

Related transactions with government agencies: Evidence from Chinese listed state-owned enterprises

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Abstract

Existing literatures investigate the impact of listed firms' related party transactions by focusing on various types of transactions. In this paper, we focus on the identity of the related counter parties and study the impact of related transactions between Chinese listed state-owned enterprises (SEOs) and government agencies. We find that governments have the incentive to prop up state-owned listed firms and political connection assists listed firms in accessing governments' favourable treatments through related party transactions. In addition, SOEs' benefiting from government related transaction is also subject to regional disparity. Finally, we find that although related transactions with government agencies can increase SOEs' firm investments, the investment efficiency reduces.

Key words: Related party transactions; State-owned enterprises; Corporate political connection; Investment efficiency; R&D expenses

JEL code:

1. Introduction

Related party transactions may serve as a channel for related parties to expropriate resources from listed firms (Berkman, Cole, & Fu, 2009; Djankov, La Porta, Lopez-de-Silanes, & Shleifer, 2008), but listed firms may also be propped up via related transactions (Cheung, Jing, Lu, Rau, & Stouraitis, 2009; Friedman, Johnson, & Mitton, 2003). Existing literatures classify related party transactions into various categories to examine the impact of these transactions on listed firms. For instance, Berkman et al. (2009) suggest that loan guarantees issued by listed firms to their related parties are the direct channel for controlling shareholders expropriating minority shareholders since controlling shareholders clearly gain benefits through lower loan interest rates and the option to default on the loan. Importantly, the influence of related party transactions may also be subject to the identity of related parties due to the intuition that different identities may have different incentives to conduct the related party transactions. However, to our knowledge, existing literature haven not yet clearly clarified the identities of related parties. In this study, we examine the related party transactions conducted between Chinese state-owned enterprises (SOEs) and government agencies to analyse the incentives of government agencies in conducting related party transactions and investigate how such transactions affect SOEs' investment efficiency.

China's listed firms are dominated by SOEs, especially in strategic industries, such as utilities, oil and gas, and mining sectors (Hubbard & Williams, 2017). Although the influence of government is expected to be weakened in SOEs through China's share issue privatizations (SIPs) and the non-tradable share reform (NTS reform)¹ (Liu, Luo, & Tian, 2017; Zhang, Lijun, Zhang, & Yi, 2016), state control is still retained by the government (Yiu, Wan, & Xu, 2018). Additionally, SOEs are essentially different from non-SOEs. Unlike private

¹ China's SIPs and the NTS reforms are the two stages of privatization programs.

shareholders, state controlling shareholders in SOEs tend to value political targets, such as maintaining employment and local GDP growth, over firm value maximization (Boubakri, Cosset, & Saffar, 2008; Zhang et al., 2016), thus sharing similar interests with the government.

We focus on government agencies that conduct related parties of transactions with SOEs. The government holds the distribution power of various state resources and is the ultimate owner of SOEs. Additionally, SOEs sometimes bears the burden to assist local government with maintaining local development and stability. Therefore, the government has stronger incentive to allocate resources to SOEs, rather to other firms, mainly due to the political function of SOEs (Liu, Liu, Tian, & Wang, 2018a).

The influence of political connection on corporations has been widely discussed and documented by existing studies. Political connection is particularly considered valuable to firms in countries with weak legal and institution environment since it is able to assist firms with accessing various resources and favourable treatments of the government (Fan, Wong, & Zhang, 2007; Wu, Li, & Li, 2013; Wu, Wu, Zhou, & Wu, 2012). On the other hand, executives with bureaucratic background may value their personal interests and political targets over firms' financial objectives (Fan et al., 2007) and thus make sub-optimal decisions that could potentially reduce firm value (Shleifer & Vishny, 1994) and efficiency (Chen, Sun, Tang, & Wu, 2011b). Therefore, we expect that political connection is able to assist SOEs in obtaining resources through related party transactions conducted with government agencies, but the resources obtained may not necessarily improve firm efficiency.

We hand collect the government-related transactions for the period from 2008 to 2014. State-owned enterprises (SOEs) and Non-SOEs are identified by checking the ultimate controller of the listed firms. Listed firms with a government agency as the ultimate controller are

identified as a SOE and otherwise a Non-SOE. To identify counterparties of the related party transactions that are government agencies, we carefully read the background of counterparties of the related party transactions and manually identify government agencies. Following Delios, Wu, and Zhou (2006), we apply 7 categories of institutions and consider them as government agencies, including local government, government ministries, government bureaus, state asset investment bureaus, state asset management bureaus, research institutions and state-owned banks. Then, following the method of Cheung et al. (2009), all related parties are divided into transactions that are more likely to tunnelling, propping up or others. Lastly, following Fan, Wong and Zhang (2007), we identify whether a SOE/Non-SOE has political connection by checking whether the chairman/CEO has current or previous government or military working experience.

We find there is a positive relation between politically connected executives and related party transactions conducted with government agencies, indicating that the government indeed maintains a close relation with SOEs via politically connected executives. We test the likelihood, frequency and the amount of such transactions and generate robust results.

As discussed, we classify the related transactions into three groups, e.g., tunnelling, propping up, and others, based on the nature and direction of transactions to further examine whether government agencies are more likely to prop up or expropriate SOEs through related party transactions. Consistent with literature, SOEs are being propping up by the government, especially those with politically connected managers (Liu, Pan, & Tian, 2018b; Ru, 2018). To control for the influence of potential endogeneity, both the propensity score matching method and Heckman Two-Stage analysis are applied. The results of these two models suggest that the positive relation between SOEs' political connection and government related transaction is relatively robust.

The connection between executives with bureaucratic background and government resources may be subject to regional variations. According to Chen, Li, Su, & Sun (2011a), political connection is more likely to be highly valued in regions with lower level of market development and higher influence of government on the local economy. We apply one category of the NERI index constructed by Wang, Fan, and Yu (2017), which indicates the extent of dependency of corporations on the local government in China's 31 provinces/regions to measure one type of regional disparity. We find that transactions between SOEs and government agencies are conducted more frequently in provinces where corporations are more dependent on the local governments.

We further examine the impact of government related transaction on SOEs' investment efficiency. As suggested by the results, SOEs with politically connected executives that conduct government related transactions are associated with overinvestment, and however, lower investment efficiency.

Our study contributes to the literature in two ways. First, the study contributes to the related party transaction literature by classifying the identity of counterparties in transactions. We find government agencies prop up politically connected SOEs via related party transactions. Second, we add new evidence that political connection would be beneficial to firms by providing access to government controlled resources. However, the resources gained from political connection may not improve firm efficiency.

2. Institutional background and hypothesis development

2.1 Related party transactions

A related-party transaction is defined as a transaction that is conducted between a firm and its related legal institutions or persons. Related persons include the listed firms' or their

subsidiaries' shareholders (who own at least 5% shares of the listed firm), board directors, top executives and their close relatives (such as partners, parents, siblings and in-laws). Related institutions are mostly listed firms' shareholders, their subsidiaries or their shareholders' subsidiaries (Peng et al., 2011)

The CSRC has issued various regulations regarding listed firms' conduction and reporting of related party transactions since 1997. Transactions conducted between a listed firm and its related persons that are worth more than RMB 300,000 and transactions conducted between a listed firm and its related legal institution that are worth more than RMB 3 million or 0.5% of net assets, whichever is higher, are required by the CSRC to be reported to the stock exchange in two days after the signing of the transaction agreement and disclosed in the firm's annual report. For related party transactions that worth more than RMB 30 million or 5% of net assets, whichever is higher, the transactions are required to be priced or audited by independent auditors and approved in shareholder meetings where related parties cannot vote.

Previous studies have mainly focused on different types of transactions to analyse the minority shareholder expropriation by block controlling shareholders. Cheung, Rau, and Stouraitis (2006) categorize transactions conducted between listed firms in Hong Kong and their related entities into three types¹ and find that the market generally reacts negatively towards the announcements of related party transactions, especially those that are more likely to expropriate listed firms. Additionally, the negative market reaction is associate with more concentrated ownership and lower level of transparency of listed firms. Cheung et al. (2009) apply the same method of related party transaction classification of listed firms on mainland China. Contrast with listed firms in Hong Kong, they find that listed firms on mainland China are expropriated and propped up simultaneously. Firms with higher state ownership are more

¹ The tree types of related party transactions include: transactions that are more likely to benefit listed firms, transactions that more likely to expropriate listed firms and transactions with unclear impact on listed firms.

likely to engage in related party transactions and are more likely to be propped up. Peng, Wei, and Yang (2011) further suggest that whether listed firms in China are expropriated or propped up via related party transactions is subjected to the financial situation of listed firms. Their analysis results show that financially healthy firms are more likely to be expropriated than firms in financial distress; while financial distressed firms are more likely to benefit from related party transactions. The suggestion is also supported by Berkman et al. (2009). They focus on a specific type of related party transaction, namely the loan guarantees issued by listed firms to their controlling shareholders as a direct measure of tunnelling. They find that larger firms with better profitability and growth opportunities are more likely to issue loan guarantees, thus expropriated by their controlling shareholders.

Different from previous studies, this paper endeavours to classify related party transactions based on the identity of related parties and examine whether the influence of related party transactions on listed firms is subject to the identity of related parties. Specifically, we focus on related transactions conducted between listed SOEs and government agencies. The government holds the discretion of distributing various economic state resources and at the same time, is the ultimate controller of SOEs. Therefore, it is natural that the governments tend to allocate more resources to the firms that they own than the firms they do not (Liu et al., 2018a). Evidence has also shown that SOEs in China are less financially constrained than non-SOEs due to their state ownership (Cull, Li, Sun, & Xu, 2015). More importantly, the government prefers to allocate state resources to SOEs since SOEs sometimes also bears political burdens such as maintaining employment and local economy development (Boubakri et al., 2008).

2.2 State owned enterprises in China

Before 1978, when a planned economy was carried out by the Chinese government, most of the firms were solely owned by the government and mainly served to fulfil social and political tasks. Severe problems of the planned economy, such as sectoral imbalances, low corporation productivities, urged the government to implement economic reforms (Klenner, 1981). A series of reforms were then implemented to facilitate the economy transformation, reduce state ownership and improve firms' performance and productivity, such as China's share issue privatizations (SIPs). However, due to the partial transformation of state ownership and the non-tradable nature of state shares, the agency problem between the state and non-state shareholders was not alleviated (Sun & Tong, 2003). The non-tradable share (NTS) reform was then initiated in 2005 to address the issues of China's SIPs through a gradual process of transforming non-tradable shares into tradable shares (Liao, Liu, & Wang, 2014).

Although the influence of the government is expected to be weakened in SOEs after the implementation of SIPs and NTS reform (Liu et al., 2017; Zhang et al., 2016), state control is still retained by the government, especially in strategic industries, such as utilities, oil and gas, and mining sectors (Hubbard & Williams, 2017; Yiu et al., 2018). According to Wu et al. (2012), by the end of 2007, out of 1533 listed firms in China that issue A-shares, 943 (more than 60%) were SOEs. The influence of state on SOEs may even increase since President Xi Jinping's governance, who emphasizes that the SOEs should continue to grow faster, better and larger (Gan, 2018)

Additionally, SOEs in China are essentially different from non-SOEs in terms of their association with the government. Firstly, comparing with private shareholders, controlling shareholders in SOEs, namely the various government agencies, hold greater concern on

political objectives rather than maximising shareholder wealth (Boubakri et al., 2008). Secondly, as mentioned before, given that SOEs are directly owned by the government and bear partially the social and political burden, they are more likely to be favoured by the government in the state-controlled resources distribution process (Ru, 2018). For instance, a four trillion RMB economic stimulus package, announced by the Chinese government in November 2008 to shake off the influence of global financial crisis, was mostly used to support the investments of SOEs rather than non-SOEs (Liu et al., 2018b).

2.3 Corporate political connection in China

Political connection serves a vital role in China, for both the government and corporations. With the allocation rights of resources at discretion, local government officials may be able to make decisions toward their own political benefits and the corporations with limited access to resources may also be willing to establish connections with rent-seeking government officials (Chen, Li, Luo, & Zhang, 2017). As documented by existing literatures, having executives with political background is able to assist firms with accessing various government controlled resources and preferential treatments, such as debt financing resources (Fan et al., 2007), beneficial tax treatments (Wu et al., 2012) and easier access to the equity market (Wu et al., 2013).

On the other hand, politically connected executives may share different interests from shareholders since they may value their personal benefits and political career over the firm's target of value maximization (Fan et al., 2007). As documented by Fan et al. (2007), firms with politically connected CEOs experience a significant reduction in operating performance after the IPO due to serious agency problems. Wu et al. (2012) also suggests that, although firms may enjoy lower effective tax rate due to their ties with the government, their operating performances does not necessarily improve after receiving such benefit. The unimproved

operating performances are mostly observed within SOEs, which are more closely related to the government than non-SOEs. Firms' investment efficiency is also under influence of political connection. According to Chen et al. (2011b) and Liu et al. (2018b), investment expenditure tend to be less sensitive to investment opportunities if firms, especially SOEs have politically connected managers. Additionally, firms' managerial system and monitoring efficiency may be deteriorated though low turnover of politically connected executives, because firms tend to replace politically connected executives only when the value loss caused by politically connection exceeds the value of resources and benefits gain via politically connected executives (Cao, Pan, Qian, & Tian, 2017).

2.4 Hypothesis development

Comparing with firms in the private sector, SOEs are more likely to receive resources and beneficial treatments from the government (Cull & Xu, 2003; Liu et al., 2018b; Ru, 2018). When distributing state controlled resources, it is reasonable for the government to allocate more resources to the firms that ultimately they own (Liu et al., 2018a) and the firms that partially bears of burden of maintaining social stability and economic development (Boubakri et al., 2008) rather than private firms. However, in order to prevail from the internal competition among SOEs to obtain government controlled resources, firms may need to have comparative advantages in other perspectives. In this case, we focus on firms' political connection. As suggest by the literatures, political connection is highly valued to firms in countries with weak legal and institution environment since it assists firms with accessing to various government controlled resources (Fan et al., 2007; Li, Meng, Wang, & Zhou, 2008; Wu et al., 2013; Wu et al., 2012). Therefore, SOEs with political connection may take advantage of their relationship with the government and be more likely to receive benefits

from the government via related party transactions. We break down this assumption into two hypotheses as specified below:

H₁: SOEs with political connection are more likely to conduct government related transactions.

H₂: SOEs with political connection are more likely to be propped up by the government via government related transactions.

3. Data and methodology

3.1 Government-related transactions

Information of related party transactions conducted by SOEs from 2008 to 2014 is obtained from the CSMAR database. To identify the counter parties of related party transactions that are government agencies, we carefully read the background of counterparties of the related party transaction and manually identify the related party transactions conducted between SOEs and government agencies. The government agency identification method follows Delios, Wu, and Zhou (2006). They classify the ownership identities of China's listed firms into 16 categories and consider 8 of them as government agencies, namely local government, government ministries, government bureaus, industry companies, state asset investment bureaus, state asset management bureaus, research institutions and state-owned banks. The industry companies are defined as firms that were controlled (?) by ministries of the government before the economic reform in 1978 and are classified as government agencies since they are believed to be still under the influence of the government. However, after the implementation of SIPs, NTS reform and other economic reforms, it is also possible that these firms are becoming more and more market oriented. Therefore, in this case, in order to

identify government agencies in a strict manner, we exclude industry companies and narrow the government agency identification down to the other 7 categories of government agencies.

In total, the government-related transaction sample consists of 1415 transactions conducted between SOEs and the government agencies from 2008 to 2014. Table 1 reports the distribution of government-related transactions by year, industry and province. In general, increasing number of government-related transactions were conducted throughout the sample period. The percentage of government related transactions in each year increased from 10.53% to 19.15% from 2008 to 2014, while the total number of listed firms on the market increased from 11.19% to 15.58% during the same period. The percentage of government-related transaction conduction across industries varies from 0.92% (Diversified) to 36.81% (Manufacturing), suggesting significance difference among industries. Similarly, province distribution of government-related transactions also shows diverse institutional settings and environment in different provinces affect the government related transactions. More government related transactions are conducted in under-developed regions than developed regions. For instance, 10.7% of the SOEs are located in Shanghai, one of the most developed regions in China, where only 5.37% of the government related transactions are conducted between SOEs and the government agencies in Shanghai. Whereas in Xinjiang, an under-developed province in north-western China with only 2.26% of the SOEs, 13.43% of the total government related transactions are conducted.

(Insert Table 1 here)

Government-related transactions are further classified into propping up transactions and tunnelling transactions following Cheung et al. (2009). Transactions are first classified as “Clear” or “Unclear” depending on whether they clearly benefit one party of the transactions. If one party in a transaction has clearly transferred cash, assets or other services to the other

party without being compensated (e.g. direct cash payments, loans or loan guarantees provided by one party to the other), the transaction is “Clear”. On the contrary, if the beneficial party in a transaction is not clear (e.g. acquisitions of sales of assets, purchases of goods or services), the transaction is “Unclear”. “Clear” transactions conducted between SOEs and government agencies are further categorized as propping up transactions and tunnelling transaction based on the beneficiary of a transaction. If a SOE benefits from a government-related transaction, the transaction considered as propping up¹ while if government agencies benefit from a transaction, the transaction is considered as tunnelling². Moreover, propping up and tunnelling transactions that involve direct cash payments are separately identified as cash-propping up and cash-tunnelling transactions. Table 2 summarizes the government-related transaction classification. In total, 298 transactions are classified as “Clear” transactions. Among them, 257 of them benefit listed SOEs (propping up transactions) and 41 transactions benefit the government (tunnelling transactions). Additionally, 95 of the propping up and 14 tunnelling transactions involve direct cash transfers. Based on the number of different type of transactions, propping up seem to dominate government related transactions.

(Insert Table 2 here)

3.2 Regression model

To examine the impact of political connection on a SOE’s government-related transaction engagement, the following model is specified:

¹ For instance, cash payments, loans or loan guarantees provided by listed SOEs to government agencies.

² For instance, cash payments, loans or loan guarantees provided by government agencies to listed SOEs.

$$\begin{aligned}
& G_D_{i,t}/G_F_{i,t}/G_M_{i,t} \\
& = \beta_0 + \beta_1 Pchair_{i,t}/Pceo_{i,t} + \beta_2 NERI\ index_{i,t} + \beta_3 Duality_{i,t} \\
& + \beta_4 Independent\ ratio_{i,t} + \beta_5 Board\ size_{i,t} + \beta_6 Firm\ size_{i,t} \\
& + \beta_7 Leverage_{i,t} + \beta_8 ROA_{i,t} + \beta_9 Tobin's\ Q_{i,t} + \beta_{10} Top1_{i,t} \\
& + \beta_{11} Institution_{i,t} + \varepsilon_{i,t} \quad (1)
\end{aligned}$$

Three measures are applied to proxy SOEs' government-related transaction conduction. First, G_D is a dummy variable that takes the value of 1 if the SOE has engaged in government-related transaction in the year and 0 otherwise. Second, G_F is applied to measure the frequency of government-related transaction conduction, which is calculated as the natural logarithm of the number of government related transactions conducted in a year plus one. Third, G_M is the total value of government-related transactions conducted by a SOE in the year scaled by total assets.

Firms' political connection is measured by $Pchair$, a binary variable that equals to 1 if the chairman of a firm has previous government working experience and 0 otherwise (Fan et al., 2007; Mara Faccio, Ronald W. Masulis, & John J. McConnell, 2006). $Pceo$ is used as an alternative measure of political connection, which equals to 1 if the CEO of a firm has previous government working experience and 0 otherwise. We expect $Pchair$ and $Pceo$ to be positively related with the engagement of government related transactions to support our hypothesis.

Control variables are divided into three groups. There is only one variable in the first group, $NERI\ index$, which measures the extent of how much local economy development relies on local government. Data of $NERI\ index$ is derived from 《Marketization index of China's provinces: NERI report 2016》 by Wang et al. (2017). In the report, they calculate and report an index that measures the extent to which how regional economy market oriented. The index

consists of 5 sub-indices that measures the relationship between local government and local economy development, the development of non-state economy, the development of local production market, the development of financial, labour and intangible markets, and the development of intermediary industry and legal environment. We apply the first sub-index (*NERI index*) that measures the relationship between local government and local economy development to proxy heterogenous institutional environment in different provinces. The *NERI index* is composed based on three main factors that could potentially influence the dependency of local economy on local government: the weight of government allocated resources in local economy, government intervention in local firms and the size of local government. The index is larger if local economy development is less dependent on the government. Therefore, we expect a negative relation between government related transaction conduction and *NERI index*, since in regions where local government dominates the economy, it might more likely for the government to prop up or exert influence on local SOEs through transactions.

The second group of variables controls a firm's corporate governance, including *Duality*, *Independent ratio*, *Board size*, *Top 1* and *Institution*. According to Peng et al. (2011), strong corporate governance may reduce the likelihood of listed firms being expropriated by its controlling shareholder in a related party transaction. *Duality* is a dummy variable that equals to 1 if the chairman also serves as the CEO in a SOE and 0 otherwise. By granting too much power to a single person, firms may increase their risk since it is hard for them to prevent powerful chairmen or CEOs to abuse their power (Jensen, 1993). *Independent ratio* is the ratio of the number of independent board directors over the total number of directors. Boards with more independent directors are argued to be more efficient in monitoring (Fama, 1980), thus may reduce the possibility of tunnelling. *Board size* is calculated as the natural logarithm of the total number of board directors. Larger board size usually suggests better board

monitoring and corporate governance (Peng et al., 2011). *Top 1* is the percentage ownership of the largest shareholder while *Institution* is the percentage of institutional investors' ownership. Concentrated ownership may have a positive influence on corporate governance since large shareholders are capable and have the financial incentive to monitor the firm (Jiang & Kim, 2015). However, it also increases the likelihood of expropriation by large shareholders to other investors (Jiang & Kim, 2015). Institutional investors may also improve firms' corporate governance, especially in SOEs since they are less interested in political targets and are less influenced by political pressure (Huang & Zhu, 2015).

The third group of controls measures firm specific characteristics, including *Firm size*, *Leverage*, *ROA* and *Tobin's Q*. Firm size is the natural logarithm of total assets. *Leverage* is the ratio of total debt over total assets. *ROA* is the return on assets, calculated as net profits over total assets. *Tobin's Q* is calculated as the sum of the market value of tradable shares and the book value of non-tradable shares and total liability over the book value of total assets. The book value of non-tradable shares is calculated since non-tradable shares are not liquid and are typically traded at a price close to the book value of equity (Chen et al., 2011b). As mentioned in the literature review, whether listed firms are being propped up or under tunnelling is subject to the financial condition of the firms (Berkman et al., 2009; Peng et al., 2011). Thus, it is possible that the conduction of government related transactions can be influenced by SOE's performances.

Data of corporate political connection, corporate governance and firm performance is collected from the CSMAR database. The sample used for regression analysis consists of non-financial SOEs listed on both the Shanghai and the Shenzhen Stock Exchanges from 2008 to 2014. After removing observations with extreme variable values and missing information, the sample includes 5217 firm-year observations.

4. Empirical results

4.1 Summary statistics

Table 3 summarises the descriptive statistics of the variables in this study. The regression sample is split into two sub-groups with SOEs that engaged in government related transactions and those SOEs did not. Mean and median of each variable are calculated and compared between two sub-groups. The differences of mean and median are tested with t-tests and Wilcoxon rank-sum tests respectively. As can be observed from Table 3, SOEs that conduct government related transactions tend to have significantly higher likelihood of having politically connected chairman and CEO. Regarding corporate governance variables, SOEs that conduct government related transactions have lower level of CEO duality and ownership concentration. There is no significant difference in *Board size* and *Independent ratio* between the two sub-groups. SOEs with lower institutional shareholding are more likely to conduct transactions with the government. In addition, based on the results of *Firm size*, *Leverage*, *ROA* and *Tobin's Q*, small firms with better performance and lower leverage ratio are more likely to be involved in government related transactions.

(Insert Table 3 here)

4.2 Main regression results

Table 4 reports the analysis results of the impact of political connection on SOEs' government related transaction conduction. *Pchair* is positively correlated with all three measures of government related transaction conduction and the coefficients are all significant at the 1% level. The results indicate that SOEs with politically connected chairman is more likely to conduct government related transactions and tend to conduct these transactions more frequently with larger amount of money involved than other SOEs. *Pceo* is also positively

related with all three dependent variables and the coefficients of *Pceo* are significant at the 1% level for the first two regressions. The results support our first hypothesis. Regarding other independent variables, *NERI index* is negatively related with SOEs' government related transaction conduction and conduction frequency, indicating that SOEs in regions where local economy is heavily dependent on the government are more likely to conduct government related transactions. The finding is consistent with Chen et al. (2011a) that political connection is more likely to be established and valued in regions where market is less developed or government-dependent. *Duality* is negatively related with government related transaction conduction, indicating that powerful managers are reluctant to introduce political intervention into the firm. Similarly, the coefficients of Top 1 are all negative and statistically significant when G_D or G_F are applied as dependent variables, indicating that SOEs with concentrated ownership are less likely to conduct transactions with the government. *Firm size* is negatively associated with government related transaction conduction as well. The coefficients are significant if G_D and G_M serve as the dependent variables in the regression. The results suggest that small SOEs are more likely to engage in government related transactions with larger amount of money involved. In addition, institutional ownership has significantly negative relationship with G_D and G_F. As Huang and Zhu (2015) suggested, institutional shareholders are independent from politics and are less politically driven, thus they may keep the SOEs they invest in from transactions with the government.

(Insert Table 4 here)

As the effect of politically connected chairman are similar to that of politically connected CEO, only the results of politically connected chairman are demonstrated and discussed

starting from here to facilitate the reporting. Results of politically connected CEOs are available upon request.

4.3 Robustness check

To mitigate the effect endogeneity and selection bias, propensity score matching method and Heckman two-stage analysis (Heckman, 1977) are applied. The propensity score matching process and the first-stage analysis of Heckman two-stage analysis are based on the following Probit model:

$$Pchair_{i,t} = \beta_0 + \beta_1 Duality_{i,t} + \beta_2 Board\ size_{i,t} + \beta_3 Independent\ ratio_{i,t} + \beta_4 Leverage_{i,t} + \beta_5 Firm\ size_{i,t} + \beta_6 ROA_{i,t} + \beta_7 Tobin's\ Q_{i,t} + \beta_8 Top1_{i,t} + \beta_9 Institution_{i,t} + \beta_{10} NERI\ index_{i,t} + \varepsilon_{i,t} \quad (2)$$

All variables in model (2) are previously defined. The invest Mills ratio is obtained from model (2) and is included as an independent variable in model (1) of the second-stage Heckman analysis.

Additionally, the president of China, Xi Jinping's inauguration in late 2012 can be considered as an exogenous shock that dramatically shifts the political environment in China. After Xi came into power, a series of anti-corruption regulations were issued with the aim of eliminating corruptions in China. Therefore, politically connected firms are expected to cut off their illegal channels of building political connections and maintain connected with the government through a fair and square way, such as engaging in government-related transactions. The government also has stronger incentives to reach out to their SOEs since Xi attaches significant importance to SOEs and explicitly emphasizes that SOEs should grow faster and stronger (Gan, 2018). Therefore, we expect more government related transaction conduction of politically connected SOEs after 2012.

A difference-in-difference approach is applied to test the effect of Xi's inauguration based on the regression model specified as below:

$$\begin{aligned}
G_{D_{i,t}}/G_{F_{i,t}}/G_{M_{i,t}} &= \beta_0 + \beta_1 Pchair_{i,t} + \beta_2 Xi_{i,t} + \beta_3 Pchair_{i,t} * Xi_{i,t} \\
&+ \beta_4 NERI\ index_{i,t} + \beta_5 Duality_{i,t} + \beta_6 Independent\ ratio_{i,t} \\
&+ \beta_7 Board\ size_{i,t} + \beta_8 Firm\ size_{i,t} + \beta_9 Leverage_{i,t} + \beta_{10} ROA_{i,t} \\
&+ \beta_{11} Tobin's\ Q_{i,t} + \beta_{12} Top1_{i,t} + \beta_{13} Institution_{i,t} + \varepsilon_{i,t} \quad (3)
\end{aligned}$$

where Xi is an indicator variable that equals to 1 for periods after 2012. We expect the interaction term *Pchair* * *Xi* to have a positive and statistically significant coefficient. All other variables are defined previously. These regressions are also conducted both in propensity matched sample and follow the Heckman Two-stage analysis (Heckman, 1977).

Table 5 and Table 6 shows the results of matched sample analysis. For the first three regressions conducted based on model (1), the relation between political connection and government related transaction conduction remains positive and significant. Regarding the difference-in-difference analysis in regressions 4-6, the coefficients of the interaction term are all positive and significant when *G_F* and *G_M* are dependent variables, indicating that politically connected SOEs are more likely to conduct government related transactions after 2012 when Xi Jinping came to power.

(Insert Table 5 here)

(Insert Table 6 here)

Table 6 shows the results of the Heckman two-stage analysis. Similar to the matched sample analysis, the relations between SOEs' political connection and their government-related transaction engagement are still positive and significant in all regressions 1-3.

(Insert Table 7 here)

Both matched sample and Heckman two-stage analyses suggest similar results with the main regression analysis. Moreover, the positive relation between political connection and government related transaction conduction responses to the exogenous shock in the difference-in-difference analysis. Therefore, previous main regression results are relatively robust. Further empirical analyses will all be conducted in the matched sample to mitigate the effect of endogeneity.

4.3 Propping up or tunnelling?

Related party transactions can be both value-adding and value-destroying to firms (Berkman et al., 2009; Cheung et al., 2009). To analyse whether SOEs with political connection are more likely to be propped up by the government through related party transactions, we examine the relationship between corporate political connection and the conduction of government related transactions that clearly props up listed firms in regression analyses. The conduction of propping-up government related transactions is proxied by three variables. *G_Prop_D* is a dummy variable that equals 1 if the firm has conducted propping up government-related transactions in the year and 0 otherwise. *G_Prop_F* is the frequency of government-related transactions that clearly prop up listed firms, calculated as the natural logarithm of the number of propping up government related transactions plus one. *G_Prop_M* is measure as the money involved in propping up government-related transactions,

scaled by total assets. To test our hypothesis, G_Prop_D , G_Prop_F and G_Prop_M are used to replace G_D , G_F and G_M in regression model (1).

Results of regression analyses are shown in Table 7. As expected, there is a positive relationship between SOEs' political connection and propping-up government related transaction conduction and the relationship is significant when G_Prop_M is the dependent variable, suggesting that political connection indeed benefits SOEs by increasing the value of government related transactions that are conducted to prop up SOEs. All three measures of propping-up government related transaction conduction are negatively correlated with *NERI index* and the relation is very statistically significant, indicating that SOEs in regions where local government is important to local economy are more likely to conduct propping-up government related transactions. Significant coefficients are also found in *Leverage* and *Firm size*. As *Leverage* is positively related with dependent variables and *Firm size* is negatively related with dependent variables, small SOEs that are deeper in debt are more likely to be propped up by the government.

(Insert Table 8 here)

To further confirm that SOEs with political connection benefit from government-related transactions, $G_Cashprop_D$, $G_Cashprop_F$ and $G_Cashprop_M$ are used as alternative dependent variables in Model (1). $G_Cashprop_D$ is a dummy variable that equals 1 if the firm has conducted cash propping up government-related transaction in the year and 0 otherwise. $G_Cashprop_F$ is the frequency of government-related transactions that prop up listed firms with cash, calculated as the natural logarithm of the number of cash-propping up government related transactions plus one. $G_Cashprop_M$ is the money involved in cash propping up government-related transactions, scaled by total assets. The regression results summarized in Table 8 are very similar with previous findings. Therefore, the finding that

political connection has a positive impact on SOEs being propped up by the government is relatively robust.

(Insert Table 9 here)

4.4 Regional disparity

According to Chen et al. (2011a), political connection is valuable, especially in regions where local economy is less market oriented or local government holds greater discretion of resources distribution. Thus, in terms of benefiting SOEs from government related transactions, the positive influence of political connection may be more pronounced in regions where local economy is more dependent on the government. To examine our assumption, a subsample is constructed based on the median of *NERI index*. Firms in a province with *NERI index* lower than the median will be included in the government-dependent subsample and higher otherwise. As expected, the regression results in table 9 show a positive relation between SOEs' political connection and government-related transaction conduction, indicating that political connection benefits SOEs in regions with powerful government influence.

(Insert Table 10 here)

4.5 Investment efficiency

Given that politically connected SOEs are propped up by the government through related party transactions, another related question is that after receiving benefits from the government, how do SOEs and SOEs with political connection make investment decisions. Existing literatures has documented the impact of political connection on Chinese listed firms' investment efficiency after receiving bank loans from the government. Chen et al. (2011b) examine the investment efficiency of both SOEs and non-SOEs in China from 2001 to 2006.

They suggest that SOEs are significantly less efficient in terms of investing compared with non-SOEs. Additionally, political connection established via top executives' previous government working experience weakens investment efficiency in SOEs. Pan and Tian (2017) also suggest that firms' investment efficiency is influenced by their political connections. By considering the arrests of corrupt politicians as exogenous shocks, they find that SOEs that are related to the arrested politician have experienced investment efficiency improvements after the shock. As SOEs with politically connected executives receive more financial support through government related transactions which is shown in earlier sections and politically connected managers may value their personal political career over firms' financial objectives, SOEs with politically connected executives might overinvest (Chen et al., 2011b), and the investment efficiency of politically connected SOEs may also be lower.

To test this hypothesis, we examine two sources of investment inefficiency. First, we check whether listed SOEs overinvest; second, we analyse whether the investment fully capitalize investment opportunities.

To examine overinvestment, we follow Shen, Luo, and Huang (2015) which defines investment efficiency as the difference between actual and expected investment expenditures. The actual investment expenditure, *InvExp*, is calculated as the ratio of investment expenditure (cash paid for fixed assets, intangible assets and other long-term assets less cash received from selling these assets) over total assets at the beginning of the year. The expected investment expenditure is measured by the following cash flow model (Cleary, Povel, & Raith, 2007):

$$Expected\ InvExp_{i,t} = \beta_0 + \beta_1 Tobin's\ Q_{i,t-1} + \beta_2 OCF_{i,t-1} + \varepsilon_{i,t}$$

where *Tobin's Q* is a measure of growth opportunities; *OCF* is the net operating cash flows scaled by total assets at the beginning of the year. The difference between *InvExp*, the actual investment expenditure and *Expected InvExp*, the expected investment expenditure is calculated to measure SOEs' investment inefficiency, which is denoted as *Abnormal Inv*. Positive value of *Abnormal Inv* suggests overinvestment while negative values imply underinvestment. *Abnormal Inv* is then regressed on various variables based on the model expressed as follows:

$$\begin{aligned}
Abnormal\ Inv_{i,t} &= \beta_0 + \beta_1 G_D_{i,t} \\
&+ \beta_2 Pchair_{i,t} + \beta_3 G_D_{i,t} * Pchair_{i,t} + \beta_4 NERI\ index_{i,t} + \beta_5 Duality_{i,t} \\
&+ \beta_6 Board\ size_{i,t} + \beta_7 Independent\ ratio_{i,t} + \beta_8 Leverage_{i,t} \\
&+ \beta_9 Firm\ size_{i,t} + \beta_{10} ROA_{i,t} + \beta_{11} Top1_{i,t} + \beta_{12} Institution_{i,t} \\
&+ \varepsilon_{i,t} \quad (4)
\end{aligned}$$

To examine the second source of investment inefficiency, we follow Chen et al. (2011b) and Pan and Tian (2017) which uses the sensitivity of investment expenditure to investment opportunities to measure investment efficiency. The regression model is shown as below:

$$\begin{aligned}
InvExp_{i,t} &= \beta_0 + \beta_1 G_D_{i,t} + \beta_2 Pchair_{i,t} + \beta_3 Tobin's\ Q_{i,t} + \beta_4 Pchair_{i,t} * Tobin's\ Q_{i,t} \\
&+ \beta_5 G_D_{i,t} * Pchair_{i,t} * Tobin's\ Q_{i,t} + \beta_6 NERI\ index_{i,t} + \beta_7 Duality_{i,t} \\
&+ \beta_8 Board\ size_{i,t} + \beta_9 Independent\ ratio_{i,t} + \beta_{10} Leverage_{i,t} \\
&+ \beta_{11} Firm\ size_{i,t} + \beta_{12} ROA_{i,t} + \beta_{13} Top1_{i,t} + \beta_{14} Institution_{i,t} \\
&+ \varepsilon_{i,t} \quad (5)
\end{aligned}$$

We focus on the interaction term $G_D * Pchair * Tobin's\ Q$, which measures the sensitivity between the firm's growth opportunities (*Tobin's Q*) and investment expenditures (*InvExp*) of listed SOEs with politically connected chairman that are involved government-related transactions. We expected the coefficient of $G_D * Pchair * Tobin's\ Q$ to be negative to support our hypothesis.

Regression results are summarized and reported in Table 10. We observe that G_D is negatively correlated with *Abnormal Inv* while the interaction term has a positive coefficient. The results suggest that SOEs that conduct transactions with the government agencies tend to invest conservatively. However, SOEs with political connection tend to overinvest, indicating that politically connected chairman in SOEs tend to care less about how to invest resources efficiently since they are able to get more support from the government. Regarding results of model (5), we observe a negative coefficient of the interaction term $G_D * Pchair * Tobin's Q$. The result is in line with our assumption that the investment efficiency of politically connected SOEs is lower than other SOEs.

(Insert Table 10 here)

4.6 Some additional tests

We have also examined the impact of government-related transaction conduction on listed SOEs' R&D expenditure, dividend policy, cash holding and sales growth. The analysis results suggest that listed SOEs that conduct government-related transactions tend to increase their R&D expenditures. However, politically connected chairman in listed SOEs have a negative impact on firms R&D by reducing R&D expenses of listed SOEs. We have also found that the conduction of government-related transactions are positively related with listed SOEs' likelihood of paying cash dividend. At this stage, no further significant result is discovered.

(Insert Table 12 here)

5. Conclusion

In this paper, we focus on government agencies as the counter parties of related party transactions conducted by China's SOEs from 2008 to 2014. We first examine the

determinants of SOEs' government related transaction and find that SOEs with political connection are more likely to conduct transactions with the government. The conduction of government related transactions is also subject to the importance of local government to the development of local economy. Then, we determine whether government related transactions prop up or expropriate listed SOEs by classify government related transactions into several categories. As a result, propping up transactions dominate transactions conducted between SOEs and the government agencies. Consistent with the argument that political connection can be valuable, we find that SOEs with politically connected top executives are more likely to benefit from government related transactions. Lastly, we examine the impact of government related transaction on SOEs' investment efficiency and find that SOEs with political connection tend to overinvest at a lower efficiency.

The study analyses listed firms' related party transactions from a new perspective by examining the identity of the counter parties of the transactions. Since the government is the owner of SOEs and values the development and stability of SOEs, it has strong incentive to prop up SOEs via related party transactions. We also add new evidence to literatures of political connection that political connection can assist firms in accessing resources. However, due to diverse interest of politically connected managers and the multiple goals of SOEs, the resources gained through political connection by SOEs do not necessarily improve firm efficiency.

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Table 1. Summary statistics of government related transactions**Panel A. Year distribution of government related transactions (G-related transactions)**

year	No. of G-related transactions	Percentage	No. of Firms with G-related transaction	Percentage	Total No. of listed firms	Percentage
2008	149	10.53%	41	10.00%	584	11.19%
2009	211	14.91%	51	12.44%	693	13.28%
2010	194	13.71%	50	12.20%	753	14.43%
2011	161	11.38%	51	12.44%	795	15.24%
2012	200	14.13%	63	15.37%	821	15.74%
2013	229	16.18%	72	17.56%	758	14.53%
2014	271	19.15%	82	20.00%	813	15.58%
Total	1415	100.00%	410	100.00%	5217	100.00%

Panel B. Industry distribution of G-related transactions

Industry	No. of G-related transactions	Percentage	No. of Firms with G-related transaction	Percentage	Total No. of listed firms	Percentage
Agriculture	54	3.82%	10	2.44%	74	1.42%
Mining	79	5.58%	25	6.10%	267	5.12%
Manufacturing	522	36.89%	162	39.51%	2734	52.41%
Electric	50	3.53%	29	7.07%	407	7.80%
Construction	43	3.04%	11	2.68%	164	3.14%
Wholesale	26	1.84%	17	4.15%	394	7.55%
Transport	207	14.63%	28	6.83%	388	7.44%
Information	59	4.17%	18	4.39%	147	2.82%
Real estate	71	5.02%	23	5.61%	356	6.82%
Leasing	114	8.06%	14	3.41%	59	1.13%
Scientific	23	1.63%	13	3.17%	22	0.42%
Water	62	4.38%	19	4.63%	62	1.19%
Culture	92	6.50%	29	7.07%	82	1.57%
Diversified	13	0.92%	12	2.93%	61	1.17%
Total	1415	100.00%	410	100.00%	5217	100.00%

7. Tables

(Continue on the next page)

Panel C. Province distribution of G-related transactions

Province	No. of G-related transactions	Percentage	No. of Firms with G-related transaction	Percentage	Total No. of listed firms	Percentage
Beijing	102	7.21%	28	6.83%	511	9.79%
Tianjin	4	0.28%	3	0.73%	148	2.84%
Hebei	7	0.49%	6	1.46%	132	2.53%
ShanXi	164	11.59%	10	2.44%	128	2.45%
Innor Mogolia	0	0.00%	0	0.00%	61	1.17%
Liaoning	45	3.18%	22	5.37%	159	3.05%
Jilin	124	8.76%	15	3.66%	112	2.15%
Heilongjiang	2	0.14%	2	0.49%	88	1.69%
Shanghai	76	5.37%	33	8.05%	558	10.70%
Jiangsu	42	2.97%	17	4.15%	294	5.64%
Zhejiang	65	4.59%	29	7.07%	206	3.95%
Anhui	61	4.31%	22	5.37%	226	4.33%
Fujian	46	3.25%	18	4.39%	161	3.09%
Jiangxi	40	2.83%	9	2.20%	120	2.30%
Shandong	7	0.49%	7	1.71%	289	5.54%
Henan	8	0.57%	6	1.46%	141	2.70%
Hubei	59	4.17%	26	6.34%	210	4.03%
Hunan	24	1.70%	12	2.93%	171	3.28%
Guangdong	143	10.11%	38	9.27%	534	10.24%
Guangxi	7	0.49%	2	0.49%	70	1.34%
Hainan	42	2.97%	12	2.93%	37	0.71%
Chongqing	6	0.42%	5	1.22%	113	2.17%
Sichuan	100	7.07%	30	7.32%	180	3.45%
Guizhou	2	0.14%	1	0.24%	81	1.55%
Yunnan	8	0.57%	8	1.95%	117	2.24%
Tibet	6	0.42%	3	0.73%	16	0.31%
Shan'Xi	30	2.12%	10	2.44%	125	2.40%
Gansu	1	0.07%	1	0.24%	60	1.15%
Qinghai	4	0.28%	2	0.49%	33	0.63%
Ningxia	0	0.00%	0	0.00%	18	0.35%
Xinjiang	190	13.43%	33	8.05%	118	2.26%
Total	1415	100.00%	410	100.00%	5217	100.00%

Table 2. Propping up transactions and tunnelling transactions

	No. of transactions	Percentage	No. of Firm-year observation	Percentage
Unclear transactions	1117	78.94%	297	72.44%
Clear transactions	298	21.06%	113	27.56%
Total Government related transactions	1415	100.00%	410	100.00%
Propping up transactions	257	86.24%	85	75.22%
Tunnelling transactions	41	13.76%	28	24.78%
Clear transactions	298	100.00%	113	100.00%
Non-cash propping up transactions	162	63.04%	33	38.82%
Cash propping up transactions	95	36.96%	52	61.18%
Total propping up transactions	257	100.00%	85	100.00%
Non-tunnelling cash transactions	27	65.85%	20	71.43%
Tunnelling cash transactions	14	34.15%	8	28.57%
Tunnelling transactions	41	100.00%	28	100.00%

The table reports the classification of the government related transactions. Among 1,415 transactions, 298 transactions (clear transactions) clearly benefit one party of the transaction. By carefully examining the nature and direction of these transactions, 257 of them are identifies as to benefit listed SOEs (propping up transactions) and 41 transactions are identifies as to benefit the government (tunnelling transactions). Additionally, 95 of the propping up and 14 tunnelling transactions involve direct cash transfers.

Table 3 Summary statistics**Panel A. Summary statistics of key variables**

Variables	No. of observations	Mean	Median	Max	Min	Standard Deviation	Range
G_D	5217	0.079	0.000	1.000	0.000	0.269	1.000
G_F	5217	0.096	0.000	3.664	0.000	0.374	3.664
G_M	5217	0.003	0.000	1.936	0.000	0.046	1.936
Pchair	5217	0.340	0.000	1.000	0.000	0.474	1.000
Pceo	5217	0.139	0.000	1.000	0.000	0.346	1.000
Duality	5217	0.094	0.000	1.000	0.000	0.291	1.000
Board Size	5217	2.352	2.303	3.401	1.609	0.244	1.792
Independent Ratio	5217	0.370	0.333	0.800	0.143	0.068	0.657
Leverage	5217	0.534	0.548	1.492	0.050	0.200	1.442
Firm Size	5217	22.525	22.333	28.506	17.990	1.366	10.517
ROA	5217	0.034	0.031	0.664	-0.754	0.060	1.418
Tobin's Q	5217	1.721	1.415	9.584	0.704	0.952	8.880
Top 1	5217	0.400	0.400	0.863	0.036	0.158	0.827
Institution	5217	0.083	0.042	0.779	0.001	0.123	0.778
NERI Index	5217	6.976	7.130	9.650	-6.750	1.566	16.400

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Panel B. Comparison between SOEs that conduct G-related transactions and those do not

	No. of observations if G_D=1	Mean if G_D=1 (1)	Median if G_D=1 (2)	No. of observations if G_D=0	Mean if G_D=0 (3)	Median if G_D=0 (4)	Difference (1)-(3)	Difference (2)-(4)
Pchair	410	0.420	0.000	4,807	0.334	0.000	0.086***	0.000***
Pceo	410	0.205	0.000	4,807	0.133	0.000	0.072***	0.000***
Duality	410	0.063	0.000	4,807	0.096	0.000	-0.033**	0.000**
Board Size	410	2.357	2.303	4,807	2.351	2.303	0.006	0.000
Independent Ratio	410	0.367	0.333	4,807	0.371	0.333	-0.004	0.000
Leverage	410	0.500	0.505	4,807	0.537	0.552	-0.037***	-0.046***
Firm Size	410	22.146	21.976	4,807	22.557	22.372	-0.411***	-0.396***
ROA	410	0.038	0.033	4,807	0.034	0.031	0.004	0.002*
Tobin's Q	410	1.915	1.548	4,807	1.704	1.403	0.211***	0.145***
Top 1	410	0.349	0.331	4,807	0.404	0.405	-0.056***	-0.074***
Institution	410	0.064	0.040	4,807	0.085	0.042	-0.021***	-0.002
NERI Index	410	6.596	7.020	4,807	7.008	7.130	-0.412***	-0.110***

Table 3 shows the summary statistics. Definition of variables can be found in Appendix 1. T-tests and Wilcoxon rank-sum tests are used to test the difference between government-related transaction conducting firms and non-conducting firms. *, ** and *** represent significance at 10%, 5% and 1% respectively.

Table 4. Determinants of conducting listed firms' government-related transactions

Variables	(1) G_D	(2) G_F	(3) G_M	(4) G_D	(5) G_F	(6) G_M
Pchair	0.129** (2.257)	0.029*** (2.688)	0.005*** (3.538)			
Pceo				0.201*** (2.667)	0.056*** (3.666)	0.003 (1.469)
NERI index	-0.066*** (-3.953)	-0.022*** (-6.382)	-0.001 (-1.469)	-0.064*** (-3.860)	-0.022*** (-6.313)	-0.001 (-1.459)
Duality	-0.201** (-1.968)	-0.032* (-1.863)	0.000 (0.010)	-0.243** (-2.345)	-0.044** (-2.489)	-0.000 (-0.221)
Boardsize	-0.062 (-0.534)	-0.000 (-0.015)	0.002 (0.788)	-0.071 (-0.605)	-0.001 (-0.044)	0.002 (0.852)
Independent ratio	-0.257 (-0.611)	-0.047 (-0.611)	-0.010 (-1.044)	-0.236 (-0.560)	-0.042 (-0.551)	-0.010 (-0.988)
Leverage	0.014 (0.081)	-0.054* (-1.660)	0.002 (0.520)	0.018 (0.105)	-0.053 (-1.624)	0.002 (0.471)
Firm size	-0.066** (-2.257)	-0.004 (-0.872)	-0.002** (-2.552)	-0.069** (-2.342)	-0.005 (-1.020)	-0.002** (-2.400)
ROA	1.006* (1.802)	0.045 (0.444)	-0.019 (-1.471)	0.989* (1.776)	0.040 (0.401)	-0.018 (-1.405)
Tobin's Q	0.017 (0.523)	0.004 (0.547)	0.001 (0.696)	0.018 (0.553)	0.004 (0.551)	0.001 (0.788)
Top 1	-1.367*** (-7.043)	-0.157*** (-4.523)	0.001 (0.204)	-1.347*** (-6.929)	-0.153*** (-4.408)	0.001 (0.157)
Institution	-0.818*** (-2.678)	-0.109*** (-2.612)	-0.000 (-0.017)	-0.812*** (-2.674)	-0.112*** (-2.673)	-0.001 (-0.117)
Constant	1.215* (1.805)	0.456*** (3.817)	0.040*** (2.640)	1.271* (1.883)	0.472*** (3.954)	0.038** (2.541)
Observations	5,217	5,217	5,217	5,217	5,217	5,217
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R²/Adjusted R²	0.104	0.061	0.004	0.105	0.063	0.002

Table 4 presents the regression analysis of the determinants of conducting government-related transactions. Definition of variables can be found in Appendix 1. Both industry and year dummy variables are included. Z-statistics (t-statistics) are reported in parentheses. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively.

Table 5. Determinants of conducting listed firms' government-related transactions, propensity score matching analysis

Variables	(1) Pchair	(2) G_D	(3) G_F	(4) G_M
Pchair		0.110* (1.712)	0.025* (1.858)	0.005*** (2.579)
NERI index	-0.008 (-0.664)	-0.068*** (-3.488)	-0.027*** (-5.773)	-0.001 (-1.134)
Duality	0.057 (0.900)	-0.294** (-2.323)	-0.046** (-2.007)	0.000 (0.104)
Boardsize	0.171** (2.179)	0.011 (0.077)	0.024 (0.845)	0.004 (0.925)
Independent ratio	0.276 (0.998)	-0.406 (-0.826)	-0.068 (-0.693)	-0.014 (-1.015)
Leverage	-0.167 (-1.403)	-0.095 (-0.463)	-0.096** (-2.192)	0.000 (0.009)
Firm size	0.108*** (5.850)	-0.046 (-1.381)	-0.003 (-0.389)	-0.002* (-1.859)
ROA	1.028*** (2.728)	1.118 (1.574)	0.080 (0.540)	-0.043** (-2.111)
Tobin's Q	0.062*** (2.588)	0.020 (0.513)	0.003 (0.359)	0.001 (1.240)
Top 1	-0.344*** (-2.736)	-1.345*** (-5.955)	-0.144*** (-3.203)	0.002 (0.334)
Institution	-0.352** (-2.238)	-0.569 (-1.511)	-0.094 (-1.551)	-0.003 (-0.309)
Constant	-2.787*** (-6.485)	0.727 (0.944)	0.422*** (2.772)	0.040* (1.882)
Observations	5,217	3,552	3,552	3,552
Industry Dummy	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes
Pseudo R²/Adjusted R²	0.0445	0.112	0.071	0.003

Table 5 presents the results of propensity score matching analysis. Column (1) reports the first step regression of propensity score matching method. The matched sample consists of 3552 firm-year observations from 2008 to 2014. Definition of variables can be found in Appendix 1. Both industry and year dummy variables are included. Z-statistics (t-statistics) are reported in parentheses. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively.

Table 6. The effect of anti-corruption on the listed firms' government-related transaction conduction, propensity score matching analysis

Variables	(1) G_D	(2) G_F	(3) G_M
Pchair	0.043 (0.539)	0.010 (0.633)	0.001 (0.604)
Xi	0.171 (1.134)	-0.008 (-0.387)	0.000 (0.168)
Pchair*Xi	0.197 (1.448)	0.056* (1.909)	0.011*** (2.794)
NERI index	-0.068*** (-3.502)	-0.026*** (-5.784)	-0.000 (-0.758)
Duality	-0.295** (-2.327)	-0.051** (-2.223)	0.001 (0.229)
Boardsize	0.005 (0.038)	0.028 (0.984)	0.004 (0.926)
Independent ratio	-0.376 (-0.764)	-0.035 (-0.362)	-0.012 (-0.896)
Leverage	-0.101 (-0.489)	-0.095** (-2.176)	0.001 (0.104)
Firm size	-0.044 (-1.302)	-0.002 (-0.274)	-0.002** (-2.231)
ROA	1.131 (1.593)	0.041 (0.282)	-0.045** (-2.241)
Tobin's Q	0.021 (0.541)	0.004 (0.474)	0.002 (1.370)
Top 1	-1.345*** (-5.951)	-0.153*** (-3.414)	0.002 (0.393)
Institution	-0.551 (-1.464)	-0.081 (-1.329)	-0.000 (-0.023)
Constant	0.703 (0.914)	0.382** (2.576)	0.043** (2.113)
Observations	3,552	3,552	3,552
Industry Dummy	Yes	Yes	Yes
Year Dummy	No	No	No
Pseudo R-squared/Adjusted R-squared	0.113	0.069	0.010

Table 6 presents the results of propensity score matching analysis on the effect of China's anti-corruption campaigns. The matched sample consists of 3552 firm-year observations from 2008 to 2014. Definition of variables can be found in Appendix 1. Both industry and year dummy variables are included. Z-statistics (t-statistics) are reported in parentheses. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively.

Table 7. Determinants of conducting listed firms' government-related transactions, Heckman Two-stage analysis

Variables	(1) G_D	(2) G_F	(3) G_M
Pchair	0.136** (2.367)	0.030*** (2.744)	0.005*** (3.552)
NERI index	-0.133*** (-5.591)	-0.026*** (-6.920)	-0.001 (-1.638)
Duality	0.264* (1.706)	-0.005 (-0.270)	0.001 (0.382)
Boardsize	1.300*** (3.605)	0.080** (2.163)	0.005 (1.063)
Independent ratio	1.944*** (2.798)	0.085 (0.931)	-0.005 (-0.478)
Leverage	-1.306*** (-3.514)	-0.133*** (-3.030)	-0.001 (-0.116)
Firm size	0.788*** (3.654)	0.047** (2.358)	0.000 (0.058)
ROA	9.471*** (4.301)	0.552** (2.573)	-0.001 (-0.030)
Tobin's Q	0.507*** (4.004)	0.033** (2.565)	0.002 (0.997)
Top 1	-4.100*** (-5.742)	-0.323*** (-4.548)	-0.005 (-0.547)
Institution	-3.729*** (-4.700)	-0.285*** (-3.661)	-0.006 (-0.635)
IMR	11.226*** (3.990)	0.676*** (2.675)	0.024 (0.743)
Constant	-29.711*** (-3.823)	-1.604** (-2.059)	-0.032 (-0.330)
Observations	5,217	5,217	5,217
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
Pseudo R²/Adjusted R²	0.110	0.062	0.004

Table 7 shows the results of Heckman two-stage regression analysis. Definition of variables can be found in Appendix 1. Both industry and year dummy variables are included. Z-statistics (t-statistics) are reported in parentheses. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively.

Table 8. Determinants of conducting listed firms' government-related transactions that prop up listed firms

Variables	(1) G_Prop_D	(2) G_Prop_F	(3) G_Prop_M
Pchair	0.179 (1.626)	0.010 (1.642)	0.003** (2.473)
NERI index	-0.076*** (-2.923)	-0.013*** (-6.261)	-0.001*** (-3.035)
Duality	-0.110 (-0.566)	-0.010 (-0.997)	-0.002 (-1.038)
Boardsize	-0.294 (-1.187)	-0.006 (-0.445)	0.002 (0.942)
Independent ratio	-0.572 (-0.695)	-0.068 (-1.510)	0.003 (0.351)
Leverage	0.831** (2.422)	0.049** (2.409)	0.016*** (4.341)
Firm size	-0.194*** (-3.099)	-0.009*** (-3.025)	-0.002*** (-2.861)
ROA	1.449 (1.253)	0.103 (1.503)	-0.002 (-0.143)
Tobin's Q	-0.140 (-1.615)	-0.006 (-1.617)	0.001 (1.172)
Top 1	-0.611 (-1.564)	-0.009 (-0.434)	-0.002 (-0.468)
Institution	-0.990 (-1.266)	-0.022 (-0.792)	-0.003 (-0.536)
Constant	3.166** (2.224)	0.345*** (4.924)	0.030** (2.297)
Observations	3,263	3,552	3,552
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
Pseudo R²/Adjusted R²	0.121	0.052	0.013

Table 8 reports the regression analysis results of the determinants of conducting government-related transactions that prop up listed firms in the matched sample. Definition of variables can be found in Appendix 1. Both industry and year dummy variables are included. Z-statistics (t-statistics) are reported in parentheses. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively.

Table 9. Determinants of conducting listed firms' government-related transactions that prop up listed firms with cash

Variables	(1) G_Cashprop_D	(2) G_Cashprop_F	(3) G_Cashprop_M
Pchair	0.173 (1.250)	0.010 (1.642)	0.003** (2.473)
NERI index	-0.084*** (-2.814)	-0.013*** (-6.261)	-0.001*** (-3.035)
Duality	-0.053 (-0.224)	-0.010 (-0.997)	-0.002 (-1.038)
Boardsize	-0.156 (-0.513)	-0.006 (-0.445)	0.002 (0.942)
Independent ratio	-0.179 (-0.182)	-0.068 (-1.510)	0.003 (0.351)
Leverage	0.769* (1.885)	0.049** (2.409)	0.016*** (4.341)
Firm size	-0.169** (-2.276)	-0.009*** (-3.025)	-0.002*** (-2.861)
ROA	2.136 (1.532)	0.103 (1.503)	-0.002 (-0.143)
Tobin's Q	-0.119 (-1.119)	-0.006 (-1.617)	0.001 (1.172)
Top 1	-0.842* (-1.722)	-0.009 (-0.434)	-0.002 (-0.468)
Institution	-1.001 (-1.003)	-0.022 (-0.792)	-0.003 (-0.536)
Constant	3.238* (1.890)	0.345*** (4.924)	0.030** (2.297)
Observations	2,837	3,552	3,552
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
Pseudo R²/Adjusted R²	0.146	0.052	0.013

Table 9 reports the regression analysis results of the determinants of conducting government-related transactions that prop up listed firms with cash in the matched sample. Definition of variables can be found in Appendix 1. Both industry and year dummy variables are included. Z-statistics (t-statistics) are reported in parentheses. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively.

Table 10. Determinants of conducting listed firms' government-related transactions, subsample analysis for regions in which corporations are more or less dependent on local government

Variables	NERI Index < Median			NERI Index > Median		
	(1) G_D	(2) G_F	(3) G_M	(4) G_D	(5) G_F	(6) G_M
Pchair	0.113 (1.276)	0.042** (1.974)	0.008** (2.484)	0.133 (1.337)	0.012 (0.773)	0.002 (0.774)
Duality	-0.362** (-2.084)	-0.053 (-1.470)	0.002 (0.489)	-0.240 (-1.231)	-0.034 (-1.232)	-0.003 (-0.662)
Boardsize	0.043 (0.238)	0.038 (0.850)	0.006 (1.032)	-0.028 (-0.124)	0.024 (0.694)	0.000 (0.014)
Independent ratio	-0.267 (-0.418)	-0.078 (-0.524)	-0.021 (-0.983)	-0.419 (-0.509)	0.047 (0.369)	0.007 (0.365)
Leverage	-0.454 (-1.640)	-0.126* (-1.826)	-0.011 (-1.130)	0.312 (0.944)	-0.087 (-1.624)	0.009 (1.257)
Firm size	0.007 (0.164)	0.007 (0.636)	-0.002 (-1.448)	-0.132** (-2.415)	-0.017** (-2.114)	-0.001 (-1.124)
ROA	1.517* (1.649)	0.261 (1.178)	-0.068** (-2.163)	-0.042 (-0.034)	-0.435** (-2.257)	-0.009 (-0.336)
Tobin's Q	0.023 (0.438)	0.003 (0.212)	0.001 (0.435)	0.010 (0.163)	0.006 (0.549)	0.002 (1.250)
Top 1	-1.239*** (-4.116)	-0.102 (-1.399)	0.004 (0.383)	-1.550*** (-4.291)	-0.123** (-2.328)	0.001 (0.151)
Institution	-0.373 (-0.746)	-0.072 (-0.686)	0.001 (0.066)	-1.022* (-1.721)	-0.149** (-2.180)	-0.003 (-0.272)
Constant	-0.687 (-0.694)	0.006 (0.025)	0.047 (1.405)	1.720 (1.369)	0.495*** (2.690)	0.020 (0.766)
Observations	1,760	1,772	1,772	1,773	1,780	1,780
Industry Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R²/Adjusted R²	0.122	0.078	0.019	0.129	0.116	0.018

Table 10 presents the regression analysis results of determinants of conducting government-related transactions in a subsample that consists of SOEs in regions where corporations are more or less dependent on local government. The subsample is created based on the median of NERI index in the matched sample. SOEs in a province with NERI index lower than the median will be included and higher otherwise. Definition of variables can be found in Appendix 1. Both industry and year dummy variables are included. Z-statistics (t-statistics) are reported in parentheses. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively.

Table 11. The impact of government-related transactions and political connection on corporate investment efficiency and R&D expenditure

Variables	(1) Abnormal Inv	(2) InvExp	(3) R&D/sales
G_D	-0.055*** (-3.142)	-0.150*** (-4.568)	0.003** (2.181)
Pchair	0.007 (1.091)	0.001 (0.051)	-0.002*** (-3.481)
G_D*Pchair	0.058** (2.565)		-0.004** (-2.412)
Tobins'Q	-0.003 (-0.691)	-0.010* (-1.801)	0.000 (1.128)
Pchair *Tobin's Q		0.004 (0.603)	
G_D*Pchair*Tobin's Q		-0.039** (-1.973)	
NERI index	-0.004* (-1.859)	-0.004* (-1.783)	0.001*** (3.647)
Duality	-0.006 (-0.543)	-0.006 (-0.515)	0.000 (0.108)
Board size	0.012 (0.888)	0.011 (0.804)	0.002* (1.685)
Independent ratio	-0.020 (-0.450)	-0.022 (-0.488)	0.002 (0.758)
Leverage	0.160*** (7.373)	0.158*** (7.268)	-0.008*** (-5.927)
Firm size	-0.001 (-0.392)	0.001 (0.237)	-0.001** (-2.372)
ROA	0.125 (1.559)	0.120 (1.503)	0.002 (0.383)
Top1	-0.036* (-1.666)	-0.032 (-1.493)	0.002 (1.334)
Institution	0.077*** (2.684)	0.075*** (2.629)	-0.000 (-0.001)
Constant	-0.044 (-0.599)	-0.041 (-0.554)	0.012** (2.473)
Observations	2,704	2,704	3,552
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
Adjusted R²	0.091	0.098	0.236

Table 11 presents the regression analysis results of the impact of government related transaction and political connection on SOEs' investment efficiency and R&D expenditure in the matched sample. Definition of variables can be found in Appendix 1. Both industry and year dummy variables are included. T-statistics are reported in parentheses. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively.

Table 12. The impact of government-related transactions and political connection on firms' dividend policy, cash holding and sales growth

Variables	(1) Div Dummy	(2) Cash ratio	(3) Sales growth
G_D	0.482*** (3.458)	-0.009 (-0.939)	-0.026 (-0.669)
Pchair	0.162*** (3.082)	0.009** (2.308)	-0.002 (-0.139)
G_D*Pchair	-0.288 (-1.534)	-0.005 (-0.402)	-0.006 (-0.119)
NERI index	0.070*** (4.107)	0.001 (0.810)	-0.020*** (-4.037)
Duality	-0.033 (-0.383)	0.017*** (2.771)	-0.011 (-0.429)
Board size	0.206* (1.870)	0.033*** (4.183)	0.045 (1.406)
Independent ratio	0.437 (1.139)	-0.039 (-1.447)	-0.136 (-1.282)
Leverage	-1.965*** (-11.497)	-0.124*** (-10.299)	0.278*** (5.840)
Firm size	0.318*** (11.527)	-0.005*** (-2.778)	-0.007 (-0.973)
ROA	11.018*** (16.038)	0.393*** (9.655)	1.753*** (10.928)
Tobins'Q	-0.151*** (-4.126)	0.008*** (3.182)	-0.008 (-0.832)
Top1	0.414** (2.391)	0.019 (1.509)	0.079 (1.622)
Institution	0.811*** (3.149)	0.027 (1.593)	0.050 (0.763)
Constant	-7.115*** (-11.277)	0.231*** (5.522)	0.190 (1.153)
Observations	3,552	3,552	3,504
Industry Dummy	Yes	Yes	Yes
Year Dummy	Yes	Yes	Yes
Pseudo R²/Adjusted R²	0.249	0.220	0.088

Table 12 presents the regression analysis results of the impact of government related transaction and political connection on SOEs' dividend policy, cash holding and sales growth in the matched sample. Definition of variables can be found in Appendix 1. Both industry and year dummy variables are included. Z-statistics (t-statistics) are reported in parentheses. *, ** and *** represent significance at the 10%, 5% and 1% level, respectively.

8. Appendix

Appendix 1. Variable Definition

Variable	Definition
G_F	Frequency of government-related transactions, calculated as $\ln(\text{number of government related transaction} + 1)$.
G_M	Value (money) involved in government-related transactions, scaled by total assets
G_D	A dummy variable that equals 1 if the firm has conducted government-related transaction in the year and 0 otherwise.
G_Prop_F	Frequency of government-related transactions that clearly prop up listed firms, calculated as $\log(\text{number of propping up government related transaction} + 1)$
G_Prop_M	Value (money) involved in propping up government-related transactions, scaled by total assets.
G_Prop_D	A dummy variable that equals 1 if the firm has conducted propping up government-related transaction in the year and 0 otherwise.
G_Cashprop_F	Frequency of government-related transactions that prop up listed firms with cash, calculated as $\log(\text{number of cash-propping up government related transaction} + 1)$
G_Cashprop_M	Value (money) involved in cash propping up government-related transactions, scaled by total assets.
G_Cashprop_D	A dummy variable that equals 1 if the firm has conducted cash propping up government-related transaction in the year and 0 otherwise.
Pchair	A dummy variable that equals to 1 if the chairman in the listed firm is politically connected and 0 otherwise.
Pceo	A dummy variable that equals to 1 if the CEO in the listed firm is politically connected and 0 otherwise.
Duality	A dummy variable that equals to 1 if chairman and CEO are the same person in the listed firm and 0 otherwise.
Board Size	Natural logarithm of the number of board members.
Independent Ratio	The ratio of the number of independent directors in a board over the number of board members.
Leverage	The ratio of total debt over total assets.
Firm Size	Natural logarithm of total assets.
ROA	Return on assets, calculated as net profit over total assets.
Tobin's Q	Calculated as $(\text{book value of debt} + \text{market value of equity}) / (\text{book value of debt} + \text{book value of equity})$.
OCF	Net operating cash flows scaled by total assets at the beginning of the year.
InvExp	Investment expenditure, calculated as the ratio of investment expenditure (cash paid for fixed assets, intangible assets and other long-term assets less cash received from selling these assets) over total assets at the beginning of the year.
Abnormal Inv	Abnormal level of investment, which is measured as the difference between firms' actual investment expenditure and their expected investment expenditure calculated based on a cash flow model.
R&D/sales	A firm's R&D expenses in a year scaled by total sales.
Div Dummy	A dummy variable that equals 1 if the firm pay cash dividend in a year and 0 otherwise.
Cash ratio	Cash and cash equivalent over total assets.
Sales growth	The growth rate of a firms' total operating income.
Xi	A dummy variable that equals to 1 for the period after Xi Jinping became president of China in 2012 and 0 for the period before.
Top1	The shareholding percentage of the largest shareholder.

Institution	The shareholding percentage of institutional shareholders.
NERI Index	An index the measures how local economy is dependent on local government. Smaller value of the NERI index represents higher dependence of government.

Appendix 2. Correlation coefficient matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1 Pchair	1.000											
2 Pceo	0.283***	1.000										
3 Duality	-0.003	0.169***	1.000									
4 Board size	0.046***	0.052***	-0.032*	1.000								
5 Independent ratio	0.012	0.001	0.030*	-0.051***	1.000							
6 Leverage	-0.011	-0.016	0.023	0.018	0.036**	1.000						
7 ROA	0.066***	0.058***	-0.026	0.004	-0.008	-0.417***	1.000					
8 Firm size	0.075***	0.076***	-0.034*	0.199***	0.148***	0.327***	0.074***	1.000				
9 Tobin's Q	-0.011	-0.016	0.023	0.018	0.036**	1.000***	-0.416***	0.324***	1.000			
10 Top 1	0.003	-0.028*	-0.091***	0.026	0.071***	-0.025	0.120***	0.322***	-0.026	1.000		
11 NERI index	0.030*	0.009	0.022	-0.051***	-0.041**	-0.031*	0.073***	-0.001	-0.031*	0.019	1.000	
12 Institution	-0.037**	-0.014	-0.007	-0.007	-0.058***	-0.026	0.092***	0.018	-0.026	0.028*	0.048***	1.000

*, ** and *** represent significance at the 10%, 5% and 1% level, respectively