

# The Externalities of Corruption: Evidence from Entrepreneurial Activity in China

Finance Working Paper N° 536/2017

November 2017

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ECGI Working Paper Series in Finance

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We thank Pat Akey, Daniel Carvalho, Nandini Gupta, Jun Qian, Cong Wang, Wenyu Wang, Frank Yu, and seminar participants at the joint CEPR conferences on Incentive, Management and Organization and Entrepreneurship, the Australian National University, European University Institute, Indiana University, the ISETEIEF Workshop on Innovation and Entrepreneurship, the Shanghai Advanced Institute of Finance at Shanghai Jiao Tong University, the University of Essex, the University of Pittsburgh, and Washington State University for valuable comments.

Giannetti gratefully acknowledges financial support from the Jan Wallander and Tom Hedelius Foundation and the Riksbanken Jubileum Foundation. Xiaoyun Yu gratefully acknowledges financial support from the Arthur M. Weimer Fellowship.

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## Abstract

We show that corruption affects negatively the performance of small entrepreneurial firms, which compete with corrupted industry peers. We exploit the Chinese anti-corruption campaign to establish causality and identify the channels through which corruption causes negative externalities. Small firms have lower sales growth in industries with high corruption, arguably because demand is diverted to the largest firms in their industries, which spend more in corrupting officials. Small firms also have higher financing costs in industries with high corruption and therefore invest less. Furthermore, corruption decreases the efficiency of labor and capital allocation and deters firm entry.

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Keywords: Corruption, corporate governance, capital and labor allocation, China

JEL Classifications: D22, D62, G30, L20, O12, P26

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We show that corruption affects negatively the performance of small entrepreneurial firms, which compete with corrupted industry peers. We exploit the Chinese anti-corruption campaign to establish causality and identify the channels through which corruption causes negative externalities. Small firms have lower sales growth in industries with high corruption, arguably because demand is diverted to the largest firms in their industries, which spend more in corrupting officials. Small firms also have higher financing costs in industries with high corruption and therefore invest less. Furthermore, corruption decreases the efficiency of labor and capital allocation and deters firm entry.

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Firms around the world attempt to obtain political favors, such as lenient taxation, relaxed regulatory oversight, and generous financing, by hiring politicians to their boards and other posts, lobbying, providing financial support to different political factions, or paying bribes. A number of papers have shown that these behaviors benefit firm shareholders in a variety of countries (see, for instance, Fisman, 2001; Faccio, 2006; Amore and Bennedsen, 2013; Cingano and Pinotti, 2013; Borisov, Goldman and Gupta, 2016; Zeume, 2017).

In this paper, we ask whether firms' behaviors aiming to obtain political favors, which can be largely assimilated to corruption, cause negative externalities and inefficiencies that go above and beyond the benefits that they yield to the corrupting firms. Our research question is motivated by influential research debating the costs and benefits of corruption. A strand of literature highlights that corruption may be efficient not only because it allows firms to avoid bureaucratic delays, but also because government employees who are allowed to levy bribes work harder (Leff, 1964; Huntington, 1968). These theories suggest that corruption would constitute oil in the wheels, especially for highly regulated economies.

However, corruption may hamper an efficient allocation of resources (Shleifer and Vishny, 1993). This may explain why, at the macroeconomic level, a country's growth rate is negatively correlated with the level of corruption (Mauro, 1995). Hence, it seems plausible that corruption may be sand in the wheels for an economy because it causes negative externalities and inefficiencies. However, evidence on the sources of these externalities and inefficiencies is scarce.

We propose a mechanism through which corruption may stifle economic growth. We conjecture that by increasing the rents of a few incumbent firms, corruption may stifle entrepreneurial activity and decrease the ability of small entrepreneurial firms to grow and

compete. Such a mechanism may have potentially large adverse consequences on an economy's performance because small entrepreneurial firms contribute disproportionately to major innovations and are therefore a key engine of economic growth (Akcigit and Kerr, 2016).

We explore the effects of competing with highly corrupted incumbents on small entrepreneurial firms' performance and entry patterns using a large-scale proprietary dataset from China. China provides a unique setting to investigate the effects of corruption on entrepreneurial activity for several reasons.

First, small entrepreneurial firms are particularly important in China. They employ the overwhelming majority of non-agricultural workers and generate the largest increments in employment (Allen, Qian and Qian, 2005). In addition, the creation of new entrepreneurial firms and the innovations by small firms are crucial for spurring creative destruction and sustained economic growth in middle-income economies, such as China, which may otherwise fall into middle-income traps (Zilibotti, 2017).

Second, we are able to access comprehensive information on a sample of public and private firms, which is largely representative of the distribution of firms in the Chinese economy across geographic regions, industries, and size classes. This allows our analysis to have direct implications on the effects of corruption on allocational efficiency (rather than exploring the effects on a selected group of firms in the economy as most of previous literature).

Third, in China, it is possible to observe firms' efforts to obtain political favors. An item on all Chinese firms' profit and loss accounts, the entertainment expenses, is highly correlated with the grease money firms spend to get better government services and the protection money firms spend to lower tax payments (Cai, Fang and Xu, 2011). Entertainment expenses are also often discussed by news media as associated with corruption and have been widely used in

existing literature to measure potential corruption (e.g., Griffin, Liu and Shu, 2016; Lin, Morck, Yeung and Zhao, 2016). We thus use the entertainment expenses of the largest companies in an industry to construct a proxy for the extent of corruption that entrepreneurial firms are likely to face in the industry in which they operate. We also explore the robustness of our results to the use of more conventional proxies for political connections.

Finally, China experienced an exogenous shock to the effectiveness of corruption. The Xi Jinping's administration launched a major anti-corruption campaign in 2012. This anti-corruption drive has been considered the most far-reaching and lasting than any previous attempts. By increasing the probability that government officials are investigated and convicted for corruption, the campaign should have made corruption efforts, as measured by entertainment expenses, less effective. Largely unanticipated by market participants, the launch of the anti-corruption campaign was exogenous to firm performance and corporate policies and was not accompanied by other shocks that could have had a differential effect on firms in industries with ex-ante different levels of corruption.

Thus, using the anti-corruption campaign as an exogenous negative shock to the extent and effectiveness of corruption, we can test whether small firms in industries in which large firms have higher entertainment expenses have systematically worse performance than their larger counterparts and whether their performance improves after the start of the anti-corruption campaign. We can also test whether the anti-corruption campaign created frictions, or if instead it resulted in a more efficient allocation of resources between firms in an industry.

Our empirical strategy relies on two identifying assumptions. First, the entertainment expenses of large firms in an industry have to be independent from small firms' actions. We show that in most industries, the aggregate entertainment expenses of small firms are negligible

in comparison to those of the largest companies, making it implausible that the latter respond to small firms' behavior in corrupting officials. Not only we provide empirical evidence in favor of this identifying assumption, but we also note that if large firms increased their entertainment expenses in response to positive shocks that affect small firms and increase the competitive pressure, our results would be downward biased.

Second, since we exploit the anti-corruption campaign as an exogenous shock to corruption, which should have affected disproportionately entrepreneurial firms in industries with high ex-ante entertainment expenses, we need that entrepreneurial firms in such industries do not experience improvements in performance already before the start of the anti-corruption campaign. Put differently, as in any difference-in-difference setting, there should be no pre-existing differential trends in performance for firms that are subject to different extents of treatment. We show that this identifying assumption also appears to be satisfied.

We find that corruption has significant negative effects on the performance of entrepreneurial firms. Small firms are less profitable and have lower total factor productivity than larger firms in the same industry when they compete with large industry peers spending more on entertainment expenses. This appears to be the case because, under these circumstances, small firms invest less, have lower growth of sales, and face higher financing costs than larger firms in the same industry.

All results are obtained by controlling for firm-level entertainment expenses and including interactions of province and time effects. Thus, our findings cannot be interpreted as being driven by provincial shocks. Furthermore, we show that large firms' entertainment expenses are unlikely to capture other large firms' characteristics, such as size, leverage, and state ownership, which may in turn be correlated with small firms' performance.



Importantly, in all our tests, the negative spillover effect of large firms' entertainment expenses is muted after the start of the anti-corruption campaign. This indicates that a negative shock to the effectiveness of corruption benefits entrepreneurial activity.

To further probe that industries in which large firms spend more on entertainment expenses are no different from other industries, we measure entertainment expenses within a firm's province. In these robustness tests, we ask whether competing for resources with large firms in the same province, which spend more on entertainment expenses, affects negatively small firms performance. Importantly, we are able to absorb industry level shocks by including interactions of industry and time fixed effects. It is therefore comforting that small firms in provinces in which large firms have higher entertainment expenses have weaker performance than their larger peers.

Finally, we provide evidence that large firms' corruption efforts hamper an efficient allocation of resources. Estimating a model based on Bai, Carvalho, and Phillips (2016), we find that labor (capital) is less likely to be allocated to firms with high marginal productivity of labor (capital) if these firms operate in industries with high entertainment expenses. Also in this case, the allocation of capital and labor improves after the start of the anti-corruption campaign.

Corruption also appears to have an effect on the geographical distribution of entrepreneurial activity. Not surprisingly, since corruption lowers their profits, the proportion of young firms is lower if large firms in the same province and industry have high average entertainment expenses during the previous year. This is the case not only for young firms in general, but also for young firms with high productivity.

Overall, our findings highlight negative spillover effects of corruption and help explain why corruption is negatively correlated with macroeconomic growth.

This paper belongs to a growing literature studying the effects of corruption and political connections. Most papers document a positive effect of political connections and firms' spending aiming to obtain political favors, such as campaign contributions, lobbying expenses and bribes, on firm value and operating performance (Faccio, 2006; Amore and Bennedsen, 2013; Borisov, Goldman and Gupta, 2016; Zeume, 2017). Others have shown that corrupt economic environments are associated with weaker firm performance and growth (Fisman and Svensson, 2007; Dass, Nanda and Xiao, 2016) and firms' attempts to shield their assets (Smith, 2016). A strand of this literature explores the effect of corruption and political connections among Chinese listed companies. Calomiris, Fisman and Wang (2010) show that political connections established through government ownership stakes benefit Chinese listed companies, confirming that political connections add value also in China. However, Fan, Wong and Zhang (2007) find that IPO firms with politically connected CEOs underperform both in terms of returns and operating performance.

We focus on the externalities of political connections and corruption, an issue that has been largely neglected in existing literature. A notable exception is Cingano and Pinotti (2013) who show that political connections reduce government sales for other non-connected firms. To the best of our knowledge, we are the first to focus on the negative effects of political connections on entrepreneurial activity and entry.

A few recent papers explore the effects of the 2012 anti-corruption campaign. Griffin, Liu and Shu (2016) show that the most corrupt firms were indeed targeted in the anti-corruption campaign. Lin, Morck, Yeung and Zhao (2016) and Ding, Fang, Lin and Shin (2017) perform event studies and show that politically connected firms' valuations drop in anticipation of future enforcement. While these studies highlight cross-sectional differences in announcement returns

across listed companies, they cannot distinguish whether differences in announcement returns are due to differences in the expected probability of detection of corporate malfeasance or on changes in allocational efficiency. Not only we can directly explore the spillover effects of corruption, but we also document for the first time the effects of the anti-corruption reform on unlisted companies, which are the vast majority of firms in China.

The rest of the paper is organized as follows. Section 1 discusses the institutional background. Section 2 introduces the methodology and Section 3 describes the data. Section 4 presents the empirical results. Section 5 explores whether corruption may nevertheless be efficient. Section 6 concludes. Variable definitions are in Appendix A.

## **1. Institutional Background**

### *1.1 Economic Growth and Corruption in China*

China is the largest emerging market and has experienced spectacular economic growth since the late 1970s, when it initiated an overhaul of its economic system. However, economic growth in China has been accompanied by widespread corruption. Thanks to extensive decentralization of administrative power, local party chiefs can allocate capital, award large contracts, and determine land use. Local party chiefs also have strong incentives to pick a few large firms that become local champions to further their political careers.

This way of allocating resources and contracts has given incentives to private businesses and state owned enterprises (SOEs) to deploy large amounts of resources in securing favorable treatment and establishing close relationships with government officials. Firms appoint CEOs and directors who are former government officials to obtain direct connections to political power. Firms also spend in lavish banqueting, private club memberships, and expensive gifts,

consisting of European luxury brands, jewelry, and artwork, to attract the favors of government officials. There exists ample evidence that these behaviors and the political connections they help establishing are associated with benefits for firms, including lower taxes, subsidies, preferential access to contracts and financing (Li, Meng, Wang and Zhou, 2008; Cai, Fang and Xu, 2011).

### *1.2 The Anti-Corruption Campaign*

President Xi Jinping's administration viewed corruption as a threat to the Communist Party's survival. For this reason, on November 8th, 2012, only 19 days into the new administration, President Xi Jinping launched an anti-corruption campaign at the 18th National Congress of the Communist Party of China (CPC). Following the launch of the campaign, on December 4<sup>th</sup>, the Political Bureau of the Central Committee of the CPC formulated an eight-point policy document to cut corruption, which specified concrete rules. Even more detailed rules were then specified by central and provincial governments. The CPC also launched a website in which whistleblowers could report violations of the policy. All these steps taken by central and local governments ultimately demonstrated the government resolution.

Xi's anti-corruption drive has been considered the most far-reaching and lasting than any previous attempts. While some proxies for corporate misbehavior, not necessarily related to corruption, such as earnings management, did not decrease (Griffin, Liu and Shu, 2016), there is plenty of evidence that the effects of the campaign were credible and persistent.

The initial announcement was followed by a number of other announcements, which have been widely studied. Not only firms with high entertainment and travel expenses, a common proxy for corruption efforts, had negative abnormal returns on the day of the announcement of the campaign on November 8<sup>th</sup>, 2012 (Lin, Morck, Yeung and Zhao 2016), but politically connected firms experienced similarly negative effects in May 2013, when the actual

inspections of provincial governments were announced (Ding, Fang, Lin and Shi, 2017). This indicates that market participants continued to consider the anti-corruption drive as credible. The effectiveness of the campaign is also demonstrated by the fact that firms decreased their entertainment and travel expenses (Griffin, Liu and Shu, 2016) and that Chinese imports of luxury goods, typically used as gifts to government officials, dropped (Qian and Wen, 2015).

As a result of the campaign, in 2013 alone, nearly 200,000 officials incurred sanctions for corruption or abuse of power. Nearly 2,000,000 people have been investigated to date (Xinhuanet, 2017).

Given its sudden and swift announcement, the anti-corruption campaign came as a surprise event, largely exogenous to firms' policies and performance. Previous administrations had typically announced policy changes roughly one year after their installation. The new administration of President Xi Jinping in turn had been formed at the end of a fierce power struggle within the CPC, which had left uncertainty on whether an anti-corruption faction of the party would have prevailed. The swift policy change was not driven by the demands of small entrepreneurial firms, but was rather an attempt of preserving the legitimacy of the CPC.

Overall, the anti-corruption campaign increased the expected punishment associated with corruption, thus decreasing officials' willingness to concede political favors and the effectiveness of firms' entertainment expenses. To design our empirical analysis, we can thus exploit the anti-corruption campaign as a negative shock to the effectiveness of corruption. Since large firms, thanks to their sheer size, could easily outspend small firms, we expect the anticorruption campaign to benefit small entrepreneurial firms in ex-ante more corrupt industries to a larger extent.

Importantly, as effectively summarized in a New York Times' (2017) review of Xi Jinping's track record, there were no other major policy reforms that may have affected firms differentially. In particular, Xi's administration continued to favor large SOEs and has been ineffective in tackling problems related to their inefficiencies. Thus, there were no changes in industrial policies that may have affected our findings or account for cross-sectional differences in the performance of small firms across industries in which large firms had devoted differential efforts to gain political favors.

In what follows, we design a test in the spirit of a difference-in-difference methodology to evaluate the negative externalities of corruption.

## **2. Methodology**

We conjecture that the larger the entertainment expenses that a company can afford, often based on its sheer size, the stronger the personal ties that it can establish with government officials and more significant the privileges it can obtain in terms of access to government services, financing, and contractual relationships. Therefore, we expect that higher entertainment expenses by the large firms in an industry should hamper the performance of entrepreneurial firms in comparison to that of their larger peers.

Our approach for identifying the negative externalities of corruption on entrepreneurial firms relies on two types of tests. First, controlling for a small firm's own ratio of entertainment expenses to sales, we explore how competing in the same industry as large firms that invest in corruption or are politically connected affects the firm's performance. While these tests are potentially subject to the criticism that industries with high entertainment expenses are different, we show that the entertainment expenses of large firms in an industry are unlikely to be affected

by small firms' entertainment expenses and industry shocks. Large firms' entertainment expenses can therefore be considered exogenous to small firms' performance and policies. We further address these concerns by performing an array of robustness tests, which we introduce in the following sections. In particular, we show that our results are robust when we exploit between-province corruption and absorb industry shocks using interactions of industry and year fixed effects.

Second, we exploit the anti-corruption campaign as a plausibly exogenous and unexpected shock to corruption. If our conjecture is valid, this negative shock to the extent and effectiveness of corruption should have benefitted small firms in industries in which large firms had ex-ante higher corruption and stronger political connections.

We also evaluate the welfare effects of corruption by examining how it affects capital and labor allocation. A more corrupt economic environment may improve the allocation of resources if special treatment is directed to the most efficient firms; however, if the firms obtaining special treatment are not as efficient as other firms, corruption could hamper an efficient allocation of resources and ultimately result in lower growth. Our empirical analysis aims to evaluate these mechanisms. Below we discuss in detail the empirical tests we perform.

### *2.1 Baseline Regression Framework*

Most of our tests explore how various measures of entrepreneurial firms' performance are affected by the average entertainment expenses to sales ratio of the large firms in their industry at year  $t - 1$ . We standardize a firm's entertainment expenses using the firm's sales to avoid that the size distribution or the number of firms in an industry affects our estimates. We define large firms as firms in the top quartile of the sample distribution in a year for total assets. We control throughout the analysis for entrepreneurial firm  $f$ 's own entertainment expenses to sales ratio,

$EE_{f,i,p,t-1}$ , where  $i$  refers to firm  $f$ 's industry and  $p$  to its province. Our variable of interest is the average entertainment expenses to sale ratio of large firms in the same industry of firm  $f$ ,  $\overline{EE}_{i,t-1}^{large}(industry)$ . We estimate the following model:

$$y_{f,i,p,t} = \alpha \overline{EE}_{i,t-1}^{large}(industry) + \beta EE_{f,i,p,t-1} + \boldsymbol{\gamma} \mathbf{X}_{f,t-1} + \vartheta_{p,t} + \varepsilon_{f,i,p,t},$$

where  $y_{f,i,p,t}$  is a measure of performance of firm  $f$  belonging to industry  $i$  and based in province  $p$  during year  $t$ . Since we are interested in testing whether  $\overline{EE}_{i,t-1}^{large}(industry)$  affects negatively the performance of small firms in comparison to other firms in the industry, as we explain in more detail later, we define  $y_{f,i,p,t}$  to capture how small firm  $f$  fares in comparison to larger firms in the industry at time  $t$ . Put differently, our dependent variable captures a performance gap. We aim to test how various measures of the performance gap relate to the extent and the effectiveness of corruption.

We expect  $\alpha < 0$  if corruption causes negative externalities on entrepreneurial firms in the same industry. Throughout the analysis, we control for a vector of time-varying firm characteristics,  $\mathbf{X}_{f,t-1}$ , industry fixed effects, and time fixed effects, which, depending on the specifications, we allow to vary across provinces ( $\vartheta_{p,t}$ ). To the extent that our results are robust to the inclusion of interactions of province and time fixed effects, a negative effect of  $\overline{EE}_{i,p,t-1}^{large}$  cannot be interpreted to spuriously depend on provincial shocks.

In the following sections, we show that  $\overline{EE}_{i,p,t-1}^{large}(industry)$  are unlikely to be jointly determined with the entertainment expenses of the small firms in our estimation sample, as the entertainment expenses of the latter are small. Using a subsample of relatively larger firms, we also provide evidence that this effect, if anything, would bias our estimates downwards.



A possible concern is that large firms have larger entertainment expenses in industries that have other uncontrolled characteristics, which are negatively associated with entrepreneurial firms' performance. This could lead to a negative correlation between entrepreneurial firms' performance and  $\overline{EE}_{i,p,t-1}^{large}(industry)$  even in the absence of a negative spillover effect. To evaluate the merit of this interpretation, we control for a number of characteristics of large firms in the same industry as firm  $f$ .

In addition, we consider the entertainment expenses of large firms headquartered in the same province as firm  $f$ . Firms in the same province as firm  $f$  are likely to compete for services and funding even when they are not competitors in the product market. They may thus generate a negative externality for small entrepreneurial firms similar to large firms in the same industry. In these specifications, we can control for interaction of industry and year effects. Therefore, a negative effect of the entertainment expenses of large firms in the same province as firm  $f$  could not be interpreted as driven by industry shocks. The stability of the effects across these alternative specifications would imply that industry and province shocks do not drive our findings.

## *2.2 The Anti-Corruption Campaign as a Negative Shock to Corruption*

To provide further evidence in favor of the negative spillover effect of large firms' average entertainment expenses to sale ratio on small firms' performance, we exploit the exogenous shock created by the anti-corruption campaign. Since the anti-corruption campaign should have decreased the effectiveness of entertainment expenses in corrupting government officials, we expect that any negative spillover of large firms' entertainment expenses on entrepreneurial firms' performance should have decreased after 2012, when the anti-corruption campaign started.

Entrepreneurial firms in industries in which large firms have higher entertainment expenses should be more exposed to the anti-corruption campaign. We thus exploit predetermined variation in the expected intensity of the treatment (the anti-corruption campaign) to test this implication. We augment our empirical model by allowing the effect of  $\overline{EE}_{i,p,t-1}^{large}(industry)$  to differ after 2012:

$$y_{f,i,p,t} = \alpha_1 \overline{EE}_{i,t-1}^{large} + \alpha_2 AntiCorruption_t \times \overline{EE}_{i,t-1}^{large}(industry) + \beta EE_{f,i,p,t-1} + \gamma X_{f,t-1} + \vartheta_{p,t} + \varepsilon_{f,i,p,t},$$

where  $AntiCorruption_t$  is a dummy variable that takes value one starting from 2013 and zero otherwise. We expect  $\alpha_1 < 0$  and  $\alpha_2 > 0$  if the anti-corruption campaign limits the negative spillovers of large firms' entertainment expenses.

The anti-corruption campaign should have affected officials' willingness to concede political favors simultaneously in all Chinese provinces. While the timing of enforcement may have differed across regions, the valuations of politically connected firms in different regions have been shown to drop synchronously after different announcements, in anticipation of future crackdowns, independently from the particular provinces that were singled out as subject of the audits at different points in time (Ding, Fang, Lin and Shi, 2017). This suggests that the effectiveness of political connections may have decreased uniformly across China.

For this reason, in our baseline specifications, the anti-corruption campaign does not take into account differences in enforcement across provinces. Nevertheless, to account for the possibility of differential enforcement across geographical areas, we exploit a province level index of the intensity of the anti-corruption campaign, described in Subsection 3.2, and show that our results are robust.

### 2.3 Allocational Efficiency

Hsieh and Klenow (2009) propose a methodology to evaluate to what extent resources are misallocated between firms. In their framework, large differences in the marginal productivity of the factors of production between firms indicate that less productive firms are able to employ more resources and that resources are therefore not allocated efficiently.

Instead of directly comparing the level of the marginal productivity of capital and labor across firms, we test a dynamic implication of the theory, which allows for slower adjustment of the scale of production to differences in productivity. We explore the effect of  $\overline{EE}_{i,t-1}^{large}(industry)$  on both labor allocation and capital allocation following the methodology of Bai, Carvalho, and Phillips (2016). We test whether the change in firm  $f$ 's share of labor input (capital input) between year  $t$  and  $t - 1$ ,  $\Delta l_{f,i,p,t}$  ( $\Delta k_{f,i,p,t}$ ), is positively related to the marginal productivity of labor (capital) input of firm  $f$  at time  $t - 1$ ,  $MPL_{f,i,p,t-1}$  ( $MPK_{f,i,p,t-1}$ ), and whether  $\overline{EE}_{i,t-1}^{large}$  decreases this correlation. We further test whether the effect of  $\overline{EE}_{i,t-1}^{large}(industry)$  is muted after the start of the anti-corruption campaign.

We estimate the following models considering as inputs a firm's employment share and its share of fixed assets, respectively:

$$\begin{aligned} \Delta l_{f,i,p,t} = & \beta_1 MPL_{f,i,p,t-1} + \beta_2 MPL_{f,i,p,t-1} \times \overline{EE}_{i,t-1}^{large}(industry) + \beta_3 MPL_{f,i,p,t-1} \\ & \times \overline{EE}_{i,p,t-1}^{large}(industry) \times AntiCorruption_t + \gamma \mathbf{X}_{f,t-1} + \vartheta_{p,t} + \varepsilon_{f,i,p,t}. \end{aligned}$$

$$\begin{aligned} \Delta k_{f,i,p,t} = & \beta_1 MPK_{f,i,p,t-1} + \beta_2 MPK_{f,i,p,t-1} \times \overline{EE}_{i,t-1}^{large}(industry) + \beta_3 MPK_{f,i,p,t-1} \\ & \times \overline{EE}_{i,p,t-1}^{large}(industry) \times AntiCorruption_t + \gamma \mathbf{X}_{f,t-1} + \vartheta_{p,t} + \varepsilon_{f,i,p,t}. \end{aligned}$$

As in the previous specifications, we control for a vector of firm time-varying characteristics,  $\mathbf{X}_{f,t-1}$ , which may affect performance, interactions of province and time fixed

effects ( $\vartheta_{p,t}$ ) as well as firm fixed effects, which allow for systematic differences in the rate of growth of the factors of production across firms.

We expect  $\beta_1 > 0$  if more productive firms increase the amounts of factors of production they employ. If corruption decreases allocational efficiency, we expect that  $\beta_2 < 0$ . Furthermore, we expect  $\beta_3 > 0$  if the anti-corruption campaign decreases the effect of corruption.

### **3. Data Sources and Sample Construction**

#### *3.1 Firm-Level Data*

Our main data source is the Annual Tax Survey (ATS) Database, an annual survey administered by the Ministry of Finance and the State Administration of Taxation of China. The ATS was started in 2004 and is implemented by regional tax authorities. The survey is conducted using a uniform, comprehensive survey system. Survey answers are collected and subsequently verified by local tax authorities. Information is further verified using technical algorithms to minimize potential reporting errors. A special task force of the local tax authorities also audits survey respondents.

Firms have to provide detailed reports on their financial statements, tax status, operations, founding year, industry, and ownership characteristics. The database includes a unique tax ID for each firm. Since the first six digits of Chinese tax IDs refer to the city where a firm is headquartered, we can trace firms' locations as well as their financial information and operating performance.

The survey covers two types of firms in manufacturing, agriculture, construction and service sectors: the "key surveyed enterprises", which are relatively large local firms, and a sample of entrepreneurial firms drawn from the tax collection and management system at the

State Administration of Taxation with the goal of covering a representative sample of the local firm population.<sup>1</sup>

Our sample period goes from 2005 to 2014 and includes a total of 2,805,331 firm-year observations. We exclude firms in the financial industry, nonprofit organizations and social groups (2,210 observations). We remove 866,481 firm-year observations with missing information on firm location or missing values for the dependent and independent variables used in the analysis. Our final sample includes 1,936,640 firm-year observations, 1,821,508 of which refer to private firms. The sample consists of 502,455 unique firms operating in 47 industries and located in 31 provinces. Appendices B and C show the distribution of sample firms across industries and provinces.

Since we aim to evaluate the negative spillover effects of corruption on small firms, most of our tests focus on firms with fewer than 30 employees. The small firm sample includes a total of 349,508 firm-year observations, consisting of 157,618 unique firms. Table 1 shows that small firms with fewer than 30 employees differ along a wide range of characteristics from the large firms in the sample, defined as firms with assets in the top quartile.

An important account, capturing a firm's effort to corrupt officials, is the entertainment expenses. Cai, Fang and Xu (2011) show that a more comprehensive account including entertainment and travel expenses is highly correlated with the grease money firms spend to obtain political favors and to pay lower taxes in firms' surveys. From the Selling, General and Administrative expenses (S&GA) of the income statements in the ATS database, we observe firms' entertainment expenses. Since travel expenses may include legitimate business travel,

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<sup>1</sup> All firms in our sample are stand-alone companies as, differently from other Asian countries, business groups are not common in China. Thus, it is implausible that small unrelated firms pay bribes for larger private or public companies.

entertainment expenses are arguably more correlated than entertainment and travel expenses with any money spent to obtain political favors and to corrupt officials.

Entertainment expenses are likely to include expenses for outright illegal activities, such as bribes, as well as borderline activities. The latter would encompass in advanced democracies (more or less corrupt) lobbying and campaign contributions, which may be donations and other investments favoring the careers of some local politicians in the Chinese context.

Entertainment expenses can be inferred not only from firms' profit and loss accounts but also from their tax returns. Therefore, if entertainment expenses are unavailable from the income statements, but can be inferred from the tax returns, we use tax returns information.

Our variable of interest is computed by dividing the entertainment expenses by the firm's sales and multiplying it by 100. As explained before, this standardization helps avoiding that differences in the size distribution or the number of firms affect our estimates.

In Table 1 Panel A, the entertainment expenses to sale ratio of small firms is just slightly smaller than for large firms. However, as is evident from Panel B, in absolute, large firms spend much more on entertainment expenses and may be more successful in obtaining political favors and cementing their political connections. Importantly, as shown in Table 2, a firm's entertainment expenses to sale ratio appears to be highly correlated over time. The majority of firms that are in the top (bottom) quintile in one year remain in the same quintile the following year. This is consistent with evidence that political contributions and lobbying efforts tend to persist over time (e.g., Yu and Yu 2011).

We proxy for the extent of corruption faced by small firms in an industry using the average ratio of entertainment expenses to sales of firms with assets in the top quartile in that industry, to which we refer as "EE(Industry)". In the median industry, the total entertainment

expenses of small firms are only 3.38% of the total entertainment expenses of large firms, making it unlikely that large firms increase their entertainment expenses in response to small firms' actions. This conclusion is further supported by Table 3.  $EE(\text{Industry})$  appears to be unrelated to the industry's profitability and sales growth as well as to the rate of entry of small firms and small firms' profitability after controlling for industry fixed effects. This makes it unlikely that large firms respond to small firms' actions.

In what follows, we present more evidence suggesting that  $EE(\text{Industry})$  is likely to be exogenous for small firms. We also evaluate the robustness of our results to the use of an alternative proxy for political connections, defined as the proportion of listed companies in an industry with a CEO that was a previous government official.

### *3.2 The Anti-Corruption Movement and Provincial Level Enforcement*

While the inspections spurred by the anti-corruption campaign occurred at different time in different provinces, the announcement of the campaign has been shown to have a nationwide effect, which does not depend on the particular time of enforcement (Ding, Fang, Lin and Shi, 2017). This suggests that the increase in the probability of enforcement decreased the effectiveness of corruption upon the announcement of the reform.

Nevertheless, to capture that the intensity of the anti-corruption campaign may have varied across provinces, we construct a provincial level index of enforcement. We start by manually collecting information on investigated officials from the websites of the Central Commission for Discipline Inspections (CCDI) and its local agencies. From the end of 2012 to 2014, the CCDI identifies 862 officials subject to corruption investigations, while its local agencies report 1,429 individuals.

We cross-verify and manually remove any instances in which the same individual is reported both by the CCDI and its local agencies or is investigated in multiple cases. The final sample includes a total of 2,235 individuals involved in investigations. We further remove 916 investigations occurred prior to the official launch of the anti-corruption campaign. Therefore, the sample of investigated ex-officials based on the CCDI's website contains 1,319 individuals.

The CCDI's website neglects a large number of senior corporate executives of the state-owned enterprises investigated for corruption, probably due to their relatively low administrative ranks. Therefore, we manually search whether the executives of the SOEs in our sample are subject to corruption investigation via various internet search engines and news reports in the China Core Newspaper Databases. To identify whether the investigations were related to corruption, we follow Griffin, Liu and Shu's (2016) list of corruption-related keywords. This search yields 211 senior corporate executives as well as an additional 46 government officials that are investigated for corruption but are omitted from the CCDI's website.

Our final sample contains 1,576 individuals that are investigated for corruption, 1,152 of which are government officials, and 424 senior executives of SOEs. Figure 1 illustrates the number of individuals in a given province being investigated for corruption during the 2012-2014 period. The darker the color, the stronger the crackdown on corruption.

Using this information, we construct the "Province Convicted Officials" index, defined as the natural logarithm of one plus the number of individuals investigated for corruption in the province during the year in 2013, and the natural logarithm of 1 plus the number of individuals investigated for corruption in the province during 2013-2014 in 2014. The index is set to zero prior to 2012.



While this index may be higher in provinces with higher ex-ante level of corruption, it allows us to capture changes in the economic environment faced by entrepreneurial firms after the start of the anti-corruption campaign. We can therefore study whether as a consequence of the investigations, the negative spillovers associated with firms' efforts to corrupt officials, measured by the entertainment expenses of large firms, weakened.

## 4. Results

### 4.1 Entrepreneurial Firms' Performance

Table 4 explores the effects of corruption, as proxied by the ratio of entertainment expenses to sales of the large firms in an industry, on entrepreneurial firms' profitability. To evaluate how small firm  $f$  ranks within its industry in each year, we subtract the median ROA of firms with more than 30 employees within the same industry as firm  $f$  in year  $t$  from firm  $f$ 's ROA. In this way, we capture the effect of corruption on small firms' performance gap, i.e., how small firms fare in comparison to their larger competitors.

It is apparent that corruption is associated with lower profitability for small firms. The effect is not only statistically but also economically significant. For instance, in column 1, a one-standard-deviation increase in the entertainment expenses of large firms in the same industry as firm  $f$  is associated with a 2.1 percentage points increase in firm  $f$ 's profitability gap, which is equivalent to a 134.62% drop in profitability relative to larger firms. Importantly, the negative effect of EE(Industry) on small firms' profitability is robust to the inclusion of province and year fixed effects as well as to their interaction, indicating that we are not capturing shocks associated with firms' local economic environment.

Furthermore, in columns 4 to 6, the negative effect of large peer firms' entertainment expenses on small firms' profitability appears to become smaller after the launch of the anti-corruption campaign, as indicated by the negative coefficient of the interaction between the anti-corruption dummy and EE(Industry). This is consistent with our interpretation of the evidence in columns 1 to 3. The anti-corruption campaign is expected to have limited the extent to which officials can be corrupted and concede political favors, thus decreasing the effectiveness of corruption and political connections. This in turn should benefit to a larger extent firms more exposed to corruption. Consistent with this conjecture, in column 4, the effect of a one-standard-deviation change in the EEs of large peer firms on small firms' profitability gap is reduced from 2.25 percentage points to 1.75 percentage points after the start of the anti-corruption campaign.

Table 5 repeats the same set of exercises considering a firm's total factor productivity (TFP) as a measure of performance. We estimate a firm's TFP as Giannetti, Liao and Yu (2015). Specifically, for the whole sample of firms in an industry and year, we estimate a log linear production function by regressing the natural logarithm of output on the natural logarithm of fixed assets, the natural logarithm of the total number of employees, and the natural logarithm of raw materials and services. The firm's TFP is computed as the residual of this regression and is effectively a ranking of all firms in an industry and year. Thus, our empirical model tests for whether small firms' total factor productivity is below their industry average when EE(Industry) is larger.

The methodology we use to estimate total factor productivity somewhat reduces the time-series dimension of the sample and, given the low time series variation of EE(Industry), it prevents us from including firm fixed effects. However, we continue to find that higher corruption by large firms in the same industry stifles entrepreneurial firms' productivity. For

instance, a one-standard-deviation increase in  $EE(\text{Industry})$  is associated with a decline in the TFP of small firms in the same industry, which is equivalent to 2.15% of the TFP's standard deviation (column 1 of Table 5).

Also in this case, we observe a positive and significant coefficient for the interaction between large peer firms' entertainment expenses and the anti-corruption campaign dummy. This confirms that the negative spillover effect associated with large firms' corruption efforts becomes smaller after the start of the anti-corruption campaign.

## *4.2 Robustness*

### *4.2.1 Industry Corruption*

As discussed in Section 2, in our analysis, we take the entertainment expenses of large firms in an industry as given from the point of view of small firms. Since the entertainment expenses of small firms are 3.38% of those of large firms in a median industry and we always use predetermined  $EE(\text{Industry})$ , we view as unlikely that large firms anticipate or react to small firms' choices in a way that may bias our findings. Such an interpretation is also corroborated by the fact that the exogenous shock to the effectiveness of corruption due to the anti-corruption campaign benefits to a larger extent small firms in industries with high ex-ante  $EE(\text{Industry})$ .

Nevertheless, we perform a number of tests to probe that the endogeneity of  $EE(\text{Industry})$  does not bias our findings. In Panels A and B of Table 6, we vary the definition of small firms, estimating our various specifications for samples of relatively larger firms (that is, firms with higher levels of employment). Our main results are robust, but the externalities of corruption appear to have larger effects on relatively smaller firms and gradually decline as we increase firm size. Since the entertainment expenses of the progressively larger firms included in the estimation sample increase relative to the entertainment expenses of large firms, these results

suggest that if large firms reacted to smaller firms' entertainment expenses, our results would be downward biased.

These results also suggest that the scale of the entertainment expenses matters for obtaining political favors. Thus, for smaller firms, which cannot afford as large entertainment expenses, a more corrupt environment appears to constitute sand in the wheels.

Panel C repeats the baseline regressions for ROA and TFP considering firms with employment in the third quartile of the whole sample. These firms are much larger than the firms with fewer than 30 employees in our baseline regressions. In the median industry, the total entertainment expenses of these firms are approximately 30% of those of the very large firms, which we use to construct  $EE(\text{Industry})$ . Thus, if any bias due to the fact that large firms' entertainment expenses are chosen in response to small firms were driving our findings, we should find stronger results in this subsample.

Panel C reveals the opposite. The point estimates for the coefficient of  $EE(\text{Industry})$  and its interaction with the anti-corruption dummy are smaller and often lack statistical significance compared to those in columns 2 and 5 of Table 4 and columns 2 and 4 of Table 5, respectively. An  $F$  test rejects the null that the coefficients are equal to the corresponding ones in Tables 4 and 5. This further supports our conclusion that our findings are not driven by the fact that large firms' entertainment expenses respond to those of small firms.

Table 7 explores whether our results depend on the specific measure of corruption we use. Instead of measuring entertainment expenses, we capture how far from a level playing field the environment faced by entrepreneurial firms is using the fraction of politically connected CEOs of listed companies in an industry. Following Fan, Wong and Zhang (2007) and

Calomiris, Fisman and Wang (2010), we define CEOs that were previously employed as bureaucrats by the central government or local governments as politically connected.

Our results continue to indicate that competing with large firms that benefit from political connections hurt entrepreneurial firms' profitability and productivity, even though the effect is not statistically significant in one specification (column 3). Importantly, also in this case, the size of the negative externality appears to decrease after the start of the anti-corruption campaign. The large magnitude of the interaction term even suggests that firms competing with politically connected listed companies become more productive than other firms following the anti-corruption campaign. This may suggest that this type of connections may have been particularly pernicious or is more likely to be disrupted by the anti-corruption campaign.

#### *4.2.2 Possible Alternative Mechanisms*

One may wonder to what extent our results may be driven by SOEs, to which central and provincial governments convey lots of resources in China. SOEs are typically significantly less efficient than private firms. Since only a handful of the small firms in our estimation sample are SOEs, this is unlikely to drive our findings. Columns 1 to 4 of Table 8 show that indeed our results are qualitatively and quantitatively invariant if we drop the few observations relative to SOEs.

A possibly more relevant concern is that  $EE(\text{Industry})$  captures the percentage of SOEs in an industry. These firms, often referred to as zombies, may drive down the productivity and profitability of the whole industry as it happened in Japan (Caballero, Hoshi and Kashyap, 2008). For this reason, in columns 5 and 6, we include controls for the proportion of assets of SOEs in an industry and an interaction between this variable and the anti-corruption dummy. Our results

are invariant. The effect of the anti-corruption campaign in industries with different proportions of SOEs is not consistent across specifications.

Table 9 provides more general evidence that industries with different levels of EE(Industry) did not experience different trends in performance already before the anti-corruption campaign. To evaluate this possibility we define a placebo campaign dummy, which takes value equal to one in 2010 and 2011, two years before the reform. We find that, if anything, small firms operating in industries with higher EE(Industry) had even lower profitability in the two years prior to the launch of the anti-corruption campaign. This is consistent with the narrative indicating that the costs of corruption were increasing up to 2012 and justifies the sense of urgency of Xi's administration in fighting corruption. More importantly, our main findings are qualitatively and quantitatively invariant.

#### *4.2.3 Industry Shocks and Other Omitted Factors*

A possible concern is that large firms have higher entertainment expenses in industries that experience difficulties in performance or have other uncontrolled characteristics, which are negatively associated with entrepreneurial firms' performance. This could lead to a negative correlation between entrepreneurial firms' performance and EE(Industry) even in the absence of a negative spillover effect.

The positive response to the anti-corruption campaign from firms facing large industry peers with higher entertainment expenses or stronger political connections makes it unlikely that industries with higher entertainment expenses are such that small firms are naturally less profitable and productive. Nevertheless, to further address this concern, in Table 10, we control for large firms' characteristics and their interaction with the anti-corruption dummy. Our results are invariant both qualitatively and quantitatively, mitigating these concerns. Interestingly, after

the start of the anti-corruption campaign, small firms perform better if their large industry peers had high leverage. Since political connections in China often translate into easier access to finance, this finding further suggests that small firms with better connected competitors perform better after the start of the anti-corruption campaign.

Table 11 controls non-parametrically for industry-level omitted factors. To do so, instead of considering firms' exposure to large firms' entertainment expenses in the same industry, we consider that firms may compete for services and resources, especially financing, with large corrupting firms located in the same province, even if these firms are not competitors in the product market. By considering entertainment expenses in a firm's province, we can absorb industry level omitted factors by saturating the regression with interactions of industry and time fixed effects. It is thus comforting that the effects we uncover are similar to the ones we estimate when we use the entertainment expenses of large firms in the same industry.

Finally, Table 12 considers differences in enforcement across provinces. Instead of using the anti-corruption campaign dummy, we use the province level index capturing the strength of the anti-corruption drive in a province. For small firms in an average industry (with  $EE(\text{Industry})$  equal to 0.502), a one-standard-deviation increase in the variable capturing the intensity of the anti-corruption campaign in the province is associated with an increase in profitability of 0.342 ( $= 0.006 \times 0.502 \times 1.135$ ) percentage points relative to larger firms.

#### *4.3 Mechanisms*

The results so far indicate that corruption has negative spillovers on the performance of small firms. To provide evidence on the mechanisms that drive our findings, we explore whether large peer firms' corruption efforts affect the demand for products as well as access to external finance.

If large peer firms divert demand from small firms, these firms should experience lower growth of sales in comparison to larger firms in the same industry. Panel A of Table 13 examines the effect of corruption on entrepreneurial firms' sales growth. We observe that entrepreneurial firms increase their sales to a lesser extent when large firms in the same industry have higher entertainment expenses. A one-standard-deviation increase in entertainment expenses by large firms in the same industry increases the sales growth gap of small firms by 11.486% of a standard deviation (column 1). Consistent with our earlier results, the sales of small firms grow faster than for larger companies after the launch of the anti-corruption campaign (columns 3 and 4), which curtails the productivity of the corruption efforts of large industry peers.

Corruption efforts are often associated with easier access to external finance. This is particularly likely to be the case in China, not only because formal financial markets are underdeveloped, but also because provincial and central governments support connected businesses by funneling cheap credit. Connected businesses are often treated as industry champions and political leaders' careers benefit from the success of their cronies. Thus, in industries with connected and corrupting firms, small firms may have difficult access to external finance.

Panel B of Table 13 explores the effect of corruption on entrepreneurial firms' cost of debt, calculated as interest expenses scaled by total liabilities, from which we subtract the median cost of debt of firms with more than 30 employees in the same industry. Small firms face a relatively higher cost of debt when large industry peers spend more on entertainment expenses. In column 1, a one-standard-deviation increase in entertainment expenses by large industry peer firms increases small firms' financing costs by 10.7% of the standard deviation in comparison to larger firms. The effect is reduced after the start of the anti-corruption campaign.



Higher financing costs appear to have real effects because small firms in industries with high entertainment expenses invest less and consequently have lower asset growth than the median larger firm, as is evident from the estimates in Panel C. Importantly, this effect also appears to be partially reversed after the start of the anti-corruption campaign.

In summary, small firms are more profitable and productive when their large industry peers spend less on entertainment expenses in proportion to their sales, because they are able to increase their sales, invest more, and have cheaper funding.

## **5. The Aggregate Effects of Corruption on the Economy**

So far, we have shown that corruption impacts negatively small firms' performance and ability to grow. However, this does not necessarily imply that corruption is inefficient from an aggregate point of view. Corruption may even be efficient if the most productive (large) firms employ more capital and labor as a result of their higher entertainment expenses. In addition, high-quality small firms could ultimately grow and overcome the initial scale disadvantage. If corruption does not discourage entry of new firms, especially new high-quality firms, the frictions it creates may have no lasting impact on the economy.

Below, we evaluate these channels to be able to infer whether corruption affects negatively macroeconomic performance.

### *5.1 The Effects of Corruption on Capital Allocation*

A recent influential paper by Hsieh and Klenow (2009) highlights that low total factor productivity in emerging economies can largely be explained by misallocation of resources. Hsieh and Klenow (2009) estimate that moving to a US benchmark level of efficiency would

increase total factor productivity in China by 30%-50%. In this section, we ask to what extent corruption hampers an efficient allocation of factors of production in China.

We test whether higher productivity firms attract more resources over time and to what extent higher corruption constitutes sand in the wheels for this adjustment process, adapting the model proposed by Bai, Carvalho and Phillips (2016). A higher correlation between the growth in the use of a factor of production and a firm's marginal productivity of the factor of production implies greater allocational efficiency.

Table 14 shows how corruption by large industry peers affects the allocation of labor and capital. The dependent variable is the logarithmic change in a firm's share of the industry's number of employees between  $t$  and  $t - 1$  in Panel A and the firm's share of the industry's fixed assets between  $t$  and  $t - 1$  in Panel B. We measure the productivity of labor (capital) as the logarithm of the ratio of sales to employees (fixed assets), as implied by a Cobb-Douglas production function. Our regressions include firm fixed effects to account for the fact that some firms may be in industries with higher productivity or grow more given their specialization. We also include interactions of province and year fixed effects to account that some provinces are subject to shocks that affect their growth rate.

We perform the estimates on the subsample of small firms, as in the previous tests, as well on the whole sample. In principle, since we want to evaluate how efficient resources are allocated within the economy, we need to include even the largest companies that may be more productive and may efficiently attract more resources. Our empirical strategy, however, relies on large firms' entertainment expenses to evaluate whether corruption hampers or facilitates an efficient allocation of resources. For this reason, we also show the robustness of our results using the subsample of small firms, which do not have control over the entertainment expenses of large

firms in the same industry. The subsample test also allows us to exclude another possible channel. Berkowitz, Lin and Liu (2017) suggest that firms losing political connections become more efficient. While in principle this could contribute to a more efficient allocation of resources, this is unlikely to be the case in the small firms' sample, as small firms were not obtaining many political favors even before the campaign.

As one would expect, columns 1 and 4 of Panels A and B indicate that a firm's use of labor (capital) in an industry increases when it has higher marginal productivity of labor (capital). However, higher entertainment expenses in an industry decrease the extent to which the most productive firms in the industry are able to attract more capital and labor (columns 2 and 5). The correlation between the marginal productivity of labor (capital) and the growth of labor (capital) shares increases for firms with higher  $EE(\text{Industry})$  peers following the launch of the anti-corruption campaign (columns 3 and 6), suggesting that a decrease in corruption improves allocational efficiency.

These tests indicate that even if corruption were to affect positively the performance of firms that are able to obtain political favors, it leads to an inefficient allocation of resources and is therefore harmful for the economy.

## *5.2 Corruption and Firm Entry*

In this section, we explore how corruption affects the entry of new firms. To address this question, we consider variation between industries and provinces and compute the fraction of young firms relative to all firms in a province and industry in a given year. We consider firms that are four years old or less as young. We test how the entertainment expenses of large firms in an industry and province affect the proportion of young firms operating in that industry and located in that province.

Considering differences between industries and provinces allow us to control for different entry and exit rates across industries as well as different levels of economic development across provinces, which could affect the proportion of new firms. For instance, some provinces could have more new firms because they have experienced recent improvements in economic performance or because an industry is younger. We absorb this variation by including industry fixed effects and interactions of province and year fixed effects.

Table 15 shows that there are fewer young firms in a province and industry when large firms in that province and in that industry spend more on entertainment expenses (columns 1 and 2). However, the effect is not statistically significant. We observe a statistically significant increase in the proportion of new firms after the anti-corruption campaign (columns 3 and 4).

More importantly, high entertainment expenses by large firms in a given province and industry prevent the entry of high-quality young firms, defined as firms with TFP in the top quartile (columns 5 and 6). Interestingly, the proportion of new high quality firms is no longer negatively affected by large firms' entertainment expenses after the start of the anti-corruption campaign. This, together with the findings that corruption decreases allocational efficiency in Table 14, suggests that corruption hampers economic performance.

## **6. Conclusions**

Using a comprehensive firm-level dataset in the world's largest emerging economy, we document a negative spillover effect of corruption on entrepreneurial activity and the allocation of capital and labor. We show that in industries with high corruption, as measured by the entertainment expenses of large firms in that industry, small firms are less profitable and productive than their more established peers. We also identify the channels through which

corruption has negative spillovers on the performance of small firms. Small firms have lower growth of sales in industries with high corruption, arguably because demand is diverted to the largest firms in their industries, which are able to spend more to obtain political favors. Small firms also have higher financing costs in industries with high corruption and can therefore invest less.

A high level of corruption in an industry prevents labor and capital from being allocated to more productive firms and deters entry of high-quality new firms. Overall, our results imply that corruption is detrimental to growth and that interventions aiming to curb corruption, such as the anti-corruption campaign, should benefit entrepreneurial activity and lead to a more efficient allocation of resources.

## References

- Akcigit, U., and W. R. Kerr (2016). Growth through heterogeneous innovations. *Journal of Political Economy*, forthcoming.
- Allen, F., J. Qian, and M. Qian (2005). Law, finance, and economic growth in China. *Journal of Financial Economics* 77, 57–116.
- Amore, M. D. and M. Bennedsen (2013). The value of local political connections in a low-corruption environment. *Journal of Financial Economics* 110, 387–402.
- Bai, J., D. R. Carvalho, and G. M. Phillips (2016). The Impact of Bank Credit on Labor Reallocation and Aggregate Industry Productivity. Working Paper, Dartmouth College.
- Berkowitz, D., C. Lin, C., and S. Liu (2015). De-Politicization and Corporate Transformation: Evidence from China's Anti-Corruption Reforms. Working Paper, University of Pittsburgh.
- Borisov, A., E. Goldman, and N. Gupta (2016). The Corporate Value of (Corrupt) Lobbying. *Review of Financial Studies* 29, 1039–1071.
- Caballero, R. J., T. Hoshi, and A. K. Kashyap (2008). Zombie Lending and Depressed Restructuring in Japan. *American Economic Review* 98, 1943–1977.
- Cai, H., H. Fang, and L. Xu (2011). Eat, Drink, Firms, Government: An Investigation of Corruption from the Entertainment and Travel Costs of Chinese Firms. *Journal of Law and Economics* 54, 55–78.
- Calomiris, C. W., R. Fisman, and Y. Wang (2010). Profiting from government stakes in a command economy: Evidence from Chinese asset sales. *Journal of Financial Economics* 96, 399–412.
- Cingano, F. and P. Pinotti (2013). Politicians at Work: The Private Returns and Social Costs of Political Connections. *Journal of the European Economic Association* 11, 433–465.
- Dass, N., V. Nanda, and S. C. Xiao (2016). Public Corruption in the United States: Implications for Local Firms. *Review of Corporate Finance Studies* 5, 102–138.
- Ding, H., H. Fang, S. Lin, and K. Shi (2017). Equilibrium Consequences of Corruption on Firms: Evidence from China's Anti-Corruption Campaign. Working Paper. University of Pennsylvania.
- Faccio, M. (2006). Politically Connected Firms. *American Economic Review* 96, 369–386.

- Fan, J., T. Wong, and T. Zhang (2007). Politically connected CEOs, corporate governance, and Post-IPO performance of China's newly partially privatized firms. *Journal of Financial Economics* 84, 330–357.
- Fisman, R. (2001). Estimating the Value of Political Connections. *American Economic Review* 91, 1095–1102.
- Fisman, R. and J. Svensson (2007). Are corruption and taxation really harmful to growth? Firm level evidence. *Journal of Development Economics* 83, 63–75.
- Giannetti, M., G. Liao, and X. Yu (2015). The Brain Gain of Corporate Boards: Evidence from China. *Journal of Finance* 70, 1629–1682.
- Griffin, J. M., C. Liu, and T. Shu (2016). Is the Chinese Anti-Corruption Campaign Effective?, University of Texas, Austin.
- Hsieh, C.-T. and P. J. Klenow (2009). Misallocation and Manufacturing TFP in China and India. *Quarterly Journal of Economics* 124, 1403–1448.
- Huntington, S. P. (1968). *Political Order in Changing Societies*. New Haven, CT: Yale University Press.
- Leff, N. (1964). Economic Development through Bureaucratic Corruption. *American Behavioral Scientist* 8, 8-14.
- Li, H., L. Meng, Q. Wang, and L.-A. Zhou (2008). Political connections, financing and firm performance: Evidence from Chinese private firms. *Journal of Development Economics*, 87, 283–299.
- Lin, C., R. Morck, B. Yeung, and X. Zhao (2016). Anti-Corruption Reforms and Shareholder Valuations: Event Study Evidence from China. Working Paper, Singapore National University.
- Mauro, P. (1995). Corruption and Growth. *Quarterly Journal of Economics* 110, 681–712.
- Qian, N. and J. Wen (2015). Xi Jinping's Anti-Corruption Campaign and the Import of Luxury Goods in China. Working Paper, Yale University.
- Shleifer, A. and R. W. Vishny (1993). Corruption. *Quarterly Journal of Economics* 108, 599–617.
- Smith, J. D. (2016). US political corruption and firm financial policies. *Journal of Financial Economics* 121, 350-367.
- Yu, F. and X. Yu (2011). Corporate Lobbying and Fraud Detection. *Journal of Financial and Quantitative Analysis* 46, 1865-1891.

Zeume, S. (2017). Bribes and firm value. *Review of Financial Studies* 30, 1457-1489.

Zilibotti, F. (2017). Growing and Slowing Down Like China. *Journal of the European Economic Association* 15, 1–46.



## Appendix A: Variable Definition

Variable	Definition and Data Source
% of SOEs	Assets of listed SOEs as a fraction of the assets of all the listed firms in an industry.
Age	The natural logarithm of one plus the difference between the current year and the year in which the firm was founded. Winsorized at the 1% and 99% levels. Source: ATS Database.
Anti-corruption	A dummy variable equal to one if the year is equal or greater than 2013, and zero otherwise.
Asset Growth	The difference between the natural logarithms of a firm's total assets between year $t$ and year $t - 1$ . Winsorized at the 1% and 99% levels. Source: ATS Database.
Capital Reallocation	The difference between the natural logarithms of a firm's share of industry fixed assets between year $t$ and year $t - 1$ , winsorized at the 1% and 99% levels. A firm's share of industry fixed assets in a given year is computed as its fixed assets divided by the aggregate fixed assets of all firms in the industry. Source: ATS Database.
Cost of Debt	A firm's interest expenses divided by the average of its total liabilities at the beginning and end of the year. Source: ATS Database.
EE	A firm's business entertainment expenses divided by sales, multiplied by 100. Winsorized at the 1% and 99% levels. Source: ATS Database.
EE (Industry)	The average of the EEs of large firms in an industry, measured at year $t - 1$ . A firm's EE is computed as its total business entertainment expenses scaled by sales. A firm is considered large if its total assets fall into the top quartile of the sample in a year. Source: ATS Database.
EE (Province)	The average of the EEs of large firms located in a province, measured at year $t - 1$ . A firm's EE is computed as its total business entertainment expenses scaled by sales. A firm is considered large if its total assets fall into the top quartile of the sample in a year. Source: ATS Database.
Labor Reallocation	The difference between the natural logarithms of a firm's share of industry employment between year $t$ and year $t - 1$ . Winsorized at the 1% and 99% levels. A firm's share of industry employment in a given year is computed as its number of employees divided by the aggregate number of employees for all firms in the industry. Source: ATS Database.
Large Firm	A dummy variable equal to one if a firm's total assets are in the top quartile of the sample in given year, and zero otherwise. Source: ATS Database.
Leverage	Total liabilities divided by total assets, measured at the beginning of the year. Winsorized at the 1% and 99% levels.

	Source: ATS Database.
MPK	The marginal productivity of capital, approximated by the natural logarithm of sales divided by fixed assets. Winsorized at the 1% and 99% levels. Source: ATS Database.
MPL	The marginal productivity of labor, approximated by the natural logarithm of sales divided by the number of employees. Winsorized at the 1% and 99% levels. Source: ATS Database.
PC (Industry)	The fraction of politically connected public firms in an industry in a year. A public firm is considered politically connected if the CEO was previously employed as a bureaucrat by the central government or a local government. Source: Manual Collection.
Province Convicted Officials	This variable is set to zero before 2013, it is equal to the natural logarithm of one plus the number of convicted ex-officials in a province in 2013, and to the natural logarithm of one plus the number of convicted ex-officials during the 2013-2014 period in 2014. Source: Manual Collection.
ROA	Net income divided by the average of total assets at the beginning and end of the year. Winsorized at the 1% and 99% levels. Source: ATS Database.
Sales Growth	The difference between the natural logarithms of a firm's sales between year $t$ and year $t - 1$ . Winsorized at the 1% and 99% levels. Source: ATS Database.
Size	Natural logarithm of total assets, measured at the beginning of the year. Winsorized at the 1% and 99% levels. Source: ATS Database.
State	A dummy variable equal to one if a firm is government controlled or owned, and zero otherwise. Source: ATS Database.
TFP	A firm's total factor productivity, defined as in Giannetti, Liao and Yu (2015). Specifically, for all firms in an industry-year, we regress the natural logarithm of output on the natural logarithm of fixed assets, the natural logarithm of the total number of employees, and the natural logarithm of raw materials and services. The firm's TFP is computed as the residual of this regression. Truncated at the 1% and 99% levels. Source: ATS Database.

## Appendix B: Sample Distribution by Industry

Industry	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Agriculture, Forestry, Animal husbandry and Fishery	245	471	477	823	996	1,010	609	689	597	239	6,156
Mining	2,341	3,978	5,128	6,711	7,419	8,254	8,050	7,903	6,639	3,834	60,257
Farm Products Processing	1,466	2,457	2,636	3,738	4,036	4,396	4,472	4,492	3,753	1,891	33,337
Food Manufacturing	966	1,827	1,935	2,372	2,585	2,738	2,662	2,657	2,461	1,480	21,683
Wine, Beverages and Refined Tea Manufacturing	647	1,126	1,213	1,459	1,573	1,684	1,602	1,619	1,549	1,176	13,648
Tobacco Products Manufacturing	75	99	83	93	87	79	80	77	73	66	812
Textile Industry	2,604	4,166	4,390	6,152	6,189	6,974	7,879	7,277	6,359	3,610	55,600
Textile Garments Manufacturing	1,855	3,456	3,540	4,767	5,041	5,465	5,817	5,160	4,370	2,640	42,111
Leather, Fur, Feather and its products and Footwear	964	1,551	1,588	2,044	2,204	2,620	2,896	2,753	2,349	1,349	20,318
Timber Processing, Bamboo, Cane, Palm Fiber and Straw Products	562	1,017	1,110	1,536	1,682	1,840	1,649	1,558	1,309	620	12,883
Furniture Manufacturing	274	586	634	929	1,075	1,108	1,197	1,119	1,032	556	8,510
Paper Making and Paper Products	1,332	1,993	2,041	2,625	2,693	2,791	2,704	2,620	2,323	1,236	22,358
Printing and Record Medium Reproduction	750	1,302	1,335	1,686	1,852	1,967	1,747	1,669	1,408	719	14,435
Cultural, Educational, Sports and Entertainment Products	433	1,024	1,035	1,393	1,461	1,496	1,524	1,397	1,259	801	11,823
Petroleum Processing, Coking and Nuclear Fuel Processing	564	854	950	1,063	1,081	1,103	1,123	1,119	1,062	665	9,584
Raw Chemical Materials and Chemical Products	3,486	5,980	6,299	8,285	8,850	9,412	9,446	9,255	8,398	4,762	74,173
Medical and Pharmaceutical Products	1,309	2,227	2,321	2,800	3,043	3,248	3,184	3,186	3,008	2,074	26,400
Chemical Fiber	262	442	447	615	627	674	770	776	665	382	5,660
Rubber and Plastic Products	1,901	3,789	3,944	5,539	6,110	6,614	7,221	6,954	6,175	3,954	52,201
Nonmetal Mineral Products	3,337	5,408	5,895	7,903	8,832	9,491	9,619	10,019	8,730	5,016	74,250
Smelting and Pressing of Ferrous Metals	1,678	2,850	3,252	4,204	4,450	4,720	4,558	4,390	3,875	2,235	36,212
Smelting and Pressing of Non-ferrous Metals	1,298	2,232	2,415	3,286	3,494	3,677	3,804	3,721	3,375	1,877	29,179
Metal Products	1,801	3,498	3,843	5,385	6,173	6,752	7,326	7,067	6,111	3,485	51,441
Ordinary Machinery Manufacturing	3,089	5,275	5,663	8,143	9,020	9,535	9,959	9,829	8,604	4,971	74,088
Special Purpose Equipment Manufacturing	1,515	2,919	3,175	4,468	5,190	5,882	6,502	6,476	5,761	3,495	45,383
Automobile Manufacturing Industry	1,609	2,763	3,017	4,140	4,770	5,501	6,087	6,007	5,648	3,682	43,224
Railroad, Marine, Aviation and other Transport Equipment Manufacturing	636	1,235	1,323	1,737	1,962	2,242	2,473	2,403	2,161	1,380	17,552
Electrical Machinery and Equipment Manufacturing Industry	2,341	4,099	4,346	5,915	6,540	6,995	7,597	7,479	6,805	4,407	56,524
Telecommunication Equipment, Computer and other Electronic Product	1,260	3,764	3,802	5,256	6,072	6,634	7,808	7,634	7,099	5,252	54,581
Equipment and Instrument Manufacturing	358	890	938	1,232	1,447	1,611	1,693	1,677	1,492	962	12,300

Other Manufacturing Industry	1,134	2,381	2,612	3,743	4,332	4,959	5,881	5,795	4,930	2,644	38,411
Comprehensive Utilization of Waste Resources	60	128	151	259	355	458	504	472	419	209	3,015
Metal Products, Machinery and Equipment Repair Industry	892	1,579	1,421	1,955	2,008	1,577	291	295	256	134	10,408
Production and Supply of Electricity, Heat, Gas and Water	3,339	5,135	5,603	6,705	7,242	7,676	7,183	7,307	6,876	4,634	61,700
Construction Industry	5,645	7,611	8,311	11,246	12,421	15,183	15,797	15,972	14,470	6,170	112,826
Wholesale and Retail	16,835	27,623	29,642	41,589	48,472	56,387	55,131	54,883	47,299	23,779	401,640
Transportation, Warehousing and Postal Service	2,729	3,883	4,179	5,517	6,065	7,197	7,550	7,852	6,370	6,046	57,388
Hotel and Restaurants	2,160	2,763	2,928	3,683	3,951	4,625	4,247	4,209	3,272	1,413	33,251
Information Transmission, Software and Information Technology Services	1,125	1,903	2,225	3,143	4,126	5,276	5,559	5,773	5,725	5,104	39,959
Real Estate	4,906	6,595	7,478	10,064	11,718	15,273	16,277	16,980	17,600	9,387	116,278
Leasing and Business Services	844	1,169	1,209	1,722	1,925	2,932	3,201	3,342	2,970	2,141	21,455
Scientific Research and Technological Services	580	839	980	1,338	1,593	2,104	2,244	2,346	2,027	1,851	15,902
Water Resources, Environment and Public Facilities Management	54	98	100	134	156	215	220	223	188	120	1,508
Residents Service, Repair and other Services	896	1,299	1,397	1,934	2,160	2,722	2,602	2,563	1,883	1,032	18,488
Education	27	51	47	95	124	180	192	206	182	110	1,214
Health and Social Work	16	81	62	138	147	193	201	218	186	53	1,295
Culture, Sports and Entertainment	918	1,408	1,454	1,927	2,002	2,095	1,500	1,540	1,329	1,046	15,219
Total	83,118	137,824	148,574	201,491	225,351	255,565	260,638	258,958	230,432	134,689	1,936,640

### Appendix C: Sample Distribution by Province

Province	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Anhui	2,416	3,733	5,188	7,389	8,597	10,735	9,491	6,224	5,313	3,291	62,377
Beijing	5,444	6,899	8,111	9,971	15,392	18,095	13,802	14,098	11,945	7,155	110,912
Chongqing	0	2,134	2,285	3,154	3,996	4,538	4,416	4,468	4,067	2,375	31,433
Fujian	3,946	6,259	7,020	8,217	9,051	9,608	9,734	9,670	8,985	4,586	77,076
Gansu	1,560	1,951	2,104	2,494	3,043	3,514	3,395	3,322	2,851	1,962	26,196
Guangdong	5,146	11,635	11,366	15,428	17,490	19,240	24,164	24,802	22,538	13,727	165,536
Guangxi	1,609	2,877	4,020	5,193	5,986	6,590	6,144	6,096	5,690	4,426	48,631
Guizhou	921	1,964	2,231	2,712	3,201	3,742	3,422	3,242	2,676	1,472	25,583
Hainan	488	924	251	1,260	1,059	1,737	1,751	1,892	1,601	994	11,957
Hebei	5,376	9,342	11,591	13,672	16,095	17,529	14,243	13,996	11,324	5,081	118,249
Heilongjiang	1,679	2,648	2,651	3,527	3,912	4,634	4,281	4,588	3,677	2,281	33,878
Henan	2,047	3,786	2,770	10,861	12,514	8,168	8,082	7,977	7,532	3,234	66,971
Hubei	2,372	3,580	3,568	4,306	5,284	6,367	6,988	7,347	6,599	2,724	49,135
Hunan	4,083	5,274	6,248	7,475	8,551	9,545	7,319	6,616	5,521	2,877	63,509
Inner Mongolia	830	1,216	1,384	2,077	2,382	3,064	3,214	3,455	3,058	1,288	21,968
Jiangsu	5,313	9,750	9,237	15,669	16,205	19,026	24,946	25,722	23,511	14,649	164,028
Jiangxi	1,563	2,221	2,601	3,646	4,611	5,372	5,311	5,340	4,406	2,089	37,160
Jilin	1,579	2,083	2,274	2,876	3,125	3,649	3,453	3,459	3,041	1,564	27,103
Liaoning	4,505	6,420	6,835	8,768	9,241	11,090	11,189	12,218	10,512	6,035	86,813
Ningxia	65	824	1,179	1,515	1,820	2,149	2,047	2,117	1,831	1,121	14,668
Qinghai	82	476	584	753	933	1,065	1,002	976	843	516	7,230
Shaanxi	1,976	3,251	3,893	4,502	4,656	5,207	4,699	4,840	4,364	1,822	39,210
Shandong	7,160	9,402	10,351	14,263	15,002	18,001	18,895	18,563	16,964	10,939	139,540
Shanghai	6,058	10,216	9,776	13,403	13,081	15,925	17,455	16,827	14,952	9,999	127,692
Shanxi	2,382	3,552	3,904	4,785	5,034	5,706	5,462	5,758	4,808	2,409	43,800
Sichuan	0	4,348	4,658	5,817	6,446	7,281	7,296	7,387	6,832	2,979	53,044
Tianjin	2,311	3,914	3,798	4,176	4,014	4,813	5,856	5,975	5,624	3,664	44,145
Xinjiang	2,118	2,695	3,027	3,556	4,110	4,164	3,917	3,911	3,630	1,577	32,705
Xizang	0	138	169	194	201	271	284	299	250	153	1,959
Yunnan	1,648	2,570	3,047	3,396	3,409	4,103	3,998	4,156	3,874	1,964	32,165
Zhejiang	8,441	11,742	12,453	16,436	16,910	20,637	24,382	23,617	21,613	15,736	171,967
Total	83,118	137,824	148,574	201,491	225,351	255,565	260,638	258,958	230,432	134,689	1,936,640

**Table 1: Descriptive Statistics**

Panel A summarizes the main firm characteristics for the full sample and for the small and large firm subsamples. The unit of observation is the firm-year. A firm is classified as small if it has no more than 30 employees. A firm is classified as large if it has total assets in the top quartile of the sample in a given year. Panel B reports the entertainment expenses for firms in the full sample as well as large and small firms.

**Panel A: Firm Characteristics**

	Full Sample			Small Firm Subsample			Large Firm Subsample			Difference in Mean
	# of obs.	Mean	Std. Dev.	# of obs.	Mean	Std. Dev.	# of obs.	Mean	Std. Dev.	
ROA	1,936,640	0.029	0.103	349,508	0.028	0.092	529,033	0.041	0.099	63.910***
TFP	1,663,179	-0.002	0.293	294,377	0.016	0.256	398,362	0.12	0.349	143.651***
Asset Growth	1,935,386	0.089	0.363	349,142	0.021	0.528	529,033	0.166	0.358	142.582***
Sales Growth	1,936,640	0.05	0.488	349,508	-0.06	0.721	529,033	0.098	0.591	107.656***
Interest Rate	1,912,368	0.011	0.04	341,856	0.004	0.051	524,669	0.015	0.025	117.330**
EE	1,542,313	0.555	0.957	255,529	0.496	0.917	442,205	0.539	1.027	18.117***
EE (Industry)	1,936,640	0.499	0.229	349,508	0.485	0.251	529,033	0.545	0.251	109.484***
Assets (in million RMB)	1,936,640	298.515	776.128	349,508	132.516	298.77	529,033	1129.565	2254.34	317.498***
Leverage	1,935,429	0.651	0.322	349,149	0.677	0.342	529,032	0.654	0.282	-33.301***
Age (years)	1,936,640	10.998	5.933	349,508	9.559	4.98	529,033	11.616	6.26	170.858***
State	1,936,640	0.135	0.342	349,508	0.083	0.276	529,033	0.23	0.421	197.687***
Capital Reallocation	1,877,410	0.037	0.441	324,321	0.021	0.697	515,100	0.064	0.491	30.990***
Labor Reallocation	1,874,233	-0.099	0.789	339,997	-0.523	1.706	515,226	-0.221	1.489	84.137***
MPK	2,727,892	1.863	2.054	331,767	3.313	2.467	686,915	1.575	2.296	-340.787***
MPL	2,771,865	6.457	1.55	348,926	8.034	1.523	692,708	7.056	1.697	-297.309***

**Table 1 Continued.**

**Panel B: Entertainment Expenses**

Year	Entertainment Expenditures (thousands RMB)				Entertainment Expenditures/Sales $\times$ 100			
	Full Sample	Large Firms	Small Firms	Difference	Full Sample	Large Firms	Small Firms	Difference
2005	397.280	912.210	207.435	59.908***	0.573	0.535	0.526	0.868
2006	423.136	995.186	202.709	77.219***	0.559	0.524	0.530	-0.704
2007	482.294	1,086.068	217.405	86.677***	0.549	0.510	0.526	-1.966**
2008	483.124	1,090.569	213.535	103.285***	0.565	0.542	0.511	4.777***
2009	511.439	1,159.165	215.893	107.960***	0.590	0.547	0.526	3.204***
2010	585.029	1,292.773	253.888	117.844***	0.567	0.543	0.518	3.924***
2011	717.031	1,693.978	296.365	132.427***	0.565	0.574	0.450	19.266***
2012	737.587	1,694.602	302.430	134.528***	0.552	0.560	0.445	18.431***
2013	749.963	1,788.271	312.157	120.295***	0.511	0.498	0.506	-1.070
2014	761.999	1,518.789	346.906	49.224***	0.435	0.373	0.520	-7.512***

**Table 2: Persistence of Business Entertainment Expenses**

This table reports the distribution of firms with different levels of EE. In column 1, the upper half of the table reports the number of firms in different EE sample quintiles in year  $t$ , which transit to different sample EE quintiles in year  $t + 1$ . The lower half of the table reports the fraction of firms' different EE sample quintiles in year  $t$ , which transit to different sample EE quintiles in year  $t + 1$ . The unit of observation is the firm-year.

Year $t + 1$	Year $t$				
	Bottom (1)	2nd (2)	Middle (3)	4th (4)	Top (5)
<b>Number of Firms</b>					
Bottom Quintile	132,145	39,208	11,263	5,679	4,945
2nd Quintile	40,316	98,021	46,841	15,196	8,084
Middle Quintile	12,220	44,652	89,962	48,825	14,971
4th Quintile	5,847	14,875	45,110	97,840	45,293
Top Quintile	5,022	7,869	13,829	41,150	135,588
<b>% of Firms</b>					
Bottom Quintile	68.38%	20.29%	5.83%	2.94%	2.56%
2nd Quintile	19.34%	47.02%	22.47%	7.29%	3.88%
Middle Quintile	5.80%	21.20%	42.71%	23.18%	7.11%
4th Quintile	2.80%	7.12%	21.59%	46.82%	21.67%
Top Quintile	2.47%	3.87%	6.80%	20.23%	66.64%



**Table 3: Determinants of Business Entertainment Expenses by Large Firms**

This table relates corruption to industry dynamics and small firm performance. The unit of observation is the industry-year. The dependent variable is “EE (Industry)”. “Industry ROA (t-1)” is the average ROA of all firms in an industry, measured at year  $t - 1$ . “Industry Sales Growth (t-1)” is the average sales growth rate of all firms in an industry, measured at year  $t - 1$ . “Entry of Small Firms” is the fraction of small firms among all the firms in an industry. “ROA of Small Firms” is the average ROA of small firms in an industry. Small firms are firms with no more than 30 employees. All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the industry level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
Industry ROA (t-1)	-0.163 (-0.80)		-0.148 (-0.71)
Industry Sales Growth (t-1)	0.005 (0.05)		0.014 (0.14)
Entry of Small Firms		0.109 (0.39)	0.177 (0.60)
ROA of Small Firms		-0.017 (-1.12)	-0.015 (-0.87)
Observations	423	517	423
R-squared	0.894	0.885	0.894
Year FE	YES	YES	YES
Industry FE	YES	YES	YES

**Table 4: Profitability**

This table relates corruption to firms' profitability. The unit of observation is the firm-year. The estimation sample includes firms with no more than 30 employees. The dependent variable is the firm's ROA from which, in each year, we subtract the median ROA of firms with more than 30 employees in the same industry. All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
EE (Industry)	-0.084*** (-23.12)	-0.085*** (-22.81)	-0.065*** (-14.79)	-0.090*** (-24.67)	-0.091*** (-24.35)	-0.065*** (-14.71)
EE (Industry) × Anti-corruption				0.020*** (12.28)	0.021*** (12.15)	0.008*** (4.24)
Size	-0.004*** (-21.32)	-0.004*** (-21.69)	-0.007*** (-15.64)	-0.004*** (-21.17)	-0.004*** (-21.53)	-0.007*** (-15.56)
Leverage	-0.041*** (-51.55)	-0.041*** (-51.58)	0.019*** (15.42)	-0.041*** (-51.48)	-0.041*** (-51.53)	0.019*** (15.50)
Age	-0.006*** (-16.42)	-0.006*** (-16.74)	-0.004*** (-4.33)	-0.005*** (-16.21)	-0.006*** (-16.55)	-0.004*** (-4.30)
State	0.011*** (12.77)	0.011*** (13.09)	0.000 (0.17)	0.011*** (12.65)	0.011*** (12.98)	0.000 (0.19)
EE	-0.002*** (-6.59)	-0.002*** (-6.43)	0.000 (0.03)	-0.002*** (-6.48)	-0.002*** (-6.33)	0.000 (0.01)
Observations	349,508	349,508	273,112	349,508	349,508	273,112
R-squared	0.058	0.065	0.599	0.059	0.065	0.599
Year FE	YES	NO	NO	YES	NO	NO
Province FE	YES	NO	NO	YES	NO	NO
Industry FE	YES	YES	NO	YES	YES	NO
Firm FE	NO	NO	YES	NO	NO	YES
Province x Year FE	NO	YES	YES	NO	YES	YES

**Table 5: Productivity**

This table relates corruption to firms' total factor productivity (TFP). The unit of observation is the firm-year. The estimation sample includes firms with no more than 30 employees. The dependent variable is the firm's TFP. All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
EE (Industry)	-0.022*	-0.024*	-0.026**	-0.027**
	(-1.76)	(-1.90)	(-2.08)	(-2.13)
EE (Industry) × Anti-corruption			0.017***	0.013**
			(2.82)	(2.05)
Size	0.076***	0.075***	0.076***	0.075***
	(117.75)	(117.26)	(117.75)	(117.27)
Leverage	-0.037***	-0.037***	-0.037***	-0.037***
	(-17.26)	(-17.19)	(-17.25)	(-17.19)
Age	-0.025***	-0.025***	-0.025***	-0.025***
	(-25.63)	(-25.56)	(-25.54)	(-25.50)
State	0.042***	0.042***	0.042***	0.042***
	(15.84)	(15.75)	(15.79)	(15.71)
EE	-0.020***	-0.020***	-0.020***	-0.020***
	(-21.53)	(-21.52)	(-21.49)	(-21.49)
Observations	294,377	294,377	294,377	294,377
R-squared	0.187	0.189	0.187	0.189
Year FE	YES	NO	YES	NO
Province FE	YES	NO	YES	NO
Industry FE	YES	YES	YES	YES
Province x Year FE	NO	YES	NO	YES

**Table 6: Different Samples of Small Firms**

This table reproduces the baseline results for different samples of small firms. The unit of observation is the firm-year. In Panels A and B, the estimation sample includes firms with no more than 50 employees in columns 1-2, firms with no more than 100 employees in columns 3-4, and firms with no more than 150 employees in columns 5-6. In Panel C, the sample includes firms whose number of employees belongs to the third quartile. The dependent variable is ROA in Panel A and columns 1-2 of Panel C; and is TFP in Panel B and columns 3-4 of Panel C. For a firm's ROA, we subtract, in each year, the median ROA of non-small firms in the same industry, where small firms are based on the above alternative definitions. All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: ROA**

	<= 50		<=100		<=150	
	(1)	(2)	(3)	(4)	(5)	(6)
EE (Industry)	-0.057*** (-18.95)	-0.061*** (-20.27)	-0.035*** (-14.47)	-0.038*** (-15.76)	-0.030*** (-13.33)	-0.032*** (-14.54)
EE (Industry) × Anti-corruption		0.014*** (10.36)		0.011*** (9.24)		0.009*** (8.14)
Size	-0.003*** (-20.65)	-0.003*** (-20.54)	-0.002*** (-16.57)	-0.002*** (-16.52)	-0.001*** (-11.03)	-0.001*** (-10.99)
Leverage	-0.049*** (-73.27)	-0.049*** (-73.21)	-0.059*** (-104.87)	-0.059*** (-104.83)	-0.063*** (-121.46)	-0.063*** (-121.43)
Age	-0.005*** (-17.56)	-0.005*** (-17.40)	-0.004*** (-18.83)	-0.004*** (-18.72)	-0.004*** (-19.67)	-0.004*** (-19.58)
State	0.011*** (15.58)	0.011*** (15.49)	0.011*** (16.70)	0.010*** (16.65)	0.010*** (16.75)	0.010*** (16.72)
EE	-0.002*** (-8.76)	-0.002*** (-8.67)	-0.002*** (-15.56)	-0.002*** (-15.50)	-0.003*** (-20.34)	-0.003*** (-20.29)
Observations	540,565	540,565	885,832	885,832	1,113,836	1,113,836
R-squared	0.062	0.062	0.066	0.066	0.069	0.069
Industry FE	YES	YES	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES	YES	YES

**Table 6 Continued.**

**Panel B: TFP**

	<= 50		<=100		<=150	
	(1)	(2)	(3)	(4)	(5)	(6)
EE (Industry)	-0.019*	-0.022**	-0.015**	-0.017**	-0.014**	-0.015**
	(-1.94)	(-2.24)	(-2.09)	(-2.32)	(-2.09)	(-2.32)
EE (Industry) × Anti-corruption		0.012**		0.007*		0.006
		(2.48)		(1.68)		(1.61)
Size	0.077***	0.077***	0.076***	0.076***	0.074***	0.074***
	(139.58)	(139.59)	(163.62)	(163.62)	(173.94)	(173.94)
Leverage	-0.044***	-0.044***	-0.057***	-0.057***	-0.062***	-0.062***
	(-24.21)	(-24.20)	(-36.79)	(-36.78)	(-43.65)	(-43.65)
Age	-0.020***	-0.020***	-0.011***	-0.011***	-0.007***	-0.007***
	(-24.08)	(-24.02)	(-15.93)	(-15.89)	(-10.25)	(-10.22)
State	0.040***	0.040***	0.038***	0.038***	0.038***	0.038***
	(18.71)	(18.68)	(21.22)	(21.21)	(23.15)	(23.14)
EE	-0.017***	-0.017***	-0.015***	-0.015***	-0.015***	-0.015***
	(-23.83)	(-23.81)	(-27.48)	(-27.47)	(-30.34)	(-30.32)
Observations	462,364	462,364	774,253	774,253	984,530	984,530
R-squared	0.159	0.159	0.138	0.138	0.130	0.130
Industry FE	YES	YES	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES	YES	YES

**Table 6 Continued.**

**Panel C: Firms with Number of Employees in the Third Quartile**

Dependent Variable	ROA		TFP	
	(1)	(2)	(3)	(4)
EE (Industry)	-0.020*** (-5.13)	-0.020*** (-4.98)	-0.008 (-0.70)	-0.007 (-0.62)
EE (Industry) × Anti-corruption		-0.002 (-0.84)		-0.002 (-0.33)
Size	0.002*** (11.44)	0.002*** (11.44)	0.080*** (114.14)	0.080*** (114.14)
Leverage	-0.082*** (-96.53)	-0.082*** (-96.54)	-0.083*** (-35.34)	-0.083*** (-35.34)
Age	-0.006*** (-16.81)	-0.006*** (-16.81)	0.017*** (15.88)	0.017*** (15.88)
State	0.004*** (4.05)	0.004*** (4.05)	0.026*** (10.02)	0.026*** (10.02)
EE	-0.006*** (-24.83)	-0.006*** (-24.83)	-0.015*** (-19.52)	-0.015*** (-19.52)
Observations	475,465	475,465	440,006	440,006
R-squared	0.094	0.094	0.131	0.131
Industry FE	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES

**Table 7: Political Connections**

This table considers the proportion of politically connected listed firms in an industry and their impact on firm performance. A listed company is considered politically connected if the CEO was previously employed as bureaucrat by the central government or a local government. The unit of observation is the firm-year. The estimation sample includes firms with less than 30 employees. The dependent variable in columns 1-2 is the firm's ROA, from which in each year we subtract the median ROA of firms with more than 30 employees in the same industry, and in columns 3-4 is the total factor productivity (TFP). "PC (Industry)" is the fraction of politically connected public companies in a firm's industry. All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	ROA		TFP	
	(1)	(2)	(3)	(4)
PC (Industry)	-0.013*** (-7.19)	-0.015*** (-7.64)	-0.007 (-1.20)	-0.014** (-2.18)
PC (Industry) × Anti-corruption		0.010** (2.54)		0.036** (2.51)
Size	-0.004*** (-20.90)	-0.004*** (-20.87)	0.075*** (117.89)	0.075*** (117.89)
Leverage	-0.041*** (-50.95)	-0.041*** (-50.94)	-0.036*** (-17.03)	-0.036*** (-17.03)
Age	-0.006*** (-16.91)	-0.006*** (-16.88)	-0.025*** (-25.49)	-0.025*** (-25.43)
State	0.011*** (12.65)	0.011*** (12.64)	0.041*** (15.64)	0.041*** (15.62)
EE	-0.002*** (-6.64)	-0.002*** (-6.62)	-0.020*** (-21.17)	-0.020*** (-21.15)
Observations	345,266	345,266	291,251	291,251
R-squared	0.063	0.063	0.190	0.190
Industry FE	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES

**Table 8: SOEs**

The dependent variables are ROA and TFP as described on the top each row. The estimation sample includes firms with less than 30 employees. In each year, we subtract from each small firm's ROA the median ROA of all firms with more than 30 employees in the same industry. In columns 1-4, we exclude SOEs from the small firm sample. In columns 5-6, we control for the fraction of assets of SOEs among listed firms in an industry, and its interaction with the anti-corruption dummy. All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	ROA	ROA	TFP	TFP	ROA	TFP
	(1)	(2)	(3)	(4)	(5)	(6)
EE (Industry)	-0.090*** (-23.29)	-0.096*** (-24.78)	-0.036*** (-2.73)	-0.039*** (-2.99)	-0.071*** (-17.17)	-0.027* (-1.84)
EE (Industry) × Anti-corruption		0.022*** (12.60)		0.016** (2.40)	0.024*** (13.88)	0.014** (2.16)
Size	-0.004*** (-19.91)	-0.004*** (-19.73)	0.076*** (115.69)	0.076*** (115.70)	-0.004*** (-21.68)	0.075*** (117.27)
Leverage	-0.040*** (-49.09)	-0.040*** (-49.05)	-0.035*** (-15.69)	-0.035*** (-15.69)	-0.041*** (-51.63)	-0.037*** (-17.20)
Age	-0.006*** (-15.91)	-0.006*** (-15.69)	-0.024*** (-23.62)	-0.024*** (-23.55)	-0.006*** (-16.71)	-0.025*** (-25.42)
EE	-0.002*** (-6.47)	-0.002*** (-6.35)	-0.021*** (-21.62)	-0.021*** (-21.59)	-0.002*** (-6.44)	-0.020*** (-21.48)
State					0.011*** (13.17)	0.042*** (15.68)
% of SOEs					-0.088*** (-12.36)	0.01 (0.39)
% of SOEs × Anti-corruption					0.016*** (5.03)	-0.038*** (-3.07)
Observations	319,769	319,769	270,776	270,776	349,508	294,377
R-squared	0.065	0.066	0.19	0.19	0.066	0.189
Industry FE	YES	YES	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES	YES	YES



**Table 9: Pre-existing Trends**

In this table, we control for the pre-existing trend prior to the anti-corruption campaign. The estimation sample includes firms with no more than 30 employees. The dependent variable in columns 1-2 is the firm's ROA, from which, in each year, we subtract the median ROA of firms with more than 30 employees in the same industry, and in columns 3-4 is the total factor productivity (TFP). "Pre Anti-corruption" is a dummy variable equal to one if a year is 2010 or 2011 and zero otherwise. All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	ROA		TFP	
	(1)	(2)	(3)	(4)
EE (Industry)	-0.075*** (-20.10)	-0.080*** (-21.47)	-0.023* (-1.82)	-0.028** (-2.17)
EE (Industry) × Anti-corruption		0.012*** (7.08)		0.013** (2.02)
EE (Industry) × Pre Anti-corruption	-0.025*** (-17.73)	-0.021*** (-14.63)	-0.003 (-0.56)	0.001 (0.20)
Size	-0.004*** (-21.56)	-0.004*** (-21.49)	0.075*** (117.26)	0.075*** (117.26)
Leverage	-0.041*** (-51.64)	-0.041*** (-51.60)	-0.037*** (-17.20)	-0.037*** (-17.19)
Age	-0.006*** (-16.72)	-0.006*** (-16.61)	-0.025*** (-25.55)	-0.025*** (-25.50)
State	0.011*** (13.13)	0.011*** (13.05)	0.042*** (15.75)	0.042*** (15.71)
EE	-0.002*** (-6.52)	-0.002*** (-6.45)	-0.020*** (-21.52)	-0.020*** (-21.49)
Observations	349,508	349,508	294,377	294,377
R-squared	0.066	0.066	0.189	0.189
Industry FE	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES

**Table 10: Controlling for the Characteristics of Large Firms in an Industry**

This table controls for some characteristics of large firms in the same industry as firm  $f$ . The unit of observation is the firm-year. The estimation sample includes firms with no more than 30 employees. The dependent variable in columns 1-2 is the firm's ROA, from which in each year, we subtract the median ROA of firms with more than 30 employees in the same industry and in columns 3-4 is the total factor productivity (TFP). "Size (Large Firms)" and "Leverage (Large Firms)" are the average of assets and leverage of the large firms in the same industry as firm  $f$ . A firm is classified as large if its total assets are in the top quartile of the sample in a year. All variables are defined in Appendix A. T-statistics computed with robust standard errors and clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	ROA		TFP	
	(1)	(2)	(3)	(4)
EE (Industry)	-0.066*** (-15.50)	-0.066*** (-15.38)	-0.034** (-2.23)	-0.033** (-2.17)
EE (Industry) × Anti-corruption		0.034*** (14.70)		0.022** (2.54)
Size	-0.004*** (-21.90)	-0.004*** (-21.79)	0.075*** (117.21)	0.075*** (117.21)
Leverage	-0.041*** (-51.73)	-0.041*** (-51.75)	-0.036*** (-17.16)	-0.037*** (-17.18)
Age	-0.006*** (-16.62)	-0.006*** (-16.36)	-0.025*** (-25.43)	-0.025*** (-25.34)
State	0.011*** (13.22)	0.011*** (13.15)	0.041*** (15.67)	0.041*** (15.65)
EE	-0.002*** (-6.47)	-0.002*** (-6.41)	-0.020*** (-21.47)	-0.020*** (-21.45)
Size (Large Firms)	0.041*** (5.16)	0.048*** (6.09)	-0.002 (-0.08)	0.003 (0.10)
Leverage (Large Firms)	0.218*** (12.57)	0.274*** (15.22)	-0.164*** (-2.73)	-0.129** (-2.09)
Size (Large Firms) × Anti-corruption	0.038*** (10.61)	-0.004 (-0.84)	0.008 (0.56)	-0.019 (-1.09)
Leverage (Large Firms) × Anti-corruption	0.021*** (3.30)	0.053*** (7.86)	0.045* (1.90)	0.066** (2.55)
Observations	349,508	349,508	294,377	294,377
R-squared	0.066	0.067	0.189	0.189
Industry FE	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES

**Table 11: Province Level Corruption and Firm Performance**

In this table, we measure corruption using the EE of large firms in the same province as firm  $f$ . The unit of observation is the firm-year. The estimation sample includes firms with no more than 30 employees. The dependent variable in columns 1-4 is the firm's ROA, from which in each year we subtract the median ROA of firms with more than 30 employees in the same industry, and in columns 5-8 is the total factor productivity (TFP). All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	ROA				TFP			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EE (Province)	-0.068*** (-16.06)	-0.081*** (-18.69)	-0.069*** (-16.37)	-0.085*** (-19.44)	-0.035*** (-2.94)	-0.042*** (-3.48)	-0.028** (-2.31)	-0.033*** (-2.72)
EE (Province) × Anti-corruption		0.061*** (13.94)		0.069*** (15.21)		0.036** (2.57)		0.026* (1.81)
Size	-0.004*** (-21.71)	-0.004*** (-21.66)	-0.004*** (-21.75)	-0.004*** (-21.67)	0.076*** (117.96)	0.076*** (117.97)	0.076*** (118.00)	0.076*** (118.00)
Leverage	-0.041*** (-51.81)	-0.041*** (-51.86)	-0.041*** (-51.80)	-0.041*** (-51.89)	-0.037*** (-17.20)	-0.037*** (-17.21)	-0.036*** (-17.13)	-0.036*** (-17.15)
Age	-0.005*** (-16.04)	-0.005*** (-16.12)	-0.005*** (-16.08)	-0.005*** (-16.17)	-0.025*** (-25.37)	-0.025*** (-25.38)	-0.025*** (-25.39)	-0.025*** (-25.40)
State	0.011*** (13.20)	0.011*** (13.24)	0.011*** (13.20)	0.011*** (13.26)	0.042*** (15.73)	0.042*** (15.74)	0.042*** (15.73)	0.042*** (15.74)
EE	-0.002*** (-6.62)	-0.002*** (-6.58)	-0.002*** (-6.62)	-0.002*** (-6.57)	-0.020*** (-21.28)	-0.020*** (-21.27)	-0.020*** (-21.30)	-0.020*** (-21.29)
Size (Large Firms)			0.021*** (3.46)	0.014** (2.30)			-0.007 (-0.40)	-0.010 (-0.53)
Leverage (Large Firms)			0.004 (0.27)	0.008 (0.49)			-0.248*** (-5.40)	-0.247*** (-5.37)
Size (Large Firms) × Anti-corruption			0.006 (1.16)	-0.010* (-1.86)			0.031* (1.93)	0.025 (1.55)
Leverage (Large Firms) × Anti-corruption			0.030** (2.34)	0.056*** (4.40)			0.059 (1.47)	0.070* (1.71)

Observations	349,503	349,503	349,503	349,503	294,371	294,371	294,371	294,371
R-squared	0.069	0.070	0.069	0.070	0.191	0.191	0.191	0.191
Province FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry x Year FE	YES	YES	YES	YES	YES	YES	YES	YES

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**Table 12: Differences in Enforcement across Provinces**

In this table, we measure the shock to the EE of large firms in the same province as firm  $f$  with “Province Convicted Officials”, computed as, for year 2014, the natural logarithm of one plus the sum of ex-officials in a province investigated for corruption during the 2013-2014 period, for year 2013, the natural logarithm of one plus the number of ex-officials in a province investigated for corruption in 2013, and zero if it is before 2013. The unit of observation is the firm-year. The estimation sample includes firms with no more than 30 employees. The dependent variable in columns 1-2 is the firm’s ROA, from which in each year, we subtract the median ROA of firms with more than 30 employees in the same industry, and in columns 3-4 is the total factor productivity (TFP). All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	ROA		TFP	
	(1)	(2)	(3)	(4)
EE (Industry)	-0.085*** (-22.81)	-0.087*** (-23.57)	-0.024* (-1.90)	-0.026** (-2.07)
EE (Industry) × Province Convicted Officials		0.006*** (10.54)		0.007*** (2.99)
Size	-0.004*** (-21.69)	-0.004*** (-21.58)	0.075*** (117.26)	0.075*** (117.26)
Leverage	-0.041*** (-51.58)	-0.041*** (-51.53)	-0.037*** (-17.19)	-0.037*** (-17.19)
Age	-0.006*** (-16.74)	-0.006*** (-16.56)	-0.025*** (-25.56)	-0.025*** (-25.47)
State	0.011*** (13.09)	0.011*** (12.98)	0.042*** (15.75)	0.042*** (15.70)
EE	-0.002*** (-6.43)	-0.002*** (-6.32)	-0.020*** (-21.52)	-0.020*** (-21.48)
Observations	349,508	349,508	294,377	294,377
R-squared	0.065	0.065	0.189	0.189
Industry FE	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES

**Table 13: Mechanisms**

This table relates corruption to firms' sales growth (Panel A), firms' financing costs (Panel B), and asset growth (Panel C). The unit of observation is the firm-year. The estimation sample includes firms with no more than 30 employees. From all dependent variables we subtract, in each year, the median value of the correspondent variable for firms with more than 30 employees in the same industry. All variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: Sales Growth**

	(1)	(2)	(3)	(4)
EE (Industry)	-0.334*** (-12.00)	-0.312*** (-11.16)	-0.367*** (-13.13)	-0.343*** (-12.18)
EE (Industry) × Anti-corruption			0.124*** (7.53)	0.113*** (6.80)
Size	-0.010*** (-8.50)	-0.010*** (-8.20)	-0.010*** (-8.34)	-0.010*** (-8.05)
Leverage	0.053*** (12.11)	0.053*** (12.16)	0.053*** (12.18)	0.053*** (12.20)
Age	-0.044*** (-22.42)	-0.043*** (-22.01)	-0.044*** (-22.20)	-0.043*** (-21.83)
State	0.035*** (7.86)	0.034*** (7.68)	0.034*** (7.72)	0.033*** (7.57)
EE	0.103*** (47.03)	0.103*** (47.16)	0.103*** (47.08)	0.103*** (47.19)
Observations	349,508	349,508	349,508	349,508
R-squared	0.032	0.036	0.032	0.036
Year FE	YES	NO	YES	NO
Province FE	YES	NO	YES	NO
Industry FE	YES	YES	YES	YES
Province x Year FE	NO	YES	NO	YES

**Continued Table 13: Mechanisms**

**Panel B: Cost of Debt**

	(1)	(2)	(3)	(4)
EE (Industry)	0.021*** (10.51)	0.022*** (10.80)	0.029*** (14.07)	0.029*** (14.22)
EE (Industry) × Anti-corruption			-0.027*** (-36.07)	-0.026*** (-34.81)
Size	0.002*** (23.63)	0.002*** (23.51)	0.002*** (23.18)	0.002*** (23.06)
Leverage	0.015*** (36.00)	0.015*** (36.06)	0.015*** (35.87)	0.015*** (35.97)
Age	0.000** (2.33)	0.000*** (2.63)	0.000* (1.76)	0.000** (2.14)
State	-0.001*** (-3.77)	-0.002*** (-3.99)	-0.001*** (-3.43)	-0.001*** (-3.71)
EE	-0.001*** (-5.49)	-0.001*** (-5.64)	-0.001*** (-5.76)	-0.001*** (-5.88)
Observations	341,856	341,856	341,856	341,856
R-squared	0.064	0.070	0.067	0.073
Year FE	YES	NO	YES	NO
Province FE	YES	NO	YES	NO
Industry FE	YES	YES	YES	YES
Province x Year FE	NO	YES	NO	YES

**Continued Table 13: Mechanisms**

**Panel C: Asset Growth**

	(1)	(2)	(3)	(4)
EE (Industry)	-0.127*** (-6.75)	-0.103*** (-5.41)	-0.133*** (-7.02)	-0.109*** (-5.69)
EE (Industry) × Anti-corruption			0.020** (2.07)	0.022** (2.20)
Size	-0.062*** (-63.74)	-0.062*** (-63.61)	-0.062*** (-63.68)	-0.062*** (-63.56)
Leverage	-0.120*** (-35.01)	-0.119*** (-34.97)	-0.120*** (-34.99)	-0.119*** (-34.96)
Age	-0.022*** (-14.12)	-0.022*** (-14.17)	-0.021*** (-14.07)	-0.022*** (-14.12)
State	0.003 (1.01)	0.003 (1.04)	0.003 (0.98)	0.003 (1.01)
EE	0.002* (1.74)	0.002* (1.84)	0.002* (1.77)	0.002* (1.87)
Observations	349,142	349,142	349,142	349,142
R-squared	0.047	0.050	0.047	0.050
Year FE	YES	NO	YES	NO
Province FE	YES	NO	YES	NO
Industry FE	YES	YES	YES	YES
Province x Year FE	NO	YES	NO	YES



**Table 14: Corruption and the Allocation of Resources**

This table studies the effect of corruption on capital and labor allocation. The unit of observation is the firm-year. The dependent variable is the change in the log of the share of industry employment of firm  $f$  from year  $t - 1$  to year  $t$ , multiplied by 100,000, in Panel A and change in the log of the share of industry fixed assets of firm  $f$  from year  $t - 1$  to year  $t$  multiplied by 100,000 in Panel B. All variables are defined in Appendix A. Estimations rely on the small firm sample in columns 1-3, and the full sample in columns 4-6. The small firm sample includes firms with no more than 30 employees. T-statistics computed with robust standard errors clustered at the firm level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

**Panel A: The Allocation of Labor**

	Small Firm Sample			Full Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
MPL	0.445*** (68.11)	0.839*** (62.43)	0.911*** (67.46)	0.403*** (201.76)	0.623*** (145.55)	0.649*** (150.84)
MPL $\times$ EE (Industry)		-0.715*** (-24.73)	-0.958*** (-33.14)		-0.412*** (-51.23)	-0.492*** (-60.55)
MPL $\times$ EE (Industry) $\times$ Anti-corruption			0.501*** (80.92)			0.164*** (115.68)
EE (Industry)		-6.501*** (-25.12)	-4.109*** (-16.41)		0.691*** (13.62)	1.041*** (20.41)
Size	-0.120*** (-14.20)	-0.178*** (-22.69)	-0.168*** (-20.98)	-0.133*** (-64.34)	-0.139*** (-67.20)	-0.145*** (-69.68)
Leverage	0.076*** (3.53)	0.030 (1.48)	0.084*** (4.17)	-0.012*** (-2.80)	-0.020*** (-4.70)	-0.005 (-1.17)
Age	0.033** (2.26)	-0.040*** (-2.80)	-0.058*** (-3.96)	-0.003 (-1.03)	-0.018*** (-6.33)	-0.019*** (-6.58)
State	0.010 (0.28)	0.037 (1.11)	0.073** (2.10)	0.013** (2.32)	0.010* (1.85)	0.016*** (2.89)
EE	0.116*** (13.70)	0.096*** (12.02)	0.082*** (10.49)	0.053*** (42.73)	0.048*** (39.64)	0.047*** (39.05)
Observations	265,437	265,437	265,437	1,744,042	1,744,042	1,744,042
R-squared	0.440	0.504	0.543	0.288	0.305	0.319
Firm FE	YES	YES	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES	YES	YES

Continued Table 14: Corruption and the Allocation of Resources

Panel B: The Allocation of Capital

	Small Firm Sample			Full Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
MPK	0.379*** (120.30)	0.443*** (71.42)	0.439*** (69.53)	0.287*** (275.41)	0.312*** (148.21)	0.309*** (145.87)
MPK × EE (Industry)		-0.118*** (-11.54)	-0.115*** (-11.10)		-0.046*** (-13.34)	-0.044*** (-12.81)
MPK × EE (Industry) × Anti-corruption			0.024*** (6.07)			0.017*** (14.35)
EE (Industry)		0.391*** (8.58)	0.397*** (8.75)		0.212*** (23.54)	0.216*** (23.95)
Size	-0.153*** (-31.77)	-0.157*** (-32.37)	-0.157*** (-32.45)	-0.123*** (-86.78)	-0.124*** (-87.19)	-0.125*** (-87.69)
Leverage	0.027** (2.48)	0.025** (2.29)	0.026** (2.47)	0.012*** (4.42)	0.011*** (4.19)	0.012*** (4.60)
Age	-0.001 (-0.16)	-0.002 (-0.27)	-0.006 (-0.78)	-0.043*** (-23.61)	-0.043*** (-23.60)	-0.044*** (-24.50)
State	0.015 (1.03)	0.015 (1.04)	0.017 (1.14)	0.009*** (2.86)	0.009*** (2.85)	0.009*** (2.90)
EE	0.108*** (33.38)	0.102*** (31.44)	0.102*** (31.46)	0.043*** (63.89)	0.042*** (62.73)	0.042*** (62.75)
Observations	252,488	252,488	252,488	1,755,034	1,755,034	1,755,034
R-squared	0.461	0.462	0.462	0.384	0.385	0.385
Firm FE	YES	YES	YES	YES	YES	YES
Province x Year FE	YES	YES	YES	YES	YES	YES

**Table 15: Corruption and Entry of New Firms**

This table relates corruption to entry of new firms. The unit of observation is the province-industry-year. The dependent variable is the proportion of young firms among all the firms in a province and industry (columns 1-4) and the proportion of high-quality young firms among all the firms in a province and industry (columns 5-8). Each year, we classify a firm to be high quality if its TFP belongs to the top quartile of the sample. A firm is considered young if it is less than or equal to four years old. “Average Size” is the average of the natural logarithm of the total assets of all firms in a province and industry; “Average Leverage” is the average of the leverage of all firms in a province and industry. The remaining variables are defined in Appendix A. T-statistics computed with robust standard errors clustered at the industry and province level are reported in parentheses. All models include a constant and fixed effects as indicated on the table, but the coefficients are not reported. \*\*\*, \*\*, and \* indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Dependent Variable	Young firms as a fraction of total firms within an industry and a province				High-quality young firms as a fraction of total firms within an industry and a province			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
EE (Industry × Province)	-0.002 (-0.57)	-0.003 (-0.72)	-0.008* (-1.95)	-0.009** (-2.30)	-0.003* (-1.78)	-0.003* (-1.86)	-0.004** (-2.44)	-0.004** (-2.46)
EE (Industry × Province) × Anti-corruption			0.036*** (5.71)	0.041*** (6.68)			0.009*** (3.57)	0.008*** (3.45)
Average Size	-0.005 (-1.11)	-0.001 (-0.23)	-0.005 (-1.11)	-0.001 (-0.22)	0.010*** (5.84)	0.010*** (5.56)	0.010*** (5.85)	0.010*** (5.58)
Average Leverage	0.035*** (3.35)	0.036*** (3.46)	0.036*** (3.44)	0.037*** (3.53)	0.013*** (3.13)	0.014*** (3.16)	0.013*** (3.16)	0.014*** (3.18)
Observations	10,905	10,905	10,905	10,905	9,503	9,503	9,503	9,503
R-squared	0.611	0.639	0.613	0.641	0.345	0.371	0.346	0.372
Year FE	YES	NO	YES	NO	YES	NO	YES	NO
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES
Province FE	YES	NO	YES	NO	YES	NO	YES	NO
Province × Year FE	NO	YES	NO	YES	NO	YES	NO	YES

**Figure 1**  
**The Anti-Corruption Movement across Chinese Provinces**

This figure reports the number of ex government officials and SOE executives investigated across Chinese provinces between 2012 and 2014. A darker color indicates a larger number.



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