Anticorruption Regulation and Firm Value: Evidence from a Quasi-Natural Experiment in China

Yongxin Xu [1]

Abstract: As part of President Jinping Xi's anticorruption campaign, China launched an anticorruption regulation that requires bureaucrats to resign from director positions in listed companies. Using the above quasi-natural experiment, our Difference-in-Difference analysis shows that firm value measured by Tobin's Q decreases by 4%. The reduction of firm value may not be explained by political repression or the loss of directorship. We further show that financial constraints and government expropriation are two plausible channels through which anticorruption regulation impedes firm value. Finally, firms may adjust their board characteristics as well as investment and operation policies to alleviate the effect of anticorruption.

JEL classifications: G32, G34, G38

Key Words: Anticorruption Regulation, Firm Value, Financial Constraint, Government Expropriation

[1] Xu is with the Institute of Financial Studies, Southwestern University of Finance and Economics.

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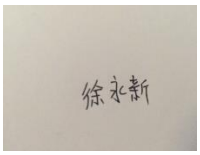
Yongxin Xu



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1. Introduction

Fighting against corruption is one of the priorities for many countries.[1] To fight against corruption, policy makers could enhance monitoring of government officers and/or provide these officers incentive not to be corrupted (Svensson, 2005; Banerjee et al., 2012). Policy makers could also set up strict rules or regulations that discipline the actions of government officers directly. Plenty of studies show that monitoring and incentive-based interventions may reduce corruption, at least in the short term (Olken and Pande, 2012). However, although the use of anticorruption regulations is prevalent,[2] little is known about whether and how anticorruption regulation works.[3] Our study fills this important void in the literature by empirically testing how anticorruption regulation affects firm value. Specifically, we exploit a quasi-natural experiment setting, namely, the Chinese anticorruption regulation (hereafter, the regulation) that requires directors with a bureaucratic background to resign from listed companies, to investigate the impact of anticorruption regulation on firm value.

From a theoretical standpoint, anticorruption regulation may or may not be beneficial for shareholders a priori. First, the impact of corruption on firm value is controversial. On one hand,

[1] http://www.worldbank.org/en/topic/governance/brief/anti-corruption, http://www.oecd.org/corruption/acn/home/.
[2] For example, some countries, such as the US, have specific restrictions for government officers to move to the private sector, although other countries do not.
[3] Even anecdotal evidences are mixed with respect to the effectiveness of anticorruption regulation (Svensson, 2005): Hong Kong and Singapore are the most-cited examples where anticorruption regulations enforced by an independent anticorruption agency work well, while the same types of anticorruption agencies in other countries seem to be used to fight against political opponents.

since government officers who lack incentives and are obsessed with red tape would probably expropriate firms through rents, corruption could harm firm value (Krueger, 1974; Murphy et al., 1991, 1993; Shleifer and Vishny, 1993; Mauro, 1995; Fisman and Svensson, 2007; Ayyagari et al., 2014). On the other hand, quite a few studies suggest that corruption may benefit firms through political connections, especially in developing countries (Bardhan, 1997; Fisman, 2001; Svensson, 2005; Li et al., 2008; Calomiris et al., 2010; Zeume, 2016). Second, not only is the relation between anticorruption and firm value ambiguous, but also whether anticorruption regulation could be used to fight corruption is unclear. In countries where legal and financial institutions are weak and corrupt themselves, anticorruption regulations could be used to repress political opponents, not to fight corruption (Svensson, 2005).

To empirically test how anticorruption regulation influences firm value, two identification challenges need to be addressed. First, simple pre-post difference in firm value around any anticorruption regulation may capture the effect of observable and/or unobservable confounding factors. Meanwhile, anticorruption regulation usually affects all the firms, making it difficult to precisely define treatment and control firms for the use of Difference-in-Difference technique. Second, anticorruption regulation may be anticipated by shareholders or firms. Therefore, it is possible that the association between anticorruption regulation and firm value is driven by omitted variables. Using the anticorruption regulation in China in 2013 may help address the two above questions. In China, corruption takes many different forms, from a variety of perquisites to direct embezzlement of public funds. Long before such regulation, former and current government officers served as (independent) directors in Chinese-listed companies

(bureaucrat directors hereafter), with high compensations and perquisites relative to bureaucrats' official pay.[4] After President Jinping Xi took power in China in November 2012, he put anticorruption at the top of his agenda. On October 19, 2013, the Organization Department of the Communist Party of China started a specific anticorruption regulation. The regulation requires that, only if the Organization Department approves, former and current government officers could serve as directors, without compensations or perquisites. Afterward, bureaucrat directors started to resign from listed companies (Figure 1). This event helps us pin down the effect of anticorruption regulation by providing clearly defined treatment firms, firms with bureaucrat independent directors before the regulation. Meanwhile, the event also helps us draw a causal inference of anticorruption regulation on firm value to the extent that such regulation brings an exogenous shock to shareholders and firms.

Since firms with bureaucrat directors may not be comparable to other firms, in the sense that firms could hire bureaucrat directors due to strategic reasons. To alleviate such concern, we match firms using propensity score matching method, based on a series of variables, including year, industry and location fixed effects.[5] By using a Difference-in-Difference analysis of the matched sample, we find evidences showing that anticorruption regulation may impede firm value. First, after the Chinese government announced its anticorruption regulations, firm value of firms affected by the regulation decreased by about 4%. Second, our descriptive analysis shows

[4] Government officers could serve as directors other than independent directors, including chairman of the board. However, such a scenario is usually due to the arrangement of the government, not due to corruption. Therefore, our empirical tests focus on former and current government officers who serve as independent directors before the anticorruption regulation.
[5] Our main findings are qualitatively the same if unmatched sample is used.

that the trend of firm value for treatment firms and control firms are similar before the regulation, supporting the parallel trend assumption (Figure 2). In addition, we also find that the reduction of firm value is within two years after the regulation, implying that the anticorruption regulation may have a long-lasting effect on firm value. One might argue that the reduction of firm value could be attributed to the loss of political connection, not to the anticorruption regulation. However, the anticorruption regulation in our setting works precisely through the discipline of the political connections between government officers and listed firms. Therefore, our study does capture the effect of anticorruption regulation, although it may also help understand the value of political connections in China.

We next perform several additional robustness tests. First, to address the concern that our results may be driven by chance, we perform a placebo test with random assigned treatment firms and control firms 5,000 times. Our placebo test generates an estimator with a zero mean on average. Second, we use event-study technique to see how the market reacted to the anticorruption regulation. We find that treatment firms experienced significant lower stock return after the anticorruption regulation commenced on October 19, 2013. Together with the fact that stock returns between treatment firms and control firms are not distinguishable before the regulation, our market reaction results suggest that the anticorruption regulation was a shock to shareholders. Importantly, the effect increased from 1% to 4%, as time went by, without reversal in the following year (Figure 3). Last, we test two alternative explanations for our results. One alternative explanation is that anticorruption regulation is just a cover-up, with the real intension being political repression. In other words, it is possible that anticorruption regulation is just used

to fight against firms affiliated with President Xi's rivals. To test this alternative explanation, we check the working experiences of President Xi's rivals: Xilai Bo and Yongkang Zhou,[6] once worked in Chongqing City, Liaoning Province and Sichuan Province. Partition analysis shows that, for sample firms located in the rest of China, our main results still hold, implying that political repression may not be a plausible explanation for our findings. The other alternative explanation is that the decrease of firm value after the regulation is simply driven by the loss of independent directors. Inconsistent with such alternative explanation, our subsample analysis shows that the decrease of firm value is not driven by firms that presumably are more sensitive to the loss of independent directors, such as firms that have a lower ratio of independent directors or a smaller board. In addition, Nguyen and Nielsen (2010) show that after the sudden deaths of directors, the stock prices drop by 0.85%, a much-smaller percentage than what we observe in our study. Therefore, our results may not be driven by the loss of independent directors, although we could not rule out such alternative explanation completely.

We further explore two possible mechanisms, financial constraints and government expropriation, through which anticorruption regulation may harm firm value. First, bureaucrat directors may help firms get better access to finance (Faccio et al., 2006; Claessens et al., 2008; Li et al., 2008). Therefore, after anticorruption regulation requests bureaucrat directors to resign, firm value may decrease, due to loss of access to finance. We find evidences that the effect of anticorruption regulation on firm value is mainly driven by firms with high intangibility and by

[6] Xilai Bo was once considered as a possible candidate for the top office in China, before he was sentenced to life imprisonment in the name of corruption. Yongkang Zhou, a former senior leader of the Communist Party of China, was reportedly the ally of Xilai Bo. Yongkang Zhou was also sentenced to life imprisonment in 2015.

firms with low bank loans before the anticorruption regulation, consistent with the financial constraints explanation. Second, bureaucrat directors may prevent the government from expropriating listed companies, especially in developing economies where property rights are not well protected (Johnson et al., 2002; Acemoglu and Johnson, 2005; Cull and Xu, 2005). Consistently, we find that firms with low government subsidiaries and firms in regions where government deficit growth is high experience a significant drop in firm value after the anticorruption regulation.

How do firms respond to anticorruption regulation? We find that firms may adjust their board characteristics as well as investment and operation policies to alleviate the effect of anticorruption regulation. First, after bureaucrat directors are requested to resign, the average age and education level of independent directors increase, while the busyness of independent directors decreases. We conjecture that firms may hire more-experienced and diligent directors to fill the position. We notice that the absence rate of independent directors in board meetings also increase, probably due to bureaucrat directors' consideration of resignation. Meanwhile, the percentage of male directors, busyness of directors, and probability of management proposal dissented by independent directors are unchanged. Second, the overall board size, independent director percentage and average pay for independent directors remain the same. Third, while firms do not change their leverage significantly, they do make less investment. Fourth, firms hire more employees and also have a lower level of net profit per capita, lower ROA and assets turnover. It is possible that, after bureaucrat directors are forced to resign, listed companies try to build an alternative connection with local government by hiring more employees to alleviate

local unemployment issues. Meanwhile, since firms with more employees may be less likely to be expropriated by government,[7] it is also possible that treatment firms may try to counterbalance the impact of anticorruption regulation by enlarging the number of their employees. Either way, operational efficiency could be reduced by redundant employees.

The rest of the paper proceeds as follows. Section 2 discusses related literature. Section 3 describes the institutional background and the sample. Section 4 presents the main results, and Section 5 tests the channel through which anticorruption may impede firm value. Section 6 investigates the potential reactions of firms after the anticorruption regulation. Section 7 concludes with major limitations of this paper.

2. Relation to Existing Literature

This study is related to several strands of the literature. First, although previous studies try to capture the effect of anticorruption, they mostly focus on monitoring and incentive-based interventions (Svensson, 2005; Olken, 2007; Björkman and Svensson, 2009). Consistently, it has also been shown that transparency and decentralization may place a powerful control on corruption (Fisman and Gatti, 2002; Brunetti and Weder, 2003; Ferraz and Finan, 2008; Fan et al., 2009; Houston et al., 2011). Although anticorruption regulations are prevalent in many countries, such as regulations for "evolving door",[8] empirical tests of anticorruption regulations

[7] The intuition is that, once listed companies with more employees fail, local government suffers from higher pressure to settle the unemployed workers. In practice, local political officers could be demoted, due to the mass disturbance caused by unemployed workers.

[8] "Evolving door" refers to a movement of personnel between government officers and positions in related private sectors. https://en.wikipedia.org/wiki/Revolving_door_%28politics%29.

are scarce. One exemption is Zeume (2016), which shows the adverse effect of anti-bribery on firm value, using the passage of the draft of the UK Bribery Act 2010. This Act imposes incremental penalties for firms and managers found to be using bribes. Our study corroborates with these early studies by empirically testing the effect of anticorruption regulation that disciplines actions of government officers. We do find that anticorruption regulation could generate long-lasting and sizable effects on firms.

Second, with the Chinese economy becoming the second largest in the world, it is of particular interest to investors around the world to understand the effects of Chinese political reforms, especially the effects of President Xi's anticorruption campaign. Our study adds to this understanding by examining how one of President Xi's anticorruption tools influences firm value. Griffin et al. (2016) provide preliminary evidences, indicating that the anticorruption campaign launched in December 2012 indeed aimed at fighting against corruption. To the best of our knowledge, two working papers, Lin et al. (2016) and Ke et al. (2016), test the influence of President Xi's anticorruption campaign on firm value by investigating the market reaction around the announcement of Eight-point Policy. Lin et al. (2016) (LMYZ, hereafter) study the Eight-point Policy, per se, while Ke et al. (2016) (KLT, hereafter) study a series of announcements starting from Eight-point Policy. The research design in LMYZ and KLT may encounter three challenges. First, Eight-point Policy is the first announcement made to discipline the behaviors of all government officers after President Xi took his power. The timing of the announcement is subtle, since President Xi announced Eight-point Policy only three weeks after

taking office. Therefore, this announcement inevitably solves a huge amount of political uncertainty, contaminating the empirical tests of the impact of anticorruption with unobservable confounding factors. Second, since this policy is nationwide, it is challenging to clearly define treatment firms and control firms. As a result, LMYZ explore the heterogeneity in the reactions of state-owned and non-state-owned firms located in different provinces, while KLT test the different reactions between firms that sell luxury goods and services and other firms. Third, the Chinese stock market is far more volatile than the US market (Carpenter et al., 2015). Short-window event studies may capture the sentiment of investors instead of the change of market valuation. Consistent with the above empirical challenges of using Eight-point Policy announcement to test the impact of anticorruption, LMYZ and KLT find conflicting results: LMYZ (KLT) find a sizable increase (decrease) of firm value after the announcement of Eight-point Policy. By using a quasi-natural experimental setting, we believe that our paper, focusing on firm value measured by Tobin's Q, provides a more-accurate estimation of the effect of anticorruption. In addition, our setting is clearer about the specific mechanism. After the Eight-point Policy was announced, different anticorruption tools were implemented, including ethics education, regular inspections by Central Leading Group for Inspection Work and the anticorruption regulation used in our study. Although LMYZ and KLT shed light on the overall effect of the anticorruption campaign, our paper helps to better understand the anticorruption campaign by providing evidences for the impacts of a specific anticorruption tool.

Third, this paper also contributes to a growing literature that explores the relation between political connection and firm value. On one hand, event studies document a positive relation between political connection and firm value (Fisman, 2001; Goldman et al., 2009). Further evidences show that politically connected firms may benefit from better access to finance and higher possibility of bailout (Faccio et al., 2006; Claessens et al., 2008; Li et al., 2008). Even in Denmark, arguably the world's least-corrupt country, a large positive effect of political power on the profitability of politically connected firms is observed (Amore and Bennedsen, 2013). On the other hand, a few Chinese studies imply a negative effect of political connection on firm value (Fan et al., 2007; Cai et al., 2011). Fan et al. (2007) find that firms with politically connected CEOs underperform those without politically connected CEOs significantly and have lower post-IPO earnings growth, sales growth and change in returns on sales. Cai et al. (2011) also find that overall entertainment and travel costs of Chinese-listed companies are negatively associated with firm productivity. Since anticorruption regulation may result in an exogenous shock for firms' connectedness to government, our paper provides further evidences, implying that political connection may benefit shareholders in China.

3. Institutional Background and Sample

3.1. Institutional Background

The practice that former and current government officers serve as independent directors in Chinese-listed companies is arguably perceived as one form of corruption. In 2004, the Organization Department of the Communist Party of China launched a mild discipline against

such practice to reduce government intervention in the Chinese economy, not to fight against corruption.[9] The enforcement of the above regulation is so weak that such practice was almost unchanged at all afterward. Since President Jinping Xi took his power in November 2012, he has been leading a campaign against corruption. In December 2012, Political Bureau of the Central Committee of the Communist Party of China announced Eight-point Policy to discipline the actions of government officers, including living a frugal life and cutting luxury perks. Meanwhile, the Central Commission for Discipline Inspection of the Communist Party of China starts to send out its Central Leading Group for Inspection Work to investigate corruption around China. Hundreds of high-rank officers have been penalized in the name of corruption after the launch of the anticorruption campaign. Ethics education was also heavily disseminated by the Organization Department and the Propaganda Department of the Central Committee of the Communist Party of China.

As part of President Xi's anticorruption campaign, the Organization Department of the Communist Party of China launched an anticorruption regulation on October 19, 2013.[10] The main details are listed as follows.

1. In general, current government officers should not work in firms simultaneously.
2. Former government officers who want to work in firms are under strict supervision of the Party Committee and Organization Department.

[9] Only a few current government officers are required to resign, according to this regulation.

[10] For more information about the agenda of President Xi's anticorruption campaign, please check the following official website (in Chinese) for Communist Party of China. http://fanfu.people.com.cn/. Also, some details (in English) could be found at https://en.wikipedia.org/wiki/Anti-corruption_campaign_under_Xi_Jinping.

3. Government officers who are authorized to work in firms should not have any kinds of compensation.
4. Government officers who are authorized to work in firms should not use their political influence to benefit those firms or themselves.

According to this regulation, only if the Organization Department approves, former and current government officers could serve as directors, with no compensations or perquisites. The resignation of officers who are required to resign would be closely supervised by the Organization Department. In practice, compensations gained by such officers would be confiscated. The same anticorruption regulation was heavily disseminated by the official media on October 30.[11] Afterwards, bureaucrat directors started to resign from listed companies (Figure 1).

[Insert Figure 1 here]

Figure 1 shows how independent directors resigned around the anticorruption regulation. Before the regulation, about a dozen independent directors resigned per month, from November 2012 to September 2013. After the regulation, from November 2013 to September 2014, the number of independent directors' resignations per month increased from 20 to more than 80, and then fell back to about 50. On average, more than 50 independent directors resigned every month after the anticorruption regulation. Meanwhile, about one quarter of resignation announcements after the regulation specifically claimed that the independent directors resigned, due to the

[11] http://paper.people.com.cn/rmrb/html/2013-10/31/nw.D110000renmrb_20131031_1-02.htm.

regulation.

3.2. Sample and Descriptive Statistics

We investigate how anticorruption regulation affects firm value by examining the change of firm value around the commencement of anticorruption. Our sample includes all A-share listed companies in China, except for companies in the financial industry. Our sample is from 2009 to 2014, to avoid the influence of the 2008 financial crisis. We match treatment firms and control firms, using propensity score matching technique. Independent director background information, as well as accounting information, stock returns and other information is from CSMAR database. The final sample contains a total of 780 (1,267) unique treatment (control) firms. All continuous variables are winsorized at 1% and 99%.

[Insert Table 1 here]

3.2.1 Defining Treatment Firms and Control Firms

We define firms with bureaucrat directors before October 19, 2013 as treatment firms, leaving other firms as control firms. Based on CSMAR database for personal characteristics of board members, bureaucrat directors are defined as independent directors who have the working experience in a government agency with the rank higher than Chu level. Chu is the lowest level under the direct supervision of the Organization Department of the Central Committee of the Communist Party of China. We do not expect that the anticorruption regulation would have a detectable influence on the directors with the lowest level bureaucratic background. The Committee of the Chinese People's Political Consultative Conference and the People's Congress

of the People's Republic of China are not considered as government agencies, given that positions at the two above institutes are usually offered as an honor. Meanwhile, firms whose independent directors were/are university officers are not considered as treatment firms, since university officers who do not have direct political influence in general are unlikely to be appointed as independent director for corruptions.

To conduct a Difference-in-Difference analysis, we also define an indicator variable, *Post,* which equals one for observations since 2013, given that the anticorruption regulation was launched on October 19, 2013.

3.2.2 Measuring Firm Value

We follow the extensive literature that uses Tobin's Q to measure firm value (Morck et al., 1988; Lang and Stulz, 1994; Yermack, 1996; Gompers et al., 2003). Tobin's Q is defined as market value of the equity plus the book value of liability, divided by total asset. Tradable shares are priced at year-end stock price. Non-tradable shares are priced at book value of equity per share. In our robustness test, we also look at the market reaction around the commencement of anticorruption. For each trading day, we compute abnormal returns relative to the value-weighted market return (Larker et al., 2011). Then we calculate the cumulative market-adjusted abnormal returns for both treatment firms and control firms.[12]

3.2.3 Financial Information and Firm Characteristics

Consistent with prior literature using Tobin's Q as the measure of firm value, we control

[12] It is possible that the information about anticorruption regulation was leaked into the stock market before October 19, 2013. If we include one trading day before the announcement, our market reaction results are unchanged.

for several firm characteristics. First, we use the natural logarithm of total sales to control for size. And due to the concern about "bad controls", in the sense of Angrist and Pischke (2009), we only control for size in some of our regressions.[13] Second, in the main test of the impact of anticorruption regulation on firm value, we also include several further controls, such as leverage, capital expenditure, R&D, PPE and ROE, since these variables seem not to be affected by the regulation significantly (results are not tabulated). Leverage is defined as total liability divided by total asset. And capital expenditure is defined as capital expenditure divided by total asset. R&D is measured by research and development expenditure divided by total asset. PPE is measured by property, plant and equipment divided by total asset. ROE is defined as net income divided by total equity. The definitions of other variables used in the paper are listed in Table 1 Panel A.

3.2.4 Matching

For each treatment firm, we select a matched control firm based on a propensity score, after a logit model is estimated, using all sample firms with non-missing variables in the years prior to the regulation. In the logit model, the dependent variable is *Treat* dummy, which equals one if a firm has at least one independent director with bureaucratic background before the anticorruption regulation. We include a vector of firm characteristics that may influence the hiring of an independent director with a bureaucratic background, such as firm size, leverage, market-to-book ratio, age, ROE, *SOE*, *StateHoldings* and *TOP1*. *SOE* is a dummy variable that equals one if the ultimate controlling shareholder is a government agency. *StateHoldings* is defined as the number

[13] Untabulated results show that firm size is not changed significantly after the regulation.

of shares held by government agencies, divided by total shares outstanding, while *TOP1* is defined as the number of shares held by the largest shareholder, divided by total shares outstanding. Year dummies, industry dummies and location dummies are also included in the logit model. We define the location of a firm as the province where the firm's headquarter locates. We include this variable in our logit model, because firms in different provinces may differ in the choice of independent directors, due to different levels of market development.

The results of logit regressions are reported in Panel A of Table 2. Column 1 (2) presents the estimations using sample firms before (after) matching. Before matching, our logit model explains the choice variable well, with a p-value from the χ^2 test below 0.001. After we perform nearest-neighbor propensity score matching, using the predicted probabilities from the estimation in Column 1, the χ^2 test for the logit model in Column 2 becomes insignificant statistically. Panel B presents the comparisons in firm characteristics between treatment and control firms. All the differences shown in Panel B are not significant at the conventional level. Diagnostic analysis in Panel A and Panel B implies that our propensity score matching procedure makes treatment firms and matched control firms comparable.

3.2.5 Descriptive Statistics

One of the underlying assumptions in Difference-in-Difference analysis is that the treatment firms and control firms have the same trend before the regulation. Figure 2 shows the firm value dynamics around the anticorruption regulation. From the top to the bottom, the solid (dash dot) line represents the 75^{th} percentile, 50^{th} percentile and 25^{th} percentile of firm value for

control (treatment) firms, respectively. Two inferences could be drawn from Figure 2. First, the firm values of treatment firms and control firms have similar trends before the regulation, supporting the Difference-in-Difference technique used in this paper. Second, the difference of trends between treatment firms and control firms persists in both year 2013 and 2014, implying that the anticorruption regulation may have a long-lasting effect on firm value.

Table 1 Panel B reports the summary statistics for our sample. The key variable in this paper, *Tobin's Q* has a mean (median) equal to 2.082 (1.638), with a heavy right tail. Firm value in our sample from 2009 to 2014 is higher than firm value before 2009 (Chen et al., 2012).

4. Main Results

4.1. The Effect of the Anticorruption Regulation on Firm Value

To test how anticorruption regulation affects firm value, we regress firm value measured by Tobin's Q on the interaction term of $Treat_i$ and $Post_t$, along with control variables.

$$Tobin's\ Q_{it} = \alpha_t + \alpha_i + \gamma Treat_i * Post_t + \beta X_{it} + \varepsilon_{it} \quad (1)$$

Tobin's Q_{it} is defined as market value of the equity plus the book value of liability, divided by total asset. $Treat_i$ is an indicator variable that equals one if a firm has at least one independent director with bureaucratic background before the regulation. $Post_t$ is an indicator variable that equals one for observations since 2013. X_{it} is the set of control variables that may influence the level of firm value. α_t and α_i are dummies for year and firm, respectively. ε_{it} is the residual of the model. If the anticorruption regulation enhances (impedes) firm value, we expect a positive

(negative) γ in our empirical results. For simplicity, we omit the subscripts of all variables afterward.

Table 3 tabulates results from estimating model (1). Column 1 shows the estimation of the effect of the regulation with only firm fixed effect and year fixed effect. The coefficient for the interaction term of *Treat* and *Post* is -0.105 (t-statistic=2.16, significant at the 5% level, two-tailed). The magnitude of the effect is nontrivial: -0.105 represents a 5.1% (=0.105/2.068) reduction relative to the sample average in the pre-regulation period. In Column 2, we add a few additional control variables in our regressions. While the coefficient for *Treat*Post* is still significant at the 10% level, the economic magnitude is reduced to 3.7% (=0.077/2.068). Collectively, Table 2 Column 1 and Column 2 suggest that the anticorruption regulation reduces firm value by about 4%. Together with Figure 2, our empirical results support the argument that the anticorruption regulation results in economically sizable reduction in firm value, a persisting effect without reversal, at least in a year. We also find that *LEV, R&D, PPE* and *ROE* are positively associated with firm value, while *SIZE* is negatively associated with firm value.

4.2 Robustness Checks

4.2.1 Placebo Tests

We next perform several robustness tests. First, we perform a placebo test to see whether our results are purely driven by chance. For all the unique firms, we randomly select 780 firms as treatment firms, leaving the rest as control firms, for 5,000 times. Table 4 represents the results of the placebo test. In the placebo test for Table 3 Column 1 (Column 2), the mean value of the

coefficient for *Treat*Post* is 0.0008 (0.0005), with the mean value of t-statistic equal to 0.0164 (0.0073). In other words, based on falsified treatment firms and control firms, our placebo test does not generate a significant effect of anticorruption regulation on firm value, implying that our previous results may not be driven by chance.

4.2.2 Event Study

Second, we use event study technique to see how the market reacts to the launch of anticorruption regulation. We calculate cumulative market-adjusted stock return (CAR) for both treatment firms and control firms. Table 5 shows the results under different event windows. During the two-day event window (the two trading days following the launch of anticorruption regulation), the difference of CARs between treatment firms and control firms is -0.2% (t-statistic=0.94). More importantly, the tests for the 6-, 31-, 51-, 101-, 151-, 201- and 251-day event windows show that treatment firms experience significant lower stock return, with the difference of CARs decreasing from -0.6% to -4.3%. As we can see in Figure 3, the magnitude of the effect increases, as time goes by, without reversal in the following year. Since market returns between treatment firms and control firms are not distinguishable before the announcement, results using event study technique support the assumption that the anticorruption regulation represents an exogenous shock to shareholders. Meanwhile, it seems that Tobin's Q, which we use to proxy for firm value, could better capture the effect of anticorruption regulation than short-window cumulative abnormal return.

4.2.3 Sensitivity to Alternative Explanation

We also test two alternative explanations. First, it is possible that anticorruption regulation is just a cover-up, with the real intension to fight against firms affiliated with political rivals. Since the legal and financial institutions in China are weak and even corrupt themselves occasionally, anticorruption regulations could be used to repress political opponents, not to fight corruption (Svensson, 2005). We notice that President Jinping Xi's rivals, Xilai Bo and Yongkang Zhou, once worked in Chongqing City, Liaoning Province and Sichuan Province. As a result, firms located in these provinces may be more likely to be affected by the above alternative explanation. However, Panel A Column 1 in Table 6 shows that the reduction of firm value is not significant in provinces where President Xi's rivals once worked. Instead, after we exclude firms locating in the above provinces, our main results still hold in Column 2, implying that anticorruption regulation instead of political repression is a plausible explanation for our findings.

Second, it is also possible that the decrease of firm value after the regulation is simply driven by the loss of independent directors. Presumably, firms with a lower ratio of independent directors or a smaller board may be more sensitive to the loss of independent directors. Inconsistent with this alternative explanation, Panel B of Table 6 shows that our results are not driven by these firms. Meanwhile, prior study shows that the sudden death of the independent director is associated with a less than 1% loss of firm value (Nguyen and Nielsen, 2010). Taken together, our results are not likely driven by the loss of the independent director.

5. Possible Underlying Mechanisms

The empirical findings thus far show that firm value may be impeded by anticorruption regulation. In this section, we explore two potential channels, financial constraints and government expropriation, through which anticorruption regulation may harm firm value.

5.1 Financial Constraints

Previous studies show that political connection may help firms get better access to finance, especially from state-owned banks (Faccio et al., 2006; Claessens et al., 2008; Li et al., 2008). Therefore, if anticorruption regulation reduces firm value through financial constraints, the value of treatment firms that are more financially constrained before the regulation should drop more. We use two measures to proxy the severity of financial constraints. The first measure is *Intangibility*, defined as intangible asset divided by total asset. The intuition is that it is difficult for firms with more intangibles to borrow from banks, since intangible assets could hardly be used as collateral. Therefore, the higher the value of *Intangibility* is, the more financially constrained the firms are. The second measure is *BankLoan*, defined as bank loan divided by total asset, given that firms with severe financial constraints may get fewer bank loans eventually.

Table 7 reports the test for the channel of financial constraints. We separate the whole sample based on the severity of financial constraints before the regulation, measured by *Intangibility* and *BankLoan*. Table 7 Column 1 (Column 2) is estimated on firms whose *Intangibility* before year 2013 is higher (lower) than the sample median, 0.031. Table 7 Column 3 (Column 4) is estimated on firms whose *BankLoan* before year 2013 is higher (lower) than the

sample median, 0.139. The coefficient for *Treat*Post* in Column 1 (Column 4) is significantly negative at the 1% (5%) level, while the coefficient for *Treat*Post* in Column 2 (Column 3) is insignificantly positive (negative). The magnitude of the effect for firms with high *Intangibility* is economically significant: -0.170 represents a 7.9% (=0.170/2.150) reduction, compared with the average pre-regulation firm value for the high *Intangibility* sample. Consistently, firm value decreases by 7.0% (=0.161/2.295) for the low *BankLoan* sample. Taken together, the results in Table 7 show that the reduction in firm value is mostly driven by firms with severe financial constraints, suggesting that anticorruption regulation may impede firm value through financial constraints.

5.2 Government Expropriation

Previous economics and finance literature documents that the government may expropriate private property (Johnson et al., 2002; Acemoglu and Johnson, 2005; Cull and Xu, 2005). Accordingly, listed companies may utilize the political influence of bureaucrat directors to help prevent government expropriation. Therefore, if anticorruption regulation reduces firm value through a higher possibility of government expropriation, the value of treatment firms that are vulnerable to government expropriation should drop more. We use two measures to proxy for the possibility of government expropriation. The first measure is *Subsidiaries*, defined as the subsidiaries from the government by total asset. Intuitively, government expropriation may not be a serious concern for a firm that can easily get government subsidiaries. Therefore, the higher the *Subsidiaries* is, the lower the possibility of government expropriation is. The second measure

is *DeficitGrowth*, defined as the local government deficit growth rate in the region where listed firms' headquarters locate. If a local government has a high demand to meet its deficit, resources in publicly owned listed companies may be squeezed out by the local government. Therefore, the higher the *DeficitGrowth* is, the higher the possibility of government expropriation is.

Table 8 reports the test for the channel of government expropriation. We separate the whole sample based on the possibility of government expropriation, measured by *Subsidiaries* and *DeficitGrowth*. Table 8 Column 1 (Column 2) is estimated on firms whose *Subsidiaries* in the year before anticorruption regulation are higher (lower) than the sample median, 0.003. Table 8 Column 3 (Column 4) is estimated on firms whose *DeficitGrowth* before 2013 is higher (lower) than the sample median, 0.154. The coefficients for *Treat*Post* in Column 1 and Column 4 are insignificantly negative, while the coefficient for *Treat*Post* in Column 2 (Column 3) is significantly negative at the 10% (5%) level. The magnitude of the effect for firms with low *Subsidiaries* is not negligible: -0.101 represents a 4.9% (=0.101/2.046) reduction relative to the average pre-regulation firm value for the low *Subsidiaries* sample. For the high *DeficitGrowth* sample, firm value decreases by 5.9% (=0.122/2.068). Table 8 shows that the reduction in firm value is mostly driven by firms that are sensitive to government expropriation, supporting the explanation that anticorruption may impede firm value through government expropriation.

6. How Firms Respond to Anticorruption Regulation

If corruption is beneficial for shareholders, and firm value is reduced by anticorruption regulation, firms may take actions to alleviate the adverse effect of anticorruption regulations. In

this section, we discuss the responses of listed firms to the anticorruption regulation by focusing on board characteristics, financial policies, investment policies and operation policies. Difference-in-Difference regression techniques are used in this section. To avoid potential "bad controls", in the sense of Angrist and Pischke (2009), we only control for size in these regressions.

6.1 The Effect of Anticorruption on Board Characteristics

Once bureaucrat directors are forced to resign by anticorruption regulation, listed firms need to fill these positions on their boards. Listed firms may change the board characteristics to lessen the adverse effect of anticorruption. We test both the personal characteristics of independent directors and the characteristics of the overall board.

We use the following firm-year variables to proxy the personal characteristics of independent directors. *DirAge* is the average age of independent directors. *Male* is the number of male independent directors divided by the number of all independent directors. We include *Male* in our empirical analysis, since Ahern and Dittmar (2012) show that the gender diversity of board members matters for firm value. *Education* is the number of independent directors with graduate degrees divided by the number of all independent directors. *Busyness* is the number of independent directors with multi-positions divided by the number of all independent directors. *Absence* is the number of the board meetings in which any independent director is absent, divided by the number of board meetings. *Dissent* is an indicator variable that equals one if an independent director dissents with a management proposal. One recent paper shows that in China,

independent directors who care about reputation may vote against management proposals (Jiang et al., 2016).

Table 9 Panel A shows that *Busyness* decreases after the anticorruption regulation, while *DirAge*, *Education* and *Absence* increase. Meanwhile, *Male*, *Busyness* and *Dissent* are not affected significantly. One explanation is that firms hire more-experienced and diligent independent directors whose expertise listed firms could use to counterbalance the adverse effect caused by bureaucrat directors' forced resignation. We also speculate that the increase of the absence rate of independent directors may be due to the consideration of resignation for bureaucrat directors.

We use the following variables to proxy the overall board characteristics. Ln(*BdSize*) is the natural logarithm of the number of board members. *IndBd* is the number of independent directors divided by the number of all board members. Ln(*IndBdPay*) is the natural logarithm of average pay of independent directors. Table 9 Panel B shows that the size of the board, percentage of independent directors and average pay of independent directors remain the same after the anticorruption regulation.

6.2 The Effect of Anticorruption on Financial and Investment Policies

Previous literature shows that politically connected firms may have better access to finance. Therefore, once bureaucrat directors are forced to resign, listed firms may need to adjust their financial and/or investment policies. We use the following variables to proxy financial and investment policies. *LEV* is equal to total liability divided by total asset. *CurrentRatio* is

measured by current asset divided by current liability. *Cash* is defined as cash holdings divided by total asset. *CAPEX* (*R&D*) is equal to capital expenditure (research and development expenditure) divided by total asset. Table 9 Panel C shows that capital expenditures decrease after the anticorruption regulation, while leverage and R&D intensity are not changed. We conjecture that firms have to invest in fewer projects, due to less access to finance after anticorruption regulation. Moreover, results in Table 9 Panel C are consistent with the explanation in section 5.1, that anticorruption regulation may impede firm value through financial constraints.

6.3 The Effect of Anticorruption on Operation Policies

Firms may also adjust their operation policies so that they can better adapt to the new era without the help of bureaucrat directors. We use Ln*(# of employees)* (the natural logarithm of number of employees), Ln*(ProfitPerEmployee)* (the natural logarithm of net profit per employee), *ROA* (earnings before interest and taxes, divided by total asset) and *AssetTurnover* (sales divided by total asset) to proxy for the operational efficiency. Our empirical results in Table 9 Panel D show that, after anticorruption regulation, the number of employees increases significantly, while net profit per employee, ROA and asset turnover decrease significantly.

The above findings may be consistent with two plausible explanations. First, after bureaucrat directors are forced to resign, listed companies try an alternative way to rebuild a connection with local government. Since unemployment is always a serious issue for local government officers, listed companies could do local government officers a favor by hiring more

employees, in exchange for favors from local government. Second, once listed companies with more employees fail, local government undertakes higher pressure to settle the unemployed workers. Sometimes, local government officers are even demoted, due to the mass disturbance caused by unemployed workers. Therefore, by enlarging the number of their employees, treatment firms could suffer less expropriation by and/or get more help from local government. Either way, once listed firms hire excessive employees for whom they may not have good use, operational efficiency of listed companies would be reduced. Moreover, results in Table 9 Panel D are consistent with the explanation in section 5.2, that anticorruption regulation may impede firm value through government expropriation.

7. Conclusion

Our paper tries to investigate how anticorruption regulation affects firm value, using a quasi-natural experiment in China. Empirically, we test two competing hypotheses, the value-enhancing hypothesis versus the value-destructing hypothesis, by analyzing the change of firm value for treatment firms and control firms around the anticorruption regulation. Our Difference-in-Difference analysis shows that, after the Chinese government launched its anticorruption regulation on October 19, 2013, firm value measured by Tobin's Q decreased by about 4%. Event study technique shows similar results: firms affected by the regulation underperform by 0.6% to 4.3%, as time goes by, without reversal in the following year. The reduction of firm value may not be explained by political repression or the loss of directorship. We further show that financial constraints and government expropriation are two plausible channels through

which anticorruption impedes firm value. Finally, firms may adjust their corporate governance practices as well as investment and operation strategy to alleviate the effect of anticorruption regulation. Specifically, after the regulation, treatment firms hire more-experienced and diligent independent directors and make less investment. Meanwhile, treatment firms also hire more employees, resulting in lower operational efficiency.

We draw three important implications from our results. First, consistent with Griffin et al. (2016), we find that the anticorruption regulation in October 2013 indeed aims to fight against corruption. Moreover, anticorruption regulation could generate long-lasting effects, compared with monitoring and incentive-based anticorruption tools. Second, corruptions in developing countries like China may be necessary for business success. Frictions in the economy caused by reluctant bureaucrats may impose a much-more-severe burden on firms. In addition, fighting against corruptions may even push firms to take actions that adversely affect operational efficiency. Third, the negative impact of anticorruption regulation does not mean that anticorruption is unnecessary. It could only imply that anticorruption alone may not be beneficial for long-lasting economic growth. Therefore, policy makers should take complementary actions such as improving government transparency, enhancing legal enforcement, protecting property rights and further developing market-oriented economy.

This paper has at least two limitations. First, one implicit assumption is that the Chinese stock market is at least semi-strong efficient in the long run. Although we believe this assumption is by and large valid (Carpenter et al., 2015), our results inevitably rely on the

Efficient Market Hypothesis to some extent. Second, it must be noticed that the anticorruption regulation studied by our paper is part of President Xi's anticorruption campaign. Therefore, the institutional background and the political environment around the anticorruption regulation may be crucial for the effectiveness of anticorruption regulation. One should generalize our findings to other settings, with cautions. To achieve a better understanding about the economics of anticorruption regulation, further studies need to be done by analyzing other anticorruption actions, including ethics education and regular inspections.

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Table 1: Variable definitions and summary statistics

Panel A：Variable definitions

Variable Name	Variable Definition
Tobin's Q	Market value of the equity plus the book value of liability, divided by total asset. Tradable shares are priced at year-end stock price. Non-tradable shares are priced at book value of equity per share.
Treat	An indicator variable that equals one if a firm has at least one independent director with bureaucratic background before the announcement of anticorruption regulation.
Post	An indicator variable that equals one for observations since 2013.
SIZE	The natural logarithm of total sales.
LEV	Total liability divided by total asset.
CAPEX	Capital expenditure divided by total asset.
R&D	Research and development expenditure divided by total asset.
PPE	Property, plant and equipment divided by total asset.
ROE	Net income divided by book value of equity.
M2B	Ratio of market value to book value of equity.
AGE	The number of years since the firm was listed on the exchange.
SOE	Dummy variable that equals one if the ultimate controlling shareholder is a government agency.
StateHoldings	Number of shares held by government agencies, divided by total shares outstanding.
TOP1	Number of shares held by the largest shareholder, divided by total shares outstanding.
Intangibility	Intangible asset divided by total asset.
BankLoan	Bank loan divided by total asset.
Subsidiaries	Subsidiaries from government divided by total asset.
DeficitGrowth	The local deficit growth rate in the region where listed firms' headquarters locate.
DirAge	The average age of independent directors.

Male	The number of male independent directors divided by the number of all independent directors.
Education	The number of independent directors with graduate degrees divided by the number of all independent directors.
Busyness	The number of independent directors with multi-positions divided by the number of all independent directors.
Absence	The number of the board meetings in which any independent director is absent divided by the number of board meetings.
Dissent	An indicator variable that equals one if an independent director dissents with a management proposal.
BdSize	The number of all board members.
IndBd	The number of independent directors divided by the number of all board members.
IndBdPay	The average pay of independent directors.
CurrentRatio	Current asset divided by current liability.
Cash	Cash divided by total asset.
# of Employees	The number of employees.
Ln*(ProfitPerEmployee)*	The natural logarithm of net profit per employee.
ROA	Earnings before interest and taxes, divided by total asset.
AssetTurnover	Sales divided by total asset.

Panel B：Summary statistics

Variable	N	p25	Median	Mean	p75	S.D.
Tobin's Q	11300	1.276	1.638	2.082	2.333	1.385
Treat	11441	0.000	0.000	0.377	1.000	0.485
Post	11441	0.000	0.000	0.358	1.000	0.479
SIZE	11432	20.232	21.119	21.213	22.099	1.493
LEV	11439	0.272	0.455	0.455	0.627	0.232
CAPEX	11439	0.028	0.061	0.098	0.117	0.130
R&D	11439	0.000	0.006	0.012	0.020	0.016
PPE	11439	0.098	0.198	0.235	0.339	0.173
ROE	11439	0.032	0.073	0.070	0.119	0.134
Intangibility	11439	0.014	0.033	0.048	0.060	0.056
M2b	11300	1.883	2.827	3.792	4.440	3.657
AGE	11441	4.000	11.000	10.226	15.000	6.207
SOE	9311	0.000	0.000	0.486	1.000	0.500
StateHoldings	11440	0.000	0.000	0.066	0.000	0.158
TOP1	9393	0.240	0.348	0.366	0.481	0.155
BankLoan	11392	0.024	0.135	0.163	0.262	0.151
Subsidiaries	11439	0.001	0.003	0.006	0.007	0.008
DeficitGrowth	9393	0.040	0.123	0.117	0.193	0.153
DirAge	11438	48.143	50.600	50.623	53.000	3.643
Male	11441	0.800	0.889	0.877	1.000	0.112
Education	7210	0.375	0.571	0.573	0.769	0.259
Busyness	11438	0.556	0.727	0.707	0.875	0.200
Absence	10559	0.000	0.000	0.002	0.000	0.011
Dissent	10671	0.000	0.000	0.009	0.000	0.097
BdSize	11395	8.000	9.000	8.928	9.000	1.749
IndBd	11395	0.333	0.333	0.369	0.400	0.052
IndBdPay	11433	37143	50000	55823	64167	29446
CurrentRatio	11440	1.020	1.534	2.622	2.626	3.424
Cash	11439	0.095	0.160	0.211	0.281	0.164
# of Employees	11418	824	1869	4644	4371	8910
Ln*(ProfitPerEmployee)*	10401	10.148	11.003	10.961	11.834	1.382
ROA	11439	0.029	0.053	0.057	0.084	0.061
AssetTurnover	11439	0.355	0.554	0.666	0.830	0.471

Table 2: Propensity score matching

Panel A: Propensity score regression and diagnostic regression

	(1) Pre-Match	(2) Post-Match
SIZE	0.242***	0.013
	[6.00]	[0.31]
LEV	-0.213	-0.031
	[0.87]	[0.12]
M2B	0.0131	0.003
	[1.09]	[0.27]
AGE	0.000	0.002
	[0.05]	[0.15]
ROE	0.169	-0.026
	[0.67]	[0.09]
SOE	0.130	0.013
	[1.06]	[0.10]
StateHoldings	0.244	-0.178
	[0.96]	[0.65]
TOP1	-0.101	0.050
	[0.31]	[0.15]
Year FE	YES	YES
Industry FE	YES	YES
Location FE	YES	YES
N	8080	5184
pseudo R^2	0.048	0.002
P-value of χ^2	<0.001	1.000

Panel B: Balance tests

	Treatment	Control	Difference	T-test	P-value
SIZE	21.270	21.249	0.021	0.52	0.601
LEV	0.458	0.459	0.000	0.00	0.998
M2B	3.788	3.756	0.031	0.31	0.755
AGE	9.689	9.658	0.032	0.19	0.848
ROE	0.079	0.079	0.000	0.05	0.963
SOE	0.527	0.532	-0.005	-0.36	0.718
StateHoldings	0.085	0.090	-0.005	-1.05	0.294
TOP1	0.372	0.372	0.000	0.02	0.986

This table reports the diagnostics and results for propensity score matching. Sample selection begins with all firms with non-missing matching variables in the years prior to the anticorruption regulation. We match firms using a one-to-one nearest neighbor propensity score matching, without replacement, on a set of variables. Panel A presents results from the logit model used in estimating the propensity scores for the treatment and control groups. The dependent variable in the logit model is the *Treat* dummy. *Treat* is an indicator variable that equals one if a firm has at least one independent director with bureaucratic background before the announcement of anticorruption regulation. Column 1 reports parameter estimates of the logit model estimated using the sample prior to matching. Propensity scores for matching treatment and control firms are based on these estimates. Column 2 reports the parameter estimates of the logit model estimated using the subsample of matched treatment-control pairs after matching. Definitions of all other variables are listed in Panel A of Table 1. The models in both columns of Panel A include year, industry and location fixed effects. Coefficient estimates are reported with absolute value of z-statistics displayed in brackets below. Panel B reports the balance test results for the pairs of treatment and control firms after matching. Absolute values of t-statistics based on errors clustered by firm are shown in brackets. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively, for two-tailed tests.

Table 3: The impact of anticorruption regulation on firm value

	(1)	(2)
*Treat*Post*	-0.105**	-0.077*
	[2.16]	[1.77]
SIZE		-0.679***
		[9.99]
LEV		0.990***
		[4.84]
CAPEX		0.090
		[0.70]
R&D		6.125***
		[3.11]
PPE		0.677***
		[3.02]
ROE		0.949***
		[7.26]
Firm	YES	YES
Year	YES	YES
N	11300	11295
adj. R^2	0.119	0.230

This table reports the results of the Difference-in-Difference regressions to test the effect of anticorruption regulation on firm value. Dependent variable is firm value measured by Tobin's Q. *Treat* is an indicator variable that equals one if a firm has at least one independent director with bureaucratic background before the announcement of anticorruption regulation. *Post* is an indicator variable that equals one for observations since 2013. Definitions for other variables are reported in Panel A of Table 1. All regressions include firm and year fixed effects. Absolute values of t-statistics based on errors clustered by firm are shown in brackets. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively, for two-tailed tests.

Table 4: Placebo tests

	Mean	P5	P25	Median	P75	P95	S.D.
Table 3 Column 1							
Coefficient for *Treat*Post*	0.0008	-0.0790	-0.0314	0.0004	0.0334	0.0816	0.0488
T-stat for *Treat*Post*	0.0164	-1.6350	-0.6444	0.0092	0.6839	1.6718	1.0016
Table 3 Column 2							
Coefficient for *Treat*Post*	0.0005	-0.0718	-0.0296	0.0005	0.0303	0.0736	0.0443
T-stat for *Treat*Post*	0.0073	-1.6372	-0.6662	0.0110	0.6818	1.6436	1.0017

This table presents the placebo test for results in Table 3, Column 1 and results in Table 3, Column 2. The placebo test is based on a randomized sample from 5,000 simulations. For each simulation, we draw a random sample of 807 "treatment firms" from the pool of all firms and then treat the other firms as "control firms". Dependent variable is firm value measured by Tobin's Q. *Treat* is an indicator variable that equals one if a firm has at least one independent director with bureaucratic background before the announcement of anticorruption regulation. *Post* is an indicator variable that equals one for observations since 2013. The distribution of the coefficient and corresponding t-statistics for the *Treat*Post* variable are reported. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively, for two-tailed tests.

Table 5: Market reaction to the commencement of anticorruption regulation

	Number of Firms	Cumulative market-adjusted abnormal returns within different event windows							
		(0,+2)	(0,+5)	(0,+30)	(0,+50)	(0,+100)	(0,+150)	(0,+200)	(0,+250)
Treatment firms	780	-0.001	-0.006***	-0.018***	0.034***	0.107***	0.105***	0.136***	0.152***
		[-0.69]	[-2.70]	[3.85]	[6.20]	[12.56]	[11.14]	[13.23]	[13.99]
Control firms	1267	0.001	-0.000	-0.007**	0.050***	0.131***	0.137***	0.172***	0.195***
		[0.67]	[0.19]	[2.04]	[11.09]	[20.35]	[19.03]	[21.14]	[22.51]
Difference	2047	-0.002	-0.006*	-0.010*	-0.016**	-0.024**	-0.032***	-0.036***	-0.043***
		[0.94]	[1.89]	[1.72]	[2.20]	[2.28]	[2.73]	[2.73]	[3.06]

This table presents the market reaction of treatment firms and control firms around the commencement of anticorruption regulation. Treatment firms are firms that have at least one independent director with bureaucratic background before the announcement of anticorruption regulation. Other firms are considered as control firms. Absolute values of t-statistics are shown in brackets. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively, for two-tailed tests.

Table 6: Tests for alternative explanations
Panel A: Anticorruption vs. political repression

	(1) Rivals	(2) Others
*Treat*Post*	-0.064	-0.077*
	[0.42]	[1.71]
SIZE	-0.720***	-0.674***
	[3.55]	[9.47]
LEV	0.820	1.008***
	[1.53]	[4.60]
CAPEX	0.025	0.086
	[0.06]	[0.64]
R&D	14.510*	5.565***
	[1.81]	[2.74]
PPE	1.153	0.638***
	[1.63]	[2.69]
ROE	0.770***	0.960***
	[2.82]	[6.73]
Firm	YES	YES
Year	YES	YES
N	916	10379
adj. R^2	0.337	0.221

Panel B: Loss of independent directors

	(1) More Independent Director	(2) Less Independent Director	(3) Large Board	(4) Small Board
*Treat*Post*	-0.135**	-0.013	-0.109**	-0.022
	[2.16]	[0.21]	[2.28]	[0.26]
SIZE	-0.812***	-0.494***	-0.552***	-0.816***
	[8.89]	[6.03]	[6.44]	[7.99]
LEV	1.211***	0.617***	0.865***	1.016***
	[3.94]	[3.12]	[3.62]	[3.14]
CAPEX	0.003	0.246	0.303*	-0.150
	[0.02]	[1.49]	[1.76]	[0.78]
R&D	9.048***	2.455	5.792**	6.691**
	[3.43]	[0.92]	[2.26]	[2.17]
PPE	0.311	1.207***	0.981***	0.414
	[1.03]	[4.19]	[3.70]	[1.13]
ROE	0.917***	1.015***	0.894***	0.987***
	[5.35]	[5.07]	[5.03]	[5.18]
Firm	YES	YES	YES	YES
Year	YES	YES	YES	YES
N	5738	5557	6997	4298
adj. R^2	0.258	0.211	0.217	0.255

This table reports the results to test alternative explanations for our findings. Dependent variable is firm value measured by Tobin's Q. *Treat* is an indicator variable that equals one if a firm has at least one independent director with bureaucratic background before the announcement of anticorruption regulation. *Post* is an indicator variable that equals one for observations since 2013. Definitions for other variables are reported in Panel A of Table 1. In Panel A of Table 6, Column 1 uses sample firms in Chongqing City, Liaoning Province and Sichuan Province, where Xilai Bo and Yongkang Zhou (President Jingping Xi's rivals) once worked. Column 2 uses the rest of the sample. In Panel B of Table 6, Column 1 (2) is based on firms whose ratio of independent directors on the board is higher (lower) than the sample median, 0.333. Column 3 (4) is based on firms where the number of board members is higher (lower) than the sample median, 9. All regressions include firm and year fixed effects. Absolute values of t-statistics based on errors clustered by firm are shown in brackets. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively, for two-tailed tests.

Table 7: The impact of anticorruption regulation on firm value: Financial constraints channel

	(1)	(2)	(3)	(4)
	High *Intangibility*	Low *Intangibility*	High *BankLoan*	Low *BankLoan*
*Treat*Post*	-0.170***	0.0298	-0.00420	-0.161**
	[2.81]	[0.48]	[0.08]	[2.28]
SIZE	-0.811***	-0.548***	-0.638***	-0.772***
	[9.04]	[5.37]	[7.93]	[7.40]
LEV	0.848***	1.048***	0.489**	1.597***
	[3.11]	[3.32]	[2.16]	[4.24]
CAPEX	0.0518	0.0933	0.225	-0.0569
	[0.24]	[0.65]	[0.96]	[0.38]
R&D	5.438*	6.377**	3.307	8.051***
	[1.83]	[2.47]	[1.16]	[3.05]
PPE	0.613**	0.688**	0.314	1.190***
	[1.98]	[2.24]	[1.14]	[3.36]
ROE	0.977***	0.844***	0.605***	1.811***
	[6.29]	[3.86]	[4.31]	[5.40]
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	5691	5604	5903	5392
adj. R^2	0.262	0.206	0.240	0.249

This table reports the results of the Difference-in-Difference regressions to test the financial constraints channel through which the anticorruption regulation may affect firm value. Dependent variable is firm value measured by Tobin's Q. *Treat* is an indicator variable that equals one if a firm has at least one independent director with bureaucratic background before the announcement of anticorruption regulation. *Post* is an indicator variable that equals one for observations since 2013. Column 1 (Column 2) is estimated on firms whose intangibility, measured as intangible assets divided by total assets before year 2013, is higher (lower) than the sample median. Column 3 (Column 4) is estimated on firms whose bank loan, measured as bank loan divided by total assets before year 2013, is higher (lower) than the sample median. Definitions for other variables are reported in Panel A of Table 1. All regressions include firm and year fixed effects. Absolute values of t-statistics based on errors clustered by firm are shown in brackets. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively, for two-tailed tests.

Table 8: The impact of anticorruption regulation on firm value: Government expropriation channel

	(1) High *Subsidiaries*	(2) Low *Subsidiaries*	(3) High *DeficitGrowth*	(4) Low *DeficitGrowth*
*Treat*Post*	-0.0552	-0.101*	-0.122**	-0.0239
	[0.89]	[1.72]	[2.01]	[0.37]
SIZE	-0.637***	-0.697***	-0.768***	-0.577***
	[5.45]	[8.60]	[8.72]	[5.43]
LEV	1.157***	0.811***	1.167***	0.737**
	[4.22]	[2.75]	[4.41]	[2.31]
CAPEX	0.318	-0.135	-0.249	0.416**
	[1.49]	[0.92]	[1.40]	[2.21]
R&D	8.507***	1.220	7.481***	3.701
	[3.34]	[0.39]	[2.78]	[1.36]
PPE	0.808**	0.582*	0.313	1.090***
	[2.40]	[1.93]	[1.10]	[3.10]
ROE	1.183***	0.724***	0.833***	1.149***
	[6.00]	[4.28]	[5.24]	[5.24]
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	5539	5756	5609	5449
adj. R^2	0.248	0.226	0.263	0.212

This table reports the results of the Difference-in-Difference regressions to test the government expropriation channel through which the anticorruption regulation may affect firm value. Dependent variable is firm value measured by Tobin's Q. *Treat* is an indicator variable that equals one if a firm has at least one independent director with bureaucratic background before the announcement of anticorruption regulation. *Post* is an indicator variable that equals one for observations since 2013. Column 1 (Column 2) is estimated on firms whose government subsidiaries, measured as subsidiaries divided by total assets in the year before anticorruption regulation, is higher (lower) than the sample median. Column 3 (Column 4) is estimated on firms whose headquarters locate in regions where local government's deficit increase before 2013 is higher (lower) than the sample median. Definitions for other variables are reported in Panel A of Table 1. All regressions include firm and year fixed effects. Absolute values of t-statistics based on errors clustered by firm are shown in brackets. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively, for two-tailed tests.

Table 9: Other impacts of anticorruption regulation on listed firms

Panel A: The impact of anticorruption regulation on independent director characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	*DirAge*	*Male*	*Education*	*Busyness*	*Absence*	*Dissent*
*Treat*Post*	0.168*	-0.002	0.016*	-0.012*	0.001**	0.542
	[1.91]	[0.75]	[1.75]	[1.72]	[2.34]	[1.20]
SIZE	0.276***	0.005*	0.005	-0.000	-0.000	-0.149
	[4.00]	[1.93]	[0.68]	[0.01]	[0.83]	[0.72]
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	11429	11432	7206	11429	10550	481
adj. R^2	0.266	0.013	0.027	0.123	0.003	
pseudo R^2						0.114

Panel B: The impact of anticorruption regulation on board characteristics

	(1)	(2)	(3)
Dep. Var.	Ln(*BdSize*)	*IndBd*	Ln(*IndBdPay*)
*Treat*Post*	-0.000	-0.001	-0.014
	[0.01]	[0.45]	[0.97]
SIZE	0.015***	-0.003**	0.061***
	[3.67]	[2.46]	[5.20]
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
N	11387	11387	11266
adj. R^2	0.026	0.007	0.060

Panel C: The impact of anticorruption regulation on financial and investment policies

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	*LEV*	*CurrentRatio*	*Cash*	*CAPEX*	*R&D*
*Treat*Post*	0.009	-0.030	-0.002	-0.014**	0.000
	[1.54]	[0.28]	[0.43]	[2.37]	[0.29]
SIZE	0.022**	-0.685***	-0.025***	-0.001	0.000
	[2.38]	[5.58]	[5.32]	[0.18]	[0.72]
Firm FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
N	11430	11431	11430	11430	11430
adj. R^2	0.017	0.061	0.142	0.027	0.116

Panel D: The impact of anticorruption regulation on firm operations

	(1)	(2)	(3)	(4)
Dep. Var.	Ln(*# of employees*)	Ln*(ProfitPerEmployee)*	*ROA*	*AssetsTurnover*
*Treat*Post*	0.044**	-0.112***	-0.004**	-0.017*
	[2.05]	[2.75]	[2.21]	[1.84]
SIZE	0.501***	0.397***	0.024***	0.173***
	[16.44]	[7.04]	[8.77]	[12.01]
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	11409	10397	11430	11430
adj. R^2	0.317	0.068	0.077	0.179

This table reports the results of the Difference-in-Difference regressions to test other impacts of the anticorruption regulation on listed firms. In Panel A, dependent variables are *DirAge* (the average age of independent directors), *Male* (the number of male independent directors divided by the number of all independent directors), *Education* (the number of independent directors with graduate degrees divided by the number of all independent directors), *Busyness* (the number of independent directors with multi-positions divided by the number of all independent directors), and *Absence* (the number of the board meetings in which any independent director is absent divided by the number of board meetings), in OLS regressions from Column 1 to Column 5, respectively. Dependent variable is *Dissent* (an indicator variable that equals one if an independent director dissents with a management proposal), in logit regression in Column 6. In Panel B, dependent variables are Ln(*BdSize*), *IndBd* and Ln(*IndBdPay*), in OLS regressions from Column 1 to Column 3, respectively. Ln(*BdSize*) is the natural logarithm of the number of board members. *IndBd* is the number of independent directors divided by the number of all board members. Ln(*IndBdPay*) is the natural logarithm of average pay of independent directors. In Panel C, dependent variables are *LEV* (total liability divided by total asset), *CurrentRatio* (current asset divided by current liability), *Cash* (cash divided by total asset), *CAPEX* (capital expenditure divided by total asset) and *R&D* (research and development expenditure divided by total asset), in OLS regressions from Column 1 to Column 5, respectively. In Panel D, dependent variables are Ln*(# of employees)* (the natural logarithm of number of employees), Ln*(ProfitPerEmployee)* (the natural logarithm of net profit per employee), *ROA* (earnings before interest and taxes, divided by total asset) and *AssetTurnover* (sales divided by total asset), in OLS regressions from Column 1 to Column 4, respectively. *Treat* is an indicator variable that equals one if a firm has at least one independent director with a bureaucratic background before the announcement of anticorruption regulation. *Post* is an indicator variable that equals one for observations since 2013. Definitions for other variables are reported in Panel A of Table 1. All regressions include firm and year fixed effects. Absolute values of t-statistics based on errors clustered by firm are shown in brackets for all OLS regressions. Absolute values of z-statistics for Column 6 in Panel A are also shown in brackets. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively, for two-tailed tests.

Figure 1: Distribution of independent director resignations

This figure shows the distribution of independent director resignations one year before and after the anticorruption regulation. The resignations in October 2013 were excluded when the anticorruption regulation was launched. The lower part of the bar after November 2013 represents the resignations that specifically state that independent directors resign due to the anticorruption regulation.

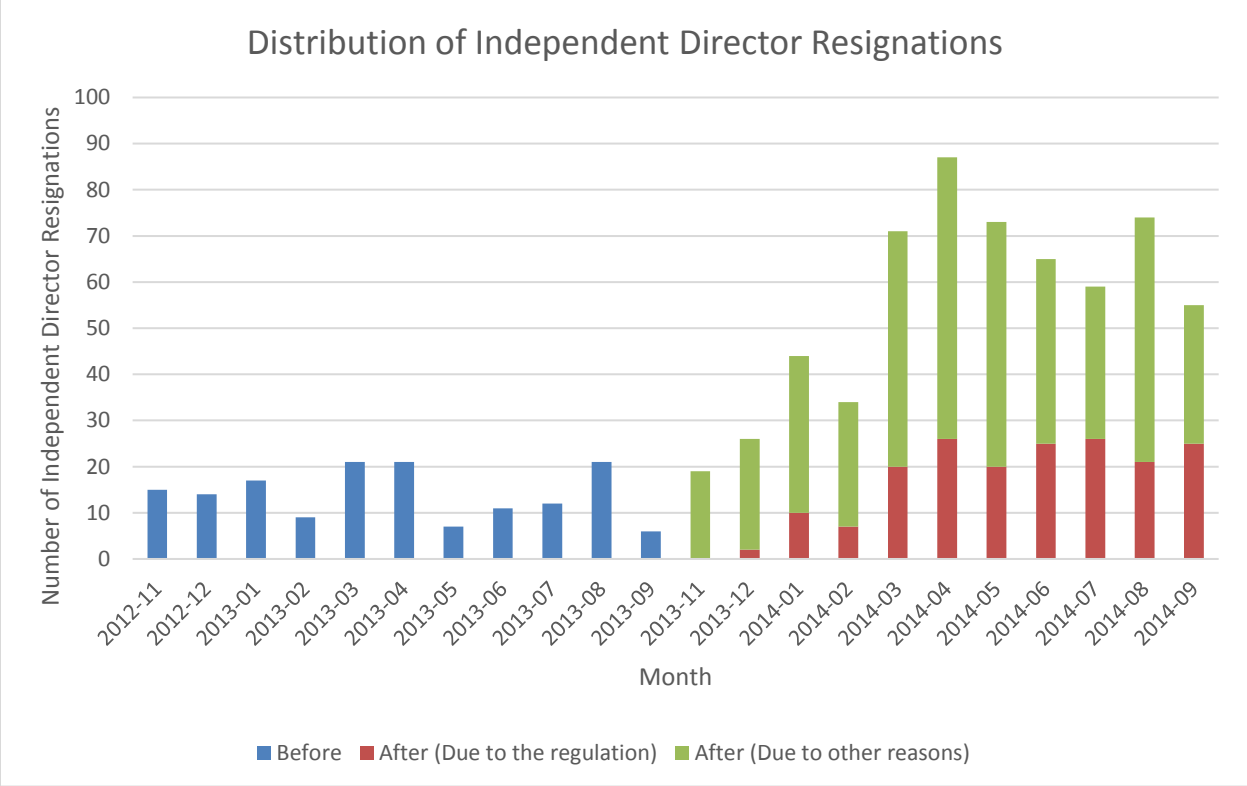

Figure 2: Firm value dynamics around the anticorruption regulation

This figure shows the distribution of firm value measured by Tobin's Q for treatment firms and control firms from two years before (year 2011 and year 2012) to two years after (year 2013 and year 2014) the commencement of anticorruption regulation. T_75, T_50 and T_25 (C_75, C_50 and C_25) are 75 percentile, 50 percentile and 25 percentile of Tobin's Q for treatment firms (control firms), respectively.

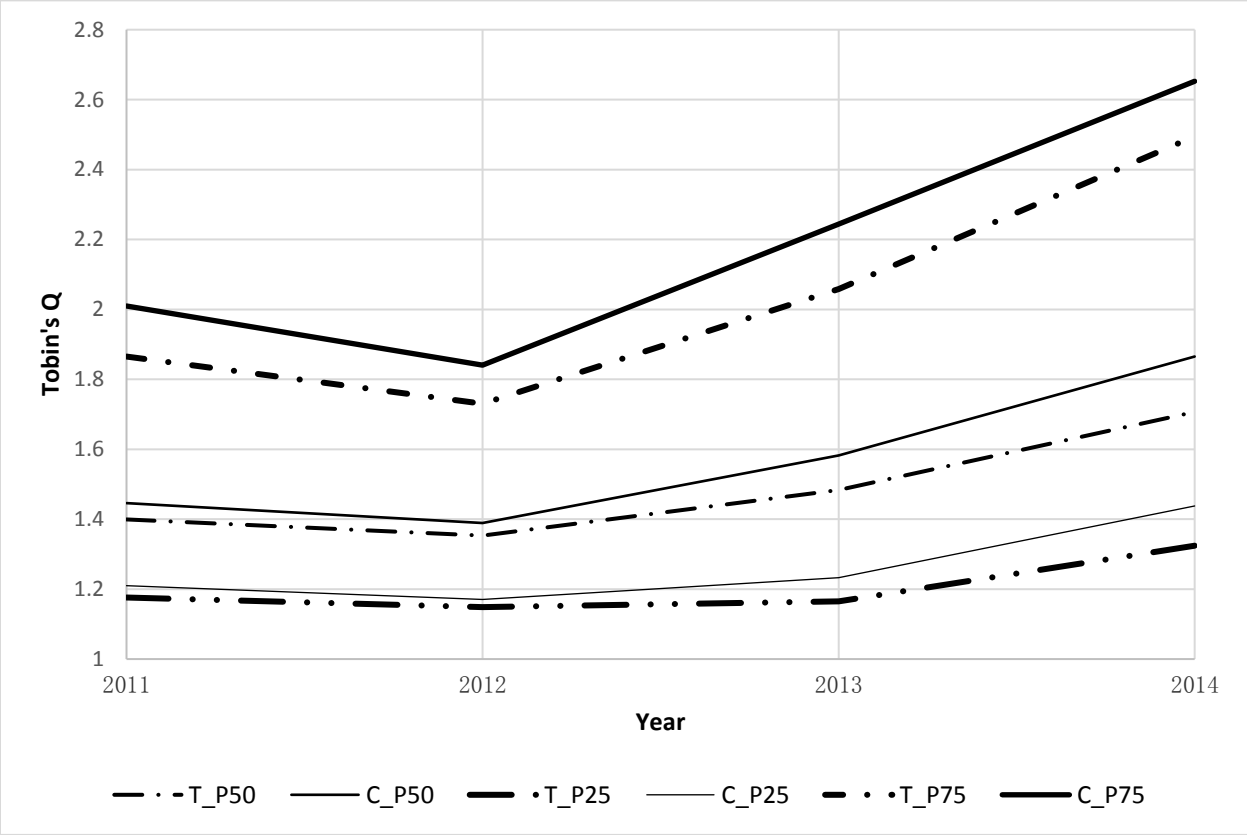

Figure 3: Market reaction around the commencement of anticorruption regulation

This figure shows the market reaction around the commencement of anticorruption regulation, from 10 days before to 250 days after. Vertical axis represents market reaction, measured by cumulative market-adjusted stock return. Market return is measured by value-weighted A share return. Horizontal axis represents the days around the announcement. Day 0 is the first trading day after the anticorruption regulation.