The Externalities of Corruption: Evidence from Entrepreneurial Firms in China*

Mariassunta Giannetti
Stockholm School of Economics, CEPR, and ECGI
Mariassunta.Giannetti@hhs.se

Guanmin Liao
School of Business, Renmin University of China
liaoguanmin@rmbs.ruc.edu.cn

Jiaxing You
School of Management, Xiamen University
jxyou@xmu.edu.cn

Xiaoyun Yu
Department of Finance, Kelley School of Business
Indiana University
xiyu@indiana.edu

September 2018

Abstract
Exploiting the Chinese anti-corruption campaign as an exogenous shock to corruption, we show that following a decrease in corruption, the performance of firms in highly corrupt industries improves. Small firms appear to benefit to a larger extent. We identify the channels through which corruption hampers firm performance. Following the anti-corruption campaign, the allocation of capital and labor becomes more efficient in ex ante highly corrupt industries. Firms in these industries experience productivity gains, easier access to debt financing, and higher growth of sales than firms in other industries. Overall, our results suggest that corruption creates negative externalities.
Keywords: Corruption, corporate governance, capital and labor allocation, China
JEL: D22, D62, G30, L20, O12, P26

* We thank Pat Akey, Emily Breza, Daniel Carvalho, Jessica Jeffers (discussant), Randall Morck (discussant), 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 China Meeting of the Econometric Society, the China International Conference in Finance, the Conference on Corporate Finance Beyond Public Companies at the University of Manchester, the Financial Intermediation Research Society Conference, the ISET-EIEF Workshop on Innovation and Entrepreneurship, the Australian National University, European University Institute, Indiana University, 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 Riksbankens Jubileumsfond. Xiaoyun Yu gratefully acknowledges financial support from the Arthur M. Weimer Fellowship.

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, providing financial support to different political factions, or paying bribes. The costs and benefits of these behaviors, which can be largely assimilated to corruption, have been subject to intense debate. A strand of literature highlights that corruption may be a second-best efficient solution; not only it allows firms to avoid bureaucratic delays, but also 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 in highly regulated economies. Empirically, a number of papers show that corruption benefits firm shareholders in a variety of countries (see, for instance, Fisman, 2001; Faccio, 2006).

On the other hand, 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. Evidence on the externalities of corruption, however, is scarce.

In this paper, we ask whether corruption causes negative externalities and inefficiencies that go above and beyond the benefits that it might yield to corrupting firms. Specifically, using China's recent anti-corruption campaign as an exogenous negative shock to corruption, we investigate whether corruption stifles firm performance and whether it affects disproportionally small firms. We also explore whether corruption impairs an efficient allocation of resources between firms with different productivities and the effect of corruption on industrial structure and entrepreneurial entry.

China provides a unique setting to investigate the effects of corruption on entrepreneurial activity for several reasons. First, China experienced an exogenous shock to the extent and 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 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, to gauge the effects of corruption, we can test whether the performance of firms ex ante more exposed to corruption improves after the start of the anti-corruption campaign.[1]

Second, we are able to access a large-scale proprietary dataset providing comprehensive information on a sample of public and private firms, which is representative of the distribution of firms in the Chinese economy across 31 provinces, 47 industries, and a variety of size classes. This allows us to test whether corruption results in a less efficient allocation of resources between firms in an industry and whether it affects disproportionately small entrepreneurial firms. Small firms are particularly important in China, where 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 (Akcigit and Kerr, 2016), especially in economies, such as China, which may otherwise fall into

[1] Our empirical approach is similar to the one used by Bertrand, Schoar and Thesmar (2007) to study bank deregulation in France.

middle-income traps (Zilibotti, 2017). Since corruption is widespread, exploring its effects and economic consequences is particularly relevant to understand the process of development in emerging economies.

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 secure 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 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 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.

We find that the negative shock to corruption is associated with an improvement in the performance of firms operating in ex ante more corrupt industries. The changes in performance following the anti-corruption campaign appear to be brought about by an increase in sales growth, easier access to debt financing, and a decrease in the cost of debt for firms in more corrupt industries.

There are significant distributional effects as the profitability and total factor productivity of smaller firms increase to a larger extent. Performance deteriorates for relatively large firms, presumably because large firms are subject to more intense competition from small firms.

Importantly, the anti-corruption campaign improves the allocation of resources between firms. Estimating a model based on Bai, Carvalho and Phillips (2018), we find that following the campaign, labor (capital) becomes more likely to be allocated to firms with high marginal productivity of labor (capital) if these firms operate in industries with high entertainment expenses.

Corruption also appears to have an effect on the geographical distribution of entrepreneurial activity. Following the start of the anti-corruption campaign, concentration decreases in the most corrupt industries. In addition, the proportion of young firms increases especially in the provinces and industries with high ex ante entertainment expenses. This is the case not only for young firms in general, but also for young firms with high productivity.

Taken together, our results suggest that corruption harms an economy by hindering an efficient allocation of resources, firm performance, and the entry of small firms. In ex ante more corrupt industries, even firms that were better poised to benefit from corruption (thanks to their large entertainment expenses) do not experience lower profitability following a crackdown on corruption.

Since we exploit the anti-corruption campaign as an exogenous shock to corruption that should have affected disproportionately firms in ex ante more corrupt industries, our empirical strategy relies on the assumption that firms in such industries did not experience improvements in performance already before the start of the 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 is satisfied.

All results are obtained by controlling for firm-level entertainment expenses and including interactions of province and time fixed effects and of size and time fixed effects; in the specifications in which we test for the differential effects on small firms, we even include industry and year fixed effects. Thus, our findings cannot be interpreted as being driven by provincial or industry shocks. Furthermore, we show that large firms' entertainment expenses are unlikely to capture other industry characteristics, such as size or leverage, which may in turn be correlated with small firms' performance.

Overall, our results indicate that a negative shock to the effectiveness of corruption benefits entrepreneurial activity. 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.

This paper belongs to a growing literature studying the effects of corruption and political connections. A strand of the literature documents 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 few papers explore 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 corruption, an issue that has been largely neglected in existing literature. An exception is Cingano and Pinotti (2013), who show that political connections reduce government sales for non-connected firms. In contemporaneous work, Avis, Ferras, and Finan (2018), Lagaras, Ponticelli and Tsoutsoura (2017), and Colonnelli and Prem (2017) study the local consequences of anti-corruption audits in Brazil. To the best of our knowledge, we are the first to be able to measure firms' ex ante exposure to corruption and to study the effects of a generalized increase in the cost of corruption on firm performance. Going beyond audits and considering a generalized crackdown on corruption is important to evaluate the effects of anti-corruption campaigns, as not all firms can be audited. Even more importantly, firms are likely to benefit if their competitors are fined or put out of business after an audit, while an increase in the perceived cost of corruption may in principle stifle firm performance and economic activity if corruption is oil in the wheels. Thus, considering a generalized crackdown of corruption as we do is crucial to evaluate whether corruption may lead to second-best outcomes.

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 the valuations of politically connected firms dropped in anticipation of future enforcement. While these studies highlight cross-sectional differences in announcement returns across listed companies, they do not 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. Instead, we directly explore the spillover effects of corruption. More importantly, we document for the first time the effects of the anti-corruption reform on unlisted companies, which are the vast majority of firms in any economy.

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 the Appendix.

1. Institutional Background

1.1 Economic Growth and Corruption in China

China is the largest emerging market and has experienced spectacular economic growth following an overhaul of its economic system in the late 1970s. 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. These costs are recorded as entertainment expenses in Chinese firms' profits and loss accounts. There exists ample evidence that entertainment expenses, and the political connections they help establishing, are associated with benefits for firms, including lower taxes, government subsidies, and 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 4th, the Political Bureau of the Central Committee of the CPC formulated an eight-point policy document to cut corruption. 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 rules. All these steps taken by central and local governments ultimately demonstrated the government's 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 November 8th, 2012, the day of the announcement of the campaign (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 credible. The effectiveness of the campaign is also demonstrated by the fact that firms have 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, have dropped (Qian and Wen, 2015).

As a result of the campaign, approximately 200,000 officials incurred sanctions for corruption or abuse of power in 2013 alone. About 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 has 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 an exogenous shock increasing in the cost of corruption and decreasing in the effectiveness of firms' efforts to obtain political favors. We expect firms in ex ante more corrupt industries to be affected by the shock to a larger extent. This allows us to evaluate the effects of a corrupt environment on firm performance and resource allocation.

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 policy that may have affected our findings or account for changes in performance in industries more exposed to corruption as well as for cross-sectional differences in performance between large and small firms.

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

2.1 Firm Performance

We exploit the 2012 anti-corruption campaign as a plausibly exogenous and unexpected shock to the extent and effectiveness of corruption. While the campaign constitutes an economy-wide shock, we expect the shock to have affected to a larger extent firms in ex ante more corrupt industries. Hence, we isolate the effect of the anti-corruption campaign on firm behavior and allocational efficiency by studying differential changes across industries, based upon the degree of corruption in different industries prior to the campaign. This approach is similar to the one followed by Bertrand, Schoar and Mullainathan (2007), who evaluate the effects of bank deregulation in France, by studying differential post-reform changes across sectors, based upon the degree to which different sectors relied on bank finance prior to the reform.

Since the anti-corruption campaign should have increased the cost of corruption, we expect that any externalities of corruption on firm performance should have decreased after 2012, when the campaign started. Empirically, if corruption indeed cause negative externalities, we should observe that the negative shock to corruption is associated with a positive effect on firm performance especially in industries ex ante more exposed to corruption. If instead corruption were oil in the wheels, we would expect a deterioration in firm performance in these industries following the start of the anti-corruption campaign. We thus exploit predetermined variation in the expected intensity of the treatment (the anti-corruption campaign) to investigate the negative externalities of corruption using a difference-in-difference methodology.

Our main proxy for an industry's exposure to corruption is the level of entertainment expenses in the industry. 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. In the Chinese context, donations and other investments favoring the careers of local politicians may play a similar role. The larger the entertainment expenses that a company could afford, often based on its sheer size, the stronger the personal ties that it could establish with government officials and more significant the privileges it could obtain in terms of access to government services, financing, and contractual relationships before the anti-corruption campaign. Therefore, our main measure for an industry's corruption is the average entertainment expenses to sales ratio in the industry.

To ensure that entertainment expenses do not depend on industry shocks, which may affect firm performance, we compute our proxy during 2006-2008, a period antecedent to our estimation sample. We refer to this variable as $\overline{EE}_{i,0}(Industry)$. We restrict our estimation sample to 2010-2014, two years before and two years after the start of the anti-corruption campaign.

Most of our tests explore how various measures of firm performance vary following the 2012 anti-corruption campaign for firms in industry i, depending on an industry's ex ante level of corruption. We rely on the following model:

$$y_{f,i,p,t} = \alpha_1 + \alpha_2 \overline{EE}_{i,0}(Industry) \times Anti\text{-}corruption_t + \boldsymbol{\gamma X_{f,t-1}} + \delta_f + \vartheta_{p,t} + \varepsilon_{f,i,p,t},$$

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; $Anti\text{-}corruption_t$ is a dummy variable that takes value one for 2013 and 2014 and zero during 2010-2012, the years preceding the anti-corruption campaign.

Throughout the analysis, as suggested by Bertrand, Duflo and Mullainathan (2004), we bootstrap standard errors to allow for within-industry correlation of the observations using 1,000 iterations for each model. In this way, we take into account that our variable of interest $\overline{EE}_{i,0}(Industry) \times Anti\text{-}corruption_t$ does not vary across firms within an industry following the anti-corruption campaign.

We control for firm f's own entertainment expenses to sales ratio, $EE_{f,i,p,t-1}$. We also control for a vector of time-varying firm characteristics, $\boldsymbol{X_{f,t-1}}$, firm fixed effects (δ_f), and time fixed effects, which, depending on the specifications, we allow to vary across provinces ($\vartheta_{p,t}$).

Since our results are robust to the inclusion of interactions of province and time fixed effects, a negative effect of $\overline{EE}_{i,0}(Industry)$ (henceforth, *EE_0(Industry)* to simplify notation) cannot be interpreted to spuriously depend on provincial shocks. The firm fixed effects (δ_f) absorb any time-invariant firm characteristics as well as the effect of ex ante entertainment expenses in the industry (*EE_0(Industry)*). Thus, our specifications identify only the differential response to the anti-corruption campaign of firms that face different levels of corruption in their industry.

We expect $\alpha_2 > 0$ if the anti-corruption campaign limits the negative spillovers of corruption. On the contrary, $\alpha_2 \leq 0$ if corruption helps to overcome frictions and bureaucracy and does not affect negatively the allocation of resources and how efficiently firms are run.

In addition, we test whether the anti-corruption campaign had differential effects on firms with different characteristics. In particular, since large firms, thanks to their sheer size, could easily outspend small firms, we expect corruption to hamper the performance of small firms in comparison to that of their larger peers. If this were the case, the anti-corruption campaign should benefit small entrepreneurial firms in ex ante more corrupt industries to a larger extent. To test this conjecture, we augment our baseline regression framework as follows:

$$y_{f,i,p,t} = \alpha_1 + \alpha_2 \overline{EE}_{i,0}(Industry) \times Anti\text{-}corruption_t + \alpha_3 \overline{EE}_{i,0}(Industry) \times Anti\text{-}corruption_t \times Size_{f,i,p,t} + \boldsymbol{\gamma X_{f,t-1}} + \delta_f + \vartheta_{p,t} + \varepsilon_{f,i,p,t},$$

where $Size_{f,i,p,t}$ is the logarithm of the number of employees.

We expect $\alpha_3 < 0$ if small firms benefit to a larger extent from the anti-corruption campaign. Importantly, in these specifications, we are able to absorb industry shocks by including interactions of industry and year fixed effects. Given our focus on the differential effect of firm size, throughout the analysis, we allow the exposure to year shocks to change with firm size by including also interactions of each of the year dummies with the variable firm size in the regressions.

The interpretation of our results is subject to a number of identifying assumptions. A possible concern is that larger entertainment expenses in an industry are associated with other uncontrolled firm characteristics, which could be associated with an improvement in firm performance following the anti-corruption campaign. This could lead to a correlation between firm performance and *EE_0(Industry)* even in the absence of a negative spillover effect. To evaluate the merit of this interpretation, we perform a number of robustness checks controlling for the characteristics of firms in the same industry as firm f.

In addition, we consider the entertainment expenses of 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 negative externalities similar to large firms in the same industry. In these specifications, we can control for interaction of industry and year effects (even when we do not consider the differential effects of the anti-corruption campaign on firms of different size). Therefore, a negative effect of the entertainment expenses of 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.

Finally, our empirical framework surmises that 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 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, which we describe in Subsection 3.3, and show that our results are robust.

2.2 Allocational Efficiency

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. If, instead, 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.

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 $\overline{EE}_{i,0}(Industry)$ on both labor and capital allocation following the methodology of Bai, Carvalho and Phillips (2018). 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 $\overline{EE}_{i,0}(Industry)$ decreases this correlation. We further test whether the effect of $\overline{EE}_{i,0}(Industry)$ is muted after the start of the anti-corruption campaign.

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

$$\Delta l_{f,i,p,t} = \beta_1 MPL_{f,i,p,t-1} + \beta_2 MPL_{f,i,p,t-1} \times \overline{EE}_{i,0}(Industry) + \beta_3 MPL_{f,i,p,t-1} \times \overline{EE}_{i,0}(Industry) \times Anti\text{-}corruption_t + \boldsymbol{\gamma X_{f,t-1}} + \delta_f + \vartheta_{p,t} + \varepsilon_{f,i,p,t}.$$

$$\Delta k_{f,i,p,t} = \beta_1 MPK_{f,i,p,t-1} + \beta_2 MPK_{f,i,p,t-1} \times \overline{EE}_{i,0}(Industry) + \beta_3 MPK_{f,i,p,t-1} \times \overline{EE}_{i,0}(Industry) \times Anti\text{-}corruption_t + \boldsymbol{\gamma X_{f,t-1}} + \delta_f + \vartheta_{p,t} + \varepsilon_{f,i,p,t}.$$

As in the previous specifications, we control for a vector of firm time-varying characteristics, $\boldsymbol{X_{f,t-1}}$, which may affect performance, interactions of province and time fixed effects ($\vartheta_{p,t}$) as well as firm fixed effects (δ_f), which control 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 any negative effects 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. Firms have to provide detailed reports on their financial statements, tax status, operations, founding year, industry, and ownership characteristics. Survey answers are collected and subsequently verified by local tax authorities. Information is further verified using technical algorithms to minimize reporting errors. A special task force of the local tax authorities also audits survey respondents.

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: 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.[2]

Our sample period goes from 2006 to 2014 and includes a total of 2,507,569 firm-year observations (743,959 unique firms). We exclude firms in the financial industry, nonprofit organizations and social groups, and firms missing industry and location information (2,017 firm-year observations). The sample thus consists of 2,505,552 firm-year observations (743,603 unique firms) operating in 47 industries and located in 31 provinces, of which 2,204,683 firm-year observations (679,842 unique firms) refer to private firms. The sample thus provides comprehensive industry and geographical coverage.

While we use this comprehensive set of firms to compute $EE_0(Industry)$ over the period 2006-2008, in the estimation sample that goes from 2010 to 2014, we further lose 326,018 firm-year observations with missing values for the dependent and independent variables. The sample for the estimation period thus contains 1,125,293 firm-year observations (386,059 unique firms), 991,207 of which refer to private firms (348,809 unique firms). Panel A of Table 1 summarizes the firm characteristics for the period 2010-2014.

3.2 Measuring Corruption

An important item in the profit and loss accounts of Chinese firms is the entertainment expenses. Cai, Fang and Xu (2011) show using a survey that a more comprehensive account consisting of entertainment and travel expenses is highly correlated with the grease money firms

---

[2] 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.

spend to obtain political favors and to pay lower taxes. From the Selling, General and Administrative expenses (SG&A) of the income statements in the ATS database, we observe firms' entertainment expenses. Since travel expenses may include legitimate business travel, 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 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, we use tax returns information.

As explained before, we identify industries more exposed to corruption using the amount of entertainment expenses in the industry, $EE_0(Industry)$. To construct $EE_0(Industry)$, we first divide the entertainment expenses by the firm's sales and multiply it by 100. Dividing by sales helps avoiding that any differences in the size distribution or the number of firms affect our findings. We then identify industries more exposed to corruption by averaging the ratios of entertainment expenses to sales of firms in the top quartile of the assets distribution in an industry during a year over the 2006-2008 period.[3]

We consider the largest firms in an industry for computing an industry's exposure to corruption because the ratio of entertainment expenses to sales of large firms is larger and the dollar amount of their aggregate entertainment expenses is several times the entertainment expenses of other firms in the sample. Thus, ultimately, the behavior of the largest firms in the industry should be what matters for making the industry more or less corrupt and for tilting the

[3] The ratio of entertainment expenses to sales is highly persistent 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).

level playing field in favor of a few players. However, the results we present hereafter are not sensitive to the specific sample we use to calculate $EE_0(Industry)$.[4]

Panel B of Table 1 validates the level of entertainment expenses of a firm as a proxy for corruption and ability to obtain political favors. Consistent with our conjecture, a firm's profitability in comparison to other firms in the industry is positively associated with the value of the entertainment expenses during the 2006-2008 period. Firms that spend more on entertainment expenses also seem to have more financial debt, suggesting easier access to financial loans, and more government subsidies. This evidence confirms the findings of previous literature and validates the use of entertainment expenses as a proxy for the extent of corruption in our sample. The findings also support our conjecture that higher entertainment expenses by some firms in an industry tilt the level playing field in favor of these firms. It is therefore legitimate to ask to what extent higher entertainment expenses in an industry may have negative externalities on the allocation of resources and firm performance.

In what follows, to evaluate the robustness of our results, we also use an alternative proxy for corruption based on political connections. In particular, we use the proportion of politically connected firms in an industry, defined as the proportion of listed companies in an industry with directors that were previous government officials.

Panel C compares some salient characteristics of firms in high and low entertainment expenses industries during the 2006-2008 period. Although statistically significant, differences between variables do not appear economically significant. Our econometric methodology and the extensive range of fixed effects we include in all specifications further control for observed and unobserved differences between firms.

[4] We control for the percentage of entertainment expenses over sales of each firm in all specifications.

3.3 The Anti-corruption Campaign and Provincial Level Enforcement

While the inspections spurred by the anti-corruption campaign occurred at different times 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.

Such an intuition is confirmed by the behavior of the entertainment expenses. For the firms in our sample, the average ratio of entertainment expenses with respect to sales went from nearly 0.60% in 2012 and previous years to 0.50% in 2013 and to 0.42% in 2014. This suggests that firms across China changed their way of doing business, making it relevant to ask how this affected firm performance and the way in which resources are allocated.

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 check whether the executives of the SOEs in our sample are subject to corruption investigations 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 “Convicted Officials” index, defined as the natural logarithm of one plus the number of individuals investigated for corruption in a province during the year in 2013, and the natural logarithm of one plus the number of individuals investigated for corruption in a 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 2 explores how the anti-corruption campaign affected the performance of firms in industries with ex ante more corruption. The campaign should have increased the cost of conceding political favors for officials, thus decreasing the effectiveness of corruption and political connections. If corruption led to more efficient outcomes, firm performance should deteriorate. Quite to the contrary, if corruption were to create negative externalities, we should expect that the performance of firms in industries with ex ante higher entertainment expenditures improves following the anti-corruption campaign.

The results in Table 2 provide evidence in favor of negative externalities of corruption. Columns 1 and 2 of Panel A show that profitability increases, on average, following the anti-corruption campaign for firms in industries that were ex ante more exposed to corruption. The effect is both statistically and economically significant. For instance, in column 2, following the start of the anti-corruption campaign, a one-standard-deviation increase in $EE_0(Industry)$ is associated with a 0.1 percentage points increase in firm f's profitability, which is equivalent to an 8% increase in profitability for the median firm. Importantly, the effect is robust to the inclusion of firm and year fixed effects as well as to the interaction of province and year fixed effects, indicating that we are not capturing shocks associated with firms' local economic environment. We also interact the year dummies with firm size, making unlikely that differential shocks affecting firms of different size may affect our findings.

The rest of Panel A explores how the gains in profitability are distributed within an industry. High corruption may disadvantage small firms that are unable to spend as much as large firms in the attempt of obtaining the favors of politicians. If the externalities of corruption at least partially derive from tilting the level playing field in favor of large incumbents, we should observe that the improvement in profitability is more pronounced for small firms. This is precisely what we find in columns 3 to 5. The result is robust to the inclusions of province times year fixed effects and of industry times year fixed effects, indicating that neither province-specific nor industry-specific shocks drive our findings. In column 4, the anti-corruption campaign appears to have a positive effect for firms up to 330 employees; the profitability of larger firms in industries ex ante more exposed to corruption decreases following the anti-corruption campaign.

In column 5, we include interactions of industry and year fixed effects, which control non-parametrically for any industry shocks, but also absorb the effect of *EE_0(Industry)* × *Anti-corruption*. We continue to find that small firms in more corrupt industries benefit more from the anti-corruption campaign, which is consistent with the negative spillover of corruption being more severe for small firms.[5]

Panel B 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 for each industry and year, using the Levinsohn and Petrin (2003) model. Once again, our results are consistent with corruption creating negative externalities and reducing efficiency. In fact, we find that firm TFP increases in industries more exposed to corruption following the anti-corruption campaign. For instance, in column 2, a one-standard-deviation increase in *EE_0(Industry)* is associated with an increase in TFP of 1.35 percentage points, which is equivalent to almost 2% of the TFP's standard deviation (Panel A of Table 1).

[5] All results in Table 2 are invariant if we consider only firms that entered before the start of the anti-corruption campaign in 2012.

Also, in this case, we observe a negative and significant coefficient for *EE_0(Industry)* × *Anti-corruption* × *Size*. However, the relative magnitude of the coefficients of *EE_0(Industry)* × *Anti-corruption* × *Size* and *EE_0(Industry)* × *Anti-corruption* is such that all firms benefit, even though the TFP of large firms improves to a lower extent.

Overall, these results suggest that any negative spillovers associated with large firms' corruption efforts become smaller after the start of the anti-corruption campaign. To the extent that the campaign decreased the effectiveness of corruption, this suggests that corruption affects negatively firm performance.

4.2 Alternative Measures of Corruption

We perform a number of tests to probe that our results do not depend on the specific measure of ex ante exposure to corruption that we use. In Table 3, we show that our results are robust when we use alternative measures of ex ante exposure to corruption. In columns 1 and 2 of Panel A and B, instead of entertainment expenses, we use the fraction of politically connected directors of privately-owned listed companies in an industry, computed as an average over the 2006-2008 period. Following Fan, Wong and Zhang (2007) and Calomiris, Fisman and Wang (2010), we define directors that were previously employed as bureaucrats by the central government or local governments as politically connected. This variable also aims to capture how far from a level-playing field the environment in an industry is. It is therefore comforting that firms' profitability and TFP appear to improve in industries with ex ante more corruption following the start of the anti-corruption campaign. Also, consistent with our earlier results, the improvements are larger for relatively small firms.

In columns 3 and 4, we identify the reaction to the anti-corruption campaign of firms ex ante more exposed to corruption, while controlling non-parametrically for industry level omitted factors (even in the specifications in which we do not consider the differential effects on firms of different size). 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, in columns 5 and 6, we consider 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. Also in this case the improvements in profitability and TFP appear to accrue disproportionately to small firms. The estimates in column 5 of Panel A indicate that the profitability of firms with up to 90 employees improves, while the TFP of all firms increases (the coefficients in column 5 of Panel B suggest that the TFP of companies with up to 8,103 employees improve).

4.3 Corrupting Firms

One may wonder whether the anti-corruption campaign benefits all firms, or if instead firms with ex ante larger entertainment expenses, which presumably had been successful in obtaining political favors, lose once their ability of corrupting officials is curtailed.

In Table 4, we test whether firms better poised to gain from a corrupt environment lose from the anti-corruption campaign. We proxy for a firm's ability to tilt the level playing field in its favor by using the average of logarithm of the firm's entertainment expenses during the 2006-2008 period. We interact this variable with the anti-corruption dummy and with *EE_0(Industry)* × *Anti-corruption* to evaluate whether the anti-corruption campaign had a differential effect on the performance of firms with ex ante higher entertainment expenses and how the effect varies between industries with ex ante different exposure to corruption.

In columns 1 to 3, we find no differential effect on firm profitability, suggesting that all firms in ex ante more corrupt industries, even those that spent more to tilt the level playing field in their favor, benefit from a reduction in corruption. In columns 4 to 6, following the start of the anti-corruption campaign, the TFP of firms that spent more on entertainment expenses decreases or does not increase to the same extent as for firms that did not spend as much on entertainment expenses. However, the TFP of firms with ex ante higher entertainment expenses decreases to a lesser extent in the most corrupt industries. This is intuitive as spending on entertainment expenses is less effective when many other firms do so. Thus, the negative shock to corruption would be expected to have a smaller impact.

Overall, it does not appear that even the firms better poised to benefit from corruption lose much from the anti-corruption campaign. Even if following the campaign, the TFP of firms that were engaging to a larger extent in corruption decreases relative to other firms, these effects are dampened for firms in ex ante more corrupt industries. In addition, profitability appears to improve for all firms, especially in the industries that spent more in entertainment expense before the campaign.

4.4 Possible Alternative Interpretations

The ability to control for different sets of fixed effects, including interactions of industry and year fixed effects, allows us to exclude a wide-range of alternative explanations related to industry and province specific-shocks. A possible relevant concern is that *EE_0(Industry)* captures industries characteristics other than the entertainment expenses, which affect firms' response to the anti-corruption campaign.

For instance, *EE_0(Industry)* may be correlated with the proportion of SOEs in an industry. Central and provincial governments typically convey lots of resources to SOEs in China. The presence of SOEs may confound the interpretation of our findings if the preferential treatment of SOEs decreased after the anti-corruption campaign. For this reason, we include controls for the proportion of assets of SOEs in an industry and an interaction between this variable and the anti-corruption dummy. Table 5 shows that our results are invariant after the inclusion of this control. The sign of the estimated coefficient continues to indicate that small firms in ex ante corrupt industries experience larger improvement in profitability and TFP after the start of the anti-corruption campaign.

More importantly, the anti-corruption campaign appears to affect negatively industries with more SOEs, suggesting that *EE_0(Industry)* does not capture the proportion of SOEs. Interestingly, after the start of the campaign, large firms perform poorly in industries with many SOEs, suggesting that private large firms' ability to compete with SOEs may have been impaired by the increased difficulties in buying political favors.

We also consider that the differential reaction to the campaign may depend on other industry characteristics, which may be potentially correlated with *EE_0(Industry).* In Table 6, we control for the average size and leverage of firms in an industry during the 2006-2008 period. Including these additional interaction terms leaves our results unchanged.

Table 7 provides more general evidence that industries with different levels of $EE_0(Industry)$ did not start experiencing improvements in performance already before the anti-corruption campaign. To evaluate this possibility, we define a pre-anti-corruption campaign dummy, which takes value equal to one in 2011, one year before the reform. We find that, if anything, firms in industries with higher $EE_0(Industry)$, and in particular small firms in these industries, had worse performance in the year prior to the launch of the 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.

4.5 Mechanisms

The results so far indicate that corruption has negative spillovers on the performance of all firms and particularly small firms. To provide evidence on the mechanisms that drive our findings, we explore how corruption in an industry affects firms' ability to expand their sales and access to external finance.

Firms may find it optimal to obtain favors from politicians if they wish to grow. In this case, corruption may help them to gain government contracts, to tilt regulations in their favor, to avoid fines, and obtain government services or land. Therefore, if corruption were to be oil in the wheels, we should observe that corruption is associated with slower firm growth in industries with ex ante higher entertainment expenses.

Panel A of Table 8 investigates the effect of the anti-corruption campaign on firms' sales growth. It provides evidence that corruption is sands in the wheels. Sales growth increases on average after the anti-corruption campaign, but it increases to a lower extent for large firms (even though the estimate of the triple interaction term in column 5 is not statistically significant at conventional levels). The estimates in column 4 imply that sales growth decreases for firms with more than 940 employees.

Overall, corruption may slow down firms' ability to expand their markets because it acts as a tax on their profits (thus decreasing profitability, as we show), and because it drives demand towards connected firms at least in industries that are suppliers to the government.

Firm growth also depends on access to external finance. 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, other firms may have difficult access to external finance.

Panel B shows that following the start of the anti-corruption campaign, firms in ex ante more corrupt industries are more likely to secure financial debt. Perhaps not surprisingly, given that our sample includes very small firms, only relatively larger firms (with more than 57 employees in column 3) are able to use financial debt following the campaign.

Small firms, however, also benefit as shown in Panel C of Table 8, which explores the effect of corruption on firms' cost of debt, calculated as interest expenses scaled by total liabilities. Following the anti-corruption campaign, the cost of debt decreases for firms that are ex ante more exposed to corruption. The decrease is more pronounced for small firms, which faced a relatively higher cost of debt before the campaign. This suggests that small firms with access to financial debt are able to increase their internal cash flows for investment by decreasing their financial expenses.

5. The Aggregate Effects of Corruption on the Economy

So far, we have shown that following the anti-corruption campaign, performance improves especially for small firms. However, this does not necessarily imply that corruption is inefficient from an aggregate point of view. Corruption may be welfare-enhancing 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 are not expected to have any lasting impact on the economy.

Below, we evaluate these channels to be able to infer whether corruption harms economic performance.

5.1 Corruption and Resource Allocation

A recent influential paper by Hsieh and Klenow (2009) highlights that low total factor productivity in emerging economies can be largely 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 (2018). 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 9 shows how corruption, measured as the entertainment expenses of large industry peers during the 2006-2008 period, 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 logarithmic change in a 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.

As one would expect, columns 1 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 of Panels A and B). Thus, corruption appears to significantly slow down the allocation of resources to the most productive firms in an industry. A one-standard-deviation increase in $EE_0(Industry)$ (equivalent to 0.214) is associated with a 13% (=0.214×0.409/0.659) drop in the speed of labor reallocation and a 5.6% (=0.214×0.145/0.554) drop in the speed of capital reallocation.

While corruption continues to hamper the reallocation of resources, following the launch of the anti-corruption campaign (columns 3 of Panels A and B), the correlation between the marginal productivity of labor (capital) and the growth of labor (capital) shares increases for firms in ex ante more corrupt industries, suggesting that a decrease in corruption improves allocational efficiency.

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

5.2 Corruption and Industry Structure

In this section, we explore how corruption affects industry structure. To address this question, we start considering 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 in that industry and province.

Considering differences between industries and provinces allows 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 industries are younger. We absorb this variation by including industry fixed effects and interactions of province and year fixed effects.

Panel A of Table 10 shows that following the start of the anti-corruption campaign, the proportion of young firms in a province and an industry increases if the industry in that province was ex ante relatively corrupt (columns 1 and 2). *EE_0(Industry × Province)* appears to be negatively associated with firm entry in column 2 before the start of the campaign.

More importantly, columns 3 and 4 show that the proportion of high quality young firms, defined as firms with TFP in the top quartile, increases in ex ante more corrupt industries and provinces, following the start of the anti-corruption campaign. The effects are not only statistically, but also economically significant. For instance, in column 2 (4), the entry of new (new high-quality) firms is on average 14% (2%), and a one-standard-deviation increase in *EE_0(Industry × Province)* is associated to a 0.88 (0.2) percentage points increase in the entry of new (new high-quality) firms following the campaign.[6]

These results, together with the findings that corruption decreases allocational efficiency in Table 9, suggest that corruption hampers economic performance. The net formation of new firms is lower in higher corruption industries as fewer firms enter and more exit.

Panel B of Table 10 explores the effect of the anti-corruption campaign on industry concentration. Columns 1 and 2 consider an industry Herfindahl index during a year, based on sales and assets, respectively, while columns 3 and 4 present the proportion of sales and assets of the top 5 firms in an industry. Consistently with the higher entry and survival of young firms following the campaign, industry concentration appears to decrease in industries ex ante more exposed to corruption. In column 4, a one-standard-deviation increase in *EE_0(Industry)* of 0.286 is associated in a decrease in the assets of the largest five firms in an industry of 0.3 percentage points, a large effect considering that the average percentage of assets held by the top five firms in an industry is about 6%.

---

[6] The economic effect of 0.88 percentage is computed using the coefficients in column 2 as (0.042-0.017)×0.352. Similarly, the economic effect of 0.2 percentage points is computed from the coefficients in column 4 as (0.015-0.009)×0.352.

Overall, these results indicate that corruption may limit competition with further negative effects on the economy. These findings also explain why large firms in ex ante more corrupt industries become less profitable following the start of the anti-corruption campaign. By preventing the entry of new firms, corruption limits competition and allows large incumbents to enjoy monopoly rents.

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 ex ante high corruption, firms become more profitable and productive after the start of the anti-corruption campaign. We also identify the channels through which corruption has negative spillovers on the economy.

A high level of corruption in an industry prevents labor and capital from being allocated to the most productive firms and deters the entry and survival of high quality new firms. Moreover, in industries with high corruption, small firms have higher financing costs, lower productivity and ultimately lower profitability compared to their large peers.

Overall, our results provide evidence that corruption constitutes sands in the wheels for an economy and that corruption is detrimental to growth. Therefore, interventions aiming to curb corruption, such as the anti-corruption campaign in China, 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.

Avis, E., C. Ferraz, and F. Finan (2018). Do Government Audits Reduce Corruption? Estimating the Impacts of Exposing Corrupt Politicians. *Journal of Political Economy*, forthcoming

Bai, J., D. R. Carvalho, and G. M. Phillips (2018). The Impact of Bank Credit on Labor Reallocation and Aggregate Industry Productivity. *Journal of Finance*, forthcoming.

Bertrand, M., E. Duflo, and S. Mullainathan (2004). How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics* 119, 249–275.

Bertrand, M., A. Schoar, and D. Thesmar (2007). Banking Deregulation and Industry Structure: Evidence from the French Banking Reforms of 1985. *Journal of Finance* 61, 597–628.

Borisov, A., E. Goldman, and N. Gupta (2016). The Corporate Value of (Corrupt) Lobbying. *Review of Financial Studies* 29, 1039–1071.

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.

Colonnelli, E., and M. Prem (2017). Corruption and Firms. Working Paper, Stanford University.

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.

Griffin, J. M., C. Liu, and T. Shu (2016). Is the Chinese Anti-Corruption Campaign Effective?. Working Paper, 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.

Lagaras, S., J. Ponticelli, and M. Tsoutsoura (2017). Caught with the Hand in the Cookie Jar: Firm Growth and Labor Reallocation after Exposure of Corrupt Practices. Working Paper, Cornell University.

Leff, N. (1964). Economic Development through Bureaucratic Corruption. *American Behavioral Scientist* 8, 8-14.

Levinsohn, J. and A. Petrin (2003). Estimating Production Functions Using Inputs to Control for Unobservables. *Review of Economic Studies* 73, 317–342.

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: Variable Definitions

Variable	Definition and Data Source
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.
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. Winsorized at the 1% and 99% levels. Source: ATS Database.
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. Winsorized at the 1% and 99% levels. Source: Manual Collection.
EE	A firm's business entertainment expenses divided by sales, multiplied by 100. Winsorized at the 1% and 99% levels. Source: ATS Database.
EE_0(Industry)	The average EE of large firms in an industry during 2006-2008. Winsorized at the 1% and 99% levels. A firm's EE is computed as its total business entertainment expenses scaled by sales, multiplied by 100. A firm is considered large if its total assets are in the top quartile of the sample in a given year. Source: ATS Database.
EE_0(Province)	The average of the EEs of large firms in a province during 2006-2008. Winsorized at the 1% and 99% levels. A firm's EE is computed as its total business entertainment expenses scaled by sales, multiplied by 100. A firm is considered large if its total assets are in the top quartile of the sample in a given 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.
Leverage	Total liabilities divided by total assets, measured at the beginning of the year. Winsorized at the 1% and 99% levels.

	Source: ATS Database.
$Leverage_0$(Industry)	The average leverage ratios of firms in an industry during 2006-2008. Winsorized at the 1% and 99% levels. Source: ATS Database.
Log(ee)	Natural logarithm of a firm's annual entertainment expenses. Source: ATS Database.
Log(ee_0)	The average of natural logarithm of a firm's annual entertainment expenses plus 0.001 during 2006-2008, divided by 100. 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_0(Industry)	The average fraction of politically connected directors of non-SOE listed firms in an industry during 2006-2008. Winsorized at the 1% and 99% levels. A director is considered politically connected if he or she was previously employed as a bureaucrat by the central government or a local government. Source: Manual Collection.
ROA	Net income divided by total assets. Winsorized at the 1% and 99% levels. Source: ATS Database.
Sales Growth	The difference between the natural logarithm of a firm's sales between year t and year $t-1$. Trimmed at the 1% and 99% levels. Source: ATS Database.
Size	Natural logarithm of the number of employees. Winsorized at the 1% and 99% levels. Source: ATS Database.
$Size_0$(Industry)	Natural logarithm of the average number of employees of firms in an industry during 2006-2008. Winsorized at the 1% and 99% levels. Source: ATS Database.
SOE_0(Industry)	Assets of listed SOEs as a fraction of the assets of all the firms in an industry during 2006-2008. Winsorized at the 1% and 99% levels. Source: ATS Database.
SOE	A dummy variable equal to one if a firm is government controlled or owned, and zero otherwise. Source: ATS Database.
TFP	Levinsohn-Petrin estimate of total factor productivity. Censored at the 1% and 99% levels. Source: ATS Database.

Table 1: Descriptive Statistics

The sample period for Panel A is the estimation period of 2010-2014, and for Panels B and C is the pre-estimation period of 2006-2008. The unit of observations is the firm-year. Panel A summarizes the main firm characteristics for the estimation sample. In Panel B, we regress firm ROA, TFP, the logarithm of total debt and government tax subsidies on "Log(ee)", defined as the logarithm of a firm's entertainment expenses. Panel C compares some salient characteristics of firms with "EE_0(Industry)" above and below the median. T-statistics comparing the differences in mean values between the two subsamples are in the last column. All the regression 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: Summary Statistics

	# of obs.	Mean	Median	Std. Dev.
ROA	1,125,293	0.03	0.013	0.1
TFP	1,030,063	6.202	6.131	0.744
Sales Growth	1,102,787	0.053	0.062	0.416
Interest Rate	1,109,302	0.009	0.01	0.037
EE	823,300	0.54	0.25	0.937
EE_0(Industry)	1,125,293	0.515	0.429	0.214
Assets (million RMB)	1,125,293	381.613	84.105	973.467
Employee	1,125,293	285.198	110	531.451
Leverage	1,125,289	0.651	0.676	0.33
Age (years)	1,125,293	13.33	11	8.852
SOE	1,125,293	0.119	0	0.324
Capital Reallocation	1,105,051	-0.014	-0.077	0.623
Labor Reallocation	1,092,916	-0.227	-0.013	1.366
MPK	1,112,325	2.404	2	2.163
MPL	1,125,284	6.728	6.495	1.5

Continued Table 1: Descriptive Statistics

Panel B: Firm Level Entertainment Expenses and Performance

	ROA	TFP	Log(Debt)	Government Subsidies/Sales
	(1)	(2)	(3)	(4)
Log(ee)	0.007***	0.212***	0.483***	0.032***
	(70.43)	(235.10)	(303.77)	(18.56)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	638,847	578,328	635,430	639,097
R-squared	0.040	0.304	0.312	0.036

Panel C: Firms in Industries with High and Low Entertainment Expenses

	Low EE_0(Industry)			High EE_0(Industry)			T-Statistics
	# of obs.	Mean	Median	# of obs.	Mean	Median	
ROA	374,862	0.017	0.005	347,487	0.028	0.009	-46.788***
TFP	335,656	6.457	6.373	313,056	6.138	6.052	142.756***
Sales Growth	251,123	0.07	0.08	227,093	0.088	0.092	-15.035***
Interest Rate	371,851	0.006	0.006	344,844	0.016	0.011	-92.498***
EE	329,639	0.439	0.239	308,916	0.728	0.386	-115.452***
EE_0(Industry)	375,037	0.367	0.381	347,696	0.661	0.603	-826.184***
Assets (million RMB)	375,037	122.683	27.698	347,696	197.612	45.243	-76.587***
Employee	374,793	224.788	82	347,255	288.929	115	-57.050***
Leverage	374,875	0.679	0.706	347,493	0.629	0.647	68.184***
Age (years)	375,037	10.117	8	347,696	12.041	9	-90.076***
SOE	375,037	0.105	0	347,696	0.185	0	-97.738***
Capital Reallocation	249,588	-0.001	-0.068	229,404	0	-0.057	-0.669
Labor Reallocation	254,737	-0.022	-0.011	232,524	-0.016	0.003	-3.562***
MPK	365,299	2.62	2.174	342,076	1.653	1.444	206.504***
MPL	374,793	6.4	6.21	347,255	5.811	5.641	177.757***

Table 2: The Anti-Corruption Campaign and Firm Performance

This table relates the anti-corruption campaign to firm performance. The unit of observation is the firm-year. The dependent variable is the firm's ROA in Panel A and the firm's total factor productivity (TFP) in Panel B. The estimation sample is 2010-2014. "EE_0(Industry)" is measured during 2006-2008. "Size" is the natural logarithm of number of employees. Control variables are measured at year $t-1$. All variables are defined in the Appendix. T-statistics computed with bootstrapped standard errors 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.

Panel A: Profitability

	(1)	(2)	(3)	(4)	(5)
EE_0(Industry) × Anti-corruption	0.003***	0.005***	0.030***	0.029***	
	(3.47)	(4.98)	(8.69)	(8.34)	
EE_0(Industry) × Anti-corruption × Size			-0.006***	-0.005***	-0.003***
			(-8.26)	(-7.48)	(-3.35)
EE_0(Industry) × Size			0.002	0.001	-0.000
			(1.25)	(0.93)	(-0.03)
Log(Assets)	-0.003***	-0.003***	-0.003***	-0.003***	-0.002***
	(-7.50)	(-7.34)	(-7.38)	(-7.25)	(-6.03)
Leverage	0.019***	0.019***	0.019***	0.019***	0.019***
	(26.36)	(26.05)	(26.46)	(26.13)	(26.66)
Age	-0.008***	-0.008***	-0.008***	-0.008***	-0.006***
	(-9.01)	(-9.33)	(-9.12)	(-9.43)	(-6.93)
SOE	-0.003***	-0.002***	-0.003***	-0.002***	-0.002**
	(-2.75)	(-2.65)	(-2.73)	(-2.63)	(-2.52)
EE	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-7.44)	(-7.30)	(-7.49)	(-7.35)	(-7.01)
Observations	1,009,569	1,009,569	1,009,569	1,009,569	1,009,569
R-squared	0.656	0.657	0.656	0.657	0.661
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO
Size × Year FE	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES
Industry × Year FE	NO	NO	NO	NO	YES

Continued Table 2: The Anti-Corruption Campaign and Firm Performance

Panel B: TFP

	(1)	(2)	(3)	(4)	(5)
EE_0(Industry) × Anti-corruption	0.067***	0.063***	0.111***	0.099***	
	(15.56)	(14.59)	(5.72)	(5.09)	
EE_0(Industry) × Anti-corruption × Size			-0.010***	-0.008**	-0.017***
			(-2.69)	(-2.18)	(-4.57)
EE_0(Industry) × Size			-0.052***	-0.053***	-0.053***
			(-7.17)	(-7.33)	(-7.21)
Log(Assets)	0.099***	0.099***	0.099***	0.099***	0.101***
	(65.38)	(65.30)	(65.46)	(65.36)	(66.81)
Leverage	0.063***	0.063***	0.063***	0.063***	0.062***
	(24.33)	(24.33)	(24.45)	(24.44)	(24.25)
Age	-0.013***	-0.013***	-0.013***	-0.014***	0.004
	(-3.76)	(-3.97)	(-3.86)	(-4.05)	(1.23)
SOE	0.002	0.003	0.003	0.003	0.002
	(0.61)	(0.77)	(0.64)	(0.80)	(0.51)
EE	-0.009***	-0.009***	-0.009***	-0.009***	-0.008***
	(-11.65)	(-11.59)	(-11.66)	(-11.59)	(-10.52)
Observations	922,675	922,675	922,675	922,675	922,675
R-squared	0.906	0.907	0.906	0.907	0.908
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO
Size × Year FE	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES
Industry × Year FE	NO	NO	NO	NO	YES

Table 3: Alternative Measures of Corruption

This table considers various measures of corruption in an industry and their impact on firm performance. The unit of observation is the firm-year. The dependent variable is the firm's ROA in Panel A, and the firm's TFP in Panel B. In columns 1-2, "PC_0(Industry)" is the average fraction of politically connected board directors of privately controlled listed companies in a firm's industry between 2006 and 2008. A board director of a listed company is considered politically connected if he or she was previously employed as bureaucrat by the central government or a local government. In columns 3-4, we measure corruption using the EE of large firms in the same province as firm f. In columns 5-6, we measure the intensity on the anti-corruption campaign in the province of firm f with "Convicted Officials", computed as the natural logarithm of one plus the sum of ex-officials in a province investigated for corruption during the 2013-2014 period for year 2014; the natural logarithm of one plus the number of ex-officials in a province investigated for corruption in 2013 for year 2013; and set equal to zero before 2013. All control variables are measured at year $t-1$. All variables are defined in the Appendix. T-statistics computed with bootstrapped standard errors 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.

Panel A: ROA

	(1)	(2)	(3)	(4)	(5)	(6)
PC_0(Industry) × Anti-corruption	0.100***					
	(3.85)					
PC_0(Industry) × Anti-corruption × Size	-0.033***	-0.025***				
	(-7.08)	(-5.28)				
PC_0(Industry) × Size	0.036***	0.024**				
	(3.74)	(2.48)				
EE_0(Province) × Anti-corruption			0.047***			
			(6.01)			
EE_0(Province) × Anti-corruption × Size			-0.011***	-0.011***		
			(-6.96)	(-6.99)		
EE_0(Province) × Size			-0.010***	-0.010***		
			(-3.02)	(-3.01)		
EE_0(Industry) × Convicted Officials					0.009***	
					(8.13)	
EE_0(Industry) × Convicted Officials × Size					-0.002***	-0.001***
					(-7.64)	(-4.45)
EE_0(Industry) × Size					0.001	-0.000
					(0.70)	(-0.23)
Convicted Officials × Size					0.001***	0.001***
					(6.19)	(3.78)
Log(Assets)	-0.003***	-0.002***	-0.002***	-0.002***	-0.003***	-0.002***
	(-7.79)	(-6.49)	(-5.91)	(-6.07)	(-7.25)	(-6.03)
Leverage	0.019***	0.019***	0.019***	0.019***	0.019***	0.019***

	(26.38)	(26.86)	(27.01)	(26.63)	(26.11)	(26.67)
Age	-0.008***	-0.006***	-0.006***	-0.006***	-0.008***	-0.006***
	(-9.51)	(-7.01)	(-6.55)	(-6.94)	(-9.47)	(-6.93)
SOE	-0.003***	-0.003***	-0.002**	-0.002**	-0.002***	-0.002**
	(-2.84)	(-2.67)	(-2.53)	(-2.53)	(-2.63)	(-2.52)
EE	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-7.10)	(-6.93)	(-7.20)	(-7.00)	(-7.34)	(-7.01)
Observations	997,447	997,447	1,009,569	1,009,569	1,009,569	1,009,569
R-squared	0.656	0.660	0.660	0.661	0.657	0.661
Firm FE	YES	YES	YES	YES	YES	YES
Size × Year FE	YES	YES	YES	YES	YES	YES
Province × Year FE	YES	YES	NO	YES	YES	YES
Industry × Year FE	NO	YES	YES	YES	NO	YES

Continued Table 3: Alternative Measures of Corruption

Panel B: TFP

	(1)	(2)	(3)	(4)	(5)	(6)
PC_0(Industry) × Anti-corruption	0.492***					
	(4.51)					
PC_0(Industry) × Anti-corruption × Size	-0.139***	-0.091***				
	(-6.95)	(-4.56)				
PC_0(Industry) × Size	-0.003	-0.037				
	(-0.08)	(-0.89)				
EE_0(Province) × Anti-corruption			0.127***			
			(3.31)			
EE_0(Province) × Anti-corruption × Size			-0.022***	-0.024***		
			(-2.94)	(-3.14)		
EE_0(Province) × Size			-0.031*	-0.028*		
			(-1.89)	(-1.70)		
EE_0(Industry) × Convicted Officials					0.036***	
					(5.70)	
EE_0(Industry) × Convicted Officials × Size					-0.004***	-0.004***
					(-3.00)	(-4.70)
EE_0(Industry) × Size					-0.052***	-0.056***
					(-7.19)	(-7.84)
Convicted Officials × Size					0.002*	0.002**
					(1.74)	(1.97)
Log(Assets)	0.099***	0.101***	0.101***	0.101***	0.099***	0.101***
	(64.49)	(65.91)	(66.79)	(66.76)	(65.33)	(66.81)
Leverage	0.062***	0.062***	0.062***	0.062***	0.063***	0.062***
	(23.38)	(23.56)	(24.16)	(24.14)	(24.41)	(24.25)
Age	-0.014***	0.005	0.005	0.004	-0.014***	0.004
	(-3.98)	(1.41)	(1.62)	(1.29)	(-4.10)	(1.24)
SOE	0.001	0.000	0.002	0.002	0.003	0.002
	(0.29)	(0.05)	(0.38)	(0.47)	(0.79)	(0.51)
EE	-0.009***	-0.008***	-0.008***	-0.008***	-0.009***	-0.008***
	(-10.94)	(-9.85)	(-10.59)	(-10.54)	(-11.53)	(-10.52)
Observations	911,793	911,793	922,675	922,675	922,675	922,675
R-squared	0.907	0.908	0.908	0.908	0.907	0.908
Firm FE	YES	YES	YES	YES	YES	YES
Size × Year FE	YES	YES	YES	YES	YES	YES
Province × Year FE	YES	YES	NO	YES	YES	YES
Industry × Year FE	NO	YES	YES	YES	NO	YES

Table 4: Corrupting Firms and the Anti-Corruption Campaign

This table relates the anti-corruption campaign to firm performance distinguishing between firms with different levels of entertainment expenses before the start of the anti-corruption campaign ("Log(ee_0)"). The dependent variable is the firm's ROA in columns 1-3, and the firm's TFP in columns 4-6. We define "Log(ee_0)" as the average of a firm's logarithm of entertainment expenses plus 0.001 over the period of 2006-2008. The estimation sample is 2010-2014. "EE_0(Industry)" is measured during 2006-2008. "Size" is the natural logarithm of number of employees. Control variables are measured at year $t-1$. All variables are defined in the Appendix. T-statistics computed with bootstrapped standard errors 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.

Dependent Variable	ROA			TFP		
	(1)	(2)	(3)	(4)	(5)	(6)
Anti-corruption × Log(ee_0)	-0.001	0.001	-0.005	-0.269***	-0.269***	-0.237***
	(-0.14)	(0.09)	(-0.58)	(-7.40)	(-7.35)	(-6.37)
EE_0(Industry) × Anti-corruption × Log(ee_0)	-0.017	-0.017	-0.012	0.244***	0.245***	0.159**
	(-1.18)	(-1.14)	(-0.77)	(3.31)	(3.33)	(2.10)
EE_0(Industry) × Anti-corruption	0.004***	0.006***		0.048***	0.044***	
	(2.97)	(3.90)		(6.65)	(6.06)	
Log(Assets)	-0.003***	-0.003***	-0.002***	0.098***	0.098***	0.100***
	(-7.59)	(-7.41)	(-6.15)	(65.03)	(64.90)	(66.30)
Leverage	0.019***	0.019***	0.019***	0.063***	0.063***	0.062***
	(26.38)	(26.06)	(26.63)	(24.36)	(24.34)	(24.16)
Age	-0.008***	-0.008***	-0.006***	-0.020***	-0.020***	-0.003
	(-9.28)	(-9.46)	(-7.28)	(-5.64)	(-5.84)	(-0.98)
State	-0.003***	-0.002***	-0.002**	0.002	0.003	0.002
	(-2.75)	(-2.65)	(-2.53)	(0.62)	(0.77)	(0.47)
EE	-0.001***	-0.001***	-0.001***	-0.009***	-0.009***	-0.008***
	(-7.44)	(-7.30)	(-7.00)	(-11.64)	(-11.58)	(-10.52)
Observations	1,009,569	1,009,569	1,009,569	922,675	922,675	922,675
R-squared	0.656	0.657	0.661	0.906	0.907	0.908
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	NO	NO	YES	NO	NO
Size x Year FE	YES	YES	YES	YES	YES	YES
Province x Year FE	NO	YES	YES	NO	YES	YES
Industry x Year FE	NO	NO	YES	NO	NO	YES

Table 5: SOEs

In this table, we control for the fraction of assets of SOEs among firms in an industry ("SOE_0(Industry)") during 2006-2008, and its interaction with the anti-corruption dummy. The dependent variable is ROA in Panel A and TFP in Panel B. The unit of observation is the firm-year. Other control variables are measured at year $t-1$. All variables are defined in the Appendix. T-statistics computed with bootstrapped standard errors 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.

Panel A: ROA

	(1)	(2)	(3)	(4)	(5)	(6)
EE_0(Industry) × Anti-corruption	0.006***	0.007***	0.026***	0.026***	0.025***	
	(6.66)	(7.22)	(7.62)	(7.58)	(7.06)	
EE_0(Industry) × Anti-corruption × Size			-0.004***	-0.004***	-0.004***	-0.002*
			(-6.18)	(-6.00)	(-5.11)	(-1.88)
EE_0(Industry) × Size			0.001	0.001	0.005***	0.005***
			(0.66)	(0.51)	(3.66)	(3.27)
Log(Assets)	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.002***
	(-7.36)	(-7.29)	(-7.29)	(-7.22)	(-7.55)	(-6.33)
Leverage	0.019***	0.019***	0.019***	0.019***	0.019***	0.019***
	(26.44)	(26.08)	(26.50)	(26.15)	(26.13)	(26.65)
Age	-0.008***	-0.008***	-0.008***	-0.008***	-0.008***	-0.006***
	(-9.17)	(-9.46)	(-9.24)	(-9.52)	(-9.56)	(-6.99)
SOE	-0.003***	-0.002***	-0.003***	-0.002***	-0.002***	-0.002**
	(-2.73)	(-2.64)	(-2.72)	(-2.63)	(-2.64)	(-2.54)
EE	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-7.53)	(-7.36)	(-7.56)	(-7.38)	(-7.40)	(-7.03)
SOE_0(Industry) × Anti-corruption	-0.010***	-0.008***	-0.009***	-0.006***	0.004	
	(-10.10)	(-7.84)	(-8.34)	(-6.20)	(0.98)	
SOE_0(Industry) × Anti-corruption × Size					-0.002***	-0.003***
					(-3.11)	(-3.38)
SOE_0(Industry) × Size					-0.014***	-0.016***
					(-9.07)	(-9.93)
Observations	1,009,569	1,009,569	1,009,569	1,009,569	1,009,569	1,009,569
R-squared	0.656	0.657	0.656	0.657	0.657	0.661
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO	NO
Size × Year FE	YES	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES	YES
Industry × Year FE	NO	NO	NO	NO	NO	YES

Continued Table 5: SOEs

Panel B: TFP

	(1)	(2)	(3)	(4)	(5)	(6)
EE_0(Industry) × Anti-corruption	0.066***	0.060***	0.112***	0.105***	0.096***	
	(13.74)	(12.23)	(5.86)	(5.48)	(4.73)	
EE_0(Industry) × Anti-corruption × Size			-0.010***	-0.010***	-0.007*	-0.017***
			(-2.86)	(-2.83)	(-1.89)	(-4.08)
EE_0(Industry) × Size			-0.052***	-0.052***	-0.028***	-0.023***
			(-7.14)	(-7.18)	(-3.45)	(-2.83)
Log(Assets)	0.099***	0.099***	0.099***	0.099***	0.098***	0.100***
	(65.38)	(65.28)	(65.45)	(65.34)	(65.03)	(66.54)
Leverage	0.063***	0.063***	0.063***	0.063***	0.063***	0.062***
	(24.34)	(24.33)	(24.45)	(24.44)	(24.48)	(24.28)
Age	-0.013***	-0.013***	-0.013***	-0.013***	-0.014***	0.004
	(-3.77)	(-3.93)	(-3.85)	(-4.01)	(-4.06)	(1.22)
SOE	0.002	0.003	0.003	0.003	0.003	0.002
	(0.61)	(0.77)	(0.64)	(0.80)	(0.79)	(0.49)
EE	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***	-0.008***
	(-11.65)	(-11.58)	(-11.65)	(-11.58)	(-11.58)	(-10.53)
SOE_0(Industry) × Anti-corruption	-0.001	0.011**	0.003	0.014***	0.078***	
	(-0.15)	(2.49)	(0.72)	(3.39)	(4.01)	
SOE_0(Industry) × Anti-corruption × Size					-0.014***	0.000
					(-3.81)	(0.09)
SOE_0(Industry) × Size					-0.074***	-0.092***
					(-9.48)	(-11.98)
Observations	922,675	922,675	922,675	922,675	922,675	922,675
R-squared	0.906	0.907	0.906	0.907	0.907	0.908
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO	NO
Size × Year FE	YES	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES	YES
Industry × Year FE	NO	NO	NO	NO	NO	YES

Table 6: Controlling for Other Industry Characteristics

In this table, we control for the average leverage of firms in an industry ("$Leverage_0$(Industry)") and the natural logarithm of the average number of employees of firms in an industry ("$Size_0$(Industry)") during 2006-2008, and their interactions with the anti-corruption dummy. The dependent variable is ROA in Panel A and TFP in Panel B. The unit of observation is the firm-year. Other control variables are measured at year $t-1$. All variables are defined in the Appendix. T-statistics computed with bootstrapped standard errors 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.

Panel A: ROA

	(1)	(2)	(3)	(4)	(5)	(6)
EE_0(Industry) × Anti-corruption	0.004***	0.005***	0.026***	0.025***	0.026***	
	(3.98)	(5.40)	(7.66)	(7.28)	(7.55)	
EE_0(Industry) × Anti-corruption × Size			-0.005***	-0.004***	-0.004***	-0.002***
			(-7.04)	(-6.23)	(-6.36)	(-2.78)
EE_0(Industry) × Size			0.001	0.001	0.002	0.000
			(0.92)	(0.59)	(1.31)	(0.32)
Log(Assets)	-0.003***	-0.003***	-0.003***	-0.003***	-0.003***	-0.002***
	(-7.56)	(-7.40)	(-7.46)	(-7.33)	(-7.32)	(-5.98)
Leverage	0.019***	0.019***	0.019***	0.019***	0.019***	0.019***
	(26.53)	(26.23)	(26.61)	(26.29)	(26.43)	(26.77)
Age	-0.008***	-0.008***	-0.008***	-0.008***	-0.008***	-0.006***
	(-9.28)	(-9.61)	(-9.37)	(-9.69)	(-9.74)	(-7.03)
SOE	-0.002***	-0.002**	-0.002***	-0.002**	-0.002**	-0.002**
	(-2.64)	(-2.54)	(-2.63)	(-2.53)	(-2.52)	(-2.51)
EE	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-7.52)	(-7.39)	(-7.56)	(-7.42)	(-7.35)	(-6.95)
$Size_0$(Industry) × Anti-corruption	-0.004***	-0.004***	-0.004***	-0.004***	0.004***	
	(-12.47)	(-12.87)	(-11.92)	(-12.35)	(3.52)	
$Leverage_0$(Industry) × Anti-corruption	0.001***	0.001***	0.001***	0.001***	0.001	
	(3.14)	(2.89)	(2.88)	(2.71)	(1.52)	
$Size_0$(Industry) × Anti-corruption × Size					-0.002***	-0.001***
					(-7.14)	(-4.21)
$Leverage_0$(Industry) × Anti-corruption × Size					-0.000	0.000
					(-0.72)	(0.40)
$Size_0$(Industry) × Size					0.005***	0.004***
					(10.63)	(8.76)
$Leverage_0$(Industry) × Size					0.001**	0.000
					(2.04)	(1.15)
Observations	1,009,569	1,009,569	1,009,569	1,009,569	1,009,569	1,009,569
R-squared	0.656	0.657	0.656	0.657	0.657	0.661

Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO	NO
Size × Year FE	YES	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES	YES
Industry × Year FE	NO	NO	NO	NO	NO	YES

Continued Table 6: Controlling for Other Industry Characteristics

Panel B: TFP

	(1)	(2)	(3)	(4)	(5)	(6)
EE_0(Industry) × Anti-corruption	0.067***	0.064***	0.127***	0.116***	0.144***	
	(15.38)	(14.55)	(6.65)	(6.08)	(7.48)	
EE_0(Industry) × Anti-corruption × Size			-0.013***	-0.012***	-0.016***	-0.016***
			(-3.64)	(-3.18)	(-4.29)	(-3.99)
EE_0(Industry) × Size			-0.051***	-0.052***	-0.057***	-0.060***
			(-7.06)	(-7.21)	(-7.63)	(-8.01)
Log(Assets)	0.099***	0.099***	0.099***	0.099***	0.098***	0.100***
	(65.50)	(65.42)	(65.59)	(65.50)	(65.29)	(66.71)
Leverage	0.063***	0.063***	0.063***	0.063***	0.063***	0.062***
	(24.24)	(24.22)	(24.35)	(24.33)	(24.34)	(24.25)
Age	-0.012***	-0.012***	-0.012***	-0.013***	-0.013***	0.003
	(-3.52)	(-3.70)	(-3.63)	(-3.80)	(-3.83)	(1.06)
SOE	0.002	0.003	0.002	0.003	0.003	0.002
	(0.54)	(0.70)	(0.57)	(0.73)	(0.75)	(0.54)
EE	-0.009***	-0.009***	-0.009***	-0.009***	-0.009***	-0.008***
	(-11.62)	(-11.55)	(-11.63)	(-11.56)	(-11.52)	(-10.51)
$Size_0$(Industry) × Anti-corruption	0.015***	0.016***	0.015***	0.016***	0.113***	
	(9.41)	(10.05)	(9.94)	(10.59)	(20.37)	
$Leverage_0$(Industry) × Anti-corruption	-0.000	0.000	-0.001	-0.000	0.015***	
	(-0.45)	(0.12)	(-0.79)	(-0.11)	(3.90)	
$Size_0$(Industry) × Anti-corruption × Size					-0.022***	-0.017***
					(-19.42)	(-14.49)
$Leverage_0$(Industry) × Anti-corruption × Size					-0.003***	-0.003***
					(-4.05)	(-3.56)
$Size_0$(Industry) × Size					0.004*	0.001
					(1.72)	(0.61)
$Leverage_0$(Industry) × Size					-0.003**	-0.004**
					(-1.97)	(-2.46)
Observations	922,675	922,675	922,675	922,675	922,675	922,675
R-squared	0.906	0.907	0.906	0.907	0.907	0.908
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO	NO
Size × Year FE	YES	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES	YES
Industry × Year FE	NO	NO	NO	NO	NO	YES

Table 7: Pre-existing Trends

This table tests for pre-existing trends. The dependent variable is the firm's ROA in Panel A, and TFP in Panel B. "Pre Anti-corruption" is a dummy variable equal to one for year 2011 and zero otherwise. All variables are defined in the Appendix. T-statistics computed with bootstrapped standard errors 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.

Panel A: ROA

	(1)	(2)	(3)	(4)	(5)
EE_0(Industry) × Anti-corruption	0.003***	0.005***	0.025***	0.025***	
	(3.42)	(4.97)	(6.99)	(6.84)	
EE_0(Industry) × Anti-corruption × Size			-0.005***	-0.004***	-0.003***
			(-6.42)	(-5.83)	(-3.03)
EE_0(Industry) × Size			0.001	0.000	-0.000
			(0.51)	(0.26)	(-0.12)
EE_0(Industry) × Pre Anti-corruption	0.001	0.001	-0.013***	-0.011***	
	(0.54)	(0.97)	(-3.45)	(-3.00)	
EE_0(Industry) × Pre Anti-corruption × Size			0.003***	0.003***	0.000
			(3.89)	(3.54)	(0.42)
Log(Assets)	-0.003***	-0.003***	-0.003***	-0.003***	-0.002***
	(-7.50)	(-7.34)	(-7.37)	(-7.24)	(-6.03)
Leverage	0.019***	0.019***	0.019***	0.019***	0.019***
	(26.36)	(26.05)	(26.47)	(26.14)	(26.66)
Age	-0.008***	-0.008***	-0.008***	-0.008***	-0.006***
	(-9.00)	(-9.32)	(-9.13)	(-9.43)	(-6.93)
SOE	-0.003***	-0.002***	-0.003***	-0.002***	-0.002**
	(-2.75)	(-2.65)	(-2.73)	(-2.63)	(-2.52)
EE	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(-7.44)	(-7.30)	(-7.49)	(-7.35)	(-7.01)
Observations	1,009,569	1,009,569	1,009,569	1,009,569	1,009,569
R-squared	0.656	0.657	0.656	0.657	0.661
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO
Size × Year FE	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES
Industry × Year FE	NO	NO	NO	NO	YES

Continued Table 7: Pre-existing Trends

Panel B: TFP

	(1)	(2)	(3)	(4)	(5)
EE_0(Industry) × Anti-corruption	0.055***	0.053***	0.099***	0.089***	
	(12.32)	(11.64)	(4.86)	(4.39)	
EE_0(Industry) × Anti-corruption × Size			-0.010**	-0.008**	-0.019***
			(-2.51)	(-2.10)	(-4.69)
EE_0(Industry) × Size			-0.052***	-0.053***	-0.051***
			(-7.12)	(-7.24)	(-6.94)
EE_0(Industry) × Pre Anti-corruption	-0.035***	-0.031***	-0.037*	-0.029	
	(-7.73)	(-6.64)	(-1.91)	(-1.52)	
EE_0(Industry) × Pre Anti-corruption × Size			0.000	-0.000	-0.005
			(0.13)	(-0.09)	(-1.27)
Log(Assets)	0.099***	0.099***	0.099***	0.099***	0.101***
	(65.35)	(65.26)	(65.43)	(65.33)	(66.81)
Leverage	0.063***	0.063***	0.063***	0.063***	0.062***
	(24.33)	(24.34)	(24.45)	(24.45)	(24.25)
Age	-0.013***	-0.013***	-0.013***	-0.014***	0.004
	(-3.78)	(-4.00)	(-3.88)	(-4.08)	(1.24)
SOE	0.003	0.003	0.003	0.003	0.002
	(0.64)	(0.79)	(0.67)	(0.83)	(0.51)
EE	-0.009***	-0.009***	-0.009***	-0.009***	-0.008***
	(-11.65)	(-11.59)	(-11.66)	(-11.59)	(-10.52)
Observations	922,675	922,675	922,675	922,675	922,675
R-squared	0.906	0.907	0.906	0.907	0.908
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO
Size × Year FE	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES
Industry × Year FE	NO	NO	NO	NO	YES

Table 8: Mechanisms

This table relates corruption to firms' sales growth in Panel A, a dummy capturing whether a firm makes use of formal financing (financial debt) in Panel B, and firms' financing costs in Panel C. The unit of observation is the firm-year. The estimation window is 2010-2014. "EE_0(Industry)" is measured during 2006-2008. "Size" is the natural logarithm of number of employees. Control variables are measured at year $t-1$. All variables are defined in the Appendix. T-statistics computed with bootstrapped standard errors 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.

Panel A: Sales Growth

	(1)	(2)	(3)	(4)	(5)
EE_0(Industry) × Anti-corruption	0.031***	0.032***	0.100***	0.089***	
	(6.02)	(6.09)	(4.47)	(4.00)	
EE_0(Industry) × Anti-corruption × Size			-0.016***	-0.013***	-0.006
			(-3.81)	(-3.24)	(-1.43)
EE_0(Industry) × Size			-0.062***	-0.062***	-0.063***
			(-8.66)	(-8.55)	(-8.64)
Log(Assets)	-0.097***	-0.095***	-0.097***	-0.095***	-0.092***
	(-49.52)	(-48.54)	(-49.56)	(-48.59)	(-46.72)
Leverage	0.043***	0.046***	0.044***	0.046***	0.047***
	(12.03)	(12.68)	(12.22)	(12.85)	(12.95)
Age	-0.144***	-0.142***	-0.145***	-0.142***	-0.128***
	(-31.36)	(-30.81)	(-31.45)	(-30.89)	(-28.00)
SOE	-0.012**	-0.011**	-0.012**	-0.011**	-0.009*
	(-2.40)	(-2.14)	(-2.35)	(-2.10)	(-1.75)
EE	0.056***	0.056***	0.056***	0.056***	0.056***
	(51.99)	(51.79)	(51.96)	(51.75)	(51.98)
Observations	987,552	987,552	987,552	987,552	987,552
R-squared	0.356	0.358	0.356	0.358	0.365
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO
Size × Year FE	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES
Industry × Year FE	NO	NO	NO	NO	YES

Continued Table 8: Mechanisms

Panel B: Use of Formal Finance

	(1)	(2)	(3)	(4)	(5)
EE_0(Industry) × Anti-corruption	0.070***	0.049***	-0.426***	-0.419***	
	(14.63)	(9.82)	(-23.85)	(-23.46)	
EE_0(Industry) × Anti-corruption × Size			0.105***	0.100***	0.112***
			(29.04)	(27.47)	(28.23)
EE_0(Industry) × Size			-0.073***	-0.069***	-0.057***
			(-12.43)	(-11.70)	(-9.57)
Log(Assets)	0.026***	0.026***	0.025***	0.025***	0.026***
	(15.73)	(15.28)	(15.22)	(14.84)	(15.83)
Leverage	0.031***	0.030***	0.030***	0.030***	0.035***
	(8.58)	(8.62)	(8.31)	(8.37)	(9.89)
Age	-0.006	-0.002	-0.005	-0.000	-0.000
	(-1.44)	(-0.41)	(-1.04)	(-0.06)	(-0.05)
SOE	-0.001	-0.001	-0.001	-0.001	0.003
	(-0.23)	(-0.24)	(-0.26)	(-0.26)	(0.60)
EE	0.003***	0.004***	0.003***	0.004***	0.003***
	(3.72)	(4.08)	(3.87)	(4.23)	(3.36)
Observations	1,009,569	1,009,569	1,009,569	1,009,569	1,009,569
R-squared	0.454	0.457	0.454	0.457	0.468
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO
Size × Year FE	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES
Industry × Year FE	NO	NO	NO	NO	YES

Continued Table 8: Mechanisms

Panel C: Cost of Debt

	(1)	(2)	(3)	(4)	(5)
EE_0(Industry) × Anti-corruption	-0.013***	-0.013***	-0.031***	-0.030***	
	(-35.06)	(-34.36)	(-22.65)	(-21.72)	
EE_0(Industry) × Anti-corruption × Size			0.004***	0.004***	0.002***
			(14.59)	(13.62)	(6.13)
EE_0(Industry) × Size			-0.005***	-0.005***	-0.003***
			(-9.61)	(-9.50)	(-6.58)
Log(Assets)	0.001***	0.001***	0.001***	0.001***	0.001***
	(7.17)	(6.71)	(6.85)	(6.43)	(6.70)
Leverage	0.002***	0.002***	0.002***	0.002***	0.002***
	(6.52)	(6.19)	(6.43)	(6.11)	(6.66)
Age	-0.000	-0.000	-0.000	-0.000	-0.000
	(-0.66)	(-1.06)	(-0.47)	(-0.90)	(-0.38)
SOE	-0.000	-0.000	-0.000	-0.000	-0.000
	(-1.21)	(-1.26)	(-1.22)	(-1.26)	(-0.88)
EE	0.000	0.000	0.000	0.000	0.000
	(0.33)	(0.27)	(0.41)	(0.35)	(0.01)
Observations	994,372	994,372	994,372	994,372	994,372
R-squared	0.548	0.549	0.549	0.550	0.556
Firm FE	YES	YES	YES	YES	YES
Year FE	YES	NO	YES	NO	NO
Size × Year FE	YES	YES	YES	YES	YES
Province × Year FE	NO	YES	NO	YES	YES
Industry × Year FE	NO	NO	NO	NO	YES

Table 9: 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 natural logarithm of the share of industry employment of firm f from year $t-1$ to year t in Panel A and the change in the natural logarithm of the share of industry fixed assets of firm f from year $t-1$ to year t in Panel B. The estimation period is 2010-2014. "EE_0(Industry)" is measured during 2006-2008. All variables are defined in the Appendix. T-statistics computed with bootstrapped standard errors 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.

Panel A: Allocation of Labor

	(1)	(2)	(3)
MPL	0.425***	0.659***	0.811***
	(82.87)	(58.56)	(69.82)
MPL × EE_0(Industry)		-0.409***	-0.822***
		(-16.02)	(-31.52)
MPL × EE_0(Industry) × Anti-corruption			0.412***
			(115.50)
Size	0.730***	0.731***	0.698***
	(169.96)	(169.86)	(163.37)
Leverage	-0.057***	-0.065***	-0.006
	(-5.55)	(-6.36)	(-0.58)
Age	0.041***	0.037***	-0.027**
	(3.33)	(2.94)	(-2.22)
SOE	0.034*	0.032*	0.057***
	(1.88)	(1.78)	(3.19)
EE	0.050***	0.043***	0.039***
	(13.94)	(12.07)	(11.42)
Observations	984,613	984,613	984,613
R-squared	0.372	0.373	0.415
Firm FE	YES	YES	YES
Province × Year FE	YES	YES	YES

Continued Table 9: Corruption and the Allocation of Resources

Panel B: Allocation of Capital

	(1)	(2)	(3)
MPK	0.470***	0.554***	0.554***
	(246.19)	(115.09)	(115.10)
MPK × EE_0(Industry)		-0.145***	-0.148***
		(-17.99)	(-18.19)
MPK × EE_0(Industry) × Anti-corruption			0.006***
			(3.84)
Size	0.074***	0.074***	0.074***
	(32.57)	(32.48)	(32.46)
Leverage	0.004	0.001	0.002
	(0.69)	(0.22)	(0.32)
Age	-0.148***	-0.149***	-0.151***
	(-23.60)	(-23.84)	(-24.15)
SOE	-0.005	-0.005	-0.005
	(-0.65)	(-0.67)	(-0.65)
EE	0.069***	0.067***	0.067***
	(47.94)	(46.77)	(46.74)
Observations	992,437	992,437	992,437
R-squared	0.439	0.440	0.440
Firm FE	YES	YES	YES
Province × Year FE	YES	YES	YES

Table 10: Corruption and Industry Structure

Panel A: Proportion of Young Firms

This table relates corruption to the proportion of young firms. The unit of observation is the province-industry-year. The estimation period is 2010-2014. "EE_0(Industry × Province)" is measured as the average EE of firms in the top quartile of assets in an industry and province during 2006-2008. The dependent variable is the proportion of young firms among all firms in a province and industry (columns 1-2) and the proportion of high-quality young firms among all firms in a province and industry (columns 3-4). 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 five 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. 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.

	All Young Firms		High Quality Young Firms	
	(1)	(2)	(3)	(4)
EE_0(Industry × Province)	-0.015**	-0.017**	-0.010***	-0.009***
	(-2.04)	(-2.29)	(-5.04)	(-4.74)
EE_0(Industry × Province) × Anti-corruption	0.035***	0.042***	0.016***	0.015***
	(6.04)	(7.47)	(7.90)	(7.12)
Average Size	-0.032***	-0.030***	-0.004*	-0.005**
	(-6.88)	(-6.20)	(-1.86)	(-2.19)
Average Leverage	0.010**	0.014***	0.005*	0.006**
	(1.99)	(2.60)	(1.95)	(2.38)
Observations	5,040	5,039	5,040	5,039
R-squared	0.604	0.635	0.603	0.615
Year FE	YES	NO	YES	NO
Province FE	YES	NO	YES	NO
Industry FE	YES	YES	YES	YES
Province FE × Year FE	NO	YES	NO	YES

Continued Table 10: Corruption and Industry Structure

Panel B: Industry Concentration

The unit of observation is the industry-year. The estimation period is 2010-2014. "EE_0(Industry)" is measured during 2006-2008. The dependent variable in columns 1 and 2 is the Herfindhal index of an industry based on sales and assets, respectively. In columns 3 and 4 the dependent variable is the fraction of largest five firms in an industry measured by sales and assets, respectively. 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.

	Herfindhal Index		% of largest 5 firms	
	Sales-based	Assets-based	Sales-based	Assets-based
	(1)	(2)	(3)	(4)
EE_0(Industry) × Anti-corruption	-0.000*	-0.001**	-0.007**	-0.010**
	(-1.95)	(-2.54)	(-2.11)	(-2.03)
Observations	235	235	235	235
R-squared	0.975	0.963	0.986	0.972
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	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. The convicted officials index used in Table 3 has mean 0.958 and standard deviation 1.505.