

Can Corruption Really Function as “Protection Money” and “Greasing Money”? Evidence from Chinese Firms

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Abstract: This paper directly investigates the “greasing money” and “protection money” effect of corruption based on Chinese firm data from 2005 Investment Climate Survey. Entertainment and travel cost (ETC) is used as a proxy for firm corruption. First, we identify a significantly positive effect of bribes on firm profitability for the full sample and non-state firms, but not for SOEs. Then we find that corruption can serve as “protection money” for non-state firms by demonstrating that bribes significantly reduce effective tax rate. We further show that corruption can function as “greasing money” for non-SOEs by empirically proving that bribes significantly reduce red tape and increase the probability of obtaining government procurement contracts. However, we fail to find any significant effect of corruption on helping firms ease financial constraints or obtain bank loans, regardless of ownership types. Therefore, this paper provides a new insight into the growth model of China’s non-state sector.

JET classification numbers: D21; D73; G38; H26; L25

Key words: corruption; protection money; greasing money; transitional economy; Chinese firms

1. Introduction

Corruption has become one of the central social and political issues in China and has increased to an epidemic level since the advent of the “reform and opening policy” in 1978.¹ What’s more, corruption in China is becoming more intensified and institutionalized in the sense that high-level, big-stakes corruption increased more rapidly than ordinary corruption cases (Wedeman, 2004). Despite having achieved spectacular progress in economic development, China, as the current second largest economy, has always found itself stuck in an awkward corruption ranking position, ranking only 100th among the 175 countries in 2014 “Corruption Perception Index”. In fact, especially in business circles, the networks of personal ties with government officials are viewed as a very important resource for obtaining government-related benefits, such as accessing political power, obtaining preferential treatment or protecting property rights. That many firms invest time and money in creating and maintaining these networks is a common practice in contemporary China.

The prevalence of corruption in China shouldn’t be considered as incidental if we give a deep thought into the roots of corruption. On one hand, China has always been a relation-based system where gift exchange is a major social norm in social interactions as well as business transactions. Offering gifts or money is viewed as the well accepted way to establish relationship with those who may bring benefits for you and to repay those who have extended favors to you. People violating these rules may be deemed as ignorant of regular social traditions or lack of interpersonal skills. On the other hand, more importantly, the existence of dual-track economy, characterized by the coexistence of central planning and market economy, and the underdevelopment of related institutions provide plenty of

¹ According to Blackburn and Wang (2009), corruption includes 3 categories in China--shouhui (extortion and acceptance of bribes), tanwu (misappropriation of public property) and tequan (seeking for privileges and favors). As we mainly focus on the corruption between firms and government officials through bribes here, corruption basically refers to the first category.

incentives and opportunities for corruption. Even though the previously dominant role of the government has been reduced and reoriented, governments still play a significant role in economic activities, reflected by the fact that governments have strong monopolistic control over both factor and product markets; Legal system still remains too weak to fully protect private property rights and enforce contracts; Red tape and regulations exist in most economic areas, which have created considerable difficulties and barriers for normal business operations. Kruger (1974) argues that it's natural for firms to devote resources to engage in rent seeking in order to compete for favorable policy decisions. Acemoglu and Johnson (2003) also argue that firms tend to purchase protection from government officials by bribe in the regime with weak institutions for property rights. Therefore, it's necessary to view bribe as a kind of firm strategy for survival and development in a transitional economy like China.

However, it seems that not all countries suffering from widespread corruption experience bad economic development. This phenomenon, termed as "East Asia Paradox" by Wedeman (2002) indicates that some East Asian countries like China, Indonesia and South Korea, display significant economic growth despite the widespread of corruption. Allen et al (2005) argue that even without sound legal and financial institutions, China's non-state sector still grows much faster than the state sector and serves as the engine of the rapid economic growth. They attribute the system of an alternative mechanism based on relationship to the astounding development in the non-state sector. Blackburn & Wang (2009) ascribe this paradox to a more organized corruption network in China, where the collective bureaucracy internalizes the negative externalities of increasing individual bribe amount on the bribe-taking capacity of others with reduced uncertainty. Fan and Grossman (2001) argue that the central government of China actually uses corruption as a decentralized compensation scheme. This satisfies the political objectives of Communist Party of China (CPC) and also

provides an effective incentive to local officials to promote economic reform because those local officials who make larger contributions in the reform are likely to be able to extract larger bribe and have more valuable public property to appropriate with smaller chance of being punished. In this sense it's necessary and reasonable to reconsider corruption as a growth-enhancing factor to shed new light on the business growth model in China.

This paper uses firm-level data from 2005 Investment Climate Survey by World Bank to explore the effect of corruption on firm development in China. Among the empirical literature that examines the effect of corruption by using firm-level survey data, some papers find that corruption is detrimental to firm performance (Gaviria, 2002; Fisman and Svensson, 2007; Cai et al., 2011; Nguyen and Van Dijk, 2012), while others identify a positive effect (Hellman et al, 2003; Vial and Hanoteau, 2009; Wang and You, 2012).² Especially in the context of excessive overregulation, rigid administration and lack of market-supporting mechanisms, corruption is argued to help overcome distortions caused by them and enhance efficiency in a second best sense. In literature, corruption promotes economic efficiency mainly through the channel of “greasing money” and “protection money”. Regarding greasing money, on one hand, bribery can function to help reduce red tape imposed on firms, such as circumventing cumbersome regulations, reducing long waiting time and speeding up the distribution of licenses and permits (Leff, 1964; Leys, 1965; Huntington, 1968; Bardhan, 1997). Lui (1985) establishes a queuing model where the opportunity costs of different agents are embodied in their size of bribery, with more efficient agents more able or willing to buy lower effective red tape, thus leading to Pareto efficiency. Dreher and Gassebner (2007), employing a data set covering a maximum of 43 countries over 2003 to 2005, show that the existence of a larger

² Most of the literature regarding this topic uses cross-country macro data to investigate the detrimental effect of corruption on economic growth, investment, FDI, innovation and entrepreneur activities (e.g., Mauro, 1995; Wei, 1997; Mo, 2001; Keefer and Knack, 1995&1997; Anokhin and Schulze, 2009).

number of procedures required to start business and the larger minimum capital requirement proves to be detrimental to entrepreneurship, but corruption can facilitate firm entry in those economies. On the other hand, the greasing money effect also refers to the function that grants firms preferential treatment in obtaining resources in an efficient way, as achieved by a competitive auction, in highly regulated environment. In a bribery game with competitive bidding for a crucial resource by private firms, such as a government procurement contract, the corrupt official awards the contract to the bidder willing to pay the highest bribes, which realizes allocation efficiency (Bardhan, 1997).³ The other channel “protection money”, can serve to ease the expropriation or predation by the government, such as protecting property rights and reducing tax or fee burdens for firms. Hellman et al. (2003) show that captor firms experience more improvement in individualized protection for their own property and contract rights in a high-capture economy. Cai et al. (2011) demonstrate that for firms with higher lagged tax rate, the negative effect of corruption on productivity is much smaller, thus indirectly proving the “protection money” hypothesis.⁴

We use the expenditures of entertainment and travel cost (ETC) to measure firm-level corruption, following Cai et al. (2011). We believe this proxy has the following advantages: first, this expenditure item is publicly recorded and reported in the accounting books of Chinese firms. Therefore, this data is very easy to access; second, this data is more objective and accurate, without the biases involved in the subjective perception index. In fact, this item is unlikely to be measured with mistakes because each reimbursement to count in this item

³ In an auction model with incomplete information about the cost levels of other bidders by Beck and Maher (1986), the firm with the lowest cost can always win the contract by offering the highest bribery. Thus bribery can reproduce the efficiency consequences of a competitive bidding system even under imperfect information.

⁴ However, as Shleifer and Vishney (1993) point out, the validity of above arguments rely on an important assumption that the regulatory burdens imposed are exogenous. Actually due to the discretionary power of the bureaucrats, the corrupt officials can often customize the nature and amount of harassment on firms to extract as many bribes as possible. By using micro survey data, some research finds out that red tape, proxied by firms’ managerial time wasted on the interaction with government officials, is significantly positively related to the size of bribes, thus contradicting the greasing wheel hypothesis (Kaufman and Wei, 1999; Gaviria, 2002).

needs a receipt. Last but not least, this item can well reflect the nature and amount of corruption, or more specifically, bribes in each firm. In addition to the legitimate expenses of entertainment (meals, gifts, karaoke and so on) and travel, managers of Chinese firms always use this item to cover the considerable expenses used to bribe government officials by gift and money with fake or inflated receipts. Therefore, this expenditure item should be an appropriate indicator of corruption for firm-level studies.

This paper intends to directly investigate the “greasing money” and “protection money” effect of corruption based on firm-level survey data. Firstly, by using instrument variables to account for the possible endogeneity of ETC, we find that corruption has a significantly positive effect on firm profitability for the full sample and non-state firms, while this effect is insignificant for SOEs. Then we proceed to directly test the “protection money” and “greasing money” effect. By using effective tax rate (ETR) to proxy the state predation, this paper finds that ETC can significantly reduce ETR for non-state firms, whereas ETC significantly increases ETR for SOEs. The reason for the latter may be attributed to the incentives of the SOEs’ managers for promotion. Regarding the “greasing money” effect, on one hand, we use the time CEO spends on the government assignments and communications to proxy red tape and the empirical result shows a significantly negative relationship between ETC and the wasted managerial time for non-SOEs. On the other hand, we also test whether corruption can help firms get favorable treatment in obtaining key resources. In this part, we mainly focus on two resources, with one being the government procurement contract and the other being the credit. Our empirical results demonstrate that the more ETC a firm spends, the higher the probability of obtaining government procurement contracts will be for non-state firms, albeit not for SOEs. Then we study the effect of corruption on the sensitivity of investment to internal cash flow as well as the effect of corruption on getting access to

bank loans. However, corruption seems not to have any effect on helping firms alleviate financial constraints or obtain bank loans, regardless of ownership types. To sum up, our conclusions show that corruption can enhance firm profitability by easing tax burden, reducing red tape and obtaining government procurement contract for non-state firms in China, thus verifying most of the “protection money” and “greasing money” hypotheses.

This paper contributes to the corruption literature in the following four ways. First of all, it extends the literature on corruption by demonstrating that the effects of corruption on firm performance and the related mechanisms are conditioned by ownership. Given the unique institutional characteristics in China, on one hand, non-state enterprises and SOEs face significantly different external environments. On the other hand, the internal factors, such as firm objectives and CEO incentives also differ a lot among them. These differences determine that the effects of corruption and the specific channels through which the effects take place should be different and need to be treated separately in the research. Secondly, this paper, for the first time, explicitly distinguishes the effect of corruption from that of political connections. In fact, corruption and political connections share many similarities. For example, both of them can serve as the channels for engaging in rent-seeking activities. Besides, corruption, or more specifically, bribe, is a useful and effective way to establish political connections with government officials. Thus, in the prior literature, the effect of corruption and that of political connection are intertwined and overlapped to a great extent. Nonetheless, some literature of political science and law has distinct opinions on the differences between the two concepts.⁵ Besides, Feng et al. (2014) argue that political participation or connection may simply serve as a form of political recognition for entrepreneurs and their past success without involving rent seeking at all. Given the

⁵ Li et al. (2010) and Jones (1994) discuss the differences between the two concepts, corruption and guanxi. As political connection is one important kind of guanxi, the differences discussed in them apply to this context.

similarities and differences of them, separating the effect of corruption from that of political connection can lead to more convincing results with respect to the very effect of “pure” corruption. By explicitly controlling for political connection status in the regression, we manage to separate those two effects. Furthermore, as far as we know, this is the first paper that directly investigates the “greasing money” and “protection money” effect of corruption. The paper of Cai et al. (2011) is the one that may be most related to ours. However, they indirectly explore the functioning mechanisms of corruption by proving that firms with higher tax burden and fewer helpful government officials suffer from smaller negative effect of corruption on firm performance. However, here we directly test the “protection money” and “greasing money” hypothesis by focusing on the effect of corruption on tax burdens⁶, red tape, access to government procurement contract and financial resources. Thus, this paper provides more direct and specific evidence in testing the hypotheses. Finally, this paper contributes to the very limited number of corruption literature that employs firm data, which provides new insights into the growth model of China, especially the non-state sector and sheds further light on the role of the alternative mechanism discussed by Allen et al. (2005).

This paper is structured as follows: in section 2, we introduce the institutional background and form the hypotheses. Section 3 illustrates the research design including the sample, variables, econometric specifications and descriptive statistics. Section 4 reports the empirical results and Section 5 performs robustness checks. Section 6 concludes the paper.

2. Institutional background and hypothesis development

2.1 The development of non-state sector in China

The non-state sector has played exceedingly significant roles in the growth of the whole China’s economy. However, mainly due to ideological reasons, private enterprises were

⁶ We use effective tax rate while Cai et al. (2011) use total tax rate.

completely forbidden until around 1980 and it was not until 1987, in the 13th Nation Congress of the CPC, that private sector was acknowledged as a necessary supplement to the state sector. Actually, the real advancement of non-state sector occurred in 1990s after Deng Xiaoping's 1992 south China tour, which in a real sense boosted the development of private economy and initiated the restructuring of SOEs (Tsui et al., 2006; Gregory et al., 2000). Since then, the growth rate of non-state sector has accelerated and outpaced that of the public sector. It grew from barely nothing during the 20 years since the founding of PRC to accounting for 49.7% of the total GDP with 29.3 million private enterprises registered by 2005 (Tsai, 2007). In 2004, the National People's Congress finally approved a constitutional amendment, which for the first time in the history of PRC, clearly announced to protect private property right in the form of Constitution. Therefore, it takes half a century for the legal status of private ownership to be officially endorsed by the CPC.

Non-state sectors, especially private enterprises in China, have been confronted with adverse economic, legal and political situations. Private firms can't get easy access to key resources, such as bank loans, as those resources are largely controlled by the state and reserved for their state-owned counterparts (McMillan, 1997; Brandit and Li, 2003). What's more, private enterprises often suffer from heavy red tape and frequent harassment from the government (Pearson, 1997), as well as severe expropriation in the form of formal or informal taxes and fees (Johnson et al., 2000; McMillan and Woodruff, 2002). Moreover, the development of legal system has lagged far behind the economic reforms and consequently, the legal framework often fails to protect property rights and enforce contracts. Even though various laws and regulations have been promulgated or revised to reduce discrimination against non-state sectors, ideological discriminations against non-state sectors still exist to a large extent due to the lingering legacy of command economy and the continuing ruling of

Communist Party of China. As a result, it makes sense for the firms in the non-state sector to take various measures to overcome the institutional, legal and market failures. For example, township village enterprises (TVEs), a unique organizational form, began to flourish during 1980s.⁷ Another kind of organizational form of private business is the “red hat” or “fake collective” firm, which is registered as collective but actually owned and operated through private investment and control (Tsui et al., 2006). Above all, it is well accepted that China is a relation-based system where gift exchange is a major social norm in business transactions: bribery or kickbacks are often offered in exchange for favors of one kind or another (Bardhan, 1997; Blackburn and Wang, 2009). Non-state firms thus find it necessary and lucrative to foster close relationships with the government officials/cadres by gifts, favors and monetary bribery. The well-established relationship with the government therefore functions as a substitute for the lacking market-supporting institution and effective legal system.

2.1 Hypothesis development

Given the unique institutional characteristics in China, it's reasonable to hypothesize that in China, corruption should have a significantly positive effect on the development of the non-state sector, through the channel of greasing money and protection money, whereas the value of corruption may be diluted for SOEs. For non-state enterprises, particularly private firms, they have to deal with adverse economic and political environment surrounding them. On one hand, they are usually denied access to key resources, such as credit and land, because governments have strong monopolistic control over both input and product markets (Chang and Wang, 1994). A considerable amount of literature demonstrates that larger SOEs enjoy better access to bank loans due to the strong bias of the state-owned banks towards

⁷ TVEs received considerable benefits from having the village government as a partner, including easier access to bank loans and rationed inputs, as well as protection from harassment and expropriation by the government (McMillan and Woodruff, 2002; Chang and Wang, 1994; Che and Qian, 1998).

SOEs in leading (e.g., Cull and Xu, 2003; Cull et al, 2009; Gordon and Li, 2003). As a result, in China non-state firms are much more financially constrained than SOEs, especially the private ones (e.g., Chen et al, 2008; Poncet et al, 2010; Cull et al., 2014). Also, non-state firms prove to stand very slim chance of obtaining government procurement (Szamosszegi & Kyle, 2011). On the other hand, non-state firms are frequently subject to excessive red tape and arbitrary state predation (Pearson, 1997; Li et al, 2006). Those corrupt bureaucrats usually have discretion over the nature and amount of harassment and then extort bribery. It's well known that it takes very long time and cumbersome procedures for the private entrepreneurs to start up new business or obtain necessary licenses and permits in China (Lopez-de-Silanes et al., 2002). Besides, the local bureaucrats often impose high tax, informal levies and extralegal payment on these non-state firms to increase both budgetary and off-budgetary revenues, often in the name of fulfilling corporate social responsibilities or contributing to local public projects (Du et al., 2014). These impose heavy burdens and extra costs on the non-state firms in China due to the ineffective legal system in protecting property rights. However, as offering bribery is a well-accepted practice in business transactions in China, which to a great extent, functions to help overcome market and legal failures and avoid ideological discriminations, it makes sense that corruption should have a very significant marginal effect on the performance of non-state firms by greasing the wheels of business and protecting property rights. Furthermore, private firms, as the engine of growth in China, prove to be more efficient and productive than SOEs (e.g., Guariglia et al., 2011; Poncet et al., 2010). Therefore, the “greasing money” and “protection money” effect of corruption can contribute to helping non-state firms release more potentials, which are otherwise seriously suppressed by the external environment.

H1: In China, corruption can significantly improve the performance of non-state firms.

H2: For non-state firms in China, corruption can function as “greasing money”, i.e., to reduce red tape and secure preferential treatment in accessing key resources, and “protection money”, i.e., to get protection from government expropriation.

As with SOEs, they have more direct and explicit ties with the government through shareholding, indicating that SOEs do not suffer from the barriers and difficulties for non-state firms mentioned above. This means the role of bribery may not matter so much as that of non-state firms, implying that the value of corruption as a way to boost firm development for SOEs is largely diluted by the government ownership. Secondly, on account of the lack of accountability and external monitor, SOEs tend to have poorer corporate governance and thus their top managers or CEOs are more likely to expand managerial discretion and engage actively in empire building (Qian, 1996). They may use the resources, which otherwise could be utilized more effectively as “productive corruption” to promote firm development, to conduct personal consumptions, for example, better and larger apartments, private use of cars, availability of “corporate accounts” for business meals, entertainment, etc (Qian and Stiglitz, 1996). Thus the performance enhancing role of corruption significantly weakens. Thirdly, above all, the CEOs of SOEs face a different reward system and have strong incentives to use resources to bribe the specific government officials who have an influence on their future career rather than those who may have an influence on the development of the firms (Cull et al., 2014). Moreover, those CEOs who are more concerned about their future career, thus committing more resources to bribing the government officials, have stronger tendency to give top priority to social and political objectives, rather than profit maximization. For example, SOEs controlled by these CEOs may intentionally overinvest to increase output and reduce unemployment (Wu et al., 2012), or have higher effective tax rate (Bradshaw et al, 2012). This indicates that, SOEs with more

resources devoted to bribery, which may indicate stronger ambitions for political promotions of the CEOs, may not have better performance at all, or even have worse performance than other enterprises resulting from the interest conflicts.

H3: In China, corruption can not significantly help improve the performance of SOEs.

H4: Corruption may not exert “greasing money” and “protection money” effect on the development of SOEs in China.

3. Research design

3.1 Sample

The data used in this paper stems from the 2005 Investment Climate Survey of China by the World Bank. It covers 12400 manufacturing firms from 120 cities in 30 provinces (including autonomous regions or directly administered municipalities) of China. Except for Tibet, Hong Kong, Macau and Taiwan, all the other provinces are included in the survey. In the 4 directly administered municipalities (Beijing, Shanghai, Tianjin and Chongqing), 200 firms are surveyed in each region while in the other cities, the sample number is 100. In order to enhance the consistency and credibility of the survey, all the subject enterprises come from manufacturing industries because service industries, such as banking and financial sectors, are more likely to be subject to government regulation, thus distorting the results to a great degree. In each province, the capital city must be incorporated in the survey, but whether other cities in the province can be included depends on the GDP of the province.⁸ As with each city involved, the top 10 industries in terms of sale revenues are targeted and in each of these industries, firms are divided into 3 groups based on the firm size and the survey intends

⁸ For provinces with very large economic scales, like Guangdong, Jiangsu and Shandong province, the number of cities involved is 9 whereas for provinces like Qinghai, Ningxia and Jiangxi, only the capital city is involved due to the small sizes of the economy.

to target similar number of firms from the 3 groups.⁹ Table 1 displays the distribution of sample firms according to their located regions and industries.

The survey questionnaire consists of 2 parts. In the first part, it asks the general manager or CEO to answer qualitative questions, most of which regard the business climate faced by each firm in the survey year. The second part involves the financial and accounting information, which usually covers the latest 3 years. This information is obtained directly from the firms' accounting books with the help of the firms' chief accountants.

3.2 Variables and econometric specifications

The first part of the paper investigates the effect of corruption on firm performance. The following specification is used to explore this effect:

$$ROS_i = \alpha_1 + \alpha_2 ETC + \mathbf{X}_i' \boldsymbol{\theta} + \mathbf{D}_c + \mathbf{D}_d + \varepsilon_i \quad (1)$$

We use returns to sales (*ROS*) to measure the firm performance, calculated as the ratio of after-tax profits to sales.¹⁰ This variable reflects the net profitability of the firms. *ETC*, measured as the ratio of entertainment and travel cost to sales is employed here to proxy firm-level corruption in Chinese firms. On the basis of the analysis in the introduction, this is an appropriate indicator with many advantages compared with the ones used in previous corruption literature. According to the hypothesis in section 2, α_2 should be significantly positive for non-state firms while for SOEs, this coefficient may not be significantly different from zero. \mathbf{X}_i' is the set of control variables that may both determine the firm performance and be correlated with *ETC*. We include the logarithm of firm size (*lnLabor*), logarithm of fixed asset per employee (*lnFixasset*), logarithm of firm age (*lnAge*), lagged ratio of total tax

⁹ For more details of the survey, please refer to World Bank (2006).

¹⁰ The information of assets or equity is not available in our dataset.

and fee over sales (*Taxfee Ratio*), the proportion of shares held by the state (*Stateshare*) and foreigners (*Foreignshare*), the ratio of sales sold to overseas market (*Export Ratio*) and the other provinces (*Interpro Ratio*), human capital quality measured by the ratio of employees with undergraduate or higher degree (*College*) and the intensity of R&D (*RDI*) in the control variable set. Besides, 120 city dummies and 30 industry dummies are also included to account for the different location and industry effects.

However, using OLS to estimate model (1) can lead to biased results due to the problem of reverse causality, omitted variables and measurement errors (Fisman and Svensson, 2007).¹¹ In order to overcome the potential endogeneity problem, we here use industry-city median of ETC to instrument for ETC. We believe that the industry-location median of ETC, as a proxy for general corruption status in the specific location and industry, should be highly correlated with each firm's ETC but does not directly affect firm performance nor indirectly affect firm performance through variables other than firm ETC as long as the related city and industry controls are included (Fisman and Svensson, 2007; Cai et al., 2011). Besides, to conduct overidentifying test, we use another variable, a dummy variable indicating whether the firm has specialized staff to handle the relationship with the government (*Specialstaff*), as a complementary IV, as Wang and You did (2012).

Then, in the second part, we focus on the specific channels through which the effect takes place. Regarding the "protection money" hypothesis, we employ the effective (income) tax rate (*ETR*) to serve as one proxy for government expropriations. This variable is calculated as the ratio of income tax over earnings before interests and tax (EBIT). In this context, ETR has several advantages compared with the total tax rate for the purpose of our

¹¹ For example, firms with higher profitability is likely to be extracted more bribes by the bureaucrats. Alternatively, firms with higher profitability may devote more resources to bribe bureaucrats to obtain licenses or permits for their investment into new areas. However, in our case the omitted variables and measurement errors may be less of a concern in that we control all the city and industry dummies and also our ETC is an objective accounting data rather than perception.

research. First of all, the value-added tax accounts for a large proportion in a firm's total tax payment. However, the policy for value-added tax is basically the same for all kinds of firms without preferential policies or treatment. Thus, the very existence of value-added tax in total tax blurs other tax benefits firms may obtain through bribes. Second, the Chinese government often uses income tax policies to implement and support various industrial policies (Wu et al., 2012).¹² What's more, the corporate income tax is generally collected by officials in local tax bureaus¹³ and also tax law enforcement and collection efforts differ greatly across cities, which leave more latitude for manipulation and corruption for firms that try to bribe the tax bureaucrats to reduce tax. The specification is very similar to model (1), only with the dependent variable replaced by ETR and some adjustments in the control variable set.

Then we turn to test the "greasing money" hypothesis. On one hand, we use the time CEO spends on the government assignments and communications per month to measure red tape. This variable derives from the question: How many days does the CEO or Vice CEO spend on the government assignments and communications per month?¹⁴ There are 8 answers listed below: (1)1 day (2)2-3 days (3)4-5 days (4)6-8 days (5)9-12 days (6)13-16 days (7)17-20 days (8) > 21 days. We create the variable *TIME* by taking the midpoint value of each interval.¹⁵ On the other hand, we proceed to test the "greasing money" effect that is presumed to enhance allocation efficiency for firms, by focusing on two key resources with one being the government procurement contract and the other being financial resources. We create a dummy variable *SELLGOV*, which equals 1 if it sells products to the government,

¹² For example, firms located in special zones for high tech firms in China can enjoy many income tax benefits. However, some firms may bribe the officials to locate in such zones to enjoy these preferential treatments even though they are not qualified as high-tech and don't engage in R&D activities.

¹³ According to "Notification regarding the scope of corporate income tax collection and administration (National Tax Bureau, [1995] 3rd)", before 2002, for firms established before 2002, corporate income tax is collected and administered by local tax bureau except central SOEs and foreign firms. A dominant portion of our sample firms fit this criterion.

¹⁴ Government agencies include Tax Administration, Customs, Labor Bureau, Registration Bureau, etc; assignments refer to handling the relationship with the government workers, consolidating and submitting various reports or statements, etc.

¹⁵ For the eighth interval, we take the value 25.5.

and 0 otherwise. Besides, we create the dummy variable *Loan Access* to indicate whether firms have borrowed loans from banks or other financial institutions. Again, the specifications are very similar to model (1), only with the dependent variable replaced by the above variables and some adjustments in the control variable set.

Furthermore, we also examine whether bribe can help firms secure preferential treatment in obtaining financial resources by investigating the effect of bribes on the sensitivity of investment to internal cash flow. The econometric specification is shown in model (2):

$$\frac{invest_{it}}{K_{t-1}} = \beta_0 + \beta_1 \frac{CF_{it}}{K_{t-1}} + \beta_2 \frac{CF_{it}}{K_{t-1}} * ETC_{it} + \beta_3 ETC_{it} + \beta_4 growth_{it} + \gamma Controls_{it} \quad (2)$$

$$+ D_c + D_d + \mu_{it}$$

Based on the framework of Fazzari et al. (1988) and Hadlock (1998), the dependent variable in model (2) is measured as the ratio of investment to lagged capital stock (value of net fixed assets) and the key explanatory variable, $\frac{Cashflow_{it}}{K_{it-1}}$, is calculated as the ratio of cash flow to lagged capital stock. If this explanatory variable has a significantly positive effect on investment intensities, it signifies the existence of financial constraints due to the capital market imperfections under some assumptions.¹⁶ In order to test whether bribes can indeed help firms ease financial constrains, we include an interaction term between *ETC* and $\frac{Cashflow_{it}}{K_{it-1}}$. If the coefficient of this interaction term is significant and negative, the above effect can be empirically corroborated. What's more, in order to account for the fact that

¹⁶ One of the hypotheses is that investment cash flow (ICF) sensitivities increase monotonically with the severity of financial constrains. For a more detailed review for the advantages and disadvantages of this method, please refer to Cull et al. (2014). Besides, to make sure of the validity of this method, Fazzari et al. (1988) propose classifying firms into different groups based on the prior beliefs about the relative severity of information and liquidity problems, and then check whether the ICF sensitivity is really larger for firms that are classified as having more information and liquidity problems. In this paper, we divide the firms into two groups based on firm size, age, perceived obstacles in financial access and financial cost, and also regional GDP. All the interaction terms have the expected sign and most of them are significant, thus justifying the method. The results are available from the authors upon request.

firms growing faster are likely to invest more and that there is likely to be a strong correlation between cash flow and growth opportunities, the lagged sales growth rate ($growth_{it-1}$) is also incorporated in the model. Besides, we also include $lnAge$, lagged ratio of sales over capital [$Lag(Sale/K)$], *Loan Access*, a dummy variable indicating whether a firm purchases raw materials using trade credit (*tracredit*), as well as city and industry dummies in the set of control variables. For more concrete definitions of the variables used in this paper, please refer to Appendix Table 1 in the appendix.

3.3 Descriptive statistics

Table 1 shows the distribution of ETC by province and industry. We can see from Table 1 that on average, firms spend 1.1% of their sale revenues as ETC expenses, basically consistent with the results of Cai et al. (2011). Regarding the distribution of ETC by province, the provinces with the highest average ETC are Hainan, Guizhou, Qinghai and Hunan, while the provinces with the lowest one are Guangdong, Shandong and Chongqing. As with the distribution of ETC by industries, medical and pharmaceutical products, general machinery and also equipment for special purposes are among the highest whereas chemical fiber products, smelting and pressing of ferrous metals as well as petroleum processing and coking are among the lowest. Actually, ETC differs a lot across different regions and industries.

[TABLE 1]

Table 2 displays the descriptive statistics and differences for the key variables by dividing firms into high ETC group and low ETC group based on the median of ETC in the full sample.¹⁷ The sign of the differences between the two groups for variables *ROS*, *TIME* and *SELLTOGOV* are consistent with our hypotheses, even though the difference is not significant for *TIME*. However, for variable *ETR* and *Loan Access*, the results are somewhat

¹⁷ Many of the variables have obvious outliers, such as $lnFixasset$, $Taxfee\ Ratio$, $\frac{Cashflow_{it}}{K_{it-1}}$ and so on. For these variables, we winsorize the observations using 1 percent tail as long as this treatment can reduce the influence of those outliers.

contrary to our previous assumptions. However, we should note that the descriptive statistics are just a preliminary test without controlling for enough necessary variables as well as having a causal effect interpretation. What's more, compared with the lower ETC group, the higher ETC group has a significantly lower cash flow intensity, smaller size, lower fixed asset per capita, older age, fewer licenses and permits needed, higher state share, lower foreign share, higher lagged tax and fee ratio, and higher probability of having an appointed CEO. What's more, firms in regions with lower GDP per capita, lower product and financial market development, more overregulation by the local government and less protection for the producers on average spend significantly more ETC. However, there are no systematic differences in terms of investment intensity and CEO experience between them.

Table 3 further shows the differences between the two groups by first dividing the firms into SOE and non-state firms. We identify a firm to be a SOE if its registration type is "state". If the registration type of a firm belongs to any one of "collective", "corporation", "private", "foreign" or "HK, Macau and Taiwan", it is identified as non-state. The results in Table 3 are basically consistent with those in Table 2. Nonetheless, for *ETR*, *Loan Access*, *Taxfee Ratio* and *Stateshare*, the differences between the two groups within SOEs are not significant.

[TABLE 2 & TABLE 3]

4. Empirical results

4.1 Effect of corruption on firm performance

Table 4 demonstrates the results of model (1), which investigates the effect of corruption on firm profitability by different ownership. Column (1) simply uses OLS to estimate the regression for the whole sample. However, the coefficient of ETC is not significant albeit positive. As mentioned before, using OLS to estimate this model is likely to lead to biased results due to endogeneity problem. Thus, from column (2), GMM is utilized to overcome

this problem. In column (2), we use city-industry median of ETC as the instrument for firm ETC. This time, the coefficient of ETC becomes highly significant at 1% significance level. The Durbin-Wu-Hausman (DWH) test strongly rejects the null hypothesis that ETC can be treated as an exogenous variable. Thus, the previous result using OLS severely underestimates the effect of bribe on firm performance. In column (3), we add another instrumental variable *Specialstaff*. The result basically remains unchanged in terms of both the value and significance of the coefficients. The underidentification test (Kleibergen-Paap rk LM test) and overidentifying test (Hansen J test) verify the validity of the two IVs. The coefficient of ETC also shows huge economic significance with one standard deviation (σ) increase in ETC resulting in 0.056 increase in ROS (47% of ROS mean). From column (4) to column (7), we repeat estimating the model as column (3), respectively for non-state firms and SOEs. However, we find out that the effect of bribe on firm performance is significantly positive for non-state firms, but insignificant for SOEs. This verifies our previous hypotheses given the fact that non-state firms and SOEs face significantly different external and internal environment. For non-state firms, increasing ETC by one σ can increase ROS by 0.059 (50% of ROS mean), an even larger effect than that for the whole sample. Again, for the subsamples, almost all the DWH tests reject the null hypothesis of exogenous ETC and the results of weak IV tests as well as overidentifying tests verify the validity of our IVs.

[TABLE 4]

Moreover, the empirical results in table 4 also show that for the whole sample and non-state subsample, firms with larger size, more fixed capital per capita and older age have significantly higher ROS. Moreover, state shares generally have a significantly negative effect on firm performance whereas foreign shares have a significantly positive effect.¹⁸

¹⁸ This is consistent with Fan et al. (2007) and Feng et al. (2014) who also find out that state ownership tend to detract from

Higher openness in terms of interprovincial trade can significantly increase ROS but export seems not to play a significant role. Besides, firms with higher human capital quality have significantly higher ROS across all the specifications. Also, R&D investment can positively affect firm profitability as expected.

[TABLE 5]

In Table 5, we further conduct some robustness tests by adding more control variables. First of all, the quality of infrastructure in a city where a firm operates may affect firm performance (Xu, 2011). Therefore in column (1) and (5), we add a variable, *INFRArating*, which is calculated as the average of the manager's rating on 4 local infrastructures, in the regression.¹⁹ However, the effect of infrastructure is not significant for both types of enterprises. Secondly, a considerable amount of literature stresses the role of managerial human capital on firm performance and behavior (Bruhn et al., 2010; Li et al., 2008). Thus in column (2) and (6), we include 5 variables to measure CEO's human capital. Particularly, we include *AppCEO* to distinguish between the effect of political connection and that of corruption. The results show that non-state firms with appointed CEO experience significantly lower profitability. Besides, for both types of firms, *CEOincent* and *CEOTOWO* exert significantly positive effect on firm performance, indicating the important role of the incentive scheme as well as the annual income of CEO on firm performance. At last, institutions are also argued to play a significant role on both national and firm performance (e.g., Acemoglu et al., 2001; Knack and Keefer, 1995; La Porta et al., 2000). Thus in column (3) and (7), we include 4 variables to measure the institutional quality of the province where a firm operates. We find out that *ceteris paribus*, SOEs in provinces with better

firm performance, and Fisman & Svensson (2007) and Wang & You (2012) who find that foreign ownership can boost firm performance.

¹⁹ The four infrastructures are communication, electricity, transport and water.

financial market development, but more overregulation by the government and less protection for the producers have significant higher ROS. It's not hard to imagine in such provinces characterized by more government interventions and less protection for property rights, SOEs can have higher profitability at the expense of non-state firms. In column (4) and (8), we include all these control variables together and obtain very similar results. Above all, the coefficients of ETC across all the specifications remain basically the same with those in Table 4 in terms of both values and significance levels, indicating that our results are highly robust and convincing.

4.2 Protection money---effect of corruption on effective tax rate (ETR)

We make some adjustment on the original ETR according to prior literature. We (1) exclude firms whose effective tax rate exceeds 1 (Zimmerman, 1983; Gupta and Newberry, 1997; Adhikari et al., 2006); (2) set ETR to 0 for firms with tax refunds and to 1 for firms with positive taxes but negative or 0 EBIT.²⁰ As a large proportion of firms have zero ETR, Tobit model is utilized here to deal with the case of corner solution.²¹ In column (1) and (2) of Table 6, we estimate the effect of ETC on ETR for the whole sample and find no significant effect. In columns (3)-(4) and (5)-(6), we repeat the estimation respectively for non-state firms and SOEs. However, we get completely contrary results with significant negative effect for non-state firms and significantly positive effect for SOEs. The former conclusion corroborates our assumption that bribes can ease non-state firms' tax burdens in an economy characterized by weak protection for property rights. For them, increasing ETC by one σ can decrease ETR by 1 percentage point (6% of ETR mean). However, the latter

²⁰ For the reasons why these adjustments are necessary and appropriate, please refer to Gupta & Newberry (1997) and Adhikari et al. (2006).

²¹ We also consider that ETC may be endogenous as in the previous section. We therefore use ivtobit to conduct the same regression and then apply Smith-Blundell test to test the exogeneity of ETC. However, the results of the tests can not reject the null hypothesis that ETC can be treated as exogenous. We conduct similar tests for the following regressions and for all of them, the null hypothesis of exogeneity can't be rejected. Thus we just use ordinary Tobit, Probit and OLS in this and the following part.

results are consistent with Bradshaw et al. (2012) who find out that SOEs have significantly higher effective income tax rate than do non-state enterprises, especially when the SOE managers are in the year of evaluations for political promotions, and those SOE managers are rewarded for higher tax rate with higher probability of being promoted. In our context, SOEs with more resources devoted to bribery, which may indicate stronger ambitions for political promotions of the CEOs, have higher level of ETR accordingly. Therefore the CEOs of SOEs use their tax payment as one of the tools for achieving promotion.

[TABLE 6]

We also find that for the whole sample and the non-state subsample, both *Infixasset* and *Loan Access* have a significantly negative effect on ETR. This is consistent with our expectation and prior literature in that the accelerated depreciation of fixed assets and interest payments can be deducted from taxable income. The coefficient of *Lag growth* is also significant and negative, implying that growing firms may make more investment in tax-favored assets. Also larger firms are subject to significantly higher ETR for both the whole sample and two subsamples (Zimmerman 1983; Wu et al., 2012). Moreover, the shares held by the state and by foreigners can effectively help firms lower their ETR. Besides, *AppCEO* is only marginally significant for the whole sample and the effect of CEO's experience on ETR is not significant across all the specifications.

4.3 Greasing money---effect of corruption on red tape

Table 7 shows the results of testing the effect of ETC on red tape. We estimate the baseline specification for the whole sample, non-state subsample and SOE subsample respectively in columns (1), (3) and (5) of table 7. The empirical results show that only for non-state subsamples, the coefficient of *ETC* on *TIME* is negative and significant, at 10% significance level. Then in columns (2), (4) and (6), we control another 4 variables that could

have an influence on a firm's interaction time with the government. The results basically remain unchanged. We find that across all the specifications, larger firms spend significantly more time on the government assignment and communications per month. This is consistent with Kaufman and Wei (1999) probably because larger firms may attract more attention from the bureaucrats. Also as expected, firms which need more licenses and permits in their operations have to spend significantly more time on interacting with the government. What's more, for the whole sample as well as the non-state subsample, firms with appointed CEO experience significantly more *TIME*, probably due to the fact that appointed CEO may have to spend more time to communicate with the government, such as attending various meetings to learn new policies and to receive government tasks, or to bond with government officials to strive for favorable policies for the firm. More importantly, we find that bribes can significantly help firms lower red tape, albeit at 10% significance level. In other words, we indirectly prove that the cumbersome regulatory barriers may be exogenous rather than endogenous in China. On one hand, China is a very huge country with so many firms needing public services. Therefore, there may be no need for the corrupt bureaucrats to customize the amount of harassment or red tape. They can still get huge amount of bribe if they just establish similar red tape for each firm and then reduce them as long as certain amount of bribe is offered. On the other hand, despite extorting bribes, the local officials still give priority to the local economic development because from the long run perspective, they can benefit more by doing so (Fan and Grossman, 2001). As the non-state sector serves as the growth engine in China's economy, the corrupt officials have incentives to reduce the red tap imposed on the non-state firms after receiving bribes.

[TABLE 7]

4.4 Greasing money---effect of corruption on the probability of obtaining government

procurement contracts

Table 8 demonstrates the results which estimate the effects of corruption on the probability of obtaining government procurement. In Table 8, we estimate the baseline specification using probit model for the whole sample, non-state and SOE subsample respectively in columns (1), (3) and (5) while adding more controls for respective groups in columns (2), (4) and (6). The empirical results show that there's a highly significant and positive relationship between firm ETC and the probability of securing government contracts for both full sample and the non-state subsample. For the latter group, increasing ETC by one σ can increase the probability by 1 percentage point (7% of average probability). This indicates that in China, it's an effective way for firms, especially non-SOEs, to secure government procurement by bribing the corresponding officials. This is consistent with the reality that in developing countries like China, the public government procurement tender has become a mere formality. On the surface, the tender seems to be conducted according to related rules and procedures but in fact the process involves "black box operation" and collusion between the government and businessmen. Firms can bribe the officials to win the bid and offer kickbacks to repay the bureaucrats in charge.^{22 23}

[TABLE 8]

Besides, from Table 8, we can see that firm size and human capital quality have a significant and positive effect on the probability of obtaining government procurement contracts for both the full sample as well as the two subsamples. For the full sample and non-state firms, firms with older age, better past profitability and more experienced CEOs are

²² The website of "News of CPC" (<http://fanfu.people.com.cn/GB/16014155.html>) condemns the involvement of bribes in the government procurement process by citing the examples that the settlement price of the air-conditioning system of Changsha administration building was 8 times higher than the bidding price and the fiscal bureau of Fushun procured ipod touch 4 as USB memory.

²³ This is also consistent with Du et al (2014) who argue that the relationship-specific rights to do business, which were often nurtured by paying bribes to bureaucrats, can enable private entrepreneurs to be treated favorably in bidding for government procurement contracts.

more likely to obtain the chance of their products being purchased by the government. However, foreign share has a significantly negative effect on this probability. This is perhaps due to the fact that the government procurement law of PRC stipulates that the governments should procure goods produced by domestic firms as possible as they can.²⁴ However, having an appointed CEO seems not to have a significant effect on increasing this probability while having a more experienced CEO can significantly increase the chance.

4.5 Greasing money---effect of corruption on the sensitivity of investment to cash flow and on the probability of obtaining bank loans

[TABLE 9]

In Table 9, we empirically test whether bribes can function to alleviate firms' financial constraints by estimating model (2). In column (1), we simply use OLS for the whole sample. As a large proportion of firms do not engage in investment in the survey year, there are many observations with 0 dependent variables. We therefore use Tobit model to account for this data structure in column (2). In column (3), following Poncet et al. (2010) and Cull et al. (2014), we treat the cash flow intensity as being endogenous and use lagged cash flow intensity as an IV to conduct GMM estimation. From columns (4)-(7), we repeat our estimation using Tobit and GMM for non-state firms and SOEs respectively. From table 9, we can see that, the coefficient of the interaction term between ETC and cash flow intensity, is not statistically significant, regardless of estimation methods and ownership types. This seems to support the idea that in China, firms can not ease their financial constraints by bribes. However, except for the SOE group, the CF intensity has a significantly positive effect on investment intensity, indicating that Chinese firms in general, especially non-state firms rely a lot on internal cash flow to fund investment, thus subject to significant financial

²⁴ For more details of the law, please refer to http://www.gov.cn/english/laws/2005-10/08/content_75023.htm.

constraints. The coefficients of *Lag (Sale/K)*, *Lag Growth*, *Loan Access* and *Tracredit* all have the expected positive sign and highly significant, particularly for the whole sample and the non-state group. Moreover, we also find that firms with older age and appointed CEO may invest less, as expected. Last but not least, consistent with Cull et al. (2014), we find that compared with non-state firms, investment in SOEs are less sensitive to access to bank loans, access to trade credit and growth opportunities, indicating that SOEs may use the resources that might otherwise be spent on investment to other activities, such as bribing government officials who may have an influence on their future career.

[TABLE 10]

In Table 10, we investigate the effect of ETC on the probability of getting access to bank loans by using probit model. The empirical results of Table 10 show that firms with higher fixed assets per capita, larger size, better past profitability and more experienced CEO generally have a significantly higher probability of having bank loans. Above all, consistent with our previous results in Table 9, we fail to find the existence of a significant and positive effect of ETC on the probability of getting access to bank loans. Similarly, Chen et al. (2013) also find that briber is not sufficient to secure access to bank loans for private firms. As explained by them, this result can be attributed to the separation of credit risk assessments and loan operations into different departments in Chinese banks required by the bank law. The former, which has the final veto power on the loan-making decisions made by the latter, is very strict with the performance criterion and actually has very little interactions with the applicant firms.²⁵ Besides, In China, non-state enterprises have serious difficulties in getting access to bank loans for several reasons. On one hand, the non-state enterprises, especially the private SMEs, have shorter life circles, higher mortality rates and less effective collateral.

²⁵ In this sense, to some extent this practice imposes an effective top-down discipline system to prevent corruption in granting loans.

To make things worse, the lack of transparent financial information increases the borrowing risk as well as the transaction cost. On the other hands, due to the implicit guarantee from the government as well as the close connections between the dominant state-owned banks and SOEs, the state-owned banks have strong incentives to lend money to SOEs. The empirical results above suggest that bribes alone are not sufficient enough to help non-state firms overcome their own deficiencies and the institutional barriers. Therefore, improving the competitiveness of non-state firms as well as reforming the banking sectors and SOEs may be more effective in dealing with the problem.

5. Robustness checks

In Table 11 and 12, we further proceed to conduct several robustness checks. First, we replace ROS, which is calculated as the ratio of after-tax profit to sales, with before-tax ROS. Our purpose is to test whether bribes can have a significant positive effect on firm's profitability through channels other than tax reduction. In other words, here we aim to separate the "greasing money" and "protection money" effect. In column (1) and (2) of Table 11, we use before-tax ROS as the dependent variable to estimate model (1) for the non-state and state group respectively. The results show ETC has a positive and highly significant effect on non-SOEs' before-tax profitability while the effect is again insignificant for SOEs.

Furthermore, as argued before, ETC is likely to consist of both legitimate normal business expenditures (including entertaining suppliers and clients and travel cost) and also bribes offered to government officials. Thus, we create a new variable, the business unrelated ETC, which is presumed to only contain the "bribe" part. As Cai et al. (2011) did, we construct this variable by first regressing ETC on several variables that can be regarded as business related, such as *lnLabor*, *lnAge*, a dummy indicating whether a firm sells its products to firms in other provinces (*SELLPROV*), logarithm of total years of relationships

with the firm's main client and supplier ($\ln Totalyear$) as well as city and industry dummies. Then the residual term for each firm is the business unrelated ETC (ETCR). In column (3) and (4) of Table 11, we re-estimate model (1) for no-state and state group respectively using the above adjusted ETC. Again, the results basically remain almost unchanged.

[TABLE 11 & TABLE 12]

In Table 12, we use the business unrelated ETC as the key explanatory variable of interest and repeat all the above regressions that investigate the “protection money” and “greasing money” effect. We only repeat the estimation for non-state group and SOEs. We can see from Table 12 that, across columns (1) to (8), the coefficients of the variables we are interested in basically remain the same with previous results in terms of both values and significance levels. The results of above regressions verify the robustness and validity of our conclusions in this paper.

6. Conclusion

This paper directly investigates the “greasing money” and “protection money” effect of corruption based on 2005 Investment Climate Survey. After finding out that bribes have a significantly positive effect on firm profitability for the non-state firms but not for SOEs, we then directly test the “protection money” and “greasing money” effect. By using effective tax rate (ETR) to proxy the government expropriation, this paper finds out that ETC can significantly reduce ETR for non-state firms, whereas ETC significantly increases ETR for SOEs. Regarding the “greasing money” effect, on one hand, we use the time CEO spends on the government assignments and communications per month to proxy red tape and the empirical result shows a significantly negative relationship between ETC and the time only for non-SOEs. On the other hand, we also test whether corruption can help firms get preferential treatment in obtaining key resources. Here we mainly focus on government

procurement contracts and financial resources, like bank loans. Our empirical results demonstrate that non-state firms that spend more on ETC have significantly higher probability of obtaining government procurement contracts. Nonetheless, corruption seems not to have any effect on helping firms alleviate financial constraints or obtain bank loans, regardless of ownership types. To sum up, corruption can enhance firm profitability by easing tax burden, reducing red tape and obtaining government procurement contract for non-SOEs in China, thus verifying most of the “protection money” and “greasing money” hypotheses.

This paper finds out that corruption can enhance firm performance, especially for non-state firms, through the channels of “protection money” and “greasing money” in China. This seems to contradict the common sense that corruption should negatively impact economic development. However, we should keep in mind that, China is a huge transitional economy at present, where although significant advances in economic liberalization and privatizations have been achieved, the concomitant institutional reforms have lagged too far behind to support a proper legal and regulatory framework. Thus in the process of the unbalanced reforms, there exist a lot of incentives and opportunities for corrupt behavior. This is consistent with the literature that finds out corruption is more likely to enhance economic development in economies with low-quality institutions. Above all, firms in a transitional economy like China may view corruption as an important strategy for survival and development at current stage. However, as the institutional improvement continues, the benefits of corruption will be reduced and finally outweighed by the detrimental effects. This implies that a series of thorough reforms on the existent institutions may be more effective to reduce corruption, which aims to significantly decrease the incentives of engaging in corruption. On one hand, the role of government in the economic activities, especially in allocating key resources, like credit and land, should be further reduced by introducing sound

market-based mechanism that promotes competition and efficiency. Efforts should also be made to combat corruption in government procurement process to make sure bidding firms can compete on a fair and transparent basis. Besides, it's imperative that a more effective legal system in terms of protecting private property rights and enforcing contracts be established. Under a strong legal framework, firms can rely on laws to resolve disputes and seek for protection, rather than resort to bribing officials. Moreover, unnecessary red tape or regulations must be inhibited, which can not only close the door for bribes but also increase economic efficiency by removing cumbersome barriers for business. On the other hand, measures that can channel the strategies of firms away from committing bribes to more legitimate ways are required. This has to involve reforms that promote equality, democracy, and political accountability. All these reforms may take a long time and great effort because this involves removing the vested interests of the privileged elite class at present.

At last, although corruption may promote firm development from micro perspective, from a macro perspective or a general equilibrium perspective, the effect of corruption is bound to be negative, especially for sustainable development (Aidt, 2009; Hellman et al., 2003). Also we should remember that the efficiency-enhancing role of corruption is only transitory and peculiar to some specific nations conditional on their unique economic, social and political factors. Having a proper grasp of the above argument is the key to understanding the method as well as the conclusions of this paper.

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Appendix Table 1. Variable definitions and descriptive statistics

Variable	Definition	Mean	Std.Dev.
ETC	ratio of entertainment and travel cost to sales	0.011	0.024
ROS	ratio of after-tax profits to sales	0.120	0.148
ETR	effective tax rate (ratio of income tax to EBIT)	0.154	0.243
Loan Access	dummy variable indicating if a firm has outstanding loan	0.600	0.490
TIME	time CEO spends on government assignment and communications per month	3.736	3.504
SELLGOV	dummy variable indicating if a firm sells to government	0.154	0.361
Lag Growth	lagged sales growth rate	0.598	1.790
I/Lag K	ratio of investment to lagged capital stock (value of net fixed assets)	0.304	0.741
CF/Lag K	ratio of cash flow (sum of total profits plus interest and financial expenses) to lagged capital stock	0.592	1.561
lnLabor	logarithm of the number of employees	5.615	1.459
lnFixasset	logarithm of capital stock per employee	3.835	1.368
lnAge	logarithm of 2004 minus the founding year of the firm	2.127	0.875
lnLicense	logarithm of licenses and permits a firm needs	1.605	0.706
Taxfee Ratio	ratio of lagged taxes and fees over lagged sales	0.059	0.220
Export Ratio	proportion of sales that are exported	0.164	0.315
Stateshare	ratio of shares owned by the state	0.134	0.316
Foreignshare	ratio of shares owned by foreigners	0.146	0.317
Interpro Ratio	proportion of sales that are sold to other provinces	0.394	0.348
Tracredit	dummy variable indicating whether a firm buys from suppliers using trade credit	0.281	0.450
Lag (Sale/K)	lagged sales over lagged capital stock	10.51	23.83
Specialstaff	dummy variable indicating whether a firm has special staff to deal with government relationship	0.266	0.442
College	ratio of employees with university degree and above	0.183	0.178
RDI	ratio of R&D over sales	0.011	0.032
AppCEO	dummy variable indicating whether the CEO is appointed by the government	0.118	0.322
CEOexper	number of years the current CEO has held position	6.378	4.715
CEOeduc	education level of CEO	2.422	0.998
CEOincent	dummy variable indicating whether the annual income of the CEO is directly linked to firm performance	0.660	0.474
CEOTOWO	ratio of CEO's annual income to that of regular workers	11.060	8.368
INFRArating	average rating of 4 local infrastructures by firm	0.771	0.732
lnGDPPcity	logarithm of local city-level GDP per capita	10.110	0.543
Promarket	extent of product market development from Fan et al. (2006); Higher value indicates better institution quality; The following variables all stem from the same source	7.511	2.028
Fimarket	extent of financial market development	7.413	2.001
Overreg	extent of overregulation by local government	4.914	2.433
Protection	extent of legal protection for producers	4.871	1.994

Appendix Table 2. Correlation Coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)ETC	1											
(2)ROS	0.109***	1										
(3)ETR	0.006	-0.088***	1									
(4)TIME	-0.004	-0.012	0.007	1								
(5)Loan Access	-0.052***	0.053***	-0.065***	0.037***	1							
(6)CF/Lag K	-0.030***	0.134***	-0.077***	-0.016*	-0.016*	1						
(7)SELLGOV	0.041***	0.048***	-0.025***	0.042***	0.061***	-0.009	1					
(8)lnLabor	-0.144***	0.062***	-0.001	0.061***	0.287***	-0.055***	0.075***	1				
(9)lnFixasset	-0.071***	0.089***	-0.053***	0.020**	0.228***	-0.229***	0.045***	0.217***	1			
(10)AppCEO	0.008	0.003	-0.017*	0.051***	-0.021**	-0.065***	0.057***	0.140***	0.030***	1		
(11)Ceosexper	-0.017*	-0.009	0.001	-0.003	0.063***	0.007	0.029***	-0.020**	-0.061***	0.032***	1	
(12)lngdppcity	-0.019**	0.0130	0.045***	-0.025***	-0.005	0.054***	-0.020**	0.148***	0.117***	-0.033***	0.031***	1

***, **and * denote 1%, 5% and 10% of significance level.

Table 1. Distribution of ETC by province and industry

Province	Mean	Freq.	Industry	Mean	Freq.
Anhui	0.012	400	agricultural & side-line food processing	0.007	969
Beijing	0.012	200	food production	0.010	243
Chongqing	0.007	200	beverages production	0.017	178
Fujian	0.008	500	tobacco production	0.006	46
Gansu	0.013	200	textiles manufacturing	0.007	952
Guangdong	0.007	900	garment, shoes, and caps manufacturing	0.010	206
Guangxi	0.013	300	leather, furs, down, and related products	0.011	139
Guizhou	0.018	200	timber processing, palm fiber & straw products	0.012	141
Hainan	0.024	100	furniture manufacturing	0.011	55
Hebei	0.010	800	papermaking and paper products	0.007	235
Henan	0.010	700	printing and record medium reproduction	0.015	62
Hubei	0.012	700	cultural, educational and sports goods	0.008	41
Hunan	0.018	600	petroleum processing and coking	0.005	182
Jiangsu	0.012	900	raw chemical materials and chemical products	0.011	1441
Jiangxi	0.010	500	medical and pharmaceutical products	0.029	426
Jilin	0.015	200	chemical fiber products	0.003	47
Neimenggu	0.014	200	rubber products	0.011	21
Ningxia	0.011	200	plastic products	0.010	329
Qinghai	0.018	100	nonmetal mineral products	0.010	1299
Shanxi	0.015	300	smelting and pressing of ferrous metals	0.004	491
Shandong	0.007	900	smelting and pressing of non-ferrous metals	0.006	345
Shanghai	0.013	200	metal products	0.010	366
Shanxi	0.011	300	general machinery	0.018	1077
Sichuan	0.010	500	equipment for special purposes	0.018	486
Tianjin	0.012	200	transportation equipment	0.011	989
Xinjiang	0.016	100	electrical equipment and machinery	0.013	864
Yunnan	0.009	300	electronic and telecommunications equipments	0.010	598
Zhejiang	0.010	800	instruments, cultural & office machinery	0.013	60
Heilongjiang	0.014	300	handicraft products and other machinery	0.009	109
Liaoning	0.013	600	renewable materials processing	0.011	3
Total	0.011	12400	Total	0.011	12400

Table 2. Descriptive statistics by ETC group

Variables	High ETC		Low ETC		MeanDiff
	N	Mean	N	Mean	
ROS	6200	0.146	6200	0.093	0.053***
ETR	6068	0.160	6098	0.148	0.011**
Loan Access	6200	0.575	6200	0.625	-0.050***
TIME	6135	3.723	6130	3.748	-0.025
SELLGOV	6200	0.177	6200	0.131	0.046***
Lag Growth	6176	0.473	6169	0.723	-0.250***
I/Lag K	6195	0.312	6184	0.295	0.016
CF/Lag K	6195	0.522	6184	0.661	-0.139***
lnLabor	6200	5.336	6200	5.893	-0.557***
lnFixasset	6197	3.688	6188	3.983	-0.295***
lnAge	6200	2.171	6200	2.083	0.088***
lnLicence	6200	1.587	6200	1.622	-0.034***
Taxfee Ratio	6197	0.069	6193	0.048	0.022***
Export Ratio	6200	0.120	6199	0.209	-0.089***
Stateshare	6200	0.150	6200	0.119	0.031***
Foreignshare	6200	0.114	6200	0.179	-0.065***
AppCEO	6200	0.132	6200	0.103	0.029***
CEOexper	6193	6.402	6191	6.354	0.048
lnGDPPcity	6200	10.08	6200	10.15	-0.069***
Promarket	6200	7.370	6200	7.652	-0.282***
Fimarket	6200	7.204	6200	7.621	-0.417***
Overreg	6200	4.752	6200	5.076	-0.324***
Protection	6200	4.735	6200	5.007	-0.272***

***, **and * denote 1%, 5% and 10% of significance level.

Table 3. Statistics by ownership of firms

Variables	Non-state firms					SOE				
	high ETC		low ETC		MeanDiff	high ETC		low ETC		MeanDiff
	N	Mean	N	Mean		N	Mean	N	Mean	
ROS	5563	0.147	5562	0.092	0.055***	615	0.141	660	0.107	0.034***
ETR	5438	0.162	5473	0.150	0.012***	603	0.146	652	0.127	0.019
Loan Access	5563	0.577	5562	0.626	-0.049***	615	0.563	660	0.598	-0.036
TIME	5508	3.670	5503	3.688	-0.018	604	4.199	650	4.268	-0.070
SELLGOV	5563	0.167	5562	0.126	0.041***	615	0.249	660	0.191	0.058**
Lag Growth	5540	0.518	5532	0.759	-0.240***	614	0.123	659	0.366	-0.244***
I/Lag K	5558	0.334	5551	0.302	0.032**	614	0.165	656	0.189	-0.024
CF/Lag K	5558	0.565	5551	0.689	-0.124***	614	0.215	656	0.353	-0.138**
lnLabor	5563	5.239	5562	5.839	-0.600***	615	6.037	660	6.495	-0.459***
lnFixasset	5561	3.658	5555	3.963	-0.305***	613	3.862	656	4.232	-0.370***
lnAge	5563	2.040	5562	1.997	0.043***	615	3.170	660	2.983	0.187***
Taxfee Ratio	5560	0.066	5556	0.045	0.021***	615	0.075	659	0.093	-0.018
Export Ratio	5563	0.131	5561	0.219	-0.088***	615	0.047	660	0.103	-0.056***
Stateshare	5563	0.069	5562	0.060	0.009**	615	0.748	660	0.739	0.009
Foreignshare	5563	0.128	5562	0.194	-0.066***	615	0.010	660	0.024	-0.015**
AppCEO	5563	0.076	5562	0.068	0.008	615	0.556	660	0.477	0.079***
CEOexper	5557	6.509	5554	6.432	0.077	614	5.496	659	5.643	-0.147

***, **and * denote 1%, 5% and 10% of significance level.

Table 4. The effect of corruption on firm performance (return to sales, ROS)

	(1)OLS whole	(2)GMM whole	(3)GMM whole	(4)GMM non-state	(5)GMM non-state	(6)GMM state	(7)GMM state
ETC	0.260 (0.295)	2.370*** (0.430)	2.352*** (0.426)	4.155*** (0.441)	2.472*** (0.449)	2.108 (1.344)	1.176 (1.534)
lnLabor	0.004*** (0.001)	0.010*** (0.002)	0.010*** (0.002)	0.014*** (0.002)	0.011*** (0.002)	0.007* (0.004)	0.003 (0.005)
lnFixasset	0.003*** (0.001)	0.006*** (0.001)	0.006*** (0.001)	0.009*** (0.002)	0.006*** (0.001)	0.003 (0.006)	0.000 (0.006)
lnAge	0.003* (0.002)	0.003* (0.002)	0.002 (0.002)	0.005** (0.002)	0.003* (0.002)	0.002 (0.006)	0.003 (0.005)
Taxfee Ratio	0.023 (0.016)	0.017 (0.011)	0.017 (0.011)	0.018* (0.010)	0.014 (0.011)	0.087** (0.042)	0.112** (0.054)
Stateshare	-0.011** (0.005)	-0.019*** (0.006)	-0.019*** (0.006)	-0.017* (0.010)	-0.013* (0.008)	-0.023 (0.015)	-0.014 (0.016)
Foreignshare	0.032*** (0.006)	0.032*** (0.006)	0.031*** (0.006)	0.026*** (0.006)	0.032*** (0.006)		
Export Ratio	-0.003 (0.005)	-0.002 (0.005)	-0.003 (0.005)	-0.009 (0.006)	-0.002 (0.005)	-0.011 (0.016)	0.001 (0.023)
Interpro Ratio	0.034*** (0.004)	0.025*** (0.005)	0.025*** (0.005)	0.016*** (0.005)	0.025*** (0.005)	0.014 (0.016)	0.015 (0.020)
College	0.084*** (0.011)	0.057*** (0.012)	0.056*** (0.012)	0.048*** (0.014)	0.051*** (0.013)	0.082** (0.039)	0.068* (0.041)
RDI	0.394*** (0.078)	0.189** (0.088)	0.177** (0.087)	0.045 (0.125)	0.164 (0.105)	0.187 (0.127)	0.172 (0.121)
lnGDPPcity				-0.007** (0.003)		0.010 (0.014)	
Kleibergen-Paa							
p rk LM		62.114	62.180	111.701	53.247	39.666	20.727
(p-value)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hensen J test			1.568	3.600	1.537	0.149	0.007
(p-value)			(0.210)	(0.058)	(0.215)	(0.670)	(0.935)
DWH (p-value)		(0.000)	(0.000)	(0.000)	(0.000)	(0.022)	(0.106)
City Dum	YES	YES	YES	NO	YES	NO	YES
Industry Dum	YES	YES	YES	NO	YES	NO	YES
R ²	0.133	0.412	0.415	0.293	0.447	0.160	-0.121
Observation	12221	12221	12221	11104	11104	1117	1117

Note: Constants are not reported. For column 2, only the industry-city median of ETC is used as the IV. For columns 3-7, in addition to the industry-city median of ETC, a dummy variable indicating whether a firm has special staffs to deal with the relationship with the government (*Specialstaff*) is also used as a complementary IV. The first-stage regressions are not reported for brevity. ***, **and * denote 1%, 5% and 10% of significance level. White heteroskedasticity-robust standard errors are in parentheses.

Table 5. The effect of corruption on firm performance (return to sales, ROS)

	(1)GMM	(2)GMM	(3)GMM	(4)GMM	(5)GMM	(6)GMM	(7)GMM	(8)GMM
	non-state	non-state	non-state	non-state	state	state	state	state
ETC	2.472 ^{***} (0.449)	2.365 ^{***} (0.440)	2.472 ^{***} (0.449)	2.363 ^{***} (0.440)	1.181 (1.523)	1.239 (1.491)	1.176 (1.534)	1.287 (1.482)
lnLabor	0.011 ^{***} (0.002)	0.009 ^{***} (0.002)	0.011 ^{***} (0.002)	0.009 ^{***} (0.002)	0.003 (0.005)	-0.002 (0.005)	0.003 (0.005)	-0.002 (0.005)
lnFixasset	0.006 ^{***} (0.001)	0.005 ^{***} (0.001)	0.006 ^{***} (0.001)	0.005 ^{***} (0.001)	0.000 (0.006)	-0.000 (0.006)	0.000 (0.006)	-0.000 (0.006)
lnAge	0.003 [*] (0.002)	0.003 [*] (0.002)	0.003 [*] (0.002)	0.003 [*] (0.002)	0.003 (0.006)	0.007 (0.006)	0.003 (0.005)	0.007 (0.006)
Taxfee Ratio	0.014 (0.011)	0.013 (0.011)	0.014 (0.011)	0.013 (0.011)	0.113 ^{**} (0.054)	0.107 ^{**} (0.054)	0.112 ^{**} (0.054)	0.105 [*] (0.055)
Stateshare	-0.013 [*] (0.008)	-0.008 (0.008)	-0.013 [*] (0.008)	-0.008 (0.008)	-0.014 (0.016)	-0.016 (0.017)	-0.014 (0.016)	-0.016 (0.017)
Foreignshare	0.032 ^{***} (0.006)	0.031 ^{***} (0.006)	0.032 ^{***} (0.006)	0.031 ^{***} (0.006)				
Export Ratio	-0.002 (0.005)	-0.001 (0.005)	-0.002 (0.005)	-0.001 (0.005)	0.001 (0.023)	0.002 (0.023)	0.001 (0.023)	0.003 (0.023)
Interpro Ratio	0.025 ^{***} (0.005)	0.025 ^{***} (0.005)	0.025 ^{***} (0.005)	0.025 ^{***} (0.005)	0.015 (0.020)	0.016 (0.020)	0.015 (0.020)	0.015 (0.019)
College	0.051 ^{***} (0.013)	0.048 ^{***} (0.013)	0.051 ^{***} (0.013)	0.048 ^{***} (0.013)	0.068 [*] (0.041)	0.081 ^{**} (0.041)	0.068 [*] (0.041)	0.083 ^{**} (0.041)
RDI	0.164 (0.105)	0.195 [*] (0.101)	0.164 (0.105)	0.195 [*] (0.100)	0.171 (0.121)	0.173 (0.120)	0.172 (0.121)	0.173 (0.120)
INFRArating	-0.000 (0.002)			-0.001 (0.002)	0.002 (0.008)			-0.001 (0.009)
AppCEO		-0.011 ^{**} (0.005)		-0.011 ^{**} (0.005)		0.019 (0.015)		0.019 (0.016)
CEOexper		0.000 (0.000)		0.000 (0.000)		0.001 (0.001)		0.001 (0.001)
CEOedu		-0.001 (0.001)		-0.001 (0.001)		0.000 (0.009)		0.000 (0.009)
CEOincent		0.010 ^{***} (0.003)		0.010 ^{***} (0.003)		0.031 ^{**} (0.014)		0.031 ^{**} (0.014)
CEOTOWO		0.000 [*] (0.000)		0.000 [*] (0.000)		0.002 ^{**} (0.001)		0.002 ^{**} (0.001)
Promarket			-0.000 (0.003)	-0.001 (0.003)			0.014 (0.013)	0.011 (0.013)
Fimarket			0.004 (0.004)	-0.001 (0.003)			0.030 ^{**} (0.012)	0.028 ^{**} (0.014)
Overreg			-0.001 (0.004)	0.003 (0.003)			-0.024 [*] (0.013)	-0.019 (0.014)
Protection			0.001 (0.005)	-0.002 (0.004)			-0.019 [*] (0.011)	-0.023 ^{**} (0.011)
City Dum	YES	YES	YES	YES	YES	YES	YES	YES
Industry Dum	YES	YES	YES	YES	YES	YES	YES	YES
R ²	0.447	0.451	0.447	0.451	-0.121	-0.127	-0.117	-0.1325
Observation	11104	10749	11104	10749	1117	1082	1117	1082

Note: Constants are not reported. From columns 1-8, the industry-city median of ETC and a dummy variable indicating whether a firm has special staffs to deal with the relationship with the government (*Specialstaff*) are used as IVs. The first-stage regressions are not reported for brevity. ***, ** and * denote 1%, 5% and 10% of significance level. White heteroskedasticity-robust standard errors are in parentheses.

Table 6. The effect of corruption on ETR (Effective Tax Rate)

	(1)Tobit whole	(2) Tobit whole	(3) Tobit non-state	(4) Tobit non-state	(5) Tobit state	(6) Tobit state
ETC	-0.215 (0.230)	-0.213 (0.229)	-0.371** (0.188)	-0.370** (0.188)	1.454* (0.772)	1.473* (0.768)
lnFixasset	-0.011*** (0.003)	-0.011*** (0.003)	-0.011*** (0.003)	-0.011*** (0.003)	-0.015 (0.018)	-0.015 (0.018)
lnLabor	0.018*** (0.003)	0.019*** (0.003)	0.017*** (0.003)	0.017*** (0.003)	0.051*** (0.014)	0.052*** (0.014)
Lag ROS	0.027 (0.033)	0.027 (0.033)	0.033 (0.033)	0.031 (0.033)	0.134 (0.148)	0.145 (0.148)
Lag growth	-0.012** (0.006)	-0.012** (0.006)	-0.015*** (0.006)	-0.015*** (0.006)	0.054 (0.041)	0.052 (0.041)
Loan Access	-0.035*** (0.008)	-0.036*** (0.008)	-0.039*** (0.008)	-0.040*** (0.008)	-0.016 (0.036)	-0.017 (0.037)
Stateshare	-0.089*** (0.013)	-0.079*** (0.014)	-0.048*** (0.018)	-0.043** (0.019)	-0.040 (0.042)	-0.040 (0.042)
Foreignshare	-0.070*** (0.012)	-0.070*** (0.012)	-0.072*** (0.012)	-0.072*** (0.012)		
AppCEO		-0.024* (0.013)		-0.018 (0.015)		-0.003 (0.032)
CEOexper		0.001 (0.001)		0.001 (0.001)		0.002 (0.003)
Left-censored	4313	4304	3722	3714	591	590
Non-censored	7632	7626	7126	7120	506	506
City Dum	YES	YES	YES	YES	YES	YES
Industry Dum	YES	YES	YES	YES	YES	YES
Pseudo R ²	0.063	0.064	0.064	0.065	0.191	0.191
Observation	11945	11930	10848	10834	1097	1096

Note: Constants are not reported. ***, **and * denote 1%, 5% and 10% of significance level. White heteroskedasticity-robust standard errors are in parentheses.

Table 7. The effect of corruption on the time CEO spends on the government assignments and communications per month

	(1)OLS whole	(2)OLS whole	(3)OLS non-state	(4)OLS non-state	(5)OLS state	(6)OLS state
ETC	-0.721 (1.202)	-0.736 (1.213)	-1.702* (1.004)	-1.718* (0.999)	4.170 (3.217)	4.265 (3.098)
lnLabor	0.167*** (0.026)	0.149*** (0.026)	0.156*** (0.027)	0.138*** (0.028)	0.245** (0.120)	0.226* (0.121)
lnAge	0.057 (0.041)	0.061 (0.045)	0.050 (0.044)	0.052 (0.048)	0.016 (0.173)	0.046 (0.176)
Stateshare	0.111 (0.120)	0.048 (0.128)	-0.033 (0.172)	-0.104 (0.175)	-0.014 (0.336)	0.007 (0.336)
Foreignshare	-0.157 (0.114)	-0.193* (0.116)	-0.146 (0.115)	-0.177 (0.117)		
lnLicense		0.289*** (0.048)		0.291*** (0.050)		0.338* (0.203)
Lag Growth		0.078 (0.053)		0.079 (0.054)		0.185 (0.340)
App CEO		0.220* (0.122)		0.326** (0.148)		-0.257 (0.269)
CEOexper		0.000 (0.007)		0.001 (0.007)		0.017 (0.032)
City Dum	YES	YES	YES	YES	YES	YES
Industry Dum	YES	YES	YES	YES	YES	YES
R ²	0.054	0.058	0.053	0.057	0.147	0.152
Observation	12114	12046	11011	10946	1103	1100

Note: Constants are not reported. ***, **and * denote 1%, 5% and 10% of significance level. White heteroskedasticity-robust standard errors are in parentheses.

Table 8. The effect of corruption on the probability of obtaining government contract

	(1)Probit whole	(2)Probit whole	(3) Probit non-state	(4) Probit non-state	(5) Probit state	(6)Probit state
ETC	1.922 ^{***} (0.556)	1.600 ^{***} (0.548)	2.362 ^{***} (0.579)	1.974 ^{***} (0.589)	-0.072 (1.315)	-0.197 (1.298)
InLabor	0.100 ^{***} (0.012)	0.099 ^{***} (0.012)	0.095 ^{***} (0.013)	0.093 ^{***} (0.013)	0.191 ^{**} (0.043)	0.195 ^{***} (0.044)
InAge	0.068 ^{***} (0.018)	0.035 [*] (0.020)	0.088 ^{**} (0.020)	0.054 [*] (0.022)	-0.024 (0.063)	-0.036 (0.063)
College	0.925 ^{***} (0.085)	0.905 ^{***} (0.087)	0.949 ^{***} (0.091)	0.925 ^{***} (0.092)	0.653 ^{**} (0.297)	0.658 [*] (0.305)
Stateshare	0.019 (0.049)	0.030 (0.053)	0.055 (0.073)	0.061 (0.076)	0.087 (0.129)	0.093 (0.129)
Foreignshare	-0.683 ^{***} (0.065)	-0.682 ^{***} (0.066)	-0.663 ^{***} (0.066)	-0.663 ^{***} (0.066)		
Lag ROS		0.502 ^{***} (0.134)		0.512 ^{***} (0.144)		0.647 (0.430)
Lag Growth		-0.060 ^{**} (0.027)		-0.044 (0.028)		-0.223 (0.136)
CEOexper		0.011 ^{***} (0.003)		0.011 ^{***} (0.003)		0.009 (0.012)
AppCEO		0.042 (0.049)		0.064 (0.059)		-0.002 (0.104)
City Dum	YES	YES	YES	YES	YES	YES
Industry Dum	YES	YES	YES	YES	YES	YES
Pseudo R^2	0.111	0.114	0.115	0.118	0.179	0.183
Observation	12245	12173	11109	11041	1028	1024

Note: Constants are not reported. ***, **and * denote 1%, 5% and 10% of significance level. White heteroskedasticity-robust standard errors are in parentheses.

Table 9. The effect of corruption on the sensitivity of investment to internal cash flow

	(1)OLS whole	(2)Tobit whole	(3)GMM whole	(4)Tobit non-state	(5)GMM non-state	(6)Tobit state	(7)GMM state
CF/Lag K	0.073*** (0.012)	0.087*** (0.014)	0.074*** (0.021)	0.093*** (0.014)	0.079*** (0.022)	-0.021 (0.063)	-0.036 (0.081)
ETC*(CF/Lag K)	-0.099 (0.411)	0.024 (0.468)	-0.304 (0.491)	0.009 (0.478)	-0.365 (0.501)	-3.440 (3.176)	-2.204 (3.112)
ETC	0.636* (0.332)	0.218 (0.461)	0.689* (0.356)	0.418 (0.509)	0.831** (0.416)	-2.471** (1.042)	-0.728** (0.349)
lnAge	-0.033*** (0.008)	-0.027*** (0.010)	-0.033*** (0.008)	-0.026** (0.012)	-0.035*** (0.009)	0.021 (0.024)	0.008 (0.018)
Lag (Sale/K)	0.004*** (0.001)	0.003*** (0.001)	0.004*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.009** (0.004)	0.009* (0.005)
Lag Growth	0.092*** (0.013)	0.125*** (0.016)	0.093*** (0.013)	0.129*** (0.017)	0.096*** (0.013)	0.044 (0.038)	0.026 (0.027)
Loan Access	0.087*** (0.014)	0.176*** (0.018)	0.089*** (0.014)	0.174*** (0.020)	0.091*** (0.015)	0.134*** (0.034)	0.070*** (0.025)
Tracredit	0.043*** (0.015)	0.074*** (0.019)	0.043*** (0.015)	0.074*** (0.021)	0.046*** (0.017)	0.041 (0.033)	0.010 (0.025)
AppCEO	-0.066*** (0.015)	-0.098*** (0.022)	-0.067*** (0.015)	-0.080*** (0.029)	-0.057*** (0.020)	-0.074** (0.030)	-0.057** (0.022)
CEOexper	0.001 (0.001)	-0.001 (0.002)	0.001 (0.001)	-0.002 (0.002)	0.001 (0.001)	0.002 (0.003)	-0.000 (0.003)
Left-censored		3303		2987		316	
Non-censored		8858		8059		799	
City Dum	YES	YES	YES	YES	YES	YES	YES
Industry Dum	YES	YES	YES	YES	YES	YES	YES
(Pseudo) R ²	0.100	0.045	0.228	0.044	0.231	0.189	0.112
Observation	12161	12161	12148	11046	11033	1115	1115

Note: Constants are not reported. ***, **and * denote 1%, 5% and 10% of significance level. White heteroskedasticity-robust standard errors are in parentheses.

Table 10. The effect of corruption on the probability of getting access to loans

	(1)Probit whole	(2)Probit non-state	(3)Probit state
ETC	0.454 (0.576)	0.832 (0.636)	0.264 (1.268)
lnFixasset	0.197 ^{***} (0.010)	0.206 ^{***} (0.011)	0.096 ^{**} (0.045)
lnLabor	0.280 ^{***} (0.011)	0.278 ^{***} (0.011)	0.395 ^{***} (0.042)
lnAge	0.003 (0.017)	0.041 ^{**} (0.019)	-0.056 (0.059)
Lag ROS	0.419 ^{***} (0.119)	0.304 ^{**} (0.126)	1.559 ^{***} (0.412)
Lag Growth	0.032 (0.021)	0.039 [*] (0.021)	-0.017 (0.110)
CEOexper	0.022 ^{***} (0.003)	0.020 ^{***} (0.003)	0.018 (0.011)
AppCEO	-0.245 ^{***} (0.041)	-0.175 ^{***} (0.052)	-0.193 ^{**} (0.094)
lnGDPPcity	0.852 ^{***} (0.266)	0.896 ^{***} (0.286)	0.400 (0.850)
City dum	YES	YES	YES
Industry dum	YES	YES	YES
Pseudo R^2	0.163	0.168	0.229
Observation	12162	11048	1068

Note: Constants are not reported. ***, **and * denote 1%, 5% and 10% of significance level. White heteroskedasticity-robust standard errors are in parentheses.

Table 11. Robustness test of corruption on firm performance

	(1)ROS (before tax) non-state	(2)ROS (before tax) state	(3)business-un related ETC non-state	(4)business-un related ETC state
ETC	2.566 ^{***} (0.461)	0.994 (1.543)		
ETCR			2.356 ^{***} (0.397)	1.085 (1.392)
lnLabor	0.011 ^{***} (0.002)	0.003 (0.005)	0.005 ^{***} (0.001)	-0.007 (0.008)
lnFixasset	0.007 ^{***} (0.001)	0.001 (0.006)	0.004 ^{***} (0.001)	0.002 (0.006)
lnAge	0.003 [*] (0.002)	0.003 (0.006)	0.003 [*] (0.002)	0.012 [*] (0.007)
Taxfee Ratio	0.031 [*] (0.017)	0.123 ^{**} (0.059)	0.013 (0.011)	0.112 ^{**} (0.055)
Stateshare	-0.016 [*] (0.008)	-0.013 (0.016)	-0.011 (0.008)	-0.013 (0.015)
Foreignshare	0.031 ^{***} (0.006)		0.031 ^{***} (0.006)	
Export Ratio	-0.002 (0.005)	-0.001 (0.023)	-0.001 (0.005)	0.020 (0.033)
Interpro Ratio	0.027 ^{**} (0.005)	0.016 (0.021)	0.032 ^{***} (0.004)	0.035 [*] (0.020)
College	0.054 ^{***} (0.013)	0.071 [*] (0.040)	0.054 ^{***} (0.012)	0.105 ^{**} (0.042)
RDI	0.167 (0.107)	0.177 (0.124)	0.209 ^{**} (0.096)	0.165 (0.139)
City Dum	YES	YES	YES	YES
Industry Dum	YES	YES	YES	YES
R ²	0.467	-0.092	0.450	0.191
Observation	11104	1117	10749	1082

Note: Constants are not reported. ***, **and * denote 1%, 5% and 10% of significance level. White heteroskedasticity-robust standard errors are in parentheses.

Table 12. Robustness check on the greasing money and protection money effect

	(1)ETR non-state	(2)ETR state	(3)TIME non-state	(4)TIME state	(5)INVEST non-state	(6)INVEST state	(7)SELLGOV non-state	(8)SELLGOV state
ETCR	-0.405** (0.198)	1.554** (0.751)	-1.786* (1.045)	3.795 (3.372)	0.764 (0.552)	-1.816* (1.042)	2.025*** (0.606)	-0.350 (1.318)
CF/Lag K					0.097*** (0.013)	-0.061 (0.057)		
ETC*(CF/Lag K)					1.026 (0.628)	3.404 (3.965)		
lnLabor	0.018*** (0.003)	0.047*** (0.015)	0.113*** (0.026)	0.173 (0.120)			0.086*** (0.013)	0.193*** (0.044)
Lag ROS	0.037 (0.033)	0.181 (0.152)					0.540*** (0.147)	0.498 (0.442)
Lag Growth	-0.014** (0.006)	0.052 (0.041)	0.048 (0.055)	-0.023 (0.293)	0.129*** (0.017)	0.051 (0.039)	-0.042 (0.028)	-0.186 (0.135)
Loan Access	-0.042*** (0.008)	-0.001 (0.037)			0.172*** (0.020)	0.143*** (0.034)		
lnGDPPcity	0.035 (0.065)	0.161 (0.228)			0.155 (0.161)	0.061 (0.151)	-0.296 (0.300)	0.112 (0.668)
AppCEO	-0.017 (0.015)	-0.011 (0.032)	0.538*** (0.153)	-0.224 (0.271)	-0.080*** (0.030)	-0.087*** (0.033)	0.070 (0.060)	0.001 (0.106)
CEOexper	0.001 (0.001)	0.002 (0.003)	-0.005 (0.007)	0.013 (0.030)	-0.002 (0.002)	0.003 (0.003)	0.011*** (0.003)	0.008 (0.012)
lnAge			0.045 (0.049)	0.042 (0.177)	-0.024** (0.012)	0.024 (0.024)	0.057*** (0.022)	-0.047 (0.064)
lnLicense			0.316*** (0.050)	0.346* (0.204)				
City Dum	YES	YES	YES	YES	YES	YES	YES	YES
Industry Dum	YES	YES	YES	YES	YES	YES	YES	YES
(Pseudo) R^2	0.065	0.193	0.016	0.161	0.044	0.184	0.118	0.183
Observation	10499	1063	10613	1064	10706	1080	10694	989

Note: Constants are not reported. ***, **and * denote 1%, 5% and 10% of significance level. White heteroskedasticity-robust standard errors are in parentheses.