Political Connections, Government Subsidies, and Capital Misallocation: Evidence from China

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Abstract

We show that government subsidies in China are granted based on the political connections of firms' independent directors and such an allocation policy exacerbates the economy's capital misallocation. Our identification strategy exploits a regulation that forces current and former government officials or members of the Communist Party in China to resign from independent-director positions. After the regulation, politically connected firms experience a substantial decline in subsidies, especially so for low-efficiency firms. But connected firms' investment-to-q sensitivity increases. Furthermore, severing political connections attenuates the economy's capital misallocation. Our findings provide supporting evidence for the effectiveness of one stage of the anti-corruption campaign.

Keywords: political connection, board of directors, government subsidy, fiscal policy, capital misallocation

JEL Classifications: G3, G38

1. Introduction

A government subsidy is a benefit given by the government to individual firms. As a component of government spending, the subsidy plays an important role in a country's fiscal policy, representing a redistribution of economic wealth, generally with the aim of promoting economic and social policy. Since a government subsidy can have a substantial influence on a country's economic growth, its efficient use (or allocation) is an important topic in economics or public finance (e.g., Leibenstein, 1966; Mayshar, 1977; Cerqua and Pellegrini, 2014).

In this paper, taking advantage of a new regulation in China, we examine how the political connections of independent directors of firms affect the allocation of government subsidies and the capital misallocation of the economy. Although China's economic system has become greatly decentralized since 1978, the influence of political connections remains significant. Thousands of firms in China hire current or retired government officials or members of the Communist Party of China (CPC) as independent directors on their boards. Compared with developed economies, such as the United States, the proportion of such "politically connected" firms is much higher in China. The existence of such official independent directors (OIDs) should significantly affect the allocation policy of government subsidies (Shleifer and Vishny, 1994). As policy makers, officials can utilize their political power to directly influence the distribution of subsidies, biasing it toward their own firms or industries. Alternatively, policy makers can easily build social networks with other officials that have the power to influence the allocation policy and seek preferential treatment of subsidies for their own firms.

An important reason for using Chinese firms as our main sample is that listed firms in China report detailed information on received subsidies. Chinese

government's fiscal policy relies heavily on the allocation of subsidies. Between 2009 and 2015, 99% of listed firms in our sample received subsidies. On average, all listed firms received 73 billion CNY (Chinese Yuan Renminbi) of subsidies each year, and each listed firm received 32 million CNY per year.[1] The primary goal of granting subsidies, as part of China's fiscal policy, is to develop strategic areas such as agriculture, public utilities, and high-tech industries and to help financially distressed state-owned enterprises (SOEs) (Chen, Lee, and Li, 2008). Therefore, the way of allocating such an important economic resource greatly concerns economic growth and social welfare.

Moreover, China provides a setting for us to cleanly identify the effect of political connections. Recently, the Chinese government attracted the world's attention by setting off a far-reaching campaign against corruption. A particular step of the anti-corruption campaign involved delinking politicians from the corporate sector. On October 19, 2013, the highest authority of CPC issued *Document 18*, which required most current and former officials to resign from their corporate positions (we use "officials" to refer to both government officials and CPC members henceforth). We observe a resignation wave of official independent directors (OIDs) from listed companies after the effective date of Document 18.[2] This event thereby created an exogenous shock to firms' degree of political connections and provides an idea setting from which we can establish the causal effect of political connections on individual firms' subsidies.

We employ a difference-in-differences (DID) approach, which can capture the

[1] According to the Statistical Yearbook (National Bureau of Statistics), the enterprise innovation subsidies amount to 76 billion, 88.5 and 96.5 billion CNY in 2004, 2005 and 2006; and the SOE loss subsidies amount to 21.8 billion, 19.3 and 18 billion CNY in 2004, 2005 and 2006.

[2] The most common practice through which officials take office in a company is to serve on the board as an independent director. Although it is also possible for an official to become the CEO of a firm, such cases are limited to state-owned companies, in which government officials are directly appointed by the government. These cases, however, do not conflict with Document 18, which only targets officials who seek corporation positions by themselves.

effect of the new regulation by comparing the change in subsidies of treated firms and that of control firms. We define treated firms as those that were hiring officials on October 19, 2013, and thus were affected by Document 18. A potential concern is that these firms are far different from those that were not hiring any officials in various dimensions (e.g., Faccio, 2006, 2010). In order to ensure that the two groups in our sample follow a relatively similar or parallel trend before the new regulation, we use a propensity-score matching (PSM) algorithm. Specifically, we find each treated firm a control firm that has the closest probability of hiring OIDs right before the regulation. We show that after the PSM, the parallel trend assumption holds well. The DID approach is thus conducted based on the matched sample.[3]

We first investigate the change in government subsidies, which comprises as much as 60% of the absolute net income for an average firm in China.[4] We find that after Document 18 caused the mass resignation of OIDs, government subsidies obtained by treated firms decline by around 30% relative to control firms. The reduction in subsidies is more pronounced for non-SOEs, firms with more local government officials, and firms with lower productivity. Furthermore, the decline is mainly driven by the reduction of "discretionary" subsidies, defined as government subsidies that are granted without designated purpose (and thus are easily subject to officials' discretion in granting decisions).[5]

Managers expecting subsidies from the government would have incentives to shirk, undertaking negative NPV (net present value) project or taking excessive risk. This is the typical moral hazard problem of soft budget constraint (Maskin

[3] Using the original sample generates similar findings though.
[4] Subsidy is recorded as "non-operating income" on a firm's income statement.
[5] In our data, each subsidy grant is under a title, usually specifying the dedicated purpose of the subsidy. For example, research and development subsidy, import/export support, and tax refund. However, 58% of the titles are in general terms, such as "subsidy," "allowance," "support," and "award," and do not specify any purpose or usage.

and Xu, 2001). In this respect, while the loss of subsidies imposes a financial constraint on the firm for the time being, it can discipline the manager by altering their expectations, which in turn leads the manager to invest more efficiently. Consistent with this conjecture, we find that after Document 18, connected firms' capital expenditures are more sensitive to Tobin's *q*. Furthermore, these firms also engage in fewer related-party transactions that are documented to facilitate controlling shareholders' self-dealing and rent-seeking behaviors at the expense of minority shareholders (Jian and Wong, 2010; Liao, Liu and Wang, 2014). Overall, the evidence suggests that Document 18, by severing the political connections of a firm, disciplines the manager and improves firm's investment and operating efficiency.

Ideally, economic resources should be allocated to firms with the highest marginal productivity such that the capital misallocation is reduced. However, our evidence suggests that China's subsidies are allocated based on firms' political connections, which have distorted firm-level investment efficiency. Hypothetically, shifting from politically-oriented allocation scheme to a more market-oriented one could promote economic efficiency at the macro level. To investigate whether the regime shift in 2013 can mitigate capital misallocations, we examine the effect of Document 18 on industry-level dispersion of revenue productivity (Hsieh and Klenow, 2009). We find that after OIDs' resignation following the new regulation, the dispersion of revenue productivity within an industry decreases. This evidence implies that de-politicization of the corporate sector can mitigate the misallocation of capital.

To our best knowledge, this study is one of the first few, if any, to provide evidence concerning the relationship between the degree of political connections and government subsidies, a major component of the government's transfer

payment. We establish the causal effect by exploiting an event that exogenously affects the political connections of firms. We also hand collected detailed information about the categories of government subsidies, which helps us to generate novel insights about subsidy-granting decisions.

The literature has been particularly interested in the effect of China's resource allocation on its economic growth (Hsieh and Klenow, 2009; Song, Storesletten, and Zilibotti, 2011). During China's transition to a market-based economy, the central government has performed progressive reforms, which has fueled its fast growth for decades. However, China has still been criticized for allocating economic resources based on social networks and political power. It remains a question how much more energy could be released by further de-politicizing China's corporate sector.[6] While Document 18 is just one step forward, it provides us an opportunity to explore this question. The Wall Street Journal (June 11, 2014) commented on Document 18: "After decades of breakneck economic growth that has disproportionately benefited companies and individuals with political connections, the party is eager to erase the notion that the country's economic system is rigged, particularly as growth has begun to slow". In this regard, this paper conducts a timely research on the effectiveness of the new reform, and document that the reform promotes firm-level efficiency and improves macro-level capital allocation. We discuss some caveats and limitations of our findings towards the end of this paper.

Our paper also contributes to the literature on boards of directors. The major role of independent directors in a firm is to monitor and advise firm managers. We

[6] The answer to this question is not immediately obvious. Although the literature has long argued that the "grabbing hand" role of government officials and potential corruptions are major obstacles to economic growth (e.g., Mauro, 1995; Frye and Shleifer, 1997), Allen, Qian, and Qian (2005) find that in China, the relationship with local government and the motivation of local government can promote the development of the private sector.

show that in China, official independent directors are able to directly transfer wealth from the government to the firm, a channel that is beyond monitoring and advising. In return, OIDs engage actively in related party transactions, which likely help them tunnel wealth from their companies.

The remainder of the paper proceeds as follows. Section 2 reviews related literature; section 3 provides the institutional background of China's independent-director system and Document 18; section 4 describes the data and sample; section 5 designs our empirical strategy; section 6 reports all regression results; and section 7 concludes.

2. Literature Review

This paper belongs to the literature that examines the cost and benefit of political connections, especially political connections through the board of directors (Goldman et al., 2009; Goldman et al., 2013). While politicians are expected to have rent-seeking incentives that would reduce firm value (Shleifer and Vishny, 1994; Kim, Yang, and Zhou, 2016), politicians can also add net value to firms through various channels by utilizing their political resources (e.g., Fishman, 2001; Faccio, 2006; Goldman et al., 2009; Cooper, et al., 2010; Goldman et al., 2013; Luechinger and Moser, 2014; Akey, 2015; Do et al., 2015). Many studies document the benefits of political connection from the perspective of firm financing, such as easier access to financing (Claessens et al., 2008) and lower financing cost of equity (Boubakri et al., 2012), public debt (Bradley et al., 2014), and bank loans (Li et al., 2008; Houston et al., 2014).

Moreover, politically connected firms are likely to be bailed out in financial distress (Faccio et al., 2006). Duchin and Sosyura (2012) find that politically connected firms obtain more government support through the Troubled Asset

Relief Program, but these government investments suffer capital misallocation. Goldman et al. (2013) and Schoenherr (2016) find that firms connected to the election-winner party receive more state-procurement contracts. While these three studies are most similar to ours, we deviate from Duchin and Sosyura (2012) by looking at a regular government spending program (government subsidies) rather than bailout programs during a financial crisis, and we deviate from Goldman et al. (2013) and Schoenherr (2016) by examining a more direct channel of value transfer—cash granted from the government.

Our paper is also related to several recent studies that examine the anti-corruption campaign in China. On December 4, 2012, the CPC announced the *Eight-point Regulation*, which is an explicit instruction about how CPC members should behave going forward. Griffin, Liu and Shu (2017) suggest that the regulation mainly targeted top executives on corrupt firms and has reduced the entertainment expenditure of these firms. Lin, Morck, Yeung and Zhao (2017) find that the market reaction to this regulation is positive for SOEs and non-SOEs located in high-marketization regions, and especially so when the prior-year entertainment expenses were high. Even though both Eight-point Regulation and Document 18 can be seen as a part of the entire anti-corruption campaign, the former mainly targeted official executives and the latter focused on official independent directors (OIDs are not necessarily corrupt though). We show below that the average number of OIDs of a firm did not respond to Eight-point Regulation. We also perform a falsification test to mitigate the concern that our results are driven by the Eight-point Regulation. On the other hand, Hope, Yue, and Zhong (2017) use the same experiment as our study and find that politically connected firms improve their accounting quality after Document 18.

3. China's Independent-Director System and Document 18

China's independent-director system, which is a "legal transplant" from US corporate governance law and practice (Clarke, 2006), was introduced in 2001. The roles and duties of China's independent directors are thus very similar to those of independent directors in the United States.[7] Boards function mainly through proposals discussed and voted on at board meetings. Several studies have documented that China's independent directors play a significant role in monitoring and advising the management of corporations (e.g., Giannetti, Liao, and Yu, 2015; Jiang, Wan, and Zhao, 2016). For a more detailed description of China's independent director system, see Jiang et al. (2016) and Clarke (2006).

After the introduction of the independent director system in China, it has become a common phenomenon that listed companies hire current or retired government officials and CPC members as independent directors. In 2004, 2008, and 2013, the CPC issued three documents setting up detailed regulations on officials taking positions in corporations. These documents aimed to restrict the power of these officials and mitigate potential corruptions. The general principle is that officials should not be involved in the real business of the company. However, the first two documents only laid down the general principle, without specifying detailed rules for execution, which left much room for officials to circumvent the regulation. As a result, few officials actually resigned because of these two regulations.

After the 18th National Congress of the CPC in the fall of 2012, China started a far-reaching anti-corruption campaign. Upon taking office, President Xi Jinping vowed to crack down on corruptions of both high-level officials and local civil

[7] In China, a director affiliated with or representing a non-insider blockholder who holds less than 1% of shares outstanding can be considered independent (this threshold is 10% in the United States).

servants. As the first step of the campaign, the CPC Politburo announced the Eight-point Regulation on December 4, 2012, which were aimed at instilling more discipline, purifying the culture of privilege, and eliminating the conspicuous perks among party members. The regulation was welcomed by the stock market investors right after the announcement (Lin, Mork, Yeung, and Zhao, 2017). However, although the entertainment expenses are significantly reduced among potentially corrupt firms, the regulation has quite limited effect on other aspects and the overall performance of targeted firms (Griffin, Liu and Shu, 2017). With the backdrop of anti-corruption, the Central Organization Department of the CPC issued the third regulation regarding OIDs, known as Document 18, on October 19, 2013. The main regulations in this document are summarized:

(1) Current officials (including government officials and CPC members) should not take any positions in corporations.

(2) Within three years after their retirement, officials should not take any positions in the corporations that had been within their official jurisdiction. If a former official wants to assume such a position, he or she needs to seek special approval from the corresponding Party Committee. Three years after retirement, a former official who intends to take a position in a corporation should also seek special approval from the corresponding Party Committee.

(3) A former official who has been approved for a position in a corporation should not receive any form of compensation from the corporation. In addition, he or she should not take more than one position, should not serve more than two tenures, and should leave the position before reaching age 70.

Enforcement, this time, was much more stringent than the previous two (2004 and 2008), and thus independent directors with official backgrounds started to resign. Within just a few months following the regulation announcement, the

media reported a large number of resignations of officials from their positions in listed companies. According to the Central Organization Department, by July 22, 2014, around 40,700 government officials had resigned from both listed and private companies, among which 229 were provincial officials or above.[8]

4. Data and Summary Statistics

To obtain the information about listed firms' financial statements, bank loans, and related party transactions, we use CSMAR database. The government subsidy data is from Wind database. According to the Accounting Standard released by the Ministry of Finance in 2001, a subsidy is defined as the actual revenue from a benefit given by the government. It is recorded in a firm's financial statement as "non-operating income." Although the financial statements are updated on a quarterly basis, subsidy data is revealed only semi-annually. Thus, we use half a year as one period in our analysis. We download the historical data concerning government subsidies for each company and merge them with the CSMAR data. Wind database not only specifies the total amount for each grant of subsidy received by firms, but also describes the dedicated purpose for each grant. For example, in 2012, United Science & Technology Co Ltd (000925) was granted 3.75 million CNY for conducting industrial planning and innovation projects in Hangzhou, 3 million for the construction of a metro transport system in Dalian, 3 million for a smoke and gas desulphurization project, and 4.12 million without specific purposes.

Based on the information about the purpose, government subsidies can be classified into six categories: technology-related, tax-related, project-related, import-/export-related, environment-related, and discretionary. For example, if

[8]http://news.xinhuanet.com/fortune/2014-07/22/c_1111747788.htm

the subsidy description contains words related to technology development or innovation (i.e., *research*, *invention*, *technology*, among others), the subsidy is classified as technology-related type. If the subsidy description includes the word *tax* (such as tax deduction, tax refund or other preferential tax treatments), the subsidy is categorized as tax-related type. We likewise classify import-/export-related and environment-related subsidies. To be qualified as a project-related type, the subsidy must be granted for a particular investment project (i.e., constructions of buildings and infrastructures). Finally, we classify items that contain no information about the purpose of subsidy but are simply described as *subsidy*, *allowance*, *award*, or *support* as discretionary type, since these subsidies do not have clearly defined purposes and can be easily manipulated or tunneled. To ensure a mutually exclusive categorization, we use the following order to assign subsidy types: technology > tax > project > import/export > environment > discretionary; that is, if a subsidy item has been assigned a type that comes earlier in the sequence, it will not be classified as any type that comes later.

The information about the board of directors is collected from both CSMAR and Wind database. To determine whether an independent director is an official, we first utilize the Personal Characteristics database in CSMAR, which directly classifies directors into officials and non-officials. However, this database does not cover the entire universe of the board members of listed firms. We supplement it using information from Wind database. For each listed company, Wind records two data files, one for current board members, and the other for historical board members. Merging these files creates a panel of firms' board members, with their names, positions, tenure, and detailed background information about their experience. Using this information, we are able to identify directors that are omitted in CSMAR and then check their background one by one to determine

whether they are affected by the regulation.[9] Therefore, a combination of the two databases allows us to clearly classify the treatment and control firms.

After excluding finance and utility firms, our sample includes 2,389 A-share firms from June 2010 to December 2016, a total of 14 periods. On October 19, 2013, 1391 firms had OIDs on board and are thus classified as treatment firms. Table 1 presents the summary statistics for treatment and control firms. In Panel A, we compare the board characteristics for the two groups of firms. Treatment firms have larger board size and fewer PhD-degree holders on the board. The average age and percentage of women are similar across the two groups. In Panel B, we describe firm characteristics for the two groups of firms. Treatment firms are slightly larger in firm size and sales, and they receive more government subsidies. Panel C shows detailed classifications of subsidies. Importantly, on average, discretionary subsidies compose more than 50% of the total granted subsidies. Furthermore, the total amount of subsidies is a substantial component of a firm's net income. For the treatment firms, on average, government subsidies account for 71% of their net income. For the control firms, this number is 43%. This comparison suggests that firms are likely to get more funds from the government when they have officials sitting on the board.

5. Empirical Strategy

To clearly identify the impact of OIDs, an ideal experiment should impose a change in the number of OIDs that is exogenous to the outcome variables. To achieve this, our identification strategy exploits the resignation of OIDs that was caused exogenously by a regulation change.

[9]Identifying whether a director is affected by the regulation needs a detailed background check. For example, some independent directors served government many years ago before they quit and started to do business. These people were not under the jurisdiction of the Communist Party and thus were not required to resign.

Document 18 was issued by the Central Organization Department of the CPC, which is the highest party authority in charge of personnel and organization affairs. As described earlier, the issuance of Document 18 was purely due to political considerations (as part of the anti-corruption campaign). It is not driven by any particular economic conditions that could affect our treatment and control firms differently. Furthermore, no firms have lobbied for its issuance and, thus, any observed outcomes after the event should not be attributed to self-selection of firms. Moreover, firms are forced to comply with the new regulation and OIDs have no choice but to resign (sooner or later).

The resignation wave following Document 18 is shown in Figure 1. Figure 1a plots the total number of official independent directors (OIDs) across time. The curve initially trends upwards, largely due to the increase in the number of firms in China, and then falls sharply from its peak at the end of 2013. This is exactly when Document 18 of the CPC was announced. In the next one and a half years, around 800 OIDs ceased to hold office. Even more evidently, Figure 1b shows the average number of OIDs per firm across time, which drops from 1 per firm to 0.5 per firm after the regulation. To further illustrate the resignation wave, Figure 1c shows the noncumulative number of resignations of OIDs semiannually. Before June 2013, the number is relatively steady across time. However, the curve surges immediately after the regulation date and then recovers to the normal level in 2015. Figure 1d plots the fraction of the number of resigned OIDs to the number of resigned independent directors. The pattern is similar to Figure 1c. This suggests that the resignation of OIDs is beyond the normal resignation rate of independent directors. Note that neither the number of OIDs or the number of resignations has any abnormal change at the end of 2012, the time when the Eight-point Regulation was announced, suggesting that the shock on OIDs is uniquely

imposed by Document 18.

However, we can still observe around 1,500 OIDs on boards by June 2015. The first reason, according to the Central Organization Department of CPC, is that some officials have actually resigned, but it takes time for their companies to complete the dismissal procedure or it takes time to find a proper replacement before dismissing the current OID.[10] Although such OIDs remain in the firm after the regulation, they are effectively delinked from the function of independent directors, especially now that they are subject to the intensive investigation conducted by the Disciplinary Committee of the CPC.[11] Therefore, these cases are supposed to be classified into the treatment group and, thus, are not a problem for our identification strategy.

The second reason we observe OIDs on boards in June 2015 is that some former officials had retired more than three years before they were seated on a board and, thus, were not required to resign; but, since it is difficult to identify their effective retirement dates (government officials' retirement in China is not strictly based on age), we could not separate these officials from those actually affected by the new regulation. Thus, we are suffering the risk of classifying a potential control firm as a treatment firm. However, this is not a serious concern in our setting for reasons we describe next.

First, firms with long-retired (3 years or more) officials can be seen as "quasi-treatment" firms in the following sense: similar to the treated officials (current officials and officials who retired less than 3 years), long-retired officials can still use the political resources they acquired during their tenure to influence their

[10]According to Chinese Company Law, when an independent director resigns, he or she should continue sitting on the board until a replacement is found. This ensures that independent directors remain at least one third of the total board size.
[11]From 2013 to 2016, the Disciplinary Committee of the CPC has performed investigations on 141 central-level officials and 872 provincial-level officials (http://www.ccdi.gov.cn/jlsc/sggb/).

firms—but to a smaller extent. Also, as with the treated officials, a long-retired official's incentive of seeking rent is significantly reduced after the new regulation because (a) the official's compensation is cut to zero as well as treated officials and, more significantly, (b) Xi's anti-corruption campaign posed a credible threat to both incumbent and former officials.[12] This would tie retired officials' hands and strip them of the political power that might have been used to influence the company. In this sense, the new regulation still causes a reasonable variation in political connections among these "quasi-treatment" firms and classifying them into treatment firms does not cause a serious concern. The second reason for our lack of concern is that even if such firms with long-retired officials should have been classified as control firms, over-classifying them into treatment firms only causes a bias that goes *against* finding a significant impact of OIDs.

Our estimation method is a difference-in-differences (DID) approach, which compares the change of treatment firms around the regulation date with that of control firms. However, treatment firms that hired officials in their boards could be highly different from those that did not hire any official with regard to a variety of characteristics (Faccio, 2006, 2010). The parallel trend assumption, prescribed by the DID approach, is likely to be violated under this circumstance. To resolve this issue, we conduct a propensity-score-matching algorithm. Since the number of treatment firms is larger than the number of control firms, for each control firm, we select a treatment firm that has the nearest propensity score of having an OID on October 19, 2013. The estimation is based on a Logit model in which the dependent variable equals zero when there was at least one OID on board and one otherwise, and the control variables include Log(Asset), Log(Board size), Tobin's *q*, ROA, and an SOE dummy. The estimated coefficients are used to compute the

[12] Notable examples of former officials that are investigated include former Politburo Standing Committee member Zhou Yongkang and former military leaders Xu Caihou and Guo Boxiong.

fitted probability of hiring OIDs (propensity score). Then we perform a nearest-neighbor, one-to-one match based on the propensity score with replacement. At last, we find a match for each of the 998 control firms, and our final sample consists of 15,673 observations.

Then, we estimate the DID model with the matched sample as follows:

$$y_{i,t} = a \times Post_i \times Treat_t + b \times Controls_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}, \quad (1)$$

where i indexes firms and t indexes years. Variable y is the outcome variable, including subsidies, total factor productivity, cash holdings, bank loan amount, leverage, and the number (or amount) of related party transactions. Variable α_i represents firm fixed effect and τ_t represents time fixed effect. *Post* equals one for the period after the regulation announcement, and equals zero for the period before that. *Treat* equals one for firms that were hiring at least one OID on the date of regulation announcement and equals zero for those that were not. *Controls* include control variables that are specific to each dependent variable. The coefficient of interest is a, which captures the treatment effect with respect to the counterfactual proxied for by the control group. All variable definitions are included in Appendix B.

6. Empirical Results

6.1. Government subsidies

We first explore the change in the total amount of government subsidies granted to firms around the regulation. Then, we examine the change in different types of subsidies. Third, we perform robustness checks and address the concern that our results could be driven by concurrent events. Finally, we conduct cross-sectional analyses and test whether the change in subsidies varies with firm types, official characteristics, and firm productivity.

6.1.1. Subsidies

As shown in Table 1, for a Chinese firm, subsidies from the government are large in magnitude as compared to the net income. Besides, the allocation process of government subsidies is not completely transparent and, thus, is easily controlled or manipulated by government officials. We examine the effect of independent directors' political connections on subsidies using a DID analysis and present the result in Table 2.

We first show the result from the baseline DID regression in column (1) and add industry fixed effects, time fixed effects, and firm fixed effects progressively in the next few columns. The results are consistent across specifications, exhibiting a positive effect of OIDs on subsidies. For example, column (1), without controlling for any fixed effects (but controls for *Treat* dummy and *Post* dummy) shows that the coefficient on *Treat*Post* is 0.381 and statistically significant at 1% level, suggesting that the loss of OIDs causes the firm to lose 38.1% more in subsidies than control firms; In column (3), we control for industry-time fixed effects, and the estimate becomes 0.319 and remains statistically significant; column (6) controls firm and industry-time fixed effects and shows that the amount of government subsidies is 25.6% less than control firms'. Since the average semi-annual subsidy is around 21 million CNY (shown in Table 1), this reduction amounts to 5.38 million CNY (semi-annually) for a treatment firm during the post-regulation period. This is an economically significant amount.[13]

Next, we examine the time dynamics of the treatment effect on government subsidies. This test helps us check the parallel trend assumption—whether the

[13] In Appendix A, we use an event study to estimate the stock return announcement effect of Document 18. We show that firms with OIDs exhibit more-negative abnormal stock returns around the announcement date than firms without any OID. This evidence suggests that losing OIDs or political connections is costly for a firm. The documented reduction in subsidies could be a channel that contributes to the value loss.

outcome variable of control firms is parallel to that of treatment firms before the event. This is shown in Table 3, where we interact the treatment dummy with period dummy variables indicating the semi-annual periods before the event, the semi-annual period coinciding with the event, and the post-event period. The insignificant coefficients for the pre-treatment periods indicate that the government subsidy of treatment and control firms are not substantially different from each other compared to the benchmark period (i.e. the six-month period ending December 31, 2013).[14] The divergence between the treatment and control group becomes significantly larger in magnitude after the event, illustrating the effect of Document 18 on subsidies received. The evidence ensures that the identification assumption holds in our DID regressions.

6.1.2. Discretionary subsidies

To shed light on which types of government subsidies are more affected by OIDs, we classify government subsidies into designated subsidies and discretional subsidies. Designated subsidies are those that have a clearly designated granting purpose, including subsidies that are technology-related, tax-related, import-/export-related, project-related, and environment-related. Discretionary subsidies constitute the remaining type of subsidies, which are described using general terms rather than specific purposes. These subsidies are subject to the discretion of the policy makers and executors, who in turn could be influenced by official independent directors. Moreover, how to use these subsidies could also be discretionary and, thus, subject to OIDs' ex post manipulation and tunneling. (It is possible that OIDs will grab a proportion of these government grants as

[14] The decline in subsidies is marginally significant one period before the event (June, 2013), which raises a concern that it could be owing to the Eight-point Regulation. While this regulation was not aimed at official independent directors, it is reasonable that its effect spilled over to party members in corporate boards. We design a test showing that the targeted group of firms does not experience any reduction in government subsidies.

"rebates").

To test whether discretionary subsidies are more affected by the presence of OIDs than designated subsidies, we estimate the DID regression using the two types of subsidies as dependent variables, respectively. We find a significant reduction for the category of discretionary subsidies. This result is presented in Table 4. We use six columns with varying sets of control variables and fixed effects. The coefficients are systematically larger than those in Table 2, suggesting that the average reduction in subsidies is mainly driven by the decline of discretionary subsidies. In column (6), after controlling for firm and year fixed effects, discretionary subsidies are reduced by around 50% relative to those of control firms. But we are unable to document any significant change for designated subsidies.

6.1.3. The influence of concurrent events

One potential concern of our empirical findings is that the Document 18 was announced soon after the change in the political leadership of the country, and it is possible that there was a shift in government policy that occurred contemporaneously. One such example is the Eight-point Regulation which is regarded by recent research as the commencement of the anti-corruption campaign (e.g., Lin, Morck, Yeung and Zhao, 2017; Griffin, Liu and Shu, 2017). This is one of the biggest political event that occurred contemporaneously and had continued effect on China's political system. It is possible that it had spillover effect on party members sitting on corporate boards and reduced their incentives of asking for government subsidies, but it cannot explain the entire magnitude of the subsidy decline. The reasons are twofold. First, Griffin, Liu and Shu (2017) find that the impact of Eight-point Regulation on industrial sectors is limited to corporate entertainment expenses, and they cast doubt on the overall effectiveness

of the anti-corruption campaign in shaping corporate policies. Second, we have shown, in Figure 1, that the Eight-point Regulation had no effect on the average number of OIDs of a firm, suggesting the uniqueness of our setting in isolating the effect of OIDs. Nevertheless, we design a falsification test to mitigate the concern that the Eight-point Regulation is the driving force of our result.

In particular, if it were the Eight-point Regulation that caused the declining trend of subsidies received, then the group of firms *targeted* by the regulation should experience the largest reduction in subsidies immediately after the event. Griffin, Liu and Shu (2017) find that the most affected group of the "Eight-point Regulation" is SOEs. Therefore, using our sample, we perform a DID in which the treatment group consists of SOEs and the post-event period includes all semiannual periods after December of 2012. We present the regression result in Table 5. Again we use varying specifications to include control variables and fixed effects. Interestingly, we find that, compared with non-SOEs, SOEs receive a higher level of government subsidies after Eight-point Regulation, and the results are consistent across different model specifications. Note that it is impossible for us to find such a result if it was the Eight-point Regulation that caused the declining trend of subsidies in our findings.

One may still argue that the effect we document can be caused by various other concurrent government policies or reforms that might have affected firms with and without political connections differently. Indeed, if there existed such a concurrent reform, then our DID estimate would not be able to uniquely capture the effect of the change in political connections. However, it is less likely that such a reform, which did not directly apply to official independent directors, would have created an effect on subsidies that co-varied *precisely* with the fraction or number of official independent directors (or the degree of board political connections).

Therefore, in a new set of tests, we replace the treatment dummy with several continuous measures of treatment—that is, the fraction of OIDs in all independent directors and the number of OIDs on board. While the treatment dummy (in previous tests) captures the effect of the *existence* of a political connection, the continuous measure can capture the effect of the *degree* of a political connection. As shown in Table 6, the coefficients on interactions between these continuous measures and the *Post* dummy are negative and statistically significant, suggesting that firms with a higher fraction of OIDs or a larger number of OIDs suffer a larger reduction in subsidies after the regulation. This evidence, showing that the effect on government subsidies is in direct proportion to the degree of political connections, allows us to mitigate the concern that the reduction of subsidies was possibly caused by some other concurrent reform(s).

6.1.4. Cross-sectional analyses

The effect of political connections on subsidies could vary with various conditions such as characteristics of firms and official independent directors. To examine such a heterogeneity, we perform cross-sectional tests.

First, compared with state-owned enterprises (SOEs), non-SOEs should be more affected by the resignation of OIDs. SOEs usually have other layers of political connections, such as CEOs, directly appointed by the government, who were not affected by Document 18. They were still able to obtain subsidies via CEO's political connections even if they lost their directors' political connections. To test this conjecture, we separate firms with OIDs (treatment firms) into two groups, SOEs and non-SOEs. Each group also includes the paired control firm of every treatment firm. We then estimate the baseline model using these two subsamples, respectively. The results are presented in columns (1) and (2) of Table 7. Consistent with our argument, the treatment effect is only statistically

significant in the subsample of non-SOE firms, and the magnitude is much larger than that of the SOE subsample.

Second, in China, the majority of government subsidies are distributed to firms via the channel of *local* government spending.[15,16] In other words, local government officials are largely in charge of the subsidy grants. Therefore, if a company hires an OID from the local government, it is more likely to receive more subsidies. On the other hand, a central government official may not have a close connection with the local officials and, thus, plays a smaller role (Admore and Bennedsen, 2013). To test this idea, we use the existence of local government officials on board to measure the central/local connectedness. A treatment firm is classified as having no local connection if all of its OIDs are central government officials. Such treatment firms together with their control firms form the first subsample and the remaining observations form the second. Then, we estimate DID on the two subsamples separately and report the result in columns (3) and (4) of Table 7. Consistent with our argument, if a firm's OIDs are all central government officials, it exhibits a smaller treatment effect on subsidies than a locally connected firm. However, the difference between the two subsamples' coefficients is small, which could be caused by the noise in our measure of local connectedness—some non–central government officials who actually work (or have worked) for the local government in another region, rather than the firm's city or province, should not be classified as having local connections. But we are not able to identify these cases.

Finally, we tackle the question whether the allocation of subsidies is distorted

[15]The central government is only in charge of some "central" SOEs' subsidies (in our sample, less than 13% of firms are "central" SOEs). But these central SOEs can also obtain subsidies from a local government.

[16] As shown in Jin et al (2005), tax paid by enterprises is an important source of revenue for local provincial governments and local governments have considerable discretion in levying those charges (tax reduction or refund is an important type of subsidies).

before 2013. In principle, an optimal allocation policy should always transfer money to firms that are most productive or efficient. We classify our treatment firms, together with their control firms, into firms with higher productivity and lower productivity based on treatment firms' median level of total factor productivity (TFP) and Tobin's *q*. The estimation of TFP is based on Olley and Pakes (1996) and is detailed in Appendix B. We then perform DID in the two subsamples separately. In columns (5) and (6), we find that the decline in subsidies is larger when the total factor productivity is lower, suggesting that less productive firms received more subsidies before the new regulation. In columns (7) and (8), we use *q* as an alternative proxy for firm efficiency or productivity, and find consistent result. This is clear evidence of capital misallocation: less productive firms received more subsidies via official independent directors prior to Document 18. Therefore, removing political connections and relying on a market-based allocation system can potentially improve the overall allocation efficiency, a question we turn to later.

6.2. Investment-q sensitivity

After establishing the relation between board political connections and subsidies received, we proceed to examine the change in treated firms' investment efficiency. Firms that face soft budget constraint could suffer from the moral hazard problem that their managers would undertake negative NPV project (Maskin and Xu, 2001). After losing political connections and associated subsidies, managers are expected to behave more prudentially and diligently, increasing the efficiency of their investment.[17] We follow the literature and use investment-*q* sensitivity to gauge the investment efficiency.

[17] It is also a central issue in the literature of fiscal policy whether the allocated subsidies can improve firm productivity (e.g., Galai and Wiener, 2003; Duchin and Sosyura, 2012; Cerqua and Pellegrini, 2014; Schoenherr, 2016).

Specifically, we define firm investment as capital expenditures scaled by lagged total book assets. Since we want to estimate treated firms' change of investment-q sensitivity after Document 18 relative to that of control firms, our regression model is specified below:

$$Invest_{i,t} = a \times Post_t \times Treat_i \times q_i + b \times Post_t \times Treat_i + c \times q_i \times Treat_i + d \times Post_t \times q_i + e \times Controls_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t} \quad (2)$$

where the *Treat* and *Post* are defined as earlier, *Controls* include lagged q, contemporaneous cash flow, lagged log sales, lagged leverage, and log board size. We are interested in coefficient a, which captures the difference-in-differences effect of Document 18 on investment-q sensitivity.

We present the estimation results in Table 8. Specifications vary by controlling for different fixed effects. The coefficient on *Post*Treat*q* is positive and significant in all specifications, suggesting that after the resignation of OIDs, the investment efficiency of treated firms increases relative to control firms. This evidence is also consistent with the notion that the capital allocation before the new regulation distorted the incentive of corporate managers and lead to low efficiency of the corporate sector.

6.3. Related party transactions

To provide further insight on the efficiency gain of treated firms, we examine the change of related party transactions around Document 18. Since in China related party transactions have been widely used to tunnel wealth from the firm to related parties, they can proxy for poor corporate governance and low efficiency (Jian and Wong, 2010; Liao, Liu and Wang, 2014). Anecdotal evidence suggests that OIDs use companies as platforms to cash out their political resources.[18] If

[18] For example, Chinese media often reports that government officials that hold company positions help firms grab government procurement contracts or embezzle state properties after accepting a considerable amount in bribes.

OIDs do obtain "rebates" from the firms they serve, related party transactions can be the most probable channel through which these "rebates" take place.

In CSMAR, related party transactions include eleven categories based on the counterparty of the transactions—counterparties include (1) the parent company of the listed company; (2) the subsidiary of the listed company; (3) another enterprise controlled by the same parent company; (4) an investor or investors exercising joint control over the listed company; (5) an investor or investors imposing significant influence on the listed company; (6) joint venture of the listed company; (7) an affiliated enterprise of the listed company; (8) major individual investors of the listed company and their close relatives; (9) key executives of the listed company (including executives of the parent company) and their close relatives; (10) an enterprise that is controlled, jointly controlled, or significantly influenced by the listed company's major individual investors, executives, and their close relatives; and (11) other related parties. In our analysis, we count related party transactions that involve top managers, board members and key personnel in a firm, i.e., category (9) and (10).

In Table 9, we show a 3.2% reduction in the number of related party transactions and a 19.2% reduction in the amount represented by related party transactions, after including various controls and fixed effects. The economic significance of the reduction implies that government officials in the boardroom were utilizing their political resources to engage the firm in a great deal of related party transactions. Such transactions may create limited value for the firm as they are usually utilized by controlling shareholders or directors to transfer wealth to related parties. Thus the reduction in related party transactions can be seen as a source of efficiency gain; it also shed light on the monetary incentives of

government officials to sit on boards.[19]

6.4. Capital misallocation

A primary goal of the fiscal policy is that firms with more valuable growth opportunities (but are financially constrained or in temporary financial distress) should be allocated with more government support (Hsieh and Klenow, 2009; Almeida et al, 2014). Our evidence, however, suggests that government subsidies are allocated based on the political connections of corporate boards, especially so for low-efficiency firms. Such an allocation is likely to generate dead weight loss for the society if a stronger political connection does not coincide with a higher marginal productivity.

We have provide firm-level evidence that severing corporate boards' political connections can lead to higher investment efficiency. To test whether there is an efficiency gain at the macro level, we follow a seminal paper by Hsieh and Klenow (2009) to construct the measure of capital misallocation. In a model of monopolistic competition, they exploit the idea that revenue productivity (the product of physical productivity and a firm's output price, denoted TFPR) should be equated across firms in the absence of allocative distortions. The greater the dispersion of revenue productivity, the worse the extent of misallocation, and the larger the loss of aggregate total factor productivity will be. We follow their method and use the standard deviation of TFPR within an industry to proxy for the degree of misallocation of that industry. TFPR is computed as $\frac{P_t^i Y_t^i}{(K_t^i)^\alpha (L_t^i)^{1-\alpha}}$, where $P_t^i Y_t^i$ is the revenue of the firm, K_t^i is the capital input and L_t^i is the labor input, and α is the capital input elasticity.[20] As a robustness check, we use the standard

[19] Beside monetary incentives, there could be nonmonetary benefits, such as personal reputation or a sense of achievement (Jiang, Wan, and Zhao, 2016).

[20] We directly obtain the value of α for manufacturing industries in China from NBER Productivity Database. We use the 5-year average value of α ending in year 2011 as the

deviation of $\frac{\log(TFP_t^i)}{\log(\overline{TFP_t^j})}$ as an alternative measure of capital misallocation in period *t*, where the denominator is the logarithm of industry mean of TFP.[21]

Since the capital misallocation is an industry-level measure, we need to identify industries that are more affected by the regulation as our treatment group. To ensure the robustness, we use two methods to define treatment. First, we compute the average fraction of politically connected firms in each industry, and define the group of industries with a fraction above the mean value as the treatment group. Second, we directly use the fraction of politically connected firms as a continuous treatment variable. We then perform a standard difference-in-differences approach, in which we control for the interaction term between the treatment variable and *Post* dummy, together with the industry-mean values of control variables, including cash flow, lagged log book assets, lagged log board size, lagged book leverage and time fixed effects.

The results are reported in Table 10. The dependent variable is the dispersion measure defined in Hsieh and Klenow (2009) for columns (1) and (2) and standard deviation of log (TFP) normalized by industry average for columns (3) and (4). Columns (1) and (3) classify an industry into treatment group if the percentage of politically connected firms in the industry is above the mean. Columns (2) and (4) directly use the percentage of politically connected firms in the industry as the continuous treatment variable. The results show that after the regulation and subsequent mass resignation of OIDs, the industry-level capital misallocation drops significantly for industries with a higher degree of political connection,

parameter value in our estimation. Using the using 5-year average ending in 2010 or using single-year value of 2011 (or 2010) does not affect our result. Since the NBER database uses SIC to classify industries, we use Worldscope data to match Chinese industries to SIC classification.

[21] In the same line, the literature also uses dispersion of TFP growth rates (Eisfeldt and Rampini, 2006) and dispersion of capital productivity (Chen and Song, 2013) to measure the degree of capital misallocation.

suggesting that de-politicization can mitigate capital misallocation. This evidence is consistent with our firm-level findings.

One should be very careful in interpreting our results regarding industry-level capital misallocation. Since we only use listed firms in our analysis, the welfare implications generated from the above tests are limited to a subsample of the economy. If the money, originally granted to politically connected firms, is now directed to more efficient private sectors (non-listed firms), our result will not capture this welfare improvement (underestimation problem). In other words, our findings suggest that shifting the allocation scheme based on political connections can mitigate the capital misallocation *among listed firms*.

7. Concluding remarks

This paper explores the causal effect of board political connections on the government subsidies a firm receives. We utilize a natural experiment—the forced resignation of OIDs following the CPC's new regulation in 2013—to isolate the effect of board political connections. Our findings suggest that the allocation of government subsidies in China is heavily biased towards firms with political connections. In particular, politically connected firms obtain a significantly lower level of government subsidies after their OIDs' resignations; and the effect is stronger for discretionary subsidies. Further, the reduction in subsidies is more pronounced for non-SOEs, firms having more local government officials, and low-efficiency firms. The de-politicization and loss of subsidies discipline managers of treated firms and lead them to invest more efficiently. They also conduct fewer related-party transactions. Overall, the firm-level evidence imply that political connections lead to distortive allocation policy, and removing the connections improves firm efficiency.

Consequently, the macro-level allocative efficiency also improves. We find a reduction in the dispersion of revenue productivity and total factor productivity in industries that are more affected by the new regulation. The efficiency gains associated with the new regulation suggest that China's resource allocation can still benefit from de-politicization and anti-corruption, even after being through a continuous marketization reform for several decades.

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Figure 1. Resignation of independent directors

This figure plots the time series of several board characteristics, including total number of official independent directors (OIDs), average number of OIDs per firm, average resignations of OIDs per firm, and average resignations of OIDs as a fraction of all resignations of independent directors.

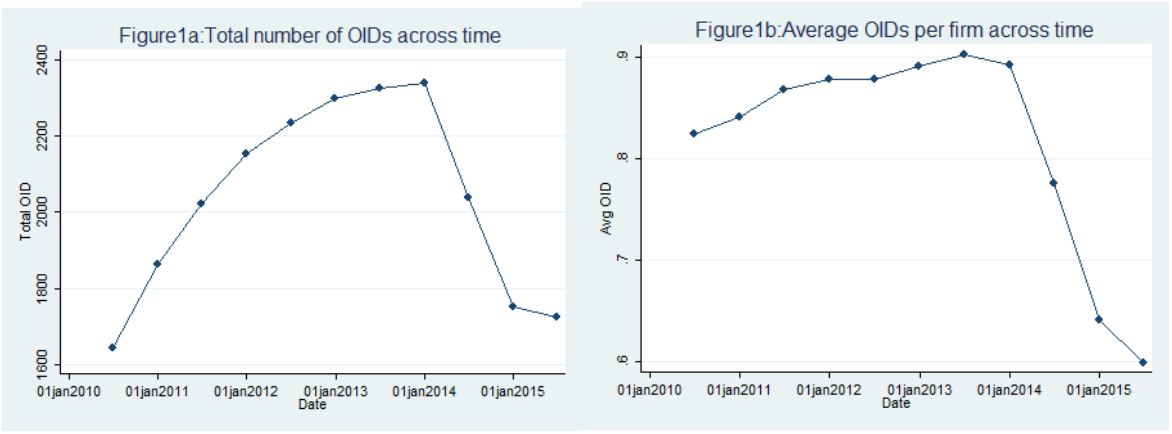

Table 1. Summary Statistics

The table below provides summary statistics of board characteristics and firm characteristics. After excluding finance and utility firms, our sample includes 1,996 A-share firms from June 2010 to Dec 2016. Treatment and control groups are reported separately. Panel A reports key characteristics of the board of directors. Board size is the average number of board members. PhD degree (%) and Female (%) measure the percentage of board members holding a PhD degree and being women. Age of directors (years) is the average age of the board. Panel B reports firm characteristics. Variable definitions are shown in Appendix B. Panel C reports characteristics of government subsidies. We classify subsidies into six categories: technology-related, tax-related, project-related, import-/export-related, environment-related and discretionary subsidies, according to the subsidy description. Raw (thousands) measures the average amount of each subsidy category. Fraction (%) measures the percentage of a subsidy category in total subsidy. % of Asset and % of Net Income measure the percentage of a subsidy category of total asset and of the absolute value of net income. All continuous variables are winsorized at levels 1% and 99%.

Panel A Board Characteristics

	Treatment				Control			
	Mean	Median	Min	Max	Mean	Median	Min	Max
Board Size	9.11	9.00	1.00	17.00	7.30	9.00	1.00	17.00
PhD Degree(%)	19.956	14.286	7.143	100.000	32.444	20.000	7.143	100.000
Female(%)	12.219	11.111	0.000	55.556	11.720	11.111	0.000	55.556
Age	50.97	50.91	41.00	61.00	49.70	49.57	41.00	61.00

Panel B Firm Characteristics

	Treatment				Control			
	Mean	Median	Min	Max	Mean	Median	Min	Max
Tobin's *q*	0.785	0.748	0.126	31.393	0.823	0.739	0.125	36.318
Log(Sales)	20.647	20.559	0.000	26.775	20.256	20.301	0.000	25.826
Book assets(billion)	12.828	3.065	0.020	921.000	6.676	2.459	0.020	479.000
Book Leverage	0.242	0.200	0.000	0.963	0.221	0.176	0.000	0.964
Profitability	0.019	0.017	-0.739	0.689	0.019	0.018	-0.684	0.613
Market-to-book	0.157	0.127	0.000	0.904	0.149	0.118	0.000	0.867
Log(1+Subsidy)	14.297	15.156	0.000	20.855	12.115	14.582	0.000	20.852

Panel C: Subsidy Characteristics

	Treatment				Control			
	Raw(K)	Fraction (%)	% of Assets	% of Net Income	Raw(K)	Fraction	% of Assets	% of Net Income
Technology	3,159.015	15.029	0.029	15.642	2,186.303	18.283	0.121	13.263
Tax	3,844.909	18.292	0.021	6.981	1,775.224	14.845	0.028	5.884
Project	1,013.988	4.824	0.008	4.947	1,052.635	8.802	0.018	2.689
Import/Export	167.407	0.796	0.001	0.666	131.807	1.102	0.007	0.709
Environment	178.692	0.850	0.000	0.564	450.919	3.771	0.001	0.525
Discretionary	12,655.785	60.209	0.066	42.818	6,361.548	53.197	0.000	20.418
Total	21,019.797	100.000	0.137	71.617	11,958.436	100.000	0.057	43.488

Table 2. Board political connections and government subsidy

This table provides OLS estimation for the following equation:

$$y_{i,t} = a \times Post_t \times Treat_i + b \times Controls_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$$

The dependent variable *y* is the logarithm of total government subsidy granted to the firm. *Post* is a dummy variable which equals one for the period after October 19, 2013 and equals zero otherwise. *Treat* is a dummy variable that equals one if the firm had at least one official independent director (OID) on the board on October 19, 2013, and zero otherwise. For each control firm, we select a treatment firm that has the nearest propensity score of having an OID on October 19, 2013. Numbers in the parentheses are standard errors corrected for heteroscedasticity and firm level clustering. (***, **, * denote significance level at 1%, 5%, and 10%, respectively).

	Dependent Variable: Log(1+Subsidy)					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Treat*Post	**-0.381*** **	**-0.381*** **	**-0.319*** **	**-0.301*** **	**-0.291*** **	**-0.256*** **
	(0.118)	(0.121)	(0.115)	(0.086)	(0.085)	(0.082)
Treat Dummy	0.674***	0.702***	0.560***			
	(0.097)	(0.102)	(0.098)			
Post Dummy	1.496***			0.910***		
	(0.090)			(0.069)		
Log(Board Size)		1.132***	0.557***	0.805***	1.012***	0.748***
		(0.175)	(0.160)	(0.307)	(0.305)	(0.250)
Log(Sales)		1.119***	1.016***	0.666***	0.526***	0.548***
		(0.034)	(0.033)	(0.067)	(0.070)	(0.040)
Book Leverage		-8.039***	-4.105***	0.271	0.140	-0.155
		(0.610)	(0.579)	(0.783)	(0.778)	(0.564)
Market-to-Book		10.826***	6.116***	0.603	1.040	1.403*
		(0.828)	(0.779)	(1.036)	(1.033)	(0.772)
Profitability		0.443	0.798	-0.406	-0.197	-0.244
		(0.741)	(0.878)	(0.596)	(0.581)	(0.337)
SOE Dummy		-0.534***	-0.392***			
		(0.067)	(0.065)			
Time		**YES**			**YES**	
Industry FE						
Industry*Time			**YES**			**YES**
Firm FE				**YES**	**YES**	**YES**
N	20350	15673	15673	15673	15673	15673
Adj R-square	0.029	0.208	0.289	0.294	0.634	0.641

Table 3. Dynamic Treatment Effects

This table presents the results of the dynamic difference-in-differences on government subsidies between treatment and control firms. The dependent variable is the logarithm of total government subsidy granted to the firm. *Post* is a dummy variable which equals one for the period after October 19, 2013 and equals zero otherwise. *Treat* is a dummy variable that equals one if the firm had at least one official independent director (OID) on the board on October 19, 2013, and zero otherwise. For each treatment firm, we select a control firm that has the nearest propensity score of having an OID on October 19, 2013. Period(-7,-6,-5) is a dummy variable that equals one for the semi-annual period ending 30 Jun 2010, 31 Dec 2010 and 30 Jun 2011 combined, and equals zero otherwise. Period(-4) through Period(+6) are dummy variables that equal one for the semi-annual period ending 30 Dec 2011 through 31 Dec 2016, respectively, and equals zero otherwise. Numbers in the parentheses are standard errors corrected for heteroscedasticity and firm level clustering. (***, **, * denote significance level at 1%, 5%, and 10%, respectively).

	(1)	**(2)**
Treat*Period(-7,-6,-5)	-0.201	-0.158
	(0.214)	(0.155)
Treat*Period(-4)	-0.105	-0.002
	(0.303)	(0.211)
Treat*Period(-3)	-0.283	-0.147
	(0.232)	(0.157)
Treat*Period(-2)	-0.039	-0.044
	(0.260)	(0.174)
Treat*Period(-1)	-0.292	-0.262*
	(0.211)	(0.147)
Treat*Period(+1)	-0.377*	-0.297**
	(0.206)	(0.148)
Treat*Period(+2)	-0.517**	-0.201
	(0.231)	(0.172)
Treat*Period(+3)	-0.544***	-0.485***
	(0.203)	(0.151)
Treat*Period(+4)	-0.594***	-0.439***
	(0.208)	(0.153)
Treat*Period(+5)	-0.467**	-0.423***
	(0.203)	(0.158)
Treat*Period(+6)	-0.429**	-0.430***
	(0.200)	(0.155)
Firm-level Controls	YES	YES
Industry*Time FE	YES	
Time FE		YES
Firm FE		YES
N	15673	15673
Adj R-square	0.299	0.644

Table 4. Board political connections and discretionary subsidies

This table provides OLS estimation for the following equation:

$$y_{i,t} = a \times Post_t \times Treat_i + b \times Controls_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$$

The dependent variable *y is* the logarithm of total discretionary subsidy granted to the firm, which includes those subsidy items without granting purpose, but simply described as "subsidy," "allowance," and "support." *Post* is a dummy variable that equals one for the period after October 19, 2013, and equals zero otherwise. *Treat* is a dummy variable that equals one if the firm had at least one official independent director (OID) on the board on October 19, 2013, and zero otherwise. For each control firm, we select a treatment firm that has the nearest propensity score of having an OID on October 19, 2013. Numbers in the parentheses are standard errors corrected for heteroscedasticity and firm level clustering. (***, **, * denote significance level at 1%, 5%, and 10%, respectively).

Dependent Variable: Log(1+Discretionary Subsidy)						
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Treat*Post	**−0.523*** **	**−0.520*** **	**−0.493*** **	**−0.492*** **	**−0.545*** **	**−0.500*** **
	(0.161)	(0.152)	(0.149)	(0.149)	(0.124)	(0.119)
Treat Dummy	0.650***	0.555***	0.495***	0.493***		
	(0.098)	(0.093)	(0.091)	(0.091)		
Post Dummy	1.884***				1.424***	
	(0.116)				(0.091)	
Log(Board Size)		−0.290	−0.760***	−0.747***	0.851**	0.973**
		(0.212)	(0.207)	(0.208)	(0.432)	(0.394)
Log(Sales)		1.187***	1.091***	1.093***	0.573***	0.717***
		(0.033)	(0.034)	(0.034)	(0.082)	(0.080)
Book Leverage		−0.063	1.060***	1.058***	1.621***	1.035***
		(0.207)	(0.204)	(0.204)	(0.428)	(0.401)
Market-to-Book		−0.036*	−0.102***	−0.099***	−0.347***	−0.074***
		(0.019)	(0.018)	(0.018)	(0.042)	(0.026)
Profitability		−0.416	2.769***	2.759***	−1.008	−1.487
		(0.951)	(0.824)	(0.821)	(0.938)	(0.942)
SOE Dummy		−1.211***	−1.080***	−1.078***		
		(0.086)	(0.084)	(0.084)		
Time FE		**YES**	**YES**			**YES**
Industry FE			**YES**			
Industry*Time FE				**YES**		
Firm FE					**YES**	**YES**
N	18408	14625	14625	14625	14625	14625
Adj. *R* square	0.015	0.162	0.193	0.194	0.448	0.522

Table 5. Eight-point Regulation and government subsidy

This table provides OLS estimation for the following equation:

$$y_{i,t} = a \times Post_t \times SOE_i + b \times Controls_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$$

The dependent variable *y* is the logarithm of total government subsidy granted to the firm. *Post* is a dummy variable which equals one for the period after January 1, 2013 and equals zero otherwise. *SOE* is a dummy variable that equals one if the firm is an SOE. Numbers in the parentheses are standard errors corrected for heteroscedasticity and firm level clustering. (***, **, * denote significance level at 1%, 5%, and 10%, respectively).

	Dependent Variable: Log(1+Subsidy)			
	(1)	**(2)**	**(3)**	**(4)**
SOE*Post	**0.423*** **	**0.611*** **	**0.499*** **	**0.473*** **
	(0.109)	(0.081)	(0.081)	(0.076)
SOE Dummy	-0.561***			
	(0.095)			
Post Dummy	0.319**	0.801***	0.998***	0.874***
	(0.151)	(0.284)	(0.282)	(0.232)
Log(Board Size)	0.911***	0.752***	0.620***	0.641***
	(0.027)	(0.061)	(0.064)	(0.036)
Log(Sales)	-2.293***	1.010	0.816	0.741
	(0.475)	(0.702)	(0.700)	(0.489)
Book Leverage	3.835***	0.231	0.689	0.723
	(0.649)	(0.915)	(0.913)	(0.666)
Market-to-Book	-0.000	-0.010	-0.006	-0.006
	(0.018)	(0.009)	(0.008)	(0.026)
Profitability		0.608***		
		(0.055)		
Time			**YES**	
Industry FE				
Industry*Time	**YES**			**YES**
Firm FE		**YES**	**YES**	**YES**
N	21100	21100	21100	21100
Adj R-square	0.175	0.253	0.268	0.617

Table 6. Board political connections and government subsidies with continuous treatment measures

This table provides OLS estimation for the following equation:

$$y_{i,t} = a \times Post_t \times Treat_i + b \times Controls_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$$

The dependent variable *y* is the logarithm of total government subsidy granted to the firm. *Post* is a dummy variable that equals one for the period after October 19, 2013, and equals zero otherwise. Fraction of OID is the fraction of OIDs on the board, and No. of OID is the number of OIDs on the board on October 19, 2013. For each control firm, we select a treatment firm that has the nearest propensity score of having an OID on October 19, 2013. Numbers in the parentheses are standard errors corrected for heteroscedasticity and firm level clustering. (***, **, * denote significance level at 1%, 5%, and 10%, respectively).

	Dependent Variable: Log(1+Subsidy)			
	(1)	**(2)**	**(3)**	**(4)**
Fraction of OID	-0.237***	-0.189**		
	(0.139)	(0.154)		
No. of OID			-0.131***	-0.073**
			(0.043)	(0.048)
Log(Board Size)		0.727***		0.796***
		(0.249)		(0.251)
Log(Sales)		0.557***		0.557***
		(0.059)		(0.059)
Book Leverage		1.374**		1.326**
		(0.574)		(0.567)
Market-to-Book		-0.676		-0.629
		(0.758)		(0.750)
Profitability		-0.005		-0.005
		(0.009)		(0.009)
Time FE	**YES**	**YES**	**YES**	**YES**
Firm FE	**YES**	**YES**	**YES**	**YES**
N	20326	15673	20326	15673
Adj. R square	0.602	0.641	0.600	0.640

Table 7. Subsample analyses for government subsidies

This table provides OLS estimation for the following equation:

$$y_{i,t} = a \times Post_t \times Treat_i + b \times Controls_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$$

The dependent variable *y* is the logarithm of total government subsidy granted to the firm. *Post* is a dummy variable that equals one for the period after October 19, 2013, and equals zero otherwise. *Treat* is a dummy variable that equals one if the firm had at least one official independent director (OID) on the board on October 19, 2013, and zero otherwise. The sample is separated into two groups according to whether the firm is an SOE, whether the firm has any local government officials, ex-ante TFP level, and ex-ante *q* level, respectively. For each treatment firm, we select a control firm that has the nearest propensity score of having an OID on October 19, 2013. Numbers in the parentheses are standard errors corrected for heteroscedasticity and firm level clustering. (***, **, * denote significance level at 1%, 5%, and 10%, respectively).

	SOE		**Local official**		**Ex-ante TFP**		**Ex-ante *q***	
	No	**Yes**	**No**	**Yes**	**Low**	**High**	**Low**	**High**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Treat*Post	**-0.365*** **	**-0.156**	**-0.273*** **	**-0.488*** **	**-0.462*** **	**-0.197**	**-0.476*** **	**-0.023**
	(0.104)	(0.146)	(0.093)	(0.097)	(0.115)	(0.133)	(0.106)	(0.140)
Controls	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Time FE	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Firm FE	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
N	10428	5315	13779	13469	8198	7071	8869	6874
Adj R-square	0.612	0.676	0.639	0.647	0.640	0.632	0.655	0.619

Table 8. Investment-*q* sensitivity

This table provides OLS estimation for the following equation:

$$y_{i,t} = a \times Post_t \times Treat_i \times q_i + b \times Post_t \times Treat_i + c \times q_i \times Treat_i + d \times Post_t \times q_i + e \times Controls_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$$

The dependent variable *y* is the investment to lagged asset ratio. *Post* is a dummy variable that equals one for the period after October 19, 2013, and equals zero otherwise. *Treat* is a dummy variable that equals one if the firm had at least one official independent director (OID) on the board on October 19, 2013, and zero otherwise. Other controls include cash flow, board size, lagged log sales, and lagged book leverage. For each treatment firm, we select a control firm that has the nearest propensity score of having an OID on October 19, 2013. Numbers in the parentheses are standard errors corrected for heteroscedasticity and firm level clustering. (***, **, * denote significance level at 1%, 5%, and 10%, respectively).

Dependent Variable: Investment-asset ratio				
	(1)	**(2)**	**(3)**	**(4)**
Treat*Post*Q	**0.051*** **	**0.032*** **	**0.033*** **	**0.070*** **
	(0.010)	(0.012)	(0.012)	(0.018)
Treat*Post	-0.040***	-0.028***	-0.029***	-0.055***
	(0.008)	(0.009)	(0.009)	(0.014)
Treat*Q	-0.016**	-0.049***	-0.048***	-0.098***
	(0.008)	(0.011)	(0.011)	(0.017)
Post*Q	-0.032***	-0.032***	-0.035***	-0.038***
	(0.007)	(0.008)	(0.008)	(0.012)
Treat	0.013**			
	(0.006)			
Q	0.016***	0.010*	0.009*	0.005
	(0.004)	(0.005)	(0.005)	(0.008)
Cash flow		0.029***		-0.372***
		(0.006)		(0.007)
Log(Board Size)	-0.170***	-0.128***	-0.128***	-0.024*
	(0.007)	(0.007)	(0.007)	(0.012)
Log(Sales)	0.013***	-0.022***	-0.023***	-0.019***
	(0.003)	(0.008)	(0.008)	(0.002)
Book Leverage	0.002***	-0.007***	-0.008***	0.087***
	(0.000)	(0.001)	(0.001)	(0.026)
Time FE			**YES**	
Industry FE				
Industry*Time FE	**YES**			**YES**
Firm FE		**YES**	**YES**	**YES**
N	17302	17302	17302	17302
Adj R-square	0.889	0.901	0.902	0.903

Table 9. Board political connections and related party transactions

This table provides OLS estimation for the following equation:

$$y_{i,t} = a \times Post_t \times Treat_i + b \times Controls_{i,t} + \alpha_i + \tau_t + \varepsilon_{i,t}$$

The dependent variable *y* is the logarithm of the total number of related party transactions in columns (1) and (2) and is the logarithm of the total amount of related party transactions in columns (3) and (4). *Post* is a dummy variable that equals one for the period after October 19, 2013, and equals zero otherwise. *Treat* is a dummy variable that equals one if the firm had at least one official independent director (OID) on the board on October 19, 2013, and zero otherwise. For each treatment firm, we select a control firm that has the nearest propensity score of having an OID on October 19, 2013. Numbers in the parentheses are standard errors corrected for heteroscedasticity and firm level clustering. (***, **, * denote significance level at 1%, 5%, and 10%, respectively).

	Log(1+RPT Number)		**Log(1+RPT Amount)**	
	(1)	**(2)**	**(3)**	**(4)**
Treat*Post	**−0.046*** **	**−0.032*** **	**−0.259*** **	**−0.192** **
	(0.014)	(0.014)	(0.143)	(0.148)
Log(Board Size)		0.142***		0.048
		(0.042)		(0.425)
Log(Sales)		0.006		−0.114
		(0.009)		(0.105)
Book Leverage		0.046		0.474
		(0.043)		(0.451)
Market-to-Book		−0.010***		−0.125***
		(0.003)		(0.040)
Profitability		−0.121		−0.455
		(0.132)		(1.506)
Time FE	**YES**	**YES**	**YES**	**YES**
Firm FE	**YES**	**YES**	**YES**	**YES**
N	14,234	13,431	14,234	13,431
Adj. *R* square	0.543	0.532	0.512	0.568

Table 10. Capital Misallocation

This table provides OLS estimation for the following equation:

$$y_{j,t} = a \times Post_t \times Treat_j + b \times Controls_{j,t} + \alpha_j + \tau_t + \varepsilon_{i,t}$$

where j indexes industry. The dependent variable y is the misallocation measure (productivity dispersion) defined in Hsieh and Klenow (2009) for columns (1) and (2) and standard deviation of log (TFP) normalized by industry average for columns (3) and (4). *Post* is a dummy variable which equals one for the period after 19 October 2013, and equals zero otherwise. Columns (1) and (3) classify an industry into treatment group if the percentage of politically connected firms in the industry is above the sample mean. Columns (2) and (4) directly use the percentage of politically connected firms in the industry as the continuous treatment variable. Control variables include cash flow, lagged log book assets, lagged log board size, and lagged book leverage. Numbers in the parentheses are standard errors corrected for heteroscedasticity and industry/province level clustering. (***, **, * denotes significance level at 1%, 5%, and 10%, respectively).

	Hsieh-Klenow misallocation		**Dispersion of Olley-Pakes TFP**	
	(1)	**(2)**	**(3)**	**(4)**
Treat*Post	**-0.325*** **	**-1.575*** **	**-0.032** **	**-0.195*** **
	(0.034)	(0.226)	(0.015)	(0.064)
Controls	**YES**	**YES**	**YES**	**YES**
Times FE	**YES**	**YES**	**YES**	**YES**
N	473	473	473	473
Adj R-square	0.012	0.011	0.057	0.068

Appendix A: Announcement effect of Document 18

In this appendix, we examine the value implications of OIDs by estimating the announcement effect of the regulation. The decline in government subsidies and subsequent consequences such as changes in productivity and financing activities should affect firm performance negatively. We test whether this is reflected in the stock price of politically connected firms.

Following Ahern and Dittmar (2012), we calculate the cumulative abnormal returns (CAR) for the whole sample around the announcement date using a market model (with Shanghai Composite Index to proxy for market returns) with an estimation window of 300 days (day -310 to day -11). We then regress CAR on a dummy variable indicating whether the firm is a treatment firm or not.

Columns (1) to (4) of Table B1 use the Shanghai Composite Index to proxy for market returns. With event windows of [0, +5] and [−5, +5], the treatment firms are consistently outperformed by the control firms by around 0.33%. One concern for the event study is that more than half of the listed firms are included in the treatment sample, thus, the market itself could be largely affected by the regulatory change. To ease this concern, we also use the Shanghai B-share Composite Index as the market return, since our sample does not include any B-share companies. Columns (5) to (8) exhibit similar results. These negative announcement effects of the treatment firms imply that independent directors' political connections add value to firms.

Table A1. Stock returns at the announcement of the regulation

CAR is calculated for the whole sample based on a market model with the estimation period during trading days −310 through −11, where date 0 is October 19, 2013. CAR is regressed on the treatment dummy and other firm characteristics. Market return is Shanghai Composite Index in columns (1) to (4) and Shanghai B-share Composite Index in columns (5) to (8). Numbers in the parentheses are standard errors corrected for heteroscedasticity and industry level clustering. (***, **, * denote significance level at 1%, 5%, and 10%, respectively).

	CAR(0,5) %		**CAR(−5,5) %**		**CAR(0,5) %**		**CAR(−5,5) %**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Treatment	**−0.312****	**−0.367*****	**−0.317****	**−0.366*****	**−0.319****	**−0.374*****	**−0.325****	**−0.375*****
	(0.131)	(0.136)	(0.131)	(0.136)	(0.132)	(0.136)	(0.132)	(0.136)
Log(Board Size)		0.154		0.095		0.168		0.112
		(0.351)		(0.351)		(0.351)		(0.351)
Log(Sales)		0.082		0.074		0.082		0.074
		(0.053)		(0.053)		(0.053)		(0.053)
Book Leverage		−0.418		−0.425		−0.427		−0.435
		(0.353)		(0.353)		(0.353)		(0.353)
Market-to-Book		−0.004		−0.007		−0.005		−0.010
		(0.055)		(0.054)		(0.055)		(0.054)
Profitability		−1.860		−2.018		−1.834		−2.001
		(2.387)		(2.384)		(2.387)		(2.384)
Industry FE	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Province FE	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
N	2,148	2,091	2,161	2,101	2,148	2,091	2,161	2,101
Adj. *R* square	0.032	0.031	0.031	0.029	0.032	0.031	0.031	0.029

Appendix B: Variable definitions

Tobin's q: (Total assets + Market value of equity – Book value of equity)/Total assets

Subsidy: The amount of subsidy granted by government in half a year

Related party transaction amount: The amount of related party transactions involving top managers, directors or key personnel in a firm in half a year

Cash: the sum of cash and marketable securities

Bank loan: The amount of loans granted by banks in half a year

Leverage: Total debt/(total debt + book value of equity)

Post: A dummy variable which equals 1 for the period after October 19, 2013, and equals 0 otherwise

Treat: A dummy variable that equals 1 if the firm had at least 1 official independent director (OID) in the board on October 19, 2013 and 0 otherwise.

Asset: The amount of total asset

Sales: The amount of sales

Board size: the number of board members

Cash flow: operating cash flow scaled by lagged assets

Investment: Capital expenditure scaled by lagged assets

Market-to-Book: (Market value of equity + total debt)/Total asset

Profitability: OIBDP/Total asset

Tangibility: PPENT/Total asset

Sales growth: $(Sales_t - Sales_{t-1})/ Sales_{t-1}$

ROA: Net income/Total asset

TFP: total factor productivity based on Olley and Pakes (1996) three-step estimation, in which we use total revenue as output and salary expenses as labor input; state variables include firm age and log capital stock (net property, plant, and equipment), proxy variable is log capital expenditure, free variables include year, economic region and industry dummies, and exit is estimated based on whether a firm is absent from the data in a particular time period (semiannually).