How Do Strong Anti-Corruption Actions Affect Firms?
--Evidence from the stock market

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Abstract

We use China's recent anti-corruption campaign as a natural experiment to examine the (market expected) economic consequences of strong anti-corruption actions. We first present a simple conceptual framework to illustrate the channels through which anti-corruption actions can influence firms. Our empirical evidence suggests that overall the stock market responded positively to the announcement of anti-corruption actions. The announcement returns are significantly lower for luxury-goods producers or politically connected firms while private or small firms significantly benefit more from the announcement. Finally, existing local institutions also play a crucial role in determining the announcement returns across firms.

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1. Introduction

Corruption is a widespread phenomenon in many developing and transitional economies. In China, official corruption has risen significantly over the last three decades. While anti-corruption efforts have always been on the agenda of the government, their effectiveness seems to be quite limited. Very recently, however, the new leadership of China launched a new round of aggressive anti-corruption campaign, which is believed to be "more severe, far-reaching and persistent than any other" (Economist, 2014).[1]

This newly launched anti-corruption campaign in China offers a unique opportunity to study the impacts of strong anti-corruption actions, which is of interest to both researchers and policymakers. The conventional wisdom holds that corruption is a distortion and is costly for economic development (e.g., Klitgaard, 1991; La Porta, et al., 1999; Shleifer and Vishny, 1993). Eliminating governments' grabbing hands helps to improve economic efficiency. An alternative view, however, argues that in an environment with excessive bureaucratic burden, paying bribes may help avoid bureaucratic delays and make government officials work harder. According to this "efficient grease" view, in a second best world with institution constraints, corruption can improve economic efficiency (e.g. Beck and Maher 1986; Lien, 1986; Huntington, 1968; Méon and Sekkat, 2005).

In addition to the above two views, there is also a third view that emphasizes the endogenous nature of red tapes and bureaucratic delays. According to this "general

[1] In terms of sheer volume as of year 2015, this new round of anti-corruption campaign has punished over 100 high-ranking officials (including 4 national leaders), more than 270,000 of its cadres for corrupt activities.

equilibrium" view, the conventional view and the efficient grease view are not necessarily conflicting. In a general equilibrium framework where bureaucratic burden and delay are endogenous, sufficiently strong anti-corruption actions can change the underlying institutional constraints that give rise to the efficient grease effect of corruption in the first place (e.g., Kaufmann and Wei, 1999; Wei, 2000a, b). If anti-corruption measures are strong enough, then the benefits from eliminating governments' grabbing hands can well dominate the costs associated with the potential loss of the efficiency grease.

In this study, we aim to use China's recent experience as a natural experiment to examine the economic impacts of a strong anti-corruption campaign. Specifically, we search for the market expected effects of anti-corruption actions by analyzing the stock market responses to a symbolic event of China's recent anti- corruption combat. On May 17, 2013, China announced a series of anti-corruption inspections to be conducted by the Central Commission for Discipline Inspection (CCDI thereafter) , which is the highest internal discipline institution of the Chinese Communist Party (CCP thereafter).[2] To rationalize our empirical analyses, we first present a simple conceptual framework to illustrate the potential mechanisms through which anti-corruption efforts can influence firms. In our simple model, anti-corruption actions affect firms through three channel including a market demand channel, a grabbing-hand channel, and a grease-of-wheel channel. The impacts on firms are thus

[2] See Section 2 for details of the anti-corruption inspections.

heterogeneous and depend upon firm characteristics as well as existing local institutions.

Employing an event study approach and using the announcement date, May 17, 2013, as our event date, our study yields several interesting findings. Overall, we find that stock market responded significantly positively to the anti-corruption announcement, indicating that the market views this new round of anti-corruption campaign is more credible than previous anti-corruption measures. It is not merely business as usual. Moreover, the positive cumulative abnormal returns (CARs thereafter) suggest on average an expected beneficial effect of combating corruption on firms.

We then conduct regression analyses to examine the potential determinants of CARs. The regression results reveal a substantial amount of heterogeneity across firms. First, there is strong evidence supporting a market demand channel. The CARs are found to be significantly lower for firms that produce luxury goods, which are often used as gifts to bribe government officials (e.g., Cai, Fang, and Xu, 2011; Qian and Wen, 2015). Second, we find that the announcement returns are significantly higher for private firms, small firms, or firms with no established political connections. On the one hand, these firms suffer more from governments' grabbing hands. On the other hand, they also rely more on the efficiency grease in a corrupt environment. Our finding is thus consistent with the general equilibrium view. That is, for sufficiently strong anti-corruption measures, the benefits from eliminating governments' grabbing hands can dominate the costs associated with the loss of the efficiency grease. Finally,

there is also evidence that local institutions matter. While private, small or firms without political connections earn higher announcement returns than state-owned, large, or connected firms, the return differentials are significantly lower in provinces with better legal protections (a smaller grabbing-hand effect) or less developed factor markets (a larger grease-of-wheel effect).

Our work contributes to the corruption literature by offering new evidence from a large-scale anti-corruption campaign. Most of the previous empirical studies in this literature take a macro approach by relating corruption measures to economic growth or other macro variables, such as capital flows (e.g. Mauro, 1995; Mo 2001; Wei, 2000b, 2001; Javorcik and Wei, 2009). Some more recent studies have also examined the private returns of bribing government officials at the firm level (Fisman and Svensson 2007; Cai, Fang, and Xu, 2011). This paper contributes the existing literature by providing micro evidence on the effects of anti-corruption actions. We also make efforts to distinguish different channels and explore potential heterogeneity across firms.

Our study also fits in a narrower literature on corruptions that focuses particularly on the case of China. A majority of the existing studies focus on detecting corruption behavior in China. For example, Fisman and Wang (2014) identify corruption behavior in sales of state assets in China. Fang, Gu, and Zhou (2014) find that government officials receive discounts in real estate purchases. Fisman and Wei (2004, 2009) use trade data to detect corruption behavior of Chinese customs. Cai, Fang, and Xu (2011) find Chinese firms often use entertainment and travel

expenditures to bribe government officials. They also analyze firms' private return of paying bribes.

While the anti-corruption campaign occurred very recently, to the best of our knowledge, there are also three working projects related to this issue. Qian and Wen (2015) study a specific sector of the Chinese economy and examine the effect of the recent anti-corruption on imports of luxury goods. They find a substantial reduction in imports of luxury goods after anti-corruption. Lin, Morck, Yeung, and Zhao (2016) and Li, Wang, and Zhou (2017) focus on the differential effects of the anti-corruption campaign on state-owned enterprises (SOEs) and non-SOE firms. Lin, Morck, Yeung, and Zhao (2016) find more productive non-SOEs in high Q industries, relying more on external finance dependence, or located in more liberalized provinces gained more. Li, Wang, and Zhou (2017) show that anti-corruption improves the efficiency of credit allocation in China by shifting debt issuances from inefficient SOE firms to more productive private firms.

Our work is closely related to the above studies, but there are several key differences that distinguish ours from existing contributions. First, while existing studies focus on some specific effects of anti-corruption actions, such as luxury imports or the differential effects on SOEs and non-SOEs, we aim to provide a more comprehensive analysis on the effects of the anti-corruption campaign on firms and to identify different channels. Second, to rationalize our empirical study, we also provide a simple theoretical framework to illustrate the underlying mechanisms through which anti-corruption actions can influence firms. Finally, while all studies examine the

impacts of the broadly-defined recent anti-corruption campaign in China, the exact event each study analyzes is in fact rather different. Qian and Wen (2015) focus on two events, the release of a new manifesto by the Third Plenum of the 18th CCP on November 15th, 2013 and the release of CCP's a five-year anti-graft plan on December 25th. Lin, Morck, Yeung, and Zhao (2016) examine the impacts of the Eight-point regulation Policy on government officials' spending of public revenues announced on Dec 4 2012. Li, Wang, and Zhou (2017) study the investigation of the CEO of Minsheng Bank, one of the largest commercial banks in China. In contrast, we analyze the stock market responses to the announcement of anti-corruption inspections to be conducted by the CCDI on May 17, 2013, which is considered a symbolic event of China's anti- corruption combat. As we shall discuss in more details in Section 2, this announcement is not only a surprise to the market but also sends a clear message to market participants about a strong commitment to fighting corruptions. The anti-corruption inspections will result in serious investigations and arrests of corrupt government officials.

The reminder of this paper is organized as follows. Section 2 discusses some institutional background. In Section 3, we present a simple conceptual framework and derive our testable hypotheses. Section 4 describes the data we use in this study, and Section 5 reports our empirical results. Concluding remarks are offered in Section 6.

2. Institutional Background

Like many developing countries, corruption is a central issue in China. The new leadership in China considers corruption as not merely a significant problem to economic growth but a real threat to the party's survival. After taking office following the 18th National Congress of the Communist Party of China in 2012, President Xi Jinping announced the so-called "Eightpoint Regulation" banning bureaucrats and employees of state-owned-firms of extravagant house and luxury goods purchases and state-funded banquets. Nonetheless, no concrete measures are taken to enforce those regulations. Since similar anti-corruption announcements were also made by previous leaders, the market did not view them as a credible commitment to fighting corruption (Qian and Wen, 2015).

Concrete and more credible investigation and punishment actions arrive in the middle of 2013. On May 17, 2013, the Central Commission for Discipline Inspection (CCDI), which is the highest internal-control institution within the party system, made an announcement that it will conduct several rounds of inspections. In the first round of inspections, the CCDI will send inspection teams to five provinces, including Chongqing, Guizhou, Jiangxi, Inner-Mongolia, and Hubei. Inspection teams are responsible to examine every ministry and government agencies for each province. As leaded by CCDI's secretary, Wang Qishan, the inspection teams have the unlimited power to investigate, detain, and interrogate almost anyone that may involved in bribery, embezzlement, trading power for profit and other personal favors, no matter how "big" they are.

The inspection teams first will perform a background checks of the provinces or organizations to be inspected. Then the teams will stay in the inspected provinces for two months or so and the teams' contact information is released to the public. During the two-month inspection, the inspectors collect information with the help of local discipline inspectors and anti-graft agency officers, and take tips from the public and retired government officials. If there is evidence of corruption, the inspectors will make records and report it to the CCDI.

Compared to previous anti-corruption measures, the CCDI inspection has a concrete plan and emphasizes on fighting corruption at all levels of governments. This announcement is an unexpected shock and a wakeup call for both government officials and the market participants. It is quite clear to them that this time is different. The inspections are often interpreted as the symbolic event of the start of China's recent anti-corruption campaign. While the announcement on May 17 did not mention explicit which states will be inspected later, it is quite clear that each province will eventually be inspected. As a result, we expect its impact is not regional but national. Firms located in other provinces will also be affected. Indeed, in our empirical analysis, we do find that its impact is national.

During the period of 2013- 2014, the CCDI conducted a total of four rounds of inspections, covering all provinces in China. The inspections broke the unspoken rule regarding 'PSC criminal immunity' by arresting the former Politburo Standing Committee member Zhou Yongkang (expelled from the Party and sentenced to life in prison). Over 100 high-ranking government officials and more than 270000

bureaucrats at different levels were detained and punished for corruption activities. Our study examines how the stock market responses to the announcement of this large scale anti-corruption campaign.

3. Conceptual Framework and Testable Hypothesis

3.1. A Simple Conceptual Framework

In this section, we provide a simple conceptual framework to motivate our empirical analyses. Base on the simple framework, we shall develop several testable hypotheses. Let b denote the corruption activity by government officials. We hypothesize that corruption activity by government officials can affect firm $i's$ net profit via three channels:

1. Grabbing Hand Channel. We model this by assuming that the "effective tax rate" of a firm, t is a non-decreasing function of b. We denote $t(b; X_i)$ as tax rate of firm i, with characteristics X_i, when corruption activity is b, with $t'(\cdot; X_i) \geq 0$.

2. Grease of Wheel Channel. We model this by assuming that the marginal cost of production for firm i, denoted by $C(b; X_i)$, is a non-increasing function of b, i.e., $C'(\cdot; X_i) \leq 0$

3. Market Demand Channel. Corruption activity may also affect a firm's profit by affecting its demand. For example, many high-end consumer products are popular choices for bribing government officials. We model this by assuming that the demand curve faced by firm i, $Q(p, b; X_i)$, , depends on b. That is, we assume that $Q_2(p,\cdot; X_i) \equiv \partial Q/\partial b$ is not necessarily zero. The exact sign of Q_2 may depend on

firm $i's$ main product. If firm i produces higher-end consumer products, it is natural to hypothesize that $Q_2 > 0$; but if i produces lower-end consumer products, $Q_2 < 0$ due to substitution.

Firm $i's$ after tax profit in a given period is given by

$$\Pi(X_i; b) \equiv \max_{\{p\}} [1 - t(b; X_i)][p - C(b; X_i)]Q(p, b; X_i) \quad (1)$$

Suppose that b is a choice by government officials, whose payoff is given by

$$b - D(b; a)$$

where $b - D(b; a)$ is the potential cost of corruption activity b, which depends on a, interpreted as anti-corruption intensity. We assume that $D_2 > 0$.

Government officials choose b to:

$$\max_{\{b\}} b - D(b; a) \quad (2)$$

Clearly, $b^*(a) < 0$.

Firm i, taking $b^*(a)$ as given, chooses p to maximize its after-tax profit. We have

$$\frac{\partial \Pi}{\partial b} = -t'(p^* - C)Q - (1 - t)C'Q + (1 - t)(p^* - C)Q_2$$

The first term $-t'(p^* - C)Q < 0$; the second term $-(1 - t)C'Q > 0$; the third

term $(1 - t)(p^* - C)Q_2$ depends on Q_2.

Thus as anti-corruption intensity a increases, b^* decreases; but its impact on firm $i's$ after tax profit is ambiguous and depends on firm characteristics.

3.2. Testable Hypotheses

The above simple conceptual framework suggests that anti-corruption actions

influence firms through different channels, and their effects are likely to be heterogeneous across firms. Below we derive some testable hypotheses based on the predictions of the simple model.

H1: The overall market response to the announcement is ambiguous. However, if market participants expect that the anti-corruption actions are strong enough to change the institutional constraints that give rise to the efficient grease effect of corruption in the first place, then the overall market reactions are likely to be positive.

Our simple model predicts that the anti-corruption actions affect firms through three channels. Since the market demand effect influences mainly a small fraction of firms that produce luxury goods, the overall announcement effect depends largely on the relative strength of the grabbing-hand effect and the grease-of-wheel effect. In a general equilibrium framework, however, the magnitude of the grease-of-wheel effect depends on market participants' expectations on whether the anti-corruption actions are strong enough to change the fundamental institutional constraints that give rise to the efficient grease effect of corruption in the first place. Market anticipations of a sufficiently strong anti-corruption campaign are thus likely to lead to positive returns.

H2: The announcement returns are lower for firms that produce luxury products compared to other firms.

H3: The announcement effects on state-owned, large, or politically connected firms depend on the relative strength of the grabbing-hand channel and the grease-of-wheel channel. An anticipation of sufficiently strong anti-corruption actions lowers the returns of state-owned, large, or politically connected firms relative to

private, small, or non-connected firms.

The grabbing-hand and the grease-of-wheel channels predict conflicting effects on state-owned, large, or politically connected firms. Existing studies have well documented that those firms are treated favorably in China compared to private, small, or firms with no political connections (e.g., Dollar and Wei, 2007; Li et al., 2008; Song et al., 2011). On the one hand, they suffer less from government interventions and extractions at different levels. The beneficial effects of anti-corruption measures associated with eliminating the "grabbing hands" are thus smaller for those firms. On the other hand, state-owned, large, or connected firms also have access to cheaper inputs (capital, land, etc.) and are treated favorably in obtaining government services. As a result, they rely less on the grease-of-wheel channel, and, compared to private, small, or non-connected firms, they suffer less from anti-corruption measures that weakens such a channel. Nonetheless, it is important to note that this difference depends on whether the anti-corruption actions can change the underlying institutional constraints that give rise to the efficient grease effect of corruption in the first place. For a sufficiently strong anti-corruption campaign, eliminating the grabbing hands would be the dominant effect, and we would expect a lower announcement return for state-owned, large, or politically connected firms.

H4: The announcement return differentials between private and state-owned firms (small and large firms, or non-connected and connected firms) are smaller in provinces with better legal protections (a smaller grabbing-hand effect) or less developed factor markets (a larger grease-of-wheel effect).

In this hypothesis, we relate the return differentials between different types of firms to local institutions. Since private, small, or non-connected firms benefit (suffer) more than state-owned, large, or politically connected firms from the anti-corruption actions through the grabbing-hand (grease-of-wheel) channel, we expect the return differentials are smaller in provinces with better legal protections (a smaller grabbing-hand effect) or less developed factor markets (a larger grease-of-wheel effect).

4. Data Description

Our sample covers all listed firms on China's stock exchanges. Stock returns and financial data are extracted from the China Stock Market and Accounting Research Database (CSMAR) maintained by GTA Information Technology. Excluding financial firms, our sample includes 2258 publicly listed companies as of the end of 2012.

To echo the hypothesis as mentioned in the above section, we construct several key firm level variables. In particularly, we build a luxury dummy variable equals one if a company belongs to a high-end jewelry, high-end health care, or high-end liquor producer, or the high-end tailing industry, zero otherwise. Company ownership, labeled as SOE, takes the value of one if the firm is ultimately controlled by the state government directly or through the equity chain, and zero otherwise. Following existing studies in the literature (Fan et al., 2007), we construct a dummy variable to measure political connections (labeled as CONNECTED), which takes the value of one if a top management team member belongs to the People's Congress (PC)

or the Chinese People's Political Consultative Conference (CPPCC).[3] Firm size is defined as the logarithm of firm total assets. We also control for other variables at the firm level, such as firm tax burden (labeled as *TAX*) and leverage ratio (labeled as *LEVERAGE)*.

In addition, we also create local institutional variables using the province-level marketization index constructed by the National Economic Research Institute (NERI), (e.g., Du et al. 2008; Firth et al. 2009; Fan et al. 2013). The index comes from official statistics of enterprise and household surveys in five fields with a total of 23 basic indicators, ranging from 0 to 10 with higher scores indicating better local institution (Fan et al. 2011). We make use of two of them to proxy two respect of the local institution in China. One of the NERI variable is the protection of producer's legitimate rights and interests, which is measured by an index of court's efficiency in resolving legal cases (economic disputes). The higher the value, the stronger the legal protection. Moreover, the grease of wheel channel is captured by the degree of factor market development, which is comprised by the degree of financial sector marketization, the degree of foreign capital importation, the degree of labor movement, and the marketization of technological achievements. The higher the score, the more developed the factor market. We also include other provincial variables, such as GDP per capita and education expense as control variables. Details of variable definitions and sources can be found in Appendix 2.

[3] We also tried to use a simple count measure. Our results still hold.

5. Empirical Results

5.1. The Event Date

We employ an event study approach to examine the reactions of stock market to the inspection announcement. To implement an event study, we first need to identify a clear event date. The CCDI launched a total of four rounds of anti-corruption inspections in years 2013 and 2014. Before each round of inspection, the CCDI would initiate a deployment meeting, in which the inspected provinces are announced.[4] Appendix Table 1 lists the announcement dates and provinces to be inspected for each round.[5] For an event study to be valid, the event must be unexpected news. Therefore, we pick the announcement of the first round inspection as our event date. The effective date is May 17, 2013.

We also check whether the inspection announcement is the most relevant news during the event periods. We at first pick the big political events (top search phrases) in the inspected month (May 2013), for example, the south Asia exposition and regulations of food safety, and then use Baidu (the largest local search engine) Index to identify the score of the top search phrases in Chinese. In Table 1, we present an illustrative example and obviously, the anti-corruption inspection is indeed the most relevant news according to the Baidu Index.

5.2. Market Responses

[4] As compared with other announcement dates, for example station-in meeting, deployment meeting is the earliest date the market make reactions.

[5] If an announcement is made on a holiday, the effective date is the nearest future working day.

Using data from the CSMAR database and an event study approach, we examine the market responses to the event.[6] We at first estimate a market model (see Huang et al (2014) and Ji and Wei (2014)) over a 180 estimation window ending 11 days before the announcement date. A value-weighted average return of all stocks in our sample is adopted as market return. We then calculate cumulative abnormal returns (CARs) over a 11 day (-5, 5) event window centered on the inspected announcement date (May 17, 2013) and test their statistic significance. Reported in Table 2, the average of inspected CARs is positive and significant different from zero, indicating that the market gains 2.818% in the 11-day event window on average. We also report the ratio of firms with negative CARs and the total number of firms. We find only 774 out of 2258 firms decline in the 11-days event window. While the simple theoretical model predicts conflicting effects of anti-corruption through different channels, our empirical results indicate that overall market participants view this anti-corruption campaign as good news. This finding is consistent with our first hypothesis and the general equilibrium view that sufficiently strong anti-corruption actions can change the underlying institutional constraints that give rise to the efficient grease effect of corruption in the first place.

To establish the robustness of our finding, we consider different market benchmarks. Following Ji and Wei (2014), an equal-weighted average return and Hushen 300 index are considered as alternative market benchmarks. In addition, we also consider a three factor model (i.e., adding the size factor and book-to-market

[6] All financial and accounting data comes from CSMAR, details of variables description can be found in Appendix Table 2.

factor as two new factors in addition to the market factor). As shown in Table 2, no matter which market benchmark we choose, our results are not affected.

Another way to check the sensitivity of our results is to choose alternative event windows. To deal with the issue that eleven days may not long enough to absorb the inspection news (Ji and Wei, 2014), we also try three longer event windows, a 16-day window, a 21-day window, and a 31-day window. As shown in the last three rows in Table 2, using alternative event windows does not alter our finding either. The estimated CARs are all positive and significant.

5.3. Firm Heterogeneity

5.3.1. Benchmark results

The above results indicate that overall stock market responded positively to the announcement of anti-corruption inspections by the CCDI. In this subsection, we explore further the heterogeneous effects of anti-corruption inspections on different firms. Our simple framework and the hypotheses developed in Section 3 suggest that the effects of combating corruption on individual firms depend on firm characteristics and local institutions. We examine firms' heterogeneous responses by regressing the estimated firm CAR obtained from the event study on firm and province characteristics. Specifically, we consider the following model:

$$\mathrm{CAR}_i\alpha + \beta_1 LUXURY_i + \beta_2 SOE_i + \beta_3 SIZE_i + \beta_4 CONNECTED_i + \gamma C_i + \varphi_j + \varphi_k \quad (3)$$

where CAR is cumulative abnormal return of each firm. *LUXURY* and *SOE* are dummies for firms that produce luxury products and firms with state ownership, respectively. Specifically, *LUXURY* equals one is a firm is a high-end jewelry,

high-end health care, or high-end liquor producer, or belongs to the high-end tailing industry, and *SOE* takes the value of one if a firm is controlled by local or national governments. *SIZE* is a measure of firm size and is defined as the logarithm of firm total assets. *CONNECTED* is a dummy variable for political connections, which takes the value of one if a top management team member belongs to the People's congress or CPPCC. We also control for other variables at the firm level, such as firm tax burden (*TAX*) and leverage ratio (*LEVERAGE*). φ_j and φ_k are industry and province fixed effects, respectively.[7]

Table 3 shows the benchmark results using the market model and an 11-day event window. In Column (1), we perform a preliminary analysis without controlling for industry or province fixed effects. In Column (2), we add industry fixed effects. In both columns, we also create an *INSPECTED* dummy variable for provinces to be inspected in the first round anti-corruption inspection and include it in the regressions. The omitted group thus consists of provinces not included in the first round inspection. Both regressions yield favorable results supporting our Hypothesis 2, which is based on the market demand channel illustrated in the simple theoretical framework. The estimated coefficient on the *LUXURY* dummy is negative and significant. Compared to other firms, firms that produce luxury products have a lower return of 3.19%.

We also find that, interestingly, the *INSPECTED* dummy is statistically insignificant and quantitatively very small in each column, indicating that the announcement of the anti-corruption campaign has a nationwide effect. While the

[7] See Appendix Table 2 for details of variable definitions.

announcement only informs market participates of five provinces to be inspected in the first round, the market well anticipates that all provinces will be inspected eventually in the future rounds of inspections.

Our model does not make an unambiguous prediction on the differential effect of fighting corruption on private and state-owned firms. On the one hand, private firms are more subject to government extractions at different levels. On the other hand, the grease of wheel channel also has a larger effect on private firms whose operations often more sensitive to government service provision. Anti-corruption measures thus can have an ambiguous effect on the return differential between private and state-owned firms. However, as emphasized by Kaufman and Wei (1999), in a general equilibrium, a strong enough combat on corruption can change the institution constraints giving rise to the grease of wheel channel in the first place. If this is the case, then we should expect a higher return for private firms. Our results are in favor of this speculation. We find that state-owned firms indeed have significantly lower anti-corruption announcement returns than private firms. This finding is also consistent with the results documented in Lin, Morck, Yeung, and Zhao (2016) and Li, Wang, and Zhou (2017) that non-SOEs benefit more from the anti-corruption campaign.

Similarly, we also find that the announcement returns are significantly lower for large or politically connected firms as the estimated coefficients on firm size and the political connection dummy are both significantly negative. The evidence from the

return differentials between private and state-owned (small and large, or non-connected and connected) firms thus is consistent with our third hypothesis.

In the last column of Table 3, we control for both industry and province fixed effects. The *INSPECTED* dummy submerges with the inclusion of the province fixed effects. We, however, still find consistent results that the announcement returns are significantly lower for luxury goods producers, state-owned, large, or politically connected firms.

5.3.2. Robustness checks

After presenting our benchmark results, here we conduct a series of sensitivity analyses to ensure the robustness of our results. In Table 4, we conduct two sets of robustness checks. The first set of robustness checks is to consider alternative event winds. Specifically, we consider a (5,10), a (10,10), and a (10, 20) event window and report the results in Columns (1)-(3), respectively. Next, in Columns (4)-(6), we try different market benchmarks. In Column (4), we change the market model to a three factor model (i.e., adding the size factor and book-to-market factor as two additional factors). In Columns (5) and (6), we follow Ji and Wei (2014) and use value weighted average return and Hushen 300 index as market benchmarks, respectively. Using alternative event winds or market benchmarks does not alter our main findings. The estimated coefficients on the *SOE* dummy are again found to be positive and significant in all columns while those on *LUXURY, SIZE,* and *CONNECTED* are still significantly negative.

Table 5 considers further the robustness of our results to alternative measures to three key firm characteristics, ownership, size, and political connections. Column (1) employs an alternative measure of state-owned firms dummy based on firms' registration type rather than actual controller. In Column (2), we use number of employees (in natural log) to proxy for firm size. Finally, we use a count measure defined as ln(1+number of connected board directors) as an alternative measure of political connection, where connected board directors are those who are current or former member of the people's congress or the CPPCC. Using alternative measures of firm characteristics does not affect our results either. We continue to find a significantly lower announcement return for state-owned, large, or connected firms.

5.4. The Role of Local Institutions

We have shown that the effects of China's anti-corruption campaign vary across firms. Here we explore further the role of local institutions in determining the return differentials of the anti-corruption campaign between different types of firms. As discussed in Hypothesis 4, to the extent local institutions affect the grabbing-hand and grease-of-wheel channels, they also influence the return differentials. For example, compared to private firms, SOEs benefit less from fighting corruption through the grabbing hands channel. This differential, however, is likely to be smaller in provinces with better legal protections of firm rights and interests where the grabbing hand effect is weaker. On the other hand, the impact of the grease-of-wheel channel depends also on local institutions. Our model suggests that the grease of wheel channel works though its impact on firms' marginal costs. Its impact thus is likely to

be weaker in provinces where factor markets are more developed and market-oriented (so that governments have less influences on factor prices and allocations). While the adverse effect of fighting corruption through the grease-of-wheel channel is larger for private firms, the differential should be smaller in provinces with more developed factor markets. Similar arguments also apply to the comparisons between large and small firms or connected and non-connected firms.

To empirically test this hypothesis, here we employ two measures of institutions at the province level constructed by a non-government research institute in China, the National Economic Research Institute (NERI). The first one is an index of legal protections, *PROTECTION*, and a higher value means better legal protections of firm rights and interests. The second index, *FACTORMKT*, measures the degree of factor market development. A higher value of this index means the government plays a smaller role in determining the allocations or prices of financial resources, labor, and patents, etc..[8]

We then re-estimate the benchmark model with industry and province fixed effects (the last regression in Table 3) but adding the interaction terms between firm characteristics and local institution measures as additional regressors. The results are reported in Table 6. Column (1) shows the interaction effects between the two institution variables and the SOE dummy. The evidence is in favor of our hypothesis. The estimated coefficient on interaction term *SOE*PROTECTION* is positive and statistically significant, and that on *SOE*FACTORMKT* significantly negative. The

[8] See Appendx Table 2 for details of the two indices.

two significant interaction terms suggest that local institutions do play a role in determining the effects of fighting corruption across firms. Specifically, the first interaction effect indicates that the return differentials between private and state-owned firms due to the grabbing hands effect declines with the degree of local legal protections of firm rights. The second interaction effect suggests that the additional adverse effect of anti-corruption actions on private firms is smaller in provinces with more developed factor markets.

Columns (2) and (3) report the interaction effects between the local institution variables and firm size and political connections, respectively. The results are also consistent with Hypothesis 4. In Column (2), we find that a positive and significant estimated coefficient on the interaction term between firm size and *PROTECTION* but a negative and significant coefficient on the interaction term between firm size and *FACTORMKT*. The two interaction terms in Column (3) also have correct signs. *CONNECTION*PROTECTION* has a t value of 1.5, and *CONNECTION *FACTORMKT* is statistically significant at the 5% level.

6. Conclusions

China's recent anti-corruption campaign provides a unique opportunity to study the economic consequences of large scale government anti-corruption effects in developing countries where corruption is a central issue. We first provide a simple theoretical framework to illustrate three potential channels through which anti-corruption policy can affect firms. It predicts an ambiguous effect of combating

corruption on an individual firm depending on firm characteristics and local institutions.

In the empirical part of our study, we use an event study approach to examine the market expected effects of the anti-corruption campaign. Specifically, we focus on market responses to the symbolic event of this campaign, the announcement of anti-corruption inspections to be conducted by the CCDI of the CCP. We find robust evidence that stock market responded significantly positively to the announcement. The estimated cumulative abnormal returns range from 2.4%-5.3% depending on different event windows or methods.

Further regression analysis reveals that the effects are heterogeneous across firms. In particular, consistent with a market demand effect, stock prices of luxury good producers fall after the announcement. Moreover, the expected beneficial effects on private are significantly larger while those on larger, or politically connected firms are significantly smaller. This finding along with an overall positive market response are in favor of the general equilibrium view. They suggest that, for a strong anti-corruption campaign, the beneficial effect associated with eliminating governments' grabbing hands on average dominates the potential adverse effect associated the potential loss of efficiency grease.

Finally, we also explore the role of local institutions in determining the effects across firms. We show that the additional gain for private or small firms are smaller in provinces with better legal protections of firm rights and interests (a weaker grabbing hands effect). The additional gain for those firms, however, are larger in provinces

with more market-oriented factor markets (a weaker grease of wheel effect). We also find the exact opposite for politically connected firms.

Appendix Table 1. Announcement Dates

Round	Provinces	Effective Date	Number of listed firms located in inspected provinces
1st	Chongqing, Guizhou, Jiangxi, Inner Mongolia, Hubei	5.17, 2013	183
2nd	Anhui, Hunan, Jilin, Yunnan, Shanxi, Guangdong	10.23, 2013	575
3rd	Xinjiang, Liaoning, Beijing, Ningxia, Shandong, Tianjin, Henan, Gansu, Hainan, Fujian	3.15, 2014	677
4th	Guangxi, Shanghai, Qinghai, Tibet, Zhejiang, Hebei, Shanxi, Heilongjiang, Sichuan, Jiangsu	7.16, 2014	850

Appendix Table 2. Variable Definitions

Variables	Description
Stock Market Data	Daily comparable closing returns (with cash dividend reinvested) and daily aggregated market returns without cash dividend (current value weighted) are denoted as stock and market returns, respectively.
INSPECTED	A dummy variable equals one if the firms are registered in the inspected provinces (usually located in the same provinces), and zero otherwise.
LUXURY	A dummy variable to indicate luxury products, equals one if the list company belongs to jewelry industry, high-end retailing industry, high-end health care products industry, high-end liquor industry, etc., and zero otherwise.
SOE	A dummy variable equals one if the firm is ultimately controlled by the state government directly or through the equity chain, and zero otherwise.
SIZE	The logarithm of total assets.
CONNECTED	A dummy variable equals one if a top management team member (including CEO) belongs to People's Congress or CPPCC at any level, and zero otherwise.
SOE 2	A dummy variable equals one if a firm is registered as a state-owned firm.
SIZE 2	The logarithm of number of employees.
CONNECTED 2	Ln(1+number of connected board directors), where connected board directors are those who are current or former member of the people's congress or the CPPCC.
TAX	The ratio of total tax to the total sales
LEVERATE	The ratio of total debts to total assets
PCGDP	The logarithm of GDP of a province
EDUCATION	The ratio of education expenditures to GDP of a province
PROTECTION	Protection denotes the protection of producer's legitimate rights and interests, which is measured by an index of court's efficiency in resolving legal cases (economic disputes). The higher the value, the stronger the legal protection.
FACTORMKT	Factor market represents factor market development, which is comprised by the degree of financial sector marketization, the degree of foreign capital importation, the degree of labor movement, and the marketization of technological achievements. The higher the score, the more developed the factor market.

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Table 1. Most Relevant News

Big Events (Baidu Search Results)	Highest Baidu Index within May 2013
World Horticultural Exposition	506
Anti-corruption Inspection	**1607**
South Asia Expo	468
Railway System Reform	842
Regulations of Food Safety	181

Notes: Baidu Index is an indicator to reflect the search scale of one specific event or news within a given period. We at first pick several big political events (top search phrases) in the inspected month (May 2013) and then adopt Baidu (the largest local search engine) Index to identify the score of the top search phrases in Chinese. The bigger the number, the larger the search scale of the event.

Table 2 Stock Market Reaction

Model	Average CAR	Negative Firms/All Firms
CAR (-5, 5)	0.02818***	774/2258
Three factor CAR (-5, 5)	0.03316***	648/2258
Total value CAR (-5, 5)	0.02430***	850/2258
Hushen300 CAR (-5, 5)	0.04216***	516/2258
CAR(-5, 10)	0.03311***	723/2258
CAR(-10, 10)	0.04601***	707/2258
CAR(-10, 20)	0.05428***	828/2258

Notes: *, ** and *** denote the 10, 5 and 1 percent significance levels, respectively.

Table 3. Benchmark Regressions

Dep = CARs	(1)	(2)	(3)
INSPECTED	-0.0074	-0.0045	
	(-1.715)	(-1.338)	
LUXURY	-0.0366***	-0.0321**	-0.0319**
	(-3.303)	(-2.873)	(-2.867)
SOE	-0.0083*	-0.0059**	-0.0054*
	(1.914)	(2.307)	(2.111)
SIZE	-0.0049***	-0.0034***	-0.0038***
	(-4.391)	(-4.187)	(-5.046)
CONNECTED	-0.0081***	-0.0073***	-0.0067**
	(-3.262)	(-3.124)	(-2.916)
TAX	0.0121	-0.0210	-0.0080
	(0.500)	(-0.684)	(-0.255)
LEVERAGE	-0.0087*	-0.0078	-0.0069
	(-1.758)	(-1.655)	(-1.552)
Industry F.E.	No	Yes	Yes
Province F.E.	No	No	Yes
Observations	2,257	2,257	2,257
R-squared	0.027	0.057	0.080

Notes: A constant is included but not reported in each regression. Standard errors are clustered at industry level. T-values are reported in the parentheses. *, ** and *** denote the 10, 5 and 1 percent significance levels, respectively.

Table 4 Alternative Event Windows and Market Models

	Alternative Event Windows			Alternative Market Models		
	(1)	(2)	(3)	(4)	(5)	(6)
Dep = CARs	CAR(5,10)	CAR(10,10)	CAR(10,20)	Three Factor	Weighted Benchmark	Hushen300
LUXURY	-0.0274***	-0.0248***	-0.0379**	-0.0317***	-0.0328***	-0.0358***
	(-3.090)	(-3.312)	(-2.473)	(-3.089)	(-3.329)	(-3.493)
SOE	-0.0064	-0.0151**	-0.0207***	-0.0053*	-0.0063**	-0.0063**
	(1.273)	(2.707)	(3.537)	(1.799)	(2.137)	(2.176)
SIZE	-0.0057***	-0.0088***	-0.0127***	-0.0015*	-0.0039***	-0.0043***
	(-6.402)	(-9.588)	(-9.590)	(-1.758)	(-5.238)	(-5.186)
CONNECTED	-0.0051**	-0.0059**	-0.0015	-0.0055**	-0.0059**	-0.0060**
	(-2.890)	(-2.808)	(-0.459)	(-2.409)	(-2.581)	(-2.602)
TAX	-0.0577	-0.0446	-0.0520	-0.0001	-0.0125	-0.0231
	(-1.331)	(-0.647)	(-0.500)	(-0.004)	(-0.392)	(-0.714)
LEVERAGE	-0.0049	-0.0167***	-0.0257***	-0.0051	-0.0042	-0.0057
	(-1.314)	(-3.397)	(-3.115)	(-1.500)	(-1.120)	(-1.507)
Industry F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Province F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,257	2,257	2,257	2,257	2,257	2,257
R-squared	0.057	0.096	0.111	0.065	0.078	0.082

Notes: A constant is included but not reported in each regression. Standard errors are clustered at industry level. T values are reported in the parentheses. *, ** and *** denote the 10, 5 and 1 percent significance levels, respectively.

Table 5. Alternative measures of firm ownership, size, or political connections

Dep = CARs	(1)	(2)	(3)
	Alternative Ownership	Alternative Size	Alternative Connection
LUXURY	-0.0333***	-0.0335***	-0.0328***
	(-3.288)	(-3.239)	(-3.314)
SOE		-0.0071**	-0.0064**
		(2.223)	(2.154)
SOE 2	-0.0049**		
	(2.203)		
SIZE	-0.0039***		-0.0038***
	(-4.851)		(-5.046)
SIZE 2		-0.0031***	
		(-3.513)	
CONNECTED	-0.0060**	-0.0064**	
	(-2.382)	(-2.934)	
CONNECTED 2			-0.0049*
			(-1.762)
TAX	-0.0219	-0.0361	-0.0234
	(-0.703)	(-1.150)	(-0.757)
LEVERAGE	-0.0044	-0.0052	-0.0043
	(-1.126)	(-1.613)	(-1.090)
Industry F.E.	No	Yes	Yes
Province F.E.	No	No	Yes
Observations	2,257	2,257	2,257
R-squared	0.079	0.079	0.079

Notes: A constant is included but not reported in each regression. Standard errors are clustered at industry level. T-values are reported in the parentheses. *, ** and *** denote the 10, 5 and 1 percent significance levels, respectively.

Table 6. The Role of Local Institutions

Dep = CAR (5, 5)	(1)	(2)	(3)
*SOE*PROTECTION*	0.0040*		
	(-2.055)		
*SOE *FACTORMKT*	-0.0089***		
	(6.084)		
*SIZE*PROTECTION*		0.0012**	
		(2.265)	
*SIZE *FACTORMKT*		-0.0025***	
		(-3.152)	
*CONNECTED*PROTECTION*			0.0045
			(1.543)
*CONNECTED*FACTORMKT*			-0.0069**
			(-2.364)
LUXURY	-0.0329***	-0.0335***	-0.0334***
	(-3.309)	(-3.316)	(-3.377)
SOE	-0.0258*	-0.0066**	-0.0061*
	(-1.968)	(2.247)	(1.996)
SIZE	-0.0040***	0.0053	-0.0040***
	(-5.349)	(1.416)	(-5.368)
CONNECTED	-0.0058**	-0.0062**	0.0117
	(-2.515)	(-2.774)	(1.609)
TAX	-0.0096	-0.0112	-0.0161
	(-0.306)	(-0.342)	(-0.509)
LEVERAGE	-0.0046	-0.0038	-0.0051
	(-1.275)	(-0.955)	(-1.323)
Industry F.E.	Yes	Yes	Yes
Province F.E.	Yes	Yes	Yes
Observations	2,283	2,283	2,283
R-squared	0.088	0.087	0.086

Notes: A constant is included but not reported in each regression. Standard errors are clustered at industry level. T values are reported in the parentheses. *, ** and *** denote the 10, 5 and 1 percent significance levels, respectively.