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Relationship-based debt financing of Chinese private sector firms: The role of social connections to banks versus political connections

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ABSTRACT

We study whether a firm's social connections to banks can augment its political connections to help it obtain loans. In China, Regulation No. 18 (announced in 2013) prohibits all high-level government officials from being independent directors of firms. As a result, many firms lost their political connections. We find that after firms lose their politically connected independent directors, firms having no social connections to banks experience, on average, a 12% decrease in the bank loan ratio relative to the median ratio; but those whose board chairs or CEOs are socially connected to local bank branch heads experience a 22% increase in the loan ratio relative to the median. However, this positive effect is short lived and thus not a new equilibrium. Overall, our findings support the hypothesis that a firm's social connections to banks can augment its political connections to help it get bank financing.

1. Introduction

Studies have found that firms with political connections can obtain bank financing more easily, and on better terms, than firms without those connections (e.g., Claessens et al., 2008; Fraser et al., 2006; Khwaja and Mian, 2005; Sapienza, 2004). The Chinese experience yields similar findings. Li et al. (2008) find that politically connected private firms in China are more likely to obtain bank loans than firms without such ties, while Giannetti et al. (2021) find that politically connected firms also enjoy lower financing costs than other firms. However, what if firms suddenly lose their political connections? Financing that arises from political connections can sometimes breed corruption in the forms of rent-seeking, bribes, and excessive perk consumption (Claessens et al., 2008; Faccio et al., 2006; Fisman, 2001; Khwaja and Mian, 2005; and Shleifer and Vishny, 1994), and China is not an exception (Chen et al., 2013; Fan et al., 2008; Giannetti et al., 2021). As Fan et al. (2008) point out, politicians and bureaucrats in China have a strong influence over the allocation of bank loans, which has given rise to pervasive corruption; and as a result, China has been cracking down on corruption in the financial industry. If a firm's political connections break down owing to the arrest of corrupt bureaucrats, as Fan et al. (2008) have

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documented and Li et al. (2019) have discussed, or because of government policies aimed at cracking down on corruption, as Yan (2019) and Giannetti et al. (2021) have documented, then this financing channel vanishes.[1]

We test the hypothesis that a firm's social connections to banks can augment its political connections to help it get bank loans. There are at least three reasons to believe that this could happen. First, studies have already shown that firms can use their social connections to banks to obtain bank financing. For example, Haselmann et al. (2018) find misallocation of bank credit inside networks of German business and bank executives who belong to the same club, while Engelberg et al. (2012) find that U.S. firms with alumni connections to banks receive loans on favorable terms. Second, social connections (*guanxi*) have historically been culturally important in China (Jacobs, 1980; Yang, 1994), and Xin and Pearce (1996) contend that *guanxi* is also important for Chinese business executives. They argue that in an environment where the legal and institutional environment significantly favors state-owned enterprises (SOEs) above non-SOEs, non-SOE executives often have to rely on their social connections to overcome biases. Park and Luo (2001) also argue that Chinese firms develop *guanxi* as a strategic mechanism to overcome competitive and resource disadvantages by exchanging favors with their connections. Third, in recent years, abundant empirical studies (discussed in the next section of this paper) have shown that managers and firms in China use social connections to their benefit.

To conduct our study, we exploit an exogenous shock after which political connections were unexpectedly eliminated for many Chinese firms. On October 19, 2013, the Organization Department of the Communist Party of China issued Regulation No. 18, which prohibits current government officials and former government officials who have resigned or retired within the preceding three years from having any paid part-time positions with firms.[2] As a result, some firms, particularly non-SOEs, lost their political connections. For these firms, we test to see whether they turn to their social connections to banks to secure bank financing. SOEs are politically connected regardless of whether or not a government official is a part-time employee or board member (we discuss this point in more detail in the next section of this paper), and they therefore remain politically connected even after the passage of Regulation No. 18, so we exclude them from our study.

To identify firms with social connections to banks, we follow some existing studies (including studies that use Chinese data) and identify two types of connections. First, we consider a firm to be socially connected to a national commercial bank if the firm's CEO or board chair graduated from the same university as the head of the bank's local branch. This school-tie-based definition of a social connection is similar to that used in previous research (e.g., Butler and Gurun, 2012; Cohen et al., 2008, 2010; Engelberg et al., 2012; Massa and Simonov, 2011). Second, we consider a firm to be socially connected to a bank if the firm's CEO or board chair is from the same hometown as the local bank branch head. Again, other scholars have applied a similar criterion (e.g., Jiang et al., 2019; Lim and Nguyen, 2021; Yonker, 2017). Most important, research on Chinese settings documents that both alumni connections and hometown connections can contribute to strong *guanxi* relationships that can benefit managers and their firms (e.g., Chen et al., 2021; Fisman et al., 2018, 2020; Gu et al., 2019; Guan et al., 2016; He et al., 2017; Kong et al., 2020; Ren et al., 2021; Ru et al., 2020). Some of this research, on how managers and firms use social connections in China, is discussed in the next section of this paper.

For our study sample of non-SOEs, we find that Regulation No. 18 immediately led to the resignation of many government officials as independent directors from listed firms. Further empirical tests yield the following findings. First, after firms lose their politically connected independent directors ("political IDs"), their bank loan ratios drop. Second, firms with social connections to banks experience no such reduction. Third, when we differentiate social connections into alumni connections and hometown connections, we find that both types of connections help firms to secure or obtain bank loans. Fourth, we find that our main results hold when we address the possibilities that a top-school effect or a manager-skill effect may be driving our results. Finally, we find that the effect of social connections on obtaining bank loans is short lived rather than constituting a new equilibrium. Overall, our results are consistent with the hypothesis that a firm's social connections to banks can augment its political connections to help it get bank loans.

Other scholars have studied how firms use political connections to get external financing and to do so on favorable terms. Faccio (2010) conducts a cross-country study and finds that firms with political connections have higher leverage than, but underperform, unconnected firms. Khwaja and Mian (2005) find that in Pakistan, politically connected firms can easily obtain loans from government banks, but they then exhibit abnormal default rates. In a cross-country study, Faccio et al. (2006) find that politically connected firms are more likely to be bailed out by their governments than unconnected firms, and firms thus bailed out perform worse than unconnected firms. Claessens et al. (2008) find that Brazilian firms that make large donations to federal deputy election campaigns experience increases in their bank loan amounts after the elections. In a paper closely related to ours, Fan et al. (2008) find an overall decline in bank debt for Chinese firms that bribed or were connected to corrupt bureaucrats after the corruption was exposed. They further find that these firms also suffer valuation declines, and find no evidence that rent seekers are efficient firms, as capital appears to be misallocated. Our paper provides complementary evidence but differs from theirs in two important ways. First, for the firms in our sample, the cause of the decline in bank loans was a policy shock, not the arrest of corrupt bureaucrats. Second, and more important, rather than focusing on the various ways in which firms that lost political connections were harmed, as do Fan et al. (2008), we focus on how these firms tried to recover.

Other scholars have studied how firms use their social connections to banks to obtain loans. Above, we mention Haselman, Schoenherr, and Vig's (2018) study of business and bank executives in Germany who belong to the same clubs, and Engelberg et al.'s (2012) study of U.S. firms with alumni connections to banks. We similarly find that firms with social connections to banks are able to

[1] Some studies also document that even the sudden deaths of politically connected independent directors can lead to a reduction in bank loans (e.g., Cheng, 2018; Li and Cheng, 2020).

[2] The formal title of the regulation is "To Further Regulate Officials Who Take Positions in Enterprises." The regulation forbids all party and government officials above the rank of section chief to take positions in enterprises, even on a part-time basis.

secure bank financing, but the firms we study relied first on political connections, and turned to their social connections only after they lost their political connections. That is, our paper shows how social connections can augment political connections.

Finally, other scholars have studied the effects of Regulation No. 18 on Chinese listed firms. For example, Berkowitz et al. (2022) find that after the regulation took effect, private firms with political IDs became highly innovative and transparent. Hope et al. (2020) find that politically connected firms improved their accounting quality. Hu et al. (2020) find that the sudden loss of political IDs reduced long-term debt financing and government subsidies for non-SOEs, but improved their minority shareholder protections. One interpretation of these findings is that firms replaced their political connections with improved corporate governance. However, some studies find that Regulation No. 18 harmed firms. For example, Xu (2018) finds that the mandatory departure of political IDs significantly decreased firm value. Wei et al. (2020) find that it significantly increased the labor costs of affected firms. In a study related to ours, Yan (2019) finds that firms that lost their political IDs subsequently found it difficult to obtain bank loans.

The rest of our paper proceeds as follows. Section 2 discusses political connections, social connections, and bank connections in China, mostly within the context of how these connections can help firms to obtain bank financing. Section 3 describes our data and variables. Section 4 presents our empirical results. We conclude with section 5.

2. How firms can use connections to obtain bank loans in China

This section provides a brief overview of SOEs and non-SOEs, and how their political connections, social connections, and bank connections are formed, intertwine, and can be used to obtain bank financing in China. We also discuss why China's imposition of Regulation No. 18 represents an ideal setting to test the hypothesis that a firm's social connections to banks can augment its political connections to help it secure bank loans, and why our findings may or may not be generalizable to other countries.

2.1. Using political connections to obtain bank loans in China

In China, SOEs are naturally politically connected, owing to the state's control over the personnel appointments and career mobility of SOE executives (Fan et al., 2007; Fan et al., 2013). Because SOEs serve as an important vehicle for the state to stabilize the economy and society (Shleifer and Vishny, 1994; Shleifer, 1998), in order to obtain promotions senior government officials in SOEs will manage the firms in a way that is consistent with guidelines set by the government (Fan et al., 2007; Wu et al., 2012). SOEs' inherent political connectedness also means that they have connections to state-owned banks, owing to their shared ownership and control. Accordingly, research confirms that state-owned banks strongly favor lending to SOEs more than to non-SOEs (Brandt and Li, 2003; Cull and Xu, 2003; Li et al., 2008).

For non-SOEs, there are a variety of ways to be politically connected. For example, the CEO or founder could be a current or former government bureaucrat, or a current party member (Cull et al., 2015; Fan et al., 2007; Li et al., 2008). Otherwise, the primary way to be politically connected is to appoint a current or former high-level politician to serve as an independent director (Hu et al., 2020; Wang, 2015; Xu, 2018). Even after government officials leave office, they continue to have significant political power and influence (Cheng and Sun, 2019). For non-SOEs, there are several reasons why and how having a political ID can provide an important means to obtain bank financing. First, because China's legal protection, financial system, and institutional environment are still developing, firms sometimes find themselves having to use informal channels to obtain external financing (Allen et al., 2005). Second, while China is transitioning from a control economy to a market economy, the government and its bureaucrats retain significant oversight and control over the allocation of scarce resources, including external financing (Cheng and Sun, 2019; Wang, 2015). Third, given that the largest and most important banks in China are state-owned, political IDs can have political power over those banks (Giannetti et al., 2021; Li et al., 2008).

Research confirms that political IDs of non-SOEs exert their clout to obtain bank loans for their firms, and on attractive financing terms (e.g., Hu et al., 2020; Wang, 2015). However, the costs and risks of using political IDs in this manner are nontrivial. For example, Chen et al. (2013) and Giannetti et al. (2021) find that when politically connected private firms in China have easy access to bank loans, then those firms also have large entertainment and travel expenses, suggesting that bribes and "greasing the wheel" may be involved. There is also the risk that this financing channel can suddenly be lost if corrupt officials are arrested or if new policies are issued to crack down on the corruption. However, given that non-SOEs were keen to appoint and use political IDs to obtain bank loans, it suggests that they perceived the benefits to outweigh the costs and be worth the risks.

2.2. Using social connections to banks to obtain bank loans in China

In China, social connections are called *guanxi*. Jacobs (1980) points out that to establish a *guanxi* bond people must have a shared identification with family, school, hometown, or place of work. Ru et al. (2020) state that among many different forms of social connections in China, school and hometown ties are two of the most important.

In China, alumni connections are known as *xiaoyou guanxi*. As Cohen et al. (2008) and Massa and Simonov (2011) have pointed out, and as He et al. (2017), Gu et al. (2019), and Guan et al. (2016) have confirmed specifically for China, because individuals from the same university share a common experience, it can imprint them with similar interests, values, beliefs, and thoughts, and this identity recognition can last after graduation. Chen et al. (2021) contend that the shared university experience can cultivate trust between alumni. They also point out that Chinese universities take steps to "deepen connections" among alumni. For example, Chinese universities often place alumni chapters in major cities. These chapters hold multiple events throughout the year, providing ample opportunities for alumni to interact and socialize with each other.

In China, hometown connections are known as *laoxiang guanxi*. Owing to identical home dialect and shared culture, norms, and experiences, individuals from the same hometown tend to build long-term relationships and form social groups (Fisman et al., 2018; Guo et al., 2021; Ren et al., 2021). Ru et al. (2020) point out that given the massive cultural diversity in China (due largely to geography), Chinese people can feel deeply entrenched in their hometown identity. They identify the basis of this bond as shared dialect, cuisine style, and culture, and assert that people from the same hometown will naturally trust and rely on one another. In fact, many Chinese cities have hometown associations, called *tong xiang hui*, that serve a similar purpose to university alumni chapters. As Fisman et al. (2020) succinctly state, in China, "hometown ties are among the most common and distinctive bases for *guanxi* to build upon. There is a literature too vast to survey here that examines the origins of *laoxiang guanxi*, and also documents its many roles in contemporary Chinese society."

Accordingly, almost all the research on how Chinese firms have used social connections to their benefit has specifically focused on alumni connections and hometown connections. For example, Guan et al. (2016) find that some controlling shareholders in China hire auditors to whom they have school ties, a practice that leads to favorable auditor opinions. In a similar vein, He et al. (2017) find cases where the firm's audit committee members share school ties with the firm's external auditors, resulting in poor audit quality. Chen et al. (2021) find that mutual fund managers in China who have alumni connections with a firm's auditor will invest more in those audited firms and generate superior portfolio returns. They also find that some mutual fund managers participated in the appointing of these alumni-connected auditors. Guo et al. (2021) find that Chinese politicians allocate more resources to firms from their hometown than to nonhometown peer firms, resources that then allow the hometown firms to invest more than other firms. Ren et al. (2021) find that when the CEO of a Chinese firm is from the town where the firm is headquartered, that CEO's familiarity with the business environment and the hometown people allows her or him to invest more in innovation and with greater success. Gu et al. (2019) find that Chinese fund managers are more likely to hold stocks covered by analysts with whom they are socially connected, and those managers also make higher returns from those holdings. In exchange, the fund managers give those analysts star rating votes and more trading commissions. That is, socially connected fund managers and analysts trade favors. The authors' definition of social connections includes both alumni connections and hometown connections. Ru et al. (2020) find that when media members in China have social connections with firms' executives, those firms are covered more, and the reporting is more optimistic in tone. These authors likewise define a social connection as either an alumni connection or a hometown connection.

2.2.1. Research question and research setting

Can non-SOEs use their social connections to banks to get bank loans? Related research is suggestive. Allen et al. (2005) contend that for China's private sector, the ability to tap key financing channels can be based largely on whether one has a good reputation and a personal relationship with lenders. Studies also find that non-SOEs can use their social connections to obtain access to other forms of external financing. For example, Kong et al. (2020) study Chinese firms where CEOs have hometown connections with suppliers and find that those firms have easier access to trade credit than other firms, and that this is especially true for non-SOEs. They find that the two channels that lead to this hometown effect are information and social trust. Liu et al. (2016) study firms where the top executives or board members belong to Chinese industry associations. They find that firms with such "professional" connections have better access to trade credit. If reputation and personal relationships (i.e., Allen et al., 2005) and information and social trust arising from social connections (i.e., Kong et al., 2020) allow firms to obtain external finance in general, then it is also plausible that firms can use their social connections to get bank financing. Trust and information that come from alumni connections and hometown connections reduce banks' monitoring costs and alleviate concern about default risk—especially if the people in the alumni network or hometown network value their reputation within the network.

However, if firms can use their social connections to banks to obtain loans, then why not use those connections in the first place? The answer is that China's banking system is dominated by state-owned banks. Therefore, it would be only natural, and likely also easiest and most efficient, for firms to use their political connections first. However, if firms suddenly lose those connections, then they may turn to their social connections to banks as a remedial measure, especially given the importance of *guanxi* in China. That is, a firm's social connections to banks may augment its political connections to help it obtain bank loans. China represents an ideal setting to test this hypothesis, for several reasons. First, bank financing is the most important and largest source of external financing in China (Ayyagari et al., 2010; Cull et al., 2015; Jiang et al., 2020). Second, political connections have been found to be extremely important for firms in China, given that government bureaucrats have power over resource allocation. Third, research has found that social connections (*guanxi*) can also be useful and beneficial to managers and firms in China. Fourth, an exogenous shock (i.e., Regulation No. 18) suddenly eliminated political connections for many firms in China.

While China represents an ideal setting to test the augmentation hypothesis, our findings may or may not be generalizable or applicable to other economies. While government ownership or control over banks is pervasive around the world, it is much more significant in developing countries or those with less developed financial systems (Dinç, 2005; La Porta et al., 2002), such as Pakistan (Khwaja and Mian, 2005), Brazil (Claessens et al., 2008; Carvalho, 2014), and India (Cole, 2009). In many emerging economies, where government officials and bureaucrats have control over resource allocation, research finds that it can be beneficial for firms to have political connections (Khwaja and Mian, 2005; Fisman, 2001; Johnson and Mitton, 2003; Claessens et al., 2008). Research on the importance of social connections to managers and firms is growing, and as it continues to grow scholars can continue to study how political connections and social connections interact, in institutional environments that either resemble or differ from China's, so that more can also be learned about how connections and institutions interact and augment each other.

2.3. Obtaining bank loans via political, social, and bank connections: A summary

Fig. 1 provides a visual summary of our discussions in this section. We view SOEs as being directly connected with banks politically, as most large and important banks in China are also state-owned. Non-SOEs may need a politically connected executive, founder, or independent director to use her or his political influence to get loans from banks. If non-SOEs lose their political connections, then they may turn to their social connections to obtain bank loans. This hypothesis statement is shaded in gray in the figure. In our study, the social connections are direct to banks. It is possible that when firms' executives or board members belong to a powerful social network, even if that network does not include bank executives, they may be able to use the network as "social collateral" to obtain bank loans (e.g., see Karlan et al., 2009), but we do not test this hypothesis. It is also possible that a firm's political connections and social connections work together to help firms secure bank loans (either with or without direct bank connections), but in our empirical tests, we find that this does not happen. Instead, non-SOEs initially rely on their political connections to get bank loans; only when they lose those connections do they then turn to their social connections to banks to obtain loans, in accord with the augmentation hypothesis. Finally, firms and banks can have direct connections through banks' dual holdings, bankers sitting on firm's boards, and firms owning shares in banks. Using Chinese data, Lu et al. (2012) find that when non-SOEs own at least 5% of a bank's shares outstanding, then they have easy access to bank loans. Pan and Tian (2015), also using Chinese data, find that when banks are both creditors and shareholders of non-SOEs, then those firms have easy access to bank loans. We do not study these types of direct connections in the present paper.

3. Data and variables

Our financial statement data come from the China Securities Market and Accounting Research (CSMAR) database.[3] To construct our study sample, we start with all non-SOEs listed on the Shanghai and Shenzhen Stock Exchanges from the first quarter of 2012 to the fourth quarter of 2014. This period encompasses the years before and after 2013, the year when Regulation No. 18 was announced. We exclude financial firms from our study sample because they differ in capital structure from nonfinancial firms, and we also remove firms that had received a special treatment designation from the stock exchanges because those firms were likely experiencing financial distress.[4]

Our study's key bank financing variable, *LoanRatio*, is the ratio of total bank loans to one-quarter-lagged total assets. The reason why we use quarterly financial data instead of annual observations is that changes in the bank loan ratio, both decreases and increases, may be immediate. Our data on a firm's social connections to banks are also quarterly, which naturally raises stickiness concerns if connections do not change much from quarter to quarter. However, we find that these data are not sticky. During our sample period, we find an 18.7% turnover of bank branch heads and a 35.7% turnover of the firm's chair or CEO, with these turnovers usually occurring in different quarters. That is, all our key variables can change at the same frequency. However, because quarterly financial data can be distorted by seasonality or accounting manipulation, we also show results using annual observations as a robustness check.

From the CSMAR database, we identify independent director (ID) departures. For each departure, we check whether the departed director was a government official and whether the departure was caused by the announcement of Regulation No. 18. We manually collect information from the ID's curriculum vitae and classify a director as a political ID if she or he is holding, or has previously held, a position in the government equal to or higher than the rank of section chief (Regulation No. 18 applies only to those officials).[5] We also create a dummy variable, *BreakPC*, which is equal to 1 during and after the quarter when all political IDs in a company leave after the issuance of Regulation No. 18, and 0 otherwise. In our sample, 192 firms out of 766 have political IDs departing after the announcement of the regulation.

For every firm in our study sample, we hand-collect information on where the CEOs and board chairs attended university, and also on their hometowns.[6] For all of these firms, we also identify the local branch heads of all national commercial banks (our definition of a "local" bank branch is one that is located in the same province as the firm). We include all 17 national commercial banks in our study.[7] A dummy variable indicating firms with a bank connection through a social connection, *SC_BC*, is equal to 1 if the firm's CEO or board chair attended the same university, or is from the same hometown, as the local bank branch head. We also create two additional social connection dummy variables. The dummy variable *SC_BC_Alum* (*SC_BC_Home*) is equal to 1 if the firm's CEO or board chair attended

[3] For a brief description of the database, see Jiang and Kim (2020).

[4] If a firm suffers from two consecutive years of annual losses, then it may receive special treatment status from market regulators. If the firm experiences another annual loss, then its trading can be suspended. A fourth annual loss can lead to delisting.

[5] The methods we use to identify the political connectedness of IDs differ from those employed by Hu et al. (2020). They started by reading all corporate announcements on ID departures and then retained only those announcements that included certain phrases, such as "according to Regulation 18," "according to the new requirement," or "adopting the new rule." By contrast, we directly read the curriculum vitae of each ID to identify whether she or he is a government official. In this way, we can identify political IDs even though their departure announcement does not explicitly mention Regulation No. 18. Also, Hu et al. (2020) include in their sample all government officials, whereas we include only those with a rank of section chief or higher.

[6] We define a CEO, chair, or bank branch head as an alumna if she received any degree from the university. Therefore, a CEO who received a bachelor's degree from Renmin University and then a master's from Tongji University is considered an alumna of both universities. CEOs', chairs', and bank branch heads' hometowns are self-identified from their CVs or websites. The hometowns are at the city level.

[7] The 17 national commercial banks include the large state-owned banks known colloquially as the "Big 5," including the Bank of China, Industrial and Commercial Bank of China, Agricultural Bank of China, China Construction Bank, and Bank of Communications, and also the 12 large national joint-stock commercial banks, including China Merchant Bank and China CITIC Bank.

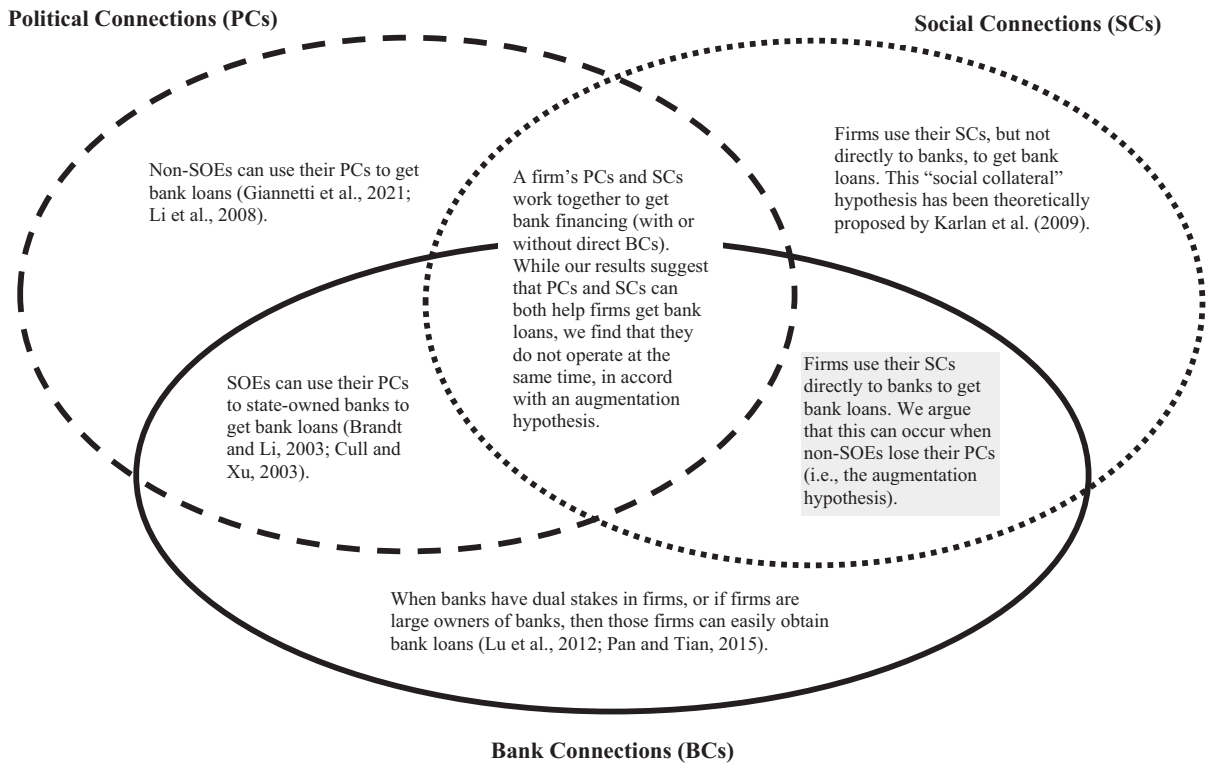

Fig. 1. How Chinese firms can get bank financing through connections.

the same university (is from the same hometown) as the local bank branch head.

Table 1 provides some descriptive insights into the social connections that our firms have with local bank branch heads. Panel A reports the number of firms in our study sample that are headquartered in each province, together with the numbers and percentages of those firms that have alumni connections and hometown connections to a local bank branch head. Guangdong province has the largest number of firms in our study sample, with 130 firms, and among those firms, 16% have a social connection with a local bank branch head. Given that 12.4% of the firms in our entire study sample have a social connection to a local bank branch head, Guangdong is merely representative of the entire study sample. However, in a later robustness check, we ensure that our main results are not merely driven by a Guangdong effect. Panel B (Panel C) reports the ten most common universities (cities) through which alumni (hometown) connections occur. There are 42 (32) firms where the CEO or board chair and the local bank branch head both attended Peking University (Tsinghua University). Because Peking University and Tsinghua University are considered to be among the best universities in China and there are so many connections through them in our sample, our results might be subject to a top-school effect, a possibility we address later in this paper. Hometown connections are less concentrated. The hometown that yields the highest number of hometown connections in our sample is the city of Nantong, in Jiangsu Province. There are 17 cases where both the firm's CEO or chair and the local bank branch head are from Nantong—only 11 more cases than the tenth highest number of hometown connections in our sample, for the city of Nanyang, in Henan Province.

We use regression analyses to estimate the effects of social connections on firm financing. In the regressions, we control for several firm-specific variables that can potentially influence corporate financing, following the existing literature (Frank and Goyal, 2003; Rajan and Zingales, 1995). Firm size is *logAsset*, collateral assets is *TangibleAsset*, firm profitability is *ROA*, firm investment is *Investment*, firm sales growth is *Growth*, firm effective tax rate is *EffTaxRate*, and size of the top management team is *TMTNumber*. Detailed definitions of all variables are located in the appendix. To minimize the effect of outliers, the variables in our sample are winsorized at 1% on both tails. Larger firms, firms with more collateral assets, less profitable firms, growing firms (as measured by both *Investment* and *Growth*), and firms that pay high taxes are expected to have higher financing ratios. We include the *TMTNumber* control variable because firms with more board directors are more likely to have a politically connected director. Finally, we recognize that it is possible for the firm's CEO or board chair to be politically connected even after Regulation 18, as she or he may be an ex-bureaucrat or ex-SOE manager that left government service more than three years ago. Therefore, to make sure that we minimize the impact of under-identifying politically connected firms, we also include *PC_Mgr*, which is a dummy equal to 1 if the firm's CEO or chair is such an ex-bureaucrat or ex-SOE manager.

Table 2 reports summary statistics of our variables. In our study sample, 12.4% of firms have social connections to banks; 8.9 (5.0) percent are via alumni (hometown) connections. Thirty firms have both alumni and hometown connections to a local bank branch head. We also note that 30.9% of firms have a politically connected CEO or board chair. The summary statistics of other variables are

Table 1
Number of firms and bank connections.

Panel A: Number of firms and bank connections by province

Province	Number of firms	Firms with alumni connections		Firms with hometown connections	
		Number	Ratio	Number	Ratio
Beijing	36	5	0.139	1	0.028
Tianjin	7	1	0.143	0	0.000
Hebei	14	3	0.214	1	0.071
Shanxi	3	0	0.000	0	0.000
Inner Mongolia	12	0	0.000	0	0.000
Liaoning	21	1	0.048	0	0.000
Jilin	16	1	0.063	0	0.000
Heilongjiang	11	2	0.182	1	0.091
Shanghai	43	5	0.116	1	0.023
Jiangsu	92	3	0.033	14	0.152
Zhejiang	98	7	0.071	13	0.133
Anhui	20	1	0.050	1	0.050
Fujian	28	2	0.071	6	0.214
Jiangxi	8	1	0.125	1	0.125
Shandong	41	3	0.073	1	0.024
Henan	16	4	0.250	2	0.125
Hubei	23	3	0.130	1	0.043
Hunan	17	0	0.000	0	0.000
Guangdong	130	16	0.123	5	0.038
Guangxi	7	0	0.000	0	0.000
Hainan	11	0	0.000	0	0.000
Chongqing	8	0	0.000	0	0.000
Sichuan	30	0	0.000	0	0.000
Guizhou	3	0	0.000	0	0.000
Yunnan	4	1	0.250	1	0.250
Tibet	5	0	0.000	0	0.000
Shaanxi	3	0	0.000	1	0.333
Gansu	8	0	0.000	0	0.000
Qinghai	2	0	0.000	0	0.000
Ningxia	5	0	0.000	0	0.000
Xinjiang	6	0	0.000	0	0.000

Panel B: Ten most common alumni connections

University that connects firm and bank	# of connections
Peking University	42
Tsinghua University	32
Renmin University of China	23
Shanghai Jiaotong University	16
Wuhan University	14
China Europe International Business School	14
Xiamen University	10
Tianjin University	10
Zhejiang University	8
Shanghai University of Finance and Economics	8

Panel C: Ten most common hometown connections

City that connects firm and bank	# of connections
Nantong, Jiangsu Province	17
Ningbo, Zhejiang Province	15
Hangzhou, Zhejiang Province	15
Quanzhou, Fujian Province	13
Shanghai	11
Suzhou, Jiangsu Province	8
Qujing, Yunnan Province	7
Xi'an, Shaanxi Province	7
Fuzhou, Fujian Province	7
Nanyang, Henan Province	6

Panel A reports the total number of private firms that are headquartered in each province, and the number and percent of those firms where the chair or CEO has an alumni connection and/or a hometown connection to the local bank branch head. Panel B (Panel C) reports the ten most common universities (hometowns) through which a firm's chair or CEO is connected to a local bank branch head.

Table 2
Summary statistics.

	Mean	SD	P10	P50	P90
LoanRatio	19.64%	14.67%	0.00%	18.39%	39.55%
BreakPC	0.088	0.283	0.000	0.000	0.000
SC_BC	0.124	0.329	0.000	0.000	1.000
SC_BC_Alum	0.089	0.284	0.000	0.000	0.000
SC_BC_Home	0.050	0.218	0.000	0.000	0.000
logAsset	22.035	1.162	20.474	22.028	23.443
TangibleAsset	0.452	0.197	0.201	0.443	0.733
ROA	0.008	0.018	−0.007	0.006	0.026
Investment	0.012	0.017	0.000	0.006	0.032
Growth	0.079	0.200	−0.061	0.034	0.261
EffTaxRate	0.172	0.332	−0.034	0.171	0.434
TMTNumber	2.953	0.248	2.639	2.944	3.296
PC_Mgr	0.309	0.462	0.000	0.000	1.000

This table reports summary statistics of the variables used in our analyses. Variable definitions are in the appendix.

largely consistent with those of previous studies that use Chinese financial statement data (for example, Jiang et al., 2020).

4. Empirical results

4.1. Baseline regression results

We employ a DID regression framework to examine whether and how social connections moderate the effect of political ID departures. The DID specification allows us to address omitted variables problems, as we can control for macroeconomic conditions that affect the firm's external financing environment and firm fixed effects. Our benchmark specification is as follows:

$$\begin{aligned} LoanRatio_{it} = {} & \beta_1 * BreakPC_{it-1} + \beta_2 * SC\_BC_{it-1} \\ & + \beta_3 * BreakPC_{it-1} * SC\_BC_{it-1} + \gamma * FirmControls_{it-1} \\ & + \theta_i + \varphi_t + \varepsilon_{it}, \end{aligned} \tag{1}$$

where the dependent variable, $LoanRatio_{it}$, represents the ratio of total bank loans to total assets for firm i at time t. As we have detailed in section 3, *BreakPC* is a dummy variable that is equal to 1 during and after the quarter when all political IDs in a company leave after the issuance of Regulation No. 18, and 0 otherwise. Two points are noteworthy in our setting. First, whereas in a traditional DID setting the shock takes place at a specific point in time, ID resignations are staggered over several quarters following the imposition of the regulation: not all firms are affected simultaneously. Our estimation allows the shock to have its effect at different points in time. Second, some firms have multiple political IDs who may leave the firm at different times. Only after all political IDs have resigned from the firm do we assign the value of 1 to *BreakPC*. In our sample, 87 firms still had political connections by the end of 2014. We assign a value of 0 to *BreakPC* for those firms and view them as not yet being affected by the regulation. *SC_BC* identifies firms that are socially connected to a local bank branch. In our estimation equation, the interaction term between *SC_BC* and *BreakPC* is our primary variable of interest because it captures whether a firm's social connections to banks can moderate the effect of its political IDs' departure. All independent variables in eq. (1) are lagged by one quarter to the dependent variable. We include firm fixed effects θ_i and time fixed effects φ_t to capture all time-invariant firm characteristics and firm-invariant time trends that can affect the firm's financing structure.

To identify matching firms for treatment firms (that is, for firms with political IDs), we employ propensity score matching. We pair each politically connected firm with a firm that lacks political connections but otherwise has similar firm characteristics. In this setting, any financing differences between the paired firms can be attributed to the treatment firm's having political connections and the matched firm's lacking them. To match the politically connected and nonconnected firms, we estimate the following logit model on a quarterly basis:

$$Pr\left(PC_i = 1 \mid X_{it}\right) = \frac{exp\left(X_{it}^{'}\beta\right)}{1 + exp\left(X_{it}^{'}\beta\right)}, \tag{2}$$

where $\Pr(PC_i = 1 \mid X_{it})$ is the conditional probability of being politically connected and X_{it} is a set of firm-level variables that are used in the matching procedure, including firm size, tangibility, return on assets, capital investment, sales growth rate, effective tax rate, the logarithm of the number of top managers and board directors, and graduate education. The model also includes industry fixed effects. We apply this regression model in each quarter separately and employ the nearest-neighbor matching procedure to search for matched firm pairs. Specifically, we calculate the predicted propensity score of each firm. Then, for each firm with a political connection, we choose the nonconnected firm with the least-differing propensity score. Untabulated *t*-test results on the variable means of the two groups after matching show that the differences in the means of all covariates are not statistically different from zero at conventional significance levels; thus, the results confirm the validity of our matching procedure. Firms in the treatment and control groups have similar characteristics, except that the treatment group had political IDs before Regulation No. 18.

We estimate eq. (1) for the sample of matched firm pairs and present the results in Table 3. The results suggest the following. First,

Table 3
Baseline regression results.

BreakPC $_{t-1}$	−0.022**
	(0.010)
SC_BC $_{t-1}$	−0.009
	(0.016)
BreakPC $_{t-1}$ * SC_BC $_{t-1}$	0.063***
	(0.022)
logAsset $_{t-1}$	0.079***
	(0.021)
TangibleAsset $_{t-1}$	0.065*
	(0.035)
ROA $_{t-1}$	−0.385**
	(0.167)
Investment $_{t-1}$	0.057
	(0.174)
Growth $_{t-1}$	−0.011
	(0.012)
EffTaxRate $_{t-1}$	0.007
	(0.004)
TMTNumber $_{t-1}$	−0.037
	(0.031)
PC_Mgr $_{t-1}$	0.001
	(0.011)
Firm FE	Yes
Quarter FE	Yes
N	2072
R^2	0.852

This table presents the regression results of the baseline model. The dependent variable, *LoanRatio*, is 1 quarter ahead of the independent variables. Independent variables include *BreakPC*, which is a dummy variable that indicates the departure of all independent directors with political connections; *SC_BC*, which is a dummy variable indicating that the local bank branch head attended the same university, or is from the same hometown, as the firm's chair or CEO; and the interaction between *BreakPC* and *SC_BC*. Control variables include *logAsset*, *TangibleAsset*, *ROA*, *Investment*, *Growth*, *EffTaxRate*, *TMTNumber*, and *PC_Mgr*. All variable descriptions are in the appendix. Firm fixed effects and year-quarter fixed effects are added in the regression specification. Robust standard errors clustered by firms are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

social connections, by themselves, do not affect bank financing if firms do not lose their political connections. That is, the parameter coefficient on the *SC_BC* variable is not statistically significant. Second, when firms lose all of their political IDs and have no social connections to banks, their bank financing declines. That is, the parameter coefficient on the *BreakPC* dummy is negative and statistically significant. This result suggests that, in the quarter after the last political ID departs, firms having no social connections to banks experience, on average, a 2.2 percentage points lower ratio of total bank loans to total assets. Given that the median bank loan ratio is 18.39%, the bank loan ratio declines by 12% (=2.2%/18.39%).[8] Third, and most important from our perspective, the coefficient on the interaction term is positive and statistically significant. This coefficient, at 0.063, implies that when the firm has a social connection to a local bank branch, it then experiences a 4.1 percentage points net increase in its loan ratio (compared with the −0.022 parameter coefficient on *BreakPC*) after all political IDs depart. This number is equivalent to a 22% increase (=4.1%/18.39%) relative to the median bank loan ratio. That is, having a social connection to a local bank branch can recover the external financing that is lost when a firm loses all of its political IDs.

As for the results on the control variables in Table 3, the statistically significant ones are generally as we expected. Larger firms have more debt capacity, so they can use more debt financing. Firms with tangible assets also have greater debt capacity. Less profitable firms have less retained earnings, so they rely more on debt financing.

Overall, the results in Table 3 suggest that a firm's social connections, by themselves, do not affect firm financing initially. Instead, what initially and partially explains a firm's bank financing is whether it has a political ID, since firms' bank financing decreases after all their political IDs depart. However, if firms have social connections to the local branches of national commercial banks, then they seem to turn to those connections to secure bank financing, as the augmentation hypothesis predicts. These social connections appear

[8] Hu et al. (2020) find a similar drop in bank financing surrounding the departure of political IDs because of Regulation No. 18.

to work. However, from the results so far, it is not clear whether this emerging positive relation between social connections and bank financing is a new equilibrium. We explore this issue later in our paper.

4.2. Alumni connections versus hometown connections

As we note in section 2, some previous studies have used alumni connections to identify social connections, while others have used hometown connections, and both groups include papers that use Chinese data. Studying both types of social connections allows us to see whether one connection type is stronger than the other. Table 4 presents regression results for eq. (1), but this time we replace the *SC_BC* dummy variable with the *SC_BC_Alum* dummy and the *SC_BC_Home* dummy.

In Table 4, the parameter coefficients on the interaction terms between *BreakPC* and each of the social connection dummies are positive and statistically significant, consistently with the result on the interaction term between *BreakPC* and *SC_BC* in Table 3. Specifically, in column (3), the coefficient on the interaction term between *BreakPC* and *SC_BC_Alum* is 0.044 and statistically significant, and the coefficient on the interaction term between *BreakPC* and *SC_BC_Home* is 0.076 and statistically significant. A *t*-test reveals that these coefficients are not statistically significantly different from each other. Therefore, in our study sample, it appears that alumni connections and hometown connections can both be used to obtain bank financing.

4.3. Political connections before regulation no. 18

Thus far, the evidence suggests that the firms in our sample used their social connections to banks to help them secure bank financing, but only after they lost their political connections with the issuance of Regulation No. 18. The decline in bank financing after political IDs depart implicitly suggests that before the issuance of the regulation political IDs had been helping firms to secure bank financing, but after the issuance those same firms were unable to obtain bank financing. To test these latter conjectures more directly, we conduct regression tests using only the 2012 subsample period and only the 2014 subsample period. For these regression tests, we introduce a dummy variable, *PC_ID_2012*, which is equal to 1 if the firm had a political ID in 2012. Note that for each firm, this dummy has the same value for both the 2012 subsample and the 2014 subsample. The dependent variable is again *LoanRatio*. If firms used their political connections to obtain bank financing before Regulation No. 18, but these same firms were unable to obtain bank financing after Regulation No. 18, then the sign on the *PC_ID_2012* parameter coefficient should be positive and statistically significant for the 2012 subperiod sample but not for the 2014 subperiod sample. The regression models use the same control variables as in the baseline model, but this time we exclude the *BreakPC* dummy simply because our subsample tests are each based on one year of data. Results are reported in Table 5.[9]

In Table 5, for the subsample period before the issuance of Regulation No. 18, the parameter coefficient on the *PC_ID_2012* variable is positive and statistically significant. The result suggests that firms relied on their political IDs to help them to secure bank financing before Regulation No. 18 was announced. For the subsample period after the issuance of Regulation No. 18, those same firms were now unable to secure bank financing, as the parameter coefficient on the *PC_ID_2012* variable is not statistically significant. When we use the 2014 subsample, the parameter coefficient on *SC_BC_Home* is positive and statistically significant, indicating that firms with hometown connections to banks are able to secure bank financing. However, the coefficient on *SC_BC_Alum* is not positive and statistically significant. That is, alumni connections continue to lack a first-order effect on bank loans after the issuance of Regulation No. 18. Note that this result is consistent with the *SC_BC* result in Table 3, where the parameter coefficient on *SC_BC* is also not statistically significant. Alumni connections, by themselves and in general, do not seem to affect bank financing. However, this is not to say that alumni connections are not important after Regulation No. 18. As is revealed by the statistically significant positive parameter coefficients on the interaction terms between the *SC_BC_Alum* dummy and the *BreakPC* dummy in Table 4, alumni connections are specifically important for those firms that lost their political IDs because of Regulation No. 18. These findings are consistent with the notion that a firm's alumni connections to banks can be used to augment its political connections to obtain bank financing.

4.4. Are top schools or manager skills driving our results?

Many of the chairs and CEOs in our study sample graduated from top universities in China. Therefore, our regression results may be capturing a top-school (or managerial-skill) effect rather than a social-connection effect. That is, a person who graduated from a top school may have more resources or greater abilities than alumni of other universities, and may use those resources or abilities to obtain external financing. To rule out this possible confounding effect, we first identify CEOs and chairs who graduated from Peking University or Tsinghua University (which are arguably the top two universities in China) and those who graduated from one of the top ten universities in China (identified by the QS world university ranking).[10] We then run regressions of our baseline model, but this time the sample excludes firms whose CEO or board chair attended a top two school (in one regression model) or a top ten school (in another regression model). The results show that the parameter coefficient on *BreakPC* remains negative and statistically significant in both

[9] For these regressions, we use industry fixed effects rather than firm fixed effects for two reasons. First, this table aims to compare firms with political IDs to firms without those connections. Adding firm fixed effects captures within-firm variation, not the impact of political connections between firms. Second, the political ID data are collected annually. Therefore, given that this regression uses only one year of data, any political connection effects will become unobservable if we also include firm fixed effects.

[10] QS university rankings can be found at www.topuniversities.com.

Table 4
Alumni versus hometown connections.

	(1)	(2)	(3)
BreakPC $_{t-1}$	−0.019**	−0.019*	−0.023**
	(0.010)	(0.010)	(0.010)
SC_BC_Alum $_{t-1}$	−0.021		−0.023
	(0.019)		(0.019)
BreakPC $_{t-1}$ * SC_BC_Alum $_{t-1}$	0.062**		0.044*
	(0.029)		(0.026)
SC_BC_Home $_{t-1}$		0.025*	0.030**
		(0.013)	(0.014)
BreakPC $_{t-1}$ * SC_BC_Home $_{t-1}$		0.091***	0.076***
		(0.029)	(0.025)
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
N	2072	2072	2072
R^2	0.851	0.852	0.853

This table presents the results of a regression to compare alumni connections to hometown connections. The dependent variable, *LoanRatio*, is 1 quarter ahead of the independent variables. Independent variables include *BreakPC*, which is a dummy variable that indicates the departure of all independent directors with political connections; *SC_BC_Alum*, which is a dummy variable indicating that the local bank branch head and the firm's chair or CEO attended the same university; the interaction between *BreakPC* and *SC_BC_Alum*; *SC_BC_Home*, which is a dummy variable indicating that the local bank breach head and the firm's chair or CEO are from the same hometown; and the interaction between *BreakPC* and *SC_BC_Home*. Control variables include *logAsset*, *TangibleAsset*, *ROA*, *Investment*, *Growth*, *EffTaxRate*, *TMTNumber*, and *PC_Mgr*. All variable descriptions are in the appendix. Firm fixed effects and year-quarter fixed effects are added in all regression specifications. Robust standard errors clustered by firms are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 5
Effects of political connections before Regulation No. 18.

	(1) Before Reg 18	(2) After Reg 18
PC_ID_2012	0.060**	0.022
	(0.026)	(0.028)
SC_BC_Alum	−0.075*	−0.024
	(0.039)	(0.034)
SC_BC_Home	0.000	0.097*
	(0.045)	(0.055)
Controls	Yes	Yes
Industry FE	Yes	Yes
Quarter FE	Yes	Yes
N	654	714
R^2	0.324	0.404

This table presents results of a regression to compare the effects of political connections before and after Regulation No. 18. Column (1) shows regression results for 2012, the year before Regulation No. 18 was issued. Column (2) shows regression results for 2014, the year after Regulation No. 18 was issued. The dependent variable, *LoanRatio*, is 1 quarter ahead of the independent variables. The key independent variable is *PC_ID_2012*, a dummy that indicates whether the firm has at least one political independent director in 2012. Other variables include *SC_BC_Alum*, which is a dummy variable indicating that the local bank branch head and the firm's chair or CEO attended the same university and *SC_BC_Home*, which is a dummy variable indicating that the local bank branch head and the firm's chair or CEO are from the same hometown. Control variables include *logAsset*, *TangibleAsset*, *ROA*, *Investment*, *Growth*, *EffTaxRate*, *TMTNumber*, and *PC_Mgr*. All control variable descriptions are in the appendix. Industry fixed effects and year-quarter fixed effects are added in all regression specifications. Robust standard errors clustered by firms are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

regressions. Just as important, the parameter coefficient on the interaction term between *BreakPC* and *SC_BC* is positive and statistically significant both for the sample that excludes the top two universities, and for the sample that excludes the top ten universities. Therefore, it does not appear that a top-school (or managerial-skill) effect is solely responsible for our main results.

While we rule out a top-school effect, we acknowledge that manager skill may not be well proxied by where the manager went to school, and so we also run regressions with CEO person-level fixed effects and chair person-level fixed effects. These two fixed effects help capture time-invariant unobservable characteristics of the CEOs and chairs, such as their skills and abilities. Table 6 reports

Table 6
Baseline regression results with manager person-level fixed effects.

BreakPC $_{t-1}$	−0.023**
	(0.010)
SC_BC $_{t-1}$	−0.014
	(0.022)
BreakPC $_{t-1}$ * SC_BC $_{t-1}$	0.055**
	(0.025)
Controls	Yes
Firm FE	Yes
Quarter FE	Yes
CEO FE	Yes
Chair FE	Yes
N	2020
R^2	0.881

This table presents regression results of the baseline model but also includes CEO person-level fixed effects and chair person-level fixed effects. The dependent variable, *LoanRatio*, is 1 quarter ahead of the independent variables. Independent variables include *BreakPC*, which is a dummy variable that indicates the departure of all independent directors with political connections; *SC_BC*, which is a dummy variable indicating that the local bank branch head attended the same university, or is from the same hometown, as the firm's chair or CEO; and the interaction between *BreakPC* and *SC_BC*. Control variables include *logAsset*, *TangibleAsset*, *ROA*, *Investment*, *Growth*, *EffTaxRate*, *TMTNumber*, and *PC_Mgr*. All variable descriptions are in the appendix. Firm fixed effects and year-quarter fixed effects are added in the regression specification. Robust standard errors clustered by firms are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

regression results of our baseline model including these two fixed effects. The parameter coefficient on the interaction term between *BreakPC* and *SC_BC* is positive and statistically significant. The coefficient on *BreakPC* is negative and statistically significant. Therefore, given that our main findings hold despite the inclusion of CEO person-level and chair person-level fixed effects, manager skill does not appear to be solely responsible for our main results.

4.5. Short-run or long-run effect?

Does the positive effect that a firm's social connections have on its bank loans after political IDs depart constitute a new equilibrium, or is it short lived? To test these competing hypotheses, we rerun our baseline regression model for the period 2014–2016, adding two more years of data after the departure of political IDs. Table 7 presents the results. The parameter coefficient on the interaction term between *BreakPC* and *SC_BC* is still positive, but it is not statistically significant. Therefore, the firm's social connections to banks may simply be providing an immediate rescue service. This finding is consistent with the hypothesis that a firm's social connections to banks are being used only to augment its political connections, not to replace them permanently.

4.6. Robustness checks

We now discuss some construction and measurement issues related to our key variables and empirical tests. First, our reported regression results are based on quarterly data. As a robustness check, we rerun our regression using annual data instead. The results based on annual data are similar to reported results based on quarterly data. In particular, the parameter coefficient on the interaction term between *BreakPC* and *SC_BC* is positive and statistically significant. However, while the parameter coefficient on the stand-alone *BreakPC* variable is negative, it is not statistically significant. That is, the decline in bank loans following the departure of political IDs, and the subsequent loan recovery, are immediate; any decline in bank loans following political ID departures is not observable at the annual interval. These results suggest that social connections work quickly to help firms to maintain their bank financing or to recover their lost bank financing, but it also confirms that this positive effect is not a new equilibrium, in accord with tests and results discussed in the previous subsection.

Second, if a chair or CEO is politically connected, then it is possible that s/he will likely bring more politically connected directors onto the board. Therefore, the basic question is what determines the chair's or CEO's political connection. There might be an omitted variable bias, as the status level of the political connection might simultaneously affect the *PC_Mgr* independent variable and the *LoanRatio* dependent variable. To explore this issue further, we include the chair's/CEO's political connection status level as additional

Table 7
Extended window regression.

BreakPC $_{t\text{-}1}$	−0.014
	(0.010)
SC_BC $_{t\text{-}1}$	0.006
	(0.016)
BreakPC $_{t\text{-}1}$* SC_BC $_{t\text{-}1}$	0.013
	(0.015)
Controls	Yes
Firm FE	Yes
Quarter FE	Yes
N	3746
R^2	0.832

This table presents results from a regression using a sample period from 2014 to 2016. The dependent variable, *LoanRatio*, is 1 quarter ahead of the independent variables. Independent variables include *BreakPC*, which is a dummy variable that indicates the departure of all independent directors with political connections; *SC_BC*, which is a dummy variable indicating that the local bank branch head attended the same university, or is from the same hometown, as the firm's chair or CEO; and the interaction between *BreakPC* and *SC_BC*. Control variables include *logAsset*, *TangibleAsset*, *ROA*, *Investment*, *Growth*, *EffTaxRate*, *TMTNumber*, and *PC_Mgr*. All variable descriptions are in the appendix. Firm fixed effects and year-quarter fixed effects are added in the regression specification. Robust standard errors clustered by firms are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

regressors (specifically, provincial-level connections, city-level connections, and county-level connections), and the main results hold after we add these variables.

Third, our bank-loan dependent variable is scaled by total book assets. Because book assets may be distorted for some firms or some sectors, we rerun our regression using different scaling factors on the bank loan variable as a robustness check. When bank loans are scaled by (1) total sales, (2) the market value of equity, and (3) the sum of the market value of equity plus the book value of total debt, we find that the results are qualitatively similar to our reported results. The parameter coefficient on the interaction term between *BreakPC* and *SC_BC* is positive and statistically significant.

Fourth, it is possible that immediately after the announcement of Regulation No. 18, political IDs decided to stop helping their firms get financing. Therefore, to check the robustness of our reported baseline results, we rerun our regression, but this time we assign a value of 1 to *BreakPC* during (1) the quarter when the first political ID resigns and (2) the quarter when the regulation was announced. From these additional regression results, we observe that the coefficients on the interaction terms between *BreakPC* and *SC_BC* are positive and statistically significant and are qualitatively similar to reported results.

Fifth, to see if graduate school connections or undergraduate school connections are driving our alumni connections results, we rerun eq. (1), but this time we replace the *SC_BC* dummy variable with two new dummies: one dummy that indicates graduate school alumni connections (1.9% of our sample) and another dummy that indicates undergraduate school alumni connections (7.0% of our sample).[11] (If the CEO or board chair and the local bank branch head also have graduate degrees from the same undergraduate university, we then code the graduate (undergraduate) school connection dummy as 1 (0), so that these two dummies are mutually exclusive.) The results show that the parameter coefficient on the interaction term between *BreakPC* and the graduate school connection dummy is positive and statistically significant, and the coefficient on the interaction term between *BreakPC* and undergraduate school connection dummy is also positive and statistically significant. Both graduate school and undergraduate school connections contribute to the alumni connection results.

Finally, given that Guangdong firms represent over 18% of our study sample, we make sure that our main results are not merely being driven by a Guangdong effect. When we delete Guangdong firms from our study sample, the main results stay intact. Specifically, the parameter coefficient on the *BreakPC* variable is negative and statistically significant, and the coefficient on the interaction term between *BreakPC* and *SC_BC* is positive and statistically significant.

[11] The CSMAR database codes firm executives' degrees into three categories: undergraduate, masters (e.g., MS, MA, MBA, EMBA, and MFA; in Chinese, all master's degrees are called *shuoshi*), and doctorate (e.g., JD, MD, and Ph.D.; in Chinese, all doctoral degrees are called *boshi*). For the bank branch heads, we hand-collect their degree information. For our empirical tests, graduate degrees include both master's and doctoral degrees

5. Conclusion

We find that in the wake of China's Regulation No. 18, after all politically connected independent directors (political IDs) have departed, non-state-owned enterprises (non-SOEs) with no social connections to local branches of national commerical banks experience declines in their bank loan ratios. However, when the firm has social connections to banks, then it appears to use those connections to retain or obtain bank loans. Specifically, in the period immediately after firms lose their political IDs, if a firm has a CEO or board chair who attended the same university, or is from the same hometown, as the local branch head of a national commercial bank, then that firm has higher bank loan ratios than other firms. We further find that before the issuance of Regulation No. 18, firms initially relied on their political IDs to secure bank financing. However, after Regulation No. 18, these same firms were unable to maintain that bank financing. Instead, firms that lost their political connections turned to their social connections to banks to secure bank loans. In additional tests, we also find that the social connections' positive effect on bank loans is short lived and not a new equilibrium. Altogether, our findings support the hypothesis that a firm's social connections to banks can augment its political connections to help it obtain bank financing.

A few caveats are in order. First, we do not know whether social connections can augment political connections in other ways. Second, our definition of social connections includes only alumni connections and hometown connections, so we do not know whether our findings are generalizable to other types of social networks, including friend, family, religion, and work-related networks. Third, our findings pertain to China, where government beauracrats control business resource allocation, and may or may not be generalizable to different institutional environments outside China. More research is warranted to elucidate how these informal networks interact and intertwine, and in what settings.

Declaration of Competing Interest

None.

Data availability

Data used in the study are publicly available from commercial vendors.

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Appendix A. Variable definitions

This table provides definitions of variables used in the analyses. *BreakPC, SC_BC, SC_BC_Alum, SC_BC_Home, PC_Mgr,* and *PC_ID_2012* are collected manually. All remaining variables are collected from CSMAR.

Variable	Definition
LoanRatio	Total loans to total assets
BreakPC	Dummy equal to 1 during and after the quarter when all politically connected independent directors (IDs) and chairs depart from the firm. Politically connected IDs are those who are holding, or have previously held in the past three years, a position in the government equal to or higher than the rank of section chief.
SC_BC_Alum	Dummy equal to 1 if the local bank branch head attended the same university (at either the graduate or the undergraduate level) as the firm's chair or CEO. A local bank branch is a bank located in the same province as the firm's headquarters.
SC_BC_Home	Dummy equal to 1 if the local bank branch head is from the same city-level hometown as the firm's chair or CEO. A local bank branch is a bank located in the same province as the firm's headquarters.
SC_BC	Dummy equal to 1 if either SC_BC_Alum or SC_BC_Home is equal to 1
logAsset	Logarithm of firm's total assets
TangibleAsset	Firm's fixed assets plus inventories to total assets
ROA	Net income to total assets

(*continued on next page*)

(*continued*)

Variable	Definition
Investment	Capital expenditure to total assets
Growth	Percentage change in year-on-year firm sales
EffTaxRate	Tax expenditure to taxable income
TMTNumber	Logarithm of number of board directors and top executives
PC_Mgr	Dummy equal to 1 if the firm has a politically connected chair or CEO
PC_ID_2012	Dummy equal to 1 if the firm has a politically connected independent director during 2012

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