)	(4)
<i>Uncertainty</i>	0.834*** (3.86)	0.070*** (3.44)	0.964*** (3.63)	0.040* (1.78)
<i>Characteristic</i>	-0.161*** (-3.48)	0.007 (0.68)	0.161*** (3.48)	0.088*** (8.33)
<i>Uncertainty × Country Characteristic</i>	2.055*** (5.21)	0.036 (0.31)	1.086** (2.07)	0.103* (1.69)
<i>Size</i>	0.008*** (2.95)	-0.002*** (-2.85)	0.009*** (3.28)	-0.002*** (-3.19)
<i>Age</i>	-0.047*** (-6.35)	-0.006*** (-4.26)	-0.042*** (-4.94)	-0.004*** (-3.16)
<i>Exporter</i>	-0.070*** (-4.83)	0.013*** (3.84)	-0.081*** (-5.23)	0.011*** (3.57)
<i>Government</i>	-0.234*** (-5.54)	0.004 (0.44)	-0.284*** (-11.77)	-0.008 (-1.04)
<i>Foreign</i>	-0.136*** (-7.16)	-0.002 (-0.43)	-0.123*** (-7.15)	-0.002 (-0.40)
<i>GDP</i>	-0.007 (-0.62)	-0.014*** (-5.11)	0.094*** (5.18)	0.021*** (4.93)
<i>ΔGDP</i>	0.021*** (4.50)	-0.002*** (-3.93)	0.017*** (4.02)	-0.004*** (-6.24)
<i>Inflation</i>	0.002** (2.12)	0.000 (1.18)	-0.002 (-1.20)	-0.000 (-1.29)
<i>Country Governance</i>	-0.006 (-1.04)	-0.018*** (-11.82)	-0.044*** (-5.02)	-0.024*** (-10.48)
Country fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Pseudo R ²	0.062	0.233	0.065	0.258
Observations	28,737	68,933	30,032	72,118
P(<i>Uncertainty</i> + <i>Characteristic</i> + <i>Uncertainty × Characteristic</i> = 0)	0.000	0.000	0.000	0.000

The table conducts cross-country analyses to assess the role of political system and income level. The results are obtained from regressing the enterprise-level norm-deviant behavior on the level of economic uncertainty, country characteristic, and other explanatory variables. In columns (1) and (2), *Characteristic* equals one if the country has a parliamentary system of government, and zero otherwise. In columns (3) and (4), *Characteristic* equals one if the country belongs to the low-income group based on World Bank's classification, and zero otherwise. Private and public firms are pooled together. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019). *Cheating on taxes* is the fraction of sales not reported to the tax authorities. *Bribes* is the fraction of sales paid in informal payments to the government authorities. Country, industry, and year fixed effects are included. All other variables are defined in Appendix in Table 13. The *t*-statistics based on industry clustered robust standard errors are shown in parentheses.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Table 12

Economic uncertainty and corruption: the mitigating role of civic norms and religiosity

Dependent variable	<i>Cheating on taxes</i>	<i>Bribes</i>	<i>Cheating on taxes</i>	<i>Bribes</i>
	<i>Civic norms</i>	<i>Civic norms</i>	<i>Religion</i>	<i>Religion</i>
	(1)	(2)	(3)	(4)
<i>Social Norm</i>				
<i>Uncertainty</i>	12.002*** (5.10)	0.146 (1.52)	3.432*** (5.65)	0.139** (2.39)
<i>Social Norm</i>	2.485 (1.35)	-0.018 (-0.49)	0.326*** (6.89)	0.006 (1.14)
<i>Uncertainty × Social Norm</i>	-13.364*** (-4.34)	-0.407 (-1.43)	-2.533*** (-3.65)	-0.117* (-1.85)
<i>Size</i>	-0.027*** (-8.16)	-0.001** (-2.05)	0.008*** (3.72)	-0.002*** (-3.02)
<i>Age</i>	-0.016** (-2.40)	-0.002 (-1.45)	-0.040*** (-5.59)	-0.004*** (-3.42)
<i>Exporter</i>	-0.015 (-1.13)	0.008** (1.98)	-0.071*** (-5.11)	0.012*** (3.71)
<i>Government</i>	-0.157*** (-5.84)	0.005 (0.46)	-0.227*** (-9.07)	-0.000 (-0.01)
<i>Foreign</i>	-0.051*** (-3.58)	0.003 (0.76)	-0.125*** (-9.31)	-0.002 (-0.47)
<i>GDP</i>	3.041*** (5.30)	-0.043 (-1.23)	0.020* (1.71)	-0.014*** (-4.98)
<i>ΔGDP</i>	0.204*** (4.67)	-0.002*** (-2.99)	0.022*** (5.13)	-0.003*** (-4.68)
<i>Inflation</i>	0.068*** (4.37)	-0.000 (-0.71)	0.004*** (3.53)	0.000 (1.36)
<i>Country Governance</i>	0.773*** (4.94)	-0.032*** (-2.91)	-0.001 (-0.16)	-0.020*** (-10.19)
Country fixed effects	Yes	Yes	No	No
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.140	0.397	0.072	0.230
Observations	22,990	56,793	29,902	72,352
P(<i>Uncertainty + Norm + Uncertainty × Norm = 0</i>)	0.000	0.000	0.000	0.000

The table analyses the role of social norms, such as civic norms and religiosity. The results are obtained by regressing the enterprise-level norm-deviant behavior on the level of economic uncertainty, social norm, and other explanatory variables. *Civic norms* is the average level of trust in others and norms of civic cooperation in a country based on World Values Survey (WVS) data, normalized to range between zero and one. *Religion* equals one if more than 70 percent of the country's residents replied 'yes' when asked, 'Is religion important in your daily life?' in a Gallop Poll in 2009. Private and public firms are pooled together. *Cheating on taxes* is the fraction of sales not reported to the tax authorities. *Bribes* is the fraction of sales paid in informal payments to the government authorities. *Uncertainty* is the World Uncertainty Index (WUI) developed by Ahir et al. (2019). Country, industry, and year fixed effects are included. All other variables are defined in Appendix in Table 13. The *t*-statistics based on industry clustered robust standard errors are shown in parentheses.

Coefficients marked with *, **, and *** are significant at 10%, 5%, and 1%, respectively.

Appendix

Table 13

Variable definitions

Variable	Description	Source
<i>Uncertainty</i>	The World Uncertainty Index (WUI) developed by Ahir et al. (2019)	Ahir, Bloom, and Furceri (2019)
<i>Election closeness</i>	The degree of competitiveness of the most recent national election (for executive branch) in the country	Database of Political Institutions
<i>Opposition seats</i>	The proportion of seats held by the largest opposition party in the given country and year.	Database of Political Institutions
<i>Cheating on taxes</i>	The fraction of sales not reported to the tax authorities	WBES
<i>Bribes</i>	The fraction of sales paid in informal payments to the government authorities	WBES
<i>Dysfunctional court system</i>	How much of an obstacle is the court system to your enterprise? Ranges between 0 (no obstacle) and 5 (very severe obstacle)	WBES
<i>Crime, theft, disorder</i>	How much of an obstacle is crime, theft, and disorder to your enterprise? Ranges between 0 (no obstacle) and 5 (very severe obstacle)	WBES
<i>Prevalent corruption</i>	How much of an obstacle is corruption to your enterprise? Ranges between 0 (no obstacle) and 5 (very severe obstacle)	WBES
<i>High tax rates</i>	How much of an obstacle is tax rates to your enterprise? Ranges between 0 (no obstacle) and 5 (very severe obstacle)	WBES
<i>Ineffective tax administration</i>	How much of an obstacle is tax administration to your enterprise? Ranges between 0 (no obstacle) and 5 (very severe obstacle)	WBES
<i>Anti-competitive practices</i>	How much of an obstacle is practices of competitors in informal sector to your enterprise? Ranges between 0 (no obstacle) and 5 (very severe obstacle)	WBES
<i>Reduced access to finance</i>	How much of an obstacle is access to finance to your enterprise? Ranges between 0 (no obstacle) and 5 (very severe obstacle)	WBES
<i>Political instability</i>	How much of an obstacle is political instability to your enterprise? Ranges between 0 (no obstacle) and 5 (very severe obstacle)	WBES
<i>Size</i>	The firm's total sales in the previous fiscal year (thousands of USD)	WBES
<i>Age</i>	The firm age in years	WBES
<i>Exporter</i>	Equals one if at least ten percent of firm's sales are exported, and zero otherwise	WBES
<i>Government</i>	Equals one if at least ten percent of the firm is owned by the government, and zero otherwise	WBES
<i>Foreign</i>	Equals one if at least ten percent of the firm is owned by a foreign entity, and zero otherwise	WBES
<i>GDP</i>	The gross domestic product per capita for the country	World Bank
<i>ΔGDP</i>	The growth in <i>GDP</i> for the country	World Bank
<i>Inflation</i>	The inflation rate for the country	World Bank
<i>Governance</i>	The first principal component of six governance indicators for each country (see Kaufmann, Kraay, and Mastruzzi (2009))	World Bank
<i>Civic norms</i>	The average level of trust in others and norms of civic cooperation in a country.	WVS
<i>Religion</i>	Equals one if more than 70 percent of the country's residents replied 'yes' when asked, 'Is religion important in your daily life?' in a Gallop Poll in 2009	Gallop
<i>Stock market volatility</i>	Calculated as the standard deviation of the major stock index in the given country over the past 12 months	Compustat Global
<i>News-based uncertainty</i>	The weighted three-month moving average of the news-based economic policy uncertainty index	Baker, Bloom, and Davis (2016)