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Family control and loan collateral: Evidence from China

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ABSTRACT

Using a sample of 612 listed Chinese non-SOEs from 2006 to 2009, we show that the use of collateral is higher in family-controlled firms. This effect is more pronounced when family firms have a larger control-ownership wedge, family representation in management, and are led by a descendant chairman/CEO. We further document that having multiple large shareholders, paying higher dividends, having completed the split-share structure reform and being located in provinces with more competitive credit markets can mitigate the incentive of controlling families to engage in expropriation and reduce the level of collateral required. Overall, we contend that in China, the risk of expropriation associated with family control leads to an increased credit risk and, in turn, higher collateral being required by banks.

1. Introduction

Recent research on the agency conflicts between controlling families and creditors takes two distinct perspectives. The first perspective, labeled reputation concern, argues that family firms are long-term investors who are most concerned with survival, preserving the family's reputation and building a lasting relationship with creditors, in order to mitigate agency conflicts (Anderson et al., 2003; Ellul et al., 2007). The second perspective, known as entrenchment, contends that family control exacerbates the agency conflicts between shareholders and creditors through excessive family control rights and family management, which enables the extraction of private benefits and results in a higher agency cost of debt (Boubakri and Ghouma, 2010; Lin et al., 2011; Yen et al., 2015).

These studies, however, exclude the second largest market, China, where the relative costs and benefits of family control are less straightforward. On the one hand, China has a poor institutional environment and weak legal protection for investors. On the other hand, the Chinese public bond market is underdeveloped and most borrowing comes from banks (Firth et al., 2008). Thus, by focusing on the Chinese lending market, this paper aims to fill this gap by empirically investigating the agency conflicts between controlling families and banks, and how banks react to the behavior of family firms by requiring collateral, an indicator of the agency cost of debt.

China also provides an excellent setting for our study. In a market-oriented loan market, a bank can price credit risks through both the interest rate and the requirement for collateral. However, in an emerging market in which controlling shareholders are more likely to engage in expropriation, using collateral as a measure of the cost of debt is more relevant to banks (Menkhoff et al., 2006; Bae and Goyal, 2009). Furthermore, as the lending rate in China is relatively regulated,[1] banks rely more on collateral to control credit risks. In addition, although family firms have only developed in China quite recently, they have made a considerable contribution to the entire economy. In this sense, an investigation into the agency conflicts between controlling families and banks provides a useful

[1] During our research period between 2006 and 2009, the People's Bank of China (PBC) relaxed the ceiling of the lending rate but still placed a floor on it, which is 90% of the benchmark interest rate set by the PBC. Though commercial banks have some autonomy to increase the interest rate charged on loan contracts, they were less likely to increase the interest rate due to the severe competition among domestic banks, as well as with foreign banks (Yao et al., 2007). Thus, the interest rate was relatively regulated and less efficient for reflecting the risks of borrowers over the period of our study. Only recently, since 2010, when the period of our data ends, has the shadow banking system become prevalent, in which interest rates have become more market-oriented (Li and Hsu, 2012).

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addition to the literature. Moreover, the unique split-share structure reform represents an exogenous shock with respect to any individual firm, which alleviates any concern about endogeneity in respect of ownership structure.

We follow Anderson and Reeb (2003) and Villalonga and Amit (2006) and define a family firm as one in which the founder or a member of his/her family, by either blood or marriage, is an executive, director or blockholder.[2] We further consider three elements of family control. One is the control-ownership wedge, defined as the divergence between control rights and cash flow rights, following Claessens et al. (2002). The second proxy is family representation in management, defined as when a family member acts as chairman or CEO (Villalonga and Amit, 2006). The last proxy is descendant chairman/CEO, defined as when a descendant acts as chairman or CEO.

Our univariate analysis shows that the use of collateral for family firms is 7.42% higher than for non-family firms. By conducting a multivariate analysis, we further document that this difference becomes larger when family firms have a larger control-ownership wedge, family representation in management, or heirs of the founders in management, and becomes smaller if family firms have multiple large shareholders, pay higher dividends, have completed the split-share structure reform or locate in provinces with more competitive credit markets. Our main findings are robust to alternative estimation methods and the application of the bank loan level dataset. Our further analysis shows that our main findings are not driven by alternative explanations.

Our study contributes to several strands of literature in the following ways. First, existing studies find that investor protection in China is quite weak and the investor protection score is significantly below the average of other countries due to strong bureaucratic influence (Allen et al., 2005; Berkman et al., 2011). We document that, under these conditions, the severe agency problems with other investors, faced by family firms, result in a high agency cost of debt. Therefore, our study adds additional evidence to the literature with regard to the agency problems between family firms and creditors (Boubakri and Ghouma, 2010; Lin et al., 2011).

In addition, unlike Amit et al. (2014), who compare the performance between family firms and state-owned enterprises (SOEs), we examine the impact of different types of ownership on the use of collateral by focusing on non-SOEs, which are free of the implicit guarantee that government provides to SOEs. Moreover, the comparison between family firms and other types of non-SOEs is more justifiable, as they all face the same dominant agency problem, which is between the controlling shareholder and minority shareholders, while the dominant agency problem in SOEs is between managers and shareholders (Villalonga and Amit, 2006; Fan et al., 2013).[3] Therefore, we present a complementary perspective to that of Amit et al. (2014).

Furthermore, this study confirms the importance of a proper privatization process, such as the split-share structure reform, in an emerging market. We provide evidence that the reform may reduce the inherent risks that concern banks, leading them to lower the amount of collateral they require, which supports the findings of Li et al. (2011) that the reform removes market frictions. Finally, extending the studies of Lin et al. (2011) and Hainz et al. (2013), who argue that credit market competition reduces the cost of borrowing, we provide com plementary evidence that credit market competition lowers the amount of collateral required by banks.

The rest of the paper proceeds as follows: Section 2 discusses the institutional background and develops the hypotheses; Section 3 describes the data and methodology; Section 4 discusses the empirical results and additional tests; and Section 5 concludes.

2. Institutional background and hypothesis development

In this section, we describe the evolution of listed family firms in China, as well as the collateral required by creditors and the means of recourse available to creditors, to provide institutional background for our study. Then, we develop our main hypotheses based on existing theories and China's institutional system.

2.1. Institutional background

2.1.1. Listed family firms

Family firms in China evolved for a short period along with the Chinese economic reform. Even after the establishment of two stock exchanges in China in the early 1990 s, the government issued 'Provisional Regulations for the administration of the issuance and trading of stock' in 1993, which still stipulated that individuals were not allowed to directly hold more than 0.5% of the total shares issued by a listed company. Later on, in 1998, this stipulation was abolished and the first family firm was listed in 2001. Although listed family firms only accounted for a small proportion of all family firms, these listed family firms contributed over 90% of the GDP made by all family firms, while the latter accounted for more than 50% of total national GDP, according to the survey conducted by the State Administration for Industry & Commerce of the People's Republic of China (SAIC).[4] Therefore, these listed family firms are quite representative of all family firms.

2.1.2. Collateral requirements on bank lending

Originally, bank loans mainly took the form of credit loans granted at low interest rates and without any guarantees or collateral; this, among other factors, resulted in a higher ratio of non-performing loans (NPL). As the market-oriented economy developed, banks became aware of lending risks, and from the 1990 s they increasingly demanded collateral (Chen et al., 2013). Indeed, according to a survey of 13 domestic banks between 2000 and 2005, the average proportion of collateral loans increased from 22% to 32% of all loans granted (Yang and Qian, 2008).

The bankruptcy law (enacted in August 2006 and taking effect in June 2007) also affected creditors' propensity to require collateral. This law resembles the bankruptcy laws in many other countries, and creates an effective threat of bankruptcy for all listed firms. The current law facilitates bankruptcy proceedings, as it clarifies creditor rights, bankruptcy expenses and other procedural matters (Lee and Ho, 2010; Mo et al., 2015). In particular, it specifies that the bankruptcy process starts with the formal application for bankruptcy, and that liquidation and reorganization are two alternative forms of recourse for creditors, who can apply directly to the People's Court. By requiring collateral, creditors enjoy the right to make a pre-emptive claim prior to the debtor company's

[2] Consistent with Amit et al. (2014), family firms are those in which the largest stake in ownership can be traced back to the founder, if the firm was founded within the private sector, or to the entrepreneur, if he/she took over a previous SOE when it was privatized.

[3] As argued by Fan et al. (2013), SOEs do not have a 'true' owner to take care of their interests, so the main conflict of interest exists between the shareholders and managers. Moreover, the pyramid ownership structure of SOEs in China is formed by the governments' incentives to reduce their interference to the business operation of the firms under their control. Thus, the divergence between control and cash-flow rights reflects the delegation of formal authority rather than the level of expropriation. As a result, the agency problem between shareholders and managers dominates the agency problem between the largest shareholders and minority shareholders in those SOEs.

[4] Source: http://business.sohu.com/20150427/n412042902.shtml.

declaration of bankruptcy.[5] Thus, collateral plays a critical role in protecting creditors' interests in insolvency.

In addition, state-owned banks still discriminate against private firms in their allocation of loans (Cull and Xu, 2003), although evidence suggests that this situation has been alleviated recently.[6] State-owned banks often lend to SOEs for political, employment and taxation purposes, rather than profitability (Brandt and Li, 2003; Yeung, 2009), while private firms are often required to provide more collateral before they can obtain a loan. As controlling families behave differently from other types of blockholders, it will be interesting to see how the use of collateral in loan contracts differs between family and non-family firms.

2.2. Hypothesis development

In this section, we present our discussion about how family control affects the collateral required by banks. We also discuss how elements of family control, namely the control-ownership wedge, family management and descendant management, affect collateral requirements. Then, we discuss the influence of different mechanisms on the relationship between family control and collateral requirements.

2.2.1. Family control and the use of collateral

Existing literature documents that controlling shareholders have an incentive to expropriate outside investors by extracting private benefits (Claessens et al., 2002; Boubakri and Ghouma, 2010; Lin et al., 2011), and this phenomenon may be more severe in China because of its weak legal protection for investors. In addition, the incentives for expropriation are strong for family firms, while incentives for expropriation are small for firms controlled by an institution or a group of people, because the private benefits of control are diluted among several independent owners (Villalonga and Amit, 2006). Claessens et al. (2002) also noted that a large control-ownership wedge is usually associated with family control, which will exacerbate the risk of expropriation and conflicts of interest between controlling families and other investors.

Moreover, in Chinese family firms, family members usually occupy important positions and participate actively in management and corporate boards (Bennedsen et al., 2015). These family firms are reluctant to hire outsiders to manage the business for fear that the outsiders might take control (Cao et al., 2015; Xu et al., 2015). We conjecture that by combining control and management, family firms have greater controlling power and face less monitoring from other investors, and thus have stronger incentives to engage in expropriation.

In addition, keeping good relationships with stakeholders, especially governments, is important for business success in China. If descendants hold managerial positions in family firms, it is argued that relationships established by the founders are more likely to be transferred and learned by their heirs and that therefore family firms will take more care of their long-term survival (Anderson et al., 2003).[7] However, Fan et al. (2012) argue that the relationships that the founders have established and invested in emerging markets are specialized intangible assets and are difficult to partition or transfer to following generations, with the result that these heirs are not able to deal with complicated government-business relationships as easily as the founders. Chung and Yuen (2003) also argue that, without previous involvement in the business, the founders' heirs are not as commercially talented as the founders. Thus, it is expected that family firms led by a descendant chairman/CEO will have more severe operational and expropriation risks.

Overall, we conjecture that family firms, particularly those with a larger control-ownership wedge, family representation in management or a descendant chairman/CEO, are more likely to suffer severe expropriation. These expropriation activities will result in more severe agency problems and increase the likelihood of, and in turn the expected costs associated with, financial distress and bankruptcy (Boubakri and Ghouma, 2010; Lin et al., 2011). Banks will largely incorporate these costs into their lending decisions by requiring higher collateral against borrowers' defaulting, because they have limited space to increase interest rates in China during the period of this study. Therefore, we formulate the following hypotheses:

H1a. The use of collateral is higher for family firms than non-family firms, especially those with a larger control-ownership wedge.

H1b. The use of collateral is higher for family firms with family representation in management.

H1c. The use of collateral is higher for family firms with a descendant CEO/chairman.

2.2.2. Factors mitigating the effect of family control on the use of collateral

2.2.2.1. Multiple large shareholders. Existing literature documents that the presence of multiple large shareholders who are not affiliated with the controlling families makes it possible to monitor the expropriation activities of controlling families (La Porta et al., 1999; Bennedsen and Wolfenson, 2000). In the context of China, Berkman et al. (2009) and Huyghebaert and Wang (2012) also find that multiple large shareholders are able to share the decision-making with controlling shareholders and protect their own interests by exercising monitoring. They further suggest that these shareholders can form coalitions and challenge the opportunistic behavior of controlling shareholders, which will benefit other investors.

2.2.2.2. Dividend policy. From the expropriation perspective, firms in which controlling shareholders have higher cash flow rights pay higher dividends for the purpose of tunneling (Chen et al., 2009), resulting in a severe expropriation risk and in turn higher credit risks faced by creditors. However, under a pyramidal structure, higher dividend payments may alleviate expropriation, because dividend payment removes corporate wealth from controlling shareholders' control (Atmaja et al., 2009; La Porta et al., 2000; Pindado et al., 2012), which will mitigate expropriation and credit risks. It is thus expected that higher dividend payment indicates less expropriation.

2.2.2.3. Split-share structure reform. The split-share structure reform, which was implemented in most listed firms between 2005 and 2007, required shareholders to convert their non-tradable shares to tradable shares. With the removal of a significant source of market friction, controlling shareholders started to become concerned about stock prices, because they could realize gains and obtain cash by selling shares on the market, and the interests of controlling shareholders and other minority shareholders were aligned (Li et al., 2011). This convergence of interests would reduce controlling shareholders' incentive for expropriation

[5] See Lee and Ho (2010) for detailed information on bankruptcy law articles, proceedings and structure.

[6] For example, the proportion of loans to private firms in total lending for the China Construction Bank increased markedly from 18.4% in 2007 to 35% in 2011 (www.suifenhe.gov.cn/contents/4290/19427.html), while Minsheng Bank, a private bank, granted more than 62% of total loans to private firms in 2010 (Source: http://www.caijing.com.cn/2011-01-19/110623008.html).

[7] We thank the reviewer for pointing out this alternative view.

and the associated costs of monitoring by creditors (Chen et al., 2012).

2.2.2.4. Credit market competition. It is argued that in less competitive regions in China, where government intervention is heavier, state-owned commercial banks are obliged to grant most loans to SOEs because of political pressure from government officials (Firth et al., 2008; Yeung, 2009), while non-SOE borrowers need to provide additional collateral to compete for the remaining bank funding (Jian and Xu, 2012). In more competitive regions, collateral requirements are lower, due to intensified market competition, and banks have less market power[8] (Hainz, 2003). Because of the combination of heavier government intervention and greater market power, banks will require higher collateral from non-SOEs in less competitive regions.

As the incentive for expropriation is stronger for controlling families, we thus expect that the effects of the abovementioned factors on mitigating expropriation, alleviating credit risks and in turn reducing the use of collateral, will be more pronounced in family firms. Therefore, we construct the following general hypothesis:

H2. The relationship between family control and the use of collateral becomes weaker if a firm has multiple large shareholders, pays higher dividends, has completed the split-share structure reform or is located in competitive credit markets.

3. Sample and methodology

3.1. The sample selection

Our initial sample data are obtained from the Chinese Stock and Market Accounting Research (CSMAR) database for all non-SOEs listed on the Shanghai and Shenzhen stock exchanges. Because information on firms' outstanding bank loans is only available between 2006 and 2009, our sample is limited to this period. In addition to this primary dataset, we also collect firms' operating cash flows and monthly stock returns from 2003 to calculate cash flow volatility and stock return volatility variables, which require cash flow data and monthly stock returns over the previous three years.

To construct firm year observations for empirical analysis, we start the data process with 42,431 observations of outstanding bank loans from the dataset of notes to financial statements. Specifically, for each firm in each year, there are a number of outstanding loan observations of different types from different banks. We divide these outstanding loans into the following types: (1) pledged loans, (2) mortgage loans, (3) credit loans, (4) guaranteed loans, and (5) other loans.[9] We then add up pledged loans and mortgage loans to get collateral loans, and add up all types of loans to get total loans for each firm in each year. Finally, there is only one observation of outstanding collateral loans and total outstanding loans for each firm in each year, and we then match outstanding bank loans data with data for each firm's characteristics and obtain a total 2288 firm year observations.

We further exclude 106 observations flagged with ST and *ST, because they denote special treatment due to irregularity in the financial reporting, and negative profit for two or three consecutive years. We also exclude 152 observations in the financial industry because of their unique accounting standards. Finally, we delete 100 observations with missing observations on the main variables used in our analysis and 75 observations with no outstanding loans. Our final sample thus consists of 612 listed firms and 1855 firm year observations.

Table 1 summarizes the detailed amounts of each outstanding bank loan. From Panel A, the ratios of both short-term and long-term collateral loans are 24.61% (595.4/2419.8) and 46.73% (576/1232.5), respectively. It is interesting to note that collateral is even required for short-term loans. One reason for this is that long-term collateral loans that matured within one year are classified as short-term loans. The other reason is that our sample covers the period of financial crisis during which the requirements for collateral were increased by banks in response to higher credit risks.[10] We also observe that short-term loans are the main source of financing and account for nearly two thirds of the total amount of loans. In Panel B, we observe that the collateral loan ratios are 37.63% (720.9/1915.6) and 25.94% (450.5/1736.7) for both family firms and non-family firms, and within collateral loans, mortgage loans are higher, while pledged loans are lower, for family firms. We also observe that guaranteed loans are higher for family firms.

3.2. Methodology and estimation

To robustly test the impact of family control on the use of collateral, we use the following estimation methods with panel data: (1) simultaneous equation system, (2) firm fixed-effects, (3) system GMM, and (4) change regression. The simultaneous equation system addresses simultaneity and reverse causality, while the firm fixed-effects model accounts for unobserved, time-invariant heterogeneity. We also use the system GMM and the change regression to provide further robustness evidence.

First, in our simultaneous equation system, collateral, family control, interest rate,[11] multiple large shareholders and dividend payment are treated endogenously. In particular, we follow Sun and Tong (2003), Jimenez et al. (2006) and Chen et al. (2013) to establish the use of collateral, family control, interest rate equations and express them as Eqs. (1)–(3):

$$\begin{aligned} Collateral_{it} = {} & \alpha_0 + \alpha_1 Family_{it} + \alpha_2 Wedge_{it} + \alpha_3 Cashflowrights \\ & + \alpha_4 Size_{it} + \alpha_5 Tangibility_{it} + \alpha_6 Sales_{it} \\ & + \alpha_7 Guaranteed_{it} + \alpha_8 ROA_{it} + \alpha_9 Age\_Est_{it} \\ & + \alpha_{10} Age\_List_{it} + \alpha_{11} Board_{it} + \alpha_{12} Indep_{it} \\ & + \alpha_{13} Political_{it} + \alpha_{14} \mathrm{Pri}vatiztion_{it} + \alpha_{15} Le\nu_{it} \\ & + \alpha_{16} LtDebt_{it} + \alpha_{17} Beta_{it} + \alpha_{18} CFVol_{it} + \alpha_{19} \mathrm{Ret}Vol_{it} \\ & + \alpha_{20} Interest_{it} + \alpha_{21} Bankrupt_{it} + \alpha_{22} Crisis_{it} \\ & + \alpha_{23} \mathrm{Prime}_{it} + \varepsilon_{it} \end{aligned} \tag{1}$$

In Eq. (1), *Collateral* is defined as the fraction of collateral loans and calculated as the ratio of total loans that are collateralized to total loans outstanding, following Chen et al. (2013).[12] *Family* is a dummy variable equal to 1 for family firms and 0 otherwise.[13] We

[8] Credit market competition has become stronger ever since 2006, when the Chinese government allowed foreign banks to enter China's banking industry, following the emergence of financial institutions controlled by private ownership, such as the China Minsheng Bank and the increased number of branches of existing commercial banks in the mid-1990s.

[9] The other loans mainly include on-balance sheet loans (including project financing and note discounting) and off-balance sheet loans (including letters of credit, note acceptances and entrust loans).

[10] In our sample, the average short-term collateral loan has increased from 118.1 million RMB before the crisis between 2006 and 2007 to 179.6 million RMB during the crisis between 2008 and 2009, and the difference is significant. The results for difference tests are available on request.

[11] Since the interest rate is allowed to be moving upwards from a level of 90% of the benchmark rate during our sample, we treat interest rate as endogenously determined.

[12] The ideal proxy for the use of collateral is to incorporate the information on collateral value. However, due to the unavailability of this information, we follow Chen et al. (2013) and use the collateral loan ratio as the proxy in this study.

[13] Consistent with Lin et al. (2011), we place a threshold of 10% of the control rights to identify controlling owners. If there is no shareholder with at least 10% of the control rights, the firm is classified as widely held.

Table 1
Distribution and classification of bank loans for non-SOEs.

	Amounts	Percentage (%)	Amounts	Percentage (%)
Panel A: short-term vs. long-term	Short-term		Long-term	
Collateral loan	595.4	24.61	576	46.73
Pledged loan	115.2	4.76	239	19.39
Mortgage loan	480.2	19.85	337	27.34
Non-collateral loan	1824.4	75.39	656.5	53.27
Credit loan	189.9	7.85	123	10.0
Guaranteed loan	755.6	31.23	192	15.57
Other loan	878.9	36.32	341.5	27.71
Total	2419.8	100	1232.5	100
Panel B: family firms vs. non-family firms	Family firms		Non-family firms	
Collateral loan	720.9	37.63	450.5	25.94
Pledged loan	155.9	8.14	198.3	11.41
Mortgage loan	565	29.49	252.2	14.52
Non-collateral loan	1194.7	62.37	1286.2	74.06
Credit loan	131.9	6.89	181	10.42
Guaranteed loan	542.6	28.33	405	23.32
Other loan	520.2	27.16	700.2	40.32
Total	1915.6	100	1736.7	100

Note: All values in million RMB.

also include a set of well-documented control variables that might affect the use of collateral, and the inclusion of these variables is in line with existing studies (Villalonga and Amit, 2006; Chen et al., 2013). First, we control for borrower characteristics, including *Wedge*, *Cash flow rights*, *Size*, *Tangibility*, *Sales*, *Guaranteed*, *ROA*, *Age_Est*, *Age_List*[14] and *Interest*. We also control for firm risk levels by including *Lev*, *LtDebt*, *CFVol*, *RetVol* and *Bankrupt*. We further account for governance structure and government connections by including *Board*, *Indep*, *Privatization* and *Political*.[15] Another set of control variables are macroeconomic factors including *Crisis* and *Prime*. The detailed definitions for these variables, as well as all the other variables used in this paper, are reported in the Appendix.

The family control equation is expressed as follows:

$$Family_{it} = \beta_0 + \beta_1 Collateral_{it} + \beta_2 Size_{it} + \beta_3 ROA_{it} + \beta_4 Lev_{it} + \beta_5 SHSE_{it} + \beta_6 Privatization_{it} + \beta_7 RetVol_{it} + \alpha_8 Age\_Est_{it} + \varepsilon_{it} \quad (2)$$

In Eq. (2), *ROA* is one of the determinants of family control because controlling families have an information advantage over other shareholders and special insight into ascertaining future performance (Anderson and Reeb, 2003). *Size* and *RetVol* are included, as it is suggested by Demsetz and Lehn (1985) that ownership is positively related to firm size and negatively related to risk. *Privatization* is also included, as family firms may have been privatized from former SOEs. *SHSE* is included, following Sun and Tong (2003). *Age_Est,* as an exogenous instrumental variable, is also included, as Franks et al. (2012) argue that firms are more likely to be controlled by a family when the firms grow, especially in countries with weak investor protection.

Following Zou and Adams (2008), we establish the following interest rate equation by employing a set of control variables similar to those in the collateral equation and also include state ownership (*State*) as an instrumental variable:

$$Interest_{it} = \alpha_0 + \alpha_1 Family_{it} + \alpha_2 Wedge_{it} + \alpha_3 Size_{it} + \alpha_4 Tangiblity_t + \alpha_5 Sales_{it} + \alpha_6 Lev_{it} + \alpha_7 LtDebt_{it} + \alpha_8 Guaranteed_{it} + \alpha_9 State_{it} + \alpha_{10} ROA_{it} + \alpha_{11} Political_{it} + \alpha_{12} Age\_Est_{it} + \alpha_{13} Collateral_{it} + \alpha_{14} Board_{it} + \alpha_{15} Indep_{it} + \varepsilon_{it} \quad (3)$$

When we examine the effect of the presence of multiple large shareholders and dividend payment on the relationship between family control and the use of collateral, we separately enter one more equation in which multiple large shareholders and dividend payment are treated endogenously. In particular, these two equations are expressed as follows:

$$MLS_{it} = \beta_0 + \beta_1 Collateral_{it} + \beta_2 Family_{it} + \beta_3 Size_{it} + \beta_4 ROA_{it} + \beta_5 Lev_{it} + \beta_6 Cycle_{it} + \beta_7 RetVol_{it} + \beta_8 State_{it} + \beta_9 SHSE_{it} + \beta_{10} LagMLS_{it} + \varepsilon_{it} \quad (4)$$

$$Dividend_{it} = \beta_0 + \beta_1 Collateral_{it} + \beta_2 Family_{it} + \beta_3 Size_{it} + \beta_4 ROA_{it} + \beta_5 Lev_{it} + \beta_6 Cash_{it} + \beta_7 Age\_List_{it} + \beta_8 Cycle_{it} + \varepsilon_{it} \quad (5)$$

In Eq. (4), *Family* is included, as controlling families usually have concentrated ownership (Chen et al., 2011). Therefore we expect that family firms are less likely to have multiple large shareholders. *Cycle* is included, as Maug (2001) argues that firms adjust their optimal ownership structure based on their life cycle. *State* is included, as during the process of privatization, the higher state ownership will result in more large shareholders (Sun and Tong, 2003). *LagMLS*, defined as the lagged value of ownership by multiple large shareholders, is included, as Hermalin and Weisbach (1991) argue that changes in ownership occur within firms over time. We also include *Size*, *ROA, Lev, RetVol* and *SHSE*, as in Eq. (2), because these variables also affect the ownership by multiple large shareholders. In Eq. (4), both *Cycle* and *LagMLS* are used as exogenous instrumental variables.

[14] There are 11, 12, 16 and 29 IPOs which only account for 4.26%, 3.96%, 4.37% and 6.95% of total family firms in 2006, 2007, 2008 and 2009, respectively, indicating that family firms' average listing history is not so short. Nevertheless, we are still concerned that the use of collateral is affected by severe information asymmetry, due to their short listing history, and we include the *Age_List* to control for this effect. We thank the reviewer for raising this issue.

[15] We thank the reviewer for the suggestion to include the variables *Privatization* and *Political*.

In Eq. (5), *Family* is included to test whether family firms have a greater propensity to pay dividends (Pindado et al., 2012). *Cash* and *Cycle* are included, as they both increase a firm's propensity to pay dividends (DeAngelo et al., 2006; Denis and Osobov, 2008). *Size*, *ROA* and *Lev* are also included, following the literature on dividend payment determinants. In Eq. (5), *Age_List* and *Cycle* are used as the exogenous instrumental variables. In all of these equations, we also include dummy variables for year, industry and region to control for year, industry and regional fixed effects, and equations are estimated with robust standard error clustered at the firm level.

We use the three-stage least square (3SLS) method to estimate our simultaneous structural equations, which takes the cross-equation error correlation into account to improve the estimation efficiency of a large sample. In the first stage, each endogenous variable is regressed on all valid instruments, including all exogenous variables in our simultaneous equation system, to obtain fitted values. In the second stage, the cross-equation correlation matrix is obtained based on the residuals from a two-stage least square procedure. In the final stage, we simultaneously estimate our structural equations by including the fitted values from the first stage and correlation matrix from the second stage, as well as the full set of exogenous variables.

In addition, we choose the system GMM, as this method can increase the efficiency of the first-difference GMM (Blundell and Bond, 1998). In our system GMM, we assume that all explanatory variables, except *Privatization*, *Crisis*, *Age_Est* and *Age_list*, are potentially endogenous, and in the estimation, the lagged differences of the dependent variable, endogenous explanatory variables and all of the exogenous variables are used as instruments in the level equation, and the second lagged values are used as instruments for their current variables in the differenced equation. We report the estimation results using the simultaneous equation system and the fixed-effects model for all regressions, while only reporting the estimation results using the system GMM and change regression for the collateral equation in order to save space.

4. Empirical results

4.1. Summary statistics

Table 2 provides the summary statistics for our sample. To eliminate the outlier effects, all the continuous variables are winsorized at the 1% level. The results in Panel A show that the mean (median) of the collateral ratio is 35.47% (35.25%), which is higher than the mean (median) value of the collateral ratio of 26.2% (13.1%) reported by Chen et al. (2013).[16] The average control-ownership wedge is 9.33%, with a median value of 7.31%. In addition, in our sample, 72.02% of observations are family firms. We also notice that within family firms about 59.73% of observations have a family member as the CEO or chairman. Moreover, within firms with family representation in management, 11.83% of observations have a descendant as the CEO or chairman. Panel B summarizes firm characteristics.

Panel C summarizes the distribution of our sample firms by owners. Columns 1 and 2 show that there are 447 family firms representing 73.04% of our sample firms, and this ratio is close to that reported by Amit et al. (2014). For 165 non-family firms, there are 47 firms controlled by a collective organization, 88 firms by a

[16] The higher collateralized loan ratio in our study may be attributable to the fact that our sample covers the financial crisis period when creditors have required higher collateral, while Chen et al. (2013) used a sample which only covers the pre-crisis period between 2001 and 2006. The even higher median of collateral ratio of 35.25% in our sample, compared to 13.1% reported by Chen et al. (2013), is also attributable to the fact that more than 25% of the observations in Chen et al. (2013) have no collateral loans.

Table 2
Summary statistics.

	Mean	Median	Observations
Panel A: collateral, ownership structure and factors			
Collateral	35.47%	35.25%	1855
Family	72.02%	1	1855
Family_CEO	59.73%	1	1336
Descendant_CEO	11.83%	0	798
Wedge	9.33%	7.31%	1855
Cash-flow rights	25.39%	22.42%	1855
MLS	53.58%	1	1855
Dividend	4.91%	0	1788
Panel B: firm characteristics			
RPTs	76.36%	12.50%	1855
BRPTs	42.48%	5.09%	1855
DRPTs	33.88%	1.96%	1855
Size	21.58	20.96	1855
Tangibility	59.35%	56.30%	1855
Sales	108%	106%	1855
Guaranteed	26.20%	5.12%	1855
ROA	4.45%	4.52%	1855
Age_Est	9	9	1855
Age_List	4.3	3	1855
Board	2.17	2.20	1855
Indep	36.33%	33.33%	1855
Political	25.03%	0	1855
Privatization	35.41%	0	1855
Lev	44.73%	45.55%	1855
LtDebt	9.97%	2.58%	1855
Beta	1.12	1.05	1855
CFVol	8.42%	9.56%	1855
RetVol	96.18%	127.48%	1855
Interest	3.05%	3.02%	1855
Bankrupt	0.20%	0.10%	1855
Prime	3.07%	3.25%	1855
Largest	34.69%	31.93%	1855
Duality	25.11%	0	1855
Cycle	24.96%	24.29%	1855
Cash	19.23%	15.49%	1855

Panel C: number and percentage of firms in our sample

	Number of firms	Percentage of total firms	Observations
1. Family controlled firms	447	73.04%	1336
2. Non-family firms	165	26.96%	519
2.1 Collective organization	47	7.68%	148
2.2 Group	88	14.38%	258
2.3 Financial Institution	19	3.10%	69
2.4 Widely held	11	1.80%	44
Total	612	100%	1855

Panel D: Number of family firms with founder, descendant and professional chairman or CEO

	Founder is chairman	Descendant is chairman	Professional chairman
Founder is CEO	177	0	0
Descendant is CEO	24	0	0
Professional CEO	200	3	43
Total	401	3	43

Table 3
Difference tests between family and non-family firms.

	Family control (%)	Non-family control (%)	Difference tests
Collateral	36.33	28.91	7.42%*** (4.05)
Wedge	9.50	8.92	0.58%** (2.16)
Cash-flow rights	25.46	12.75	12.71%*** (3.99)
MLS	51.09	59.98	−8.89%** (2.55)
Dividend	4.78	5.23	−0.45%* (−1.89)
Beta	1.21	0.98	0.23%** (2.03)
RetVol	96.92	95.82	1.10% (0.47)

*, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Table 4
The effect of family control on the use of collateral.

Dependent variable is the collateral loan ratio								
	Simultaneous equation system				Fixed-effects			
	1	2	3	4	5	6	7	8
Family	0.10***	0.10***			0.08**	0.07**		
	(3.16)	(2.13)			(2.52)	(2.30)		
Family*wedge		0.09***				0.06**		
		(3.39)				(2.42)		
Family*cash-flow rights		−0.01**				−0.39***		
		(−2.34)				(−3.68)		
Family_CEO			0.07**				0.02**	
			(2.22)				(2.51)	
Descendant_CEO				0.12**				0.29***
				(2.15)				(4.70)
Wedge	0.24**	0.29**	0.17**	0.02**	0.06**	0.05**	0.13	0.17**
	(2.29)	(2.45)	(2.11)	(2.27)	(2.12)	(2.15)	(1.30)	(2.41)
Cash flow rights	−0.04**	−0.05**	−0.02**	−0.08**	−0.12*	−0.22**	−0.07**	−0.17**
	(−2.08)	(−2.31)	(−2.37)	(−2.41)	(−1.85)	(−2.01)	(−1.96)	(−2.53)
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	No	No	No	No
Region fixed effect	Yes	Yes	Yes	Yes	No	No	No	No
Sum tests (*F*-values)		9.95***				4.82**		
Adjusted R^2	0.36	0.36	0.39	0.42	0.17	0.17	0.13	0.14
No. of firms	612	612	447	404	612	612	447	404
Observations	1855	1855	1336	798	1855	1855	1336	798

This table reports the estimation results of the collateral equation using a simultaneous equation system and a fixed-effects model. Control variables from Eq. (1) are included in each regression. Definitions of all variables are as in the Appendix. Sum tests report the significance of the sum of the coefficients between *Family*Wedge* and *Wedge*. Columns 1, 2, 5 and 6 use the full sample. Columns 3 and 7 use the family firm sample and columns 4 and 8 use the sample of firms with family representation in management.
T-statistics are in parentheses, computed using the Roger (1993) robust standard error clustered at the firm level.
*, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

group of people (or co-founders), 19 by a financial institution. There are also 11 widely held non-family firms.

Panel D reports the prevalence of founders and descendants in the positions of chairman or CEO for family firms. Among 447 family firms, there are 401 firms in which the founder acts as the chairman of the board, among which 177 firms also have the founder as the CEO, 24 have a descendant as the CEO and 200 have a professional CEO. We also observe that there are three firms where a descendant acts as the chairman.

4.2. Family control and the use of collateral

To provide some preliminary evidence on our main hypothesis, we present univariate difference tests of key variables between family firms and non-family firms in Table 3. The results show that the collateral loan ratio, control-ownership wedge and cash flow rights are significantly higher in family firms than in non-family firms by 7.42%, 0.58% and 12.71%, respectively. We also observe that family firms pay lower dividends and are less likely to have multiple shareholders. We further find that *Beta* is significantly higher for family firms, indicating that family firms have a higher risk level.

We next conduct a multivariate analysis and report the results of the collateral equation in Table 4.[17] As can be seen, the results using both the simultaneous equation system and the firm fixed-effects model are quantitatively similar. In column 1, the estimated coefficient on *Family* is 0.10 and significant at the 1% level (*t*-value is 3.16), indicating that family firms use more collateral. This result supports our hypothesis H1a and is consistent with the expropriation view (Ellul et al., 2007; Boubakri and Ghouma, 2010). In column 2, we find that the estimated coefficients on *Wedge* and *Family*Wedge* are 0.29 and 0.09, both significant at the 5% and 1% levels (*t*-values are 2.45 and 3.39, respectively), indicating that the use of collateral is higher for family firms with a larger control-ownership wedge, which further supports our hypothesis H1a. The sum test confirms the significance of the sum of the coefficients between these two variables. In particular, the coefficient of *Wedge* for family firms is 0.38 (0.29 + 0.09), which implies that a one-standard-deviation increase in *Wedge* creates a 9.7% increase in collateral loan ratio for family firms.[18]

Column 3 reports the results using the family firm sample. We observe a positive coefficient on *Family_CEO*, which is 0.07, statistically significant at the 5% level (*t*-value is 2.22). This result is consistent with H1b and corroborates the findings by Yen et al. (2015). Column 4 focuses on firms with family representation in management. We find that the estimated coefficient on *Descendant_CEO* is 0.12 and statistically significant at the 5% level (*t*-value is 2.15), which supports H1c and is consistent with Bertrand et al. (2008), who find that successors are more aggressive in extracting private benefits through expropriation.

Consistent with the view of the incentive effect of cash flow ownership (Claessens et al., 2002), we observe that cash flow rights can reduce the use of collateral, and this effect is more pronounced in family firms, reflected by the significantly negative coefficient on *Family*Cash-flow rights*. Nevertheless, after controlling for the incentive effect of cash flow rights, our main finding is still economically significant.

Table 5 reports the results using system GMM, and it is noted that the number of observations is reduced, as the lagged dependent variable is included as an explanatory variable in the collateral equation. As shown in the table, we conduct both Hansen over-identification and the difference-in-Hansen tests and report the *J*-statistics (*p*-values). These *J*-statistics follow the Chi-square

[17] The estimates of the other equations of the simultaneous equation system are available on request.

[18] We also repeat the regression analysis using the sample of firms with the presence of blockholders, and the results are quite similar to our full sample estimation, which further supports H1a.

Table 5
The effect of family control on the use of collateral: System GMM estimation.

	1	2	3	4
Family	0.07**(2.04)	0.07**(2.37)		
Family*wedge		0.08**(2.20)		
Family_CEO			0.05**(2.30)	
Descendant_CEO				0.04***(2.66)
Wedge	0.14**(2.01)	0.15**(2.42)	0.08**(2.14)	0.04**(2.51)
Lagged dependent variable	0.46***(3.98)	0.46***(3.88)	0.14**(2.28)	0.16***(3.28)
Hansen test (*p*-value)	0.79	0.72	0.67	0.67
Diff-in-Hansen test (*p*-value)	0.31	0.29	0.28	0.20
AR (1) (*p*-value)	0.00	0.00	0.00	0.01
AR (2) (*p*-value)	0.76	0.70	0.58	0.87
Sum tests (*F*-value)		4.10**		
No. of firms	495	495	384	271
Observations	1389	1389	1001	596

This table reports the estimation results of the collateral equation using the system GMM. Control variables from the collateral equation are also included in each regression. Definitions of all variables are as in the Appendix. Sum tests report the significance of the sum of the coefficients between *Family*∗*Wedge* and *Wedge*.
Columns 1 and 2 use the full sample. Column 3 uses the family firm sample and column 4 uses the sample of firms with family representation in management.
T-statistics are in parentheses, computed using the two-step robust, firm-clustered standard errors by incorporating the Windmeijer (2005) small-sample correction.
, and * indicate significance at the 5% and 1% levels, respectively.

Table 6
The effect of family control on the use of collateral: Change regression estimation.

	1	2	3	4	5	6
NF_F	0.10**	0.05**				
	(2.20)	(2.12)				
NF_F*ΔWedge		0.06**				
		(2.20)				
F_NF			−0.10**	−0.09**		
			(−2.08)	(−2.44)		
F_NF*ΔWedge				−0.01		
				(−0.32)		
NFC_FC					0.09**	
					(1.97)	
FC_NFC						−0.05
						(−1.33)
ΔWedge	0.05	0.04	0.15	0.15	0.05	0.15
	(0.38)	(0.35)	(1.07)	(1.07)	(0.15)	(0.39)
Sum tests (*F*-value)		4.71**		0.47		
Adjusted R^2	0.15	0.17	0.17	0.19	0.18	0.15
No. of firms	473	473	473	473	369	369
Observations	1077	1077	1077	1077	803	803

This table reports the change regression results. Control variables from the collateral equation are also included in each regression. All variables are defined as in the Appendix and measured in change in the regressions. Sum tests report the significance of the sum of the coefficients between *NF_F (F_NF)*ΔWedge* and *ΔWedge*.
Columns 1–4 use the full sample. Columns 5 and 6 use the family firm sample.
T-statistics are in parentheses, computed using the Roger (1993) robust standard error clustered at the firm level.
** indicates significance at the 5% level.

(χ^2) distribution under the null hypothesis that the instruments we use are exogenous. Table 5 shows that *p*-values are all larger than 0.1, indicating that we cannot reject the null hypothesis and the instruments we use are exogenous. Moreover, AR (1) test results suggest that we can reject the null hypothesis of no first-order serial correlation, and AR (2) test results indicate that residuals are not correlated in the second differences. These tests indicate the validity of our system GMM method.

We next examine the effect of the change in family control on the change in the use of collateral. Focusing on changes accounts for time-invariant or omitted firm-specific characteristics that might affect both family control and the use of collateral. Table 6 reports results of the change regression, and we need a firm with at least two firm-year observations in the sample for this analysis. In the equation, *NF_F* equals 1 if a non-family firm changes to a family firm and *F_NF* equals 1 if a family firm changes to a non-family firm. Similarly, *NFC_FC* equals 1 if a firm without family management changes to a family-managed firm, and *FC_NFC* equals 1 if a family-managed firm changes to a firm without family management. The results in columns 1 and 3 indicate that for a given firm, ownership transfer from non-family (family) to family (non-family) is associated with an increase (decrease) in the use of collateral, which is consistent with our hypothesis H1a that the use of collateral is higher for family firms. The interaction term from column 2 provides further supportive evidence that an increase in controlling families' control-ownership wedge relates to a greater use of collateral. In column 5, we also find that if a family member enters the top management team, the use of collateral becomes higher, which supports our hypothesis H1b. Overall, the results from Table 6 further confirm the findings from the previous regression analyses and support our main hypotheses.

4.3. Mechanisms influencing the effect of family control on the use of collateral

In this section, we provide the empirical results in Table 7 to test H2 by including an interaction term between each factor (multiple large shareholders, dividend payment, market reform and market competition) and *Family* in the collateral equation, and as in Table 4, we report the estimation results using the simultaneous equation system in the first four columns and the fixed-effects model in the last four columns. Overall, the estimation results using both the simultaneous equation system and the fixed-effects model are qualitatively similar. Columns 1, 2, 5 and 6 focus on the full sample, and columns 3, 4, 7 and 8 on the subsamples with and without the presence of excess control rights, in order to address the concern that excess control rights may drive the results.

In column 2, the estimated coefficients on the interactions between these factors and *Family*, which are our main concern, are all negative and statistically significant, indicating that these factors are effective in weakening the positive relationship between family control and the use of collateral. As shown in Panel A, the coefficient on *MLS*Family* is −0.07 and significant at the 5% level (*t*-value is −2.36), indicating that the family-collateral relationship becomes weaker for firms with the presence of multiple large shareholders. This result is consistent with the view of Laeven and Levine (2008). In Panel B, the coefficient on *Dividend*Family* is −0.13 (*t*-value is −2.70), indicating that a one-standard-deviation increase in dividend payment is associated

Table 7
The effect of multiple large shareholders, dividend payment, reform and market competition on expropriation incentives.

Dependent variable is collateral loan ratio								
	Simultaneous equation system				Fixed-effects			
	1	2	3	4	5	6	7	8
Panel A: multiple large shareholder effect on family control and the use of collateral relationship								
Family	0.10***	0.10***	0.16***	0.09	0.11**	0.10**	0.10**	0.04
	(3.19)	(2.62)	(2.76)	(1.55)	(2.26)	(2.46)	(2.06)	(0.70)
MLS	−0.07**	−0.06*	−0.07**	−0.06	−0.05**	−0.04*	−0.04**	−0.04
	(−2.45)	(−1.91)	(−2.14)	(−0.59)	(−2.48)	(−1.79)	(−2.56)	(−0.76)
MLS*Family		−0.07**	−0.18**	0.06		−0.03*	−0.04**	−0.04
		(−2.36)	(−2.24)	(1.22)		(−1.68)	(−2.47)	(−0.68)
Wedge	0.06**	0.07**			0.01*	0.02***		
	(2.15)	(2.22)			(1.73)	(2.61)		
Wedge*Family		0.08**				0.01**		
		(2.00)				(2.39)		
Sum tests (*F*-values)		4.55**[a]	5.63**[a]	1.64[a]		4.09**[a]	4.85**[a]	0.04[a]
		7.23***[b]				6.40**[b]		
Adjusted R^2	0.36	0.35	0.36	0.43	0.16	0.18	0.19	0.16
No. of firms	612	612	425	187	612	612	425	187
Obs	1855	1855	1285	570	1855	1855	1285	570
Panel B: dividend effect on family control and the use of collateral relationship								
Family	0.10**	0.07**	0.15***	0.06	0.12**	0.09**	0.22***	0.04
	(2.87)	(2.15)	(2.00)	(0.91)	(2.19)	(2.43)	(2.59)	(0.61)
Dividend	−0.08***	−0.07**	−0.05**	−0.13**	−0.50**	−0.40*	−0.70**	−0.27
	(−2.73)	(−2.41)	(−2.49)	(−2.31)	(−2.51)	(−1.89)	(−2.42)	(−0.99)
Dividend*Family		−0.13***	−0.25**	−0.09		−0.35**	−0.41**	−0.24
		(−2.70)	(−2.28)	(−0.82)		(−2.16)	(−2.48)	(−1.33)
Wedge	0.08**	0.08**			0.01**	0.02***		
	(2.40)	(2.14)			(2.48)	(2.59)		
Wedge*Family		0.09**				0.01**		
		(2.02)				(2.33)		
Sum tests (*F*-values)		5.62**[a]	4.95**[a]	1.06 [a]		4.81**[a]	4.20**[a]	1.20 [a]
		8.02***[b]				5.52**[b]		
Adjusted R^2	0.35	0.37	0.35	0.44	0.16	0.19	0.14	0.20
No. of firms	599	599	419	180	599	599	419	180
Obs	1788	1788	1220	568	1788	1788	1220	568
Panel C: split-share structure reform effect on family control and the use of collateral relationship								
Family	0.10**	0.08**	0.17**	0.02*	0.11**	0.09**	0.13**	0.05
	(2.16)	(1.98)	(2.68)	(1.71)	(2.26)	(2.45)	(2.17)	(0.80)
Reform	−0.04***	−0.02**	−0.05**	−0.06*	−0.02***	−0.01**	−0.03*	−0.04
	(−2.85)	(−2.08)	(−2.05)	(−1.81)	(−2.75)	(−2.53)	(−1.88)	(−1.23)
Reform*Family		−0.05**	−0.02**	−0.07		−0.02**	−0.03**	−0.02
		(−2.34)	(−2.09)	(−1.40)		(−2.07)	(−2.01)	(−0.56)
Wedge	0.07**	0.08**			0.05**	0.02**		
	(2.29)	(2.03)			(2.53)	(2.46)		
Wedge*Family		0.08***				0.01**		
		(2.95)				(2.31)		
Sum tests (*F*-values)		6.30**[a]	6.00**[a]	2.38[a]		5.85**[a]	5.75**[a]	2.15[a]
		9.00***[b]				8.19***[b]		
Adjusted R^2	0.35	0.35	0.34		0.43	0.15	0.19	0.18
No. of firms	612	612	425	187	612	612	425	187
Obs	1752	1752	1205	547	1752	1752	1205	547
Panel D: market competition effect on family control and the use of collateral relationship								
Family	0.10***	0.09**	0.08**	0.11	0.11**	0.08***	0.14**	0.09
	(2.87)	(2.47)	(2.46)	(0.57)	(2.08)	(2.59)	(2.22)	(1.23)
Market	−0.11***	−0.10**	−0.10	−0.02**	−0.10***	−0.05**	−0.12	−0.04**
	(−3.02)	(−2.20)	(−1.36)	(−2.39)	(−4.17)	(−1.98)	(−1.32)	(−2.45)
Market*Family		−0.09**	−0.09**	−0.07		−0.06**	−0.08***	−0.05
		(−2.53)	(−2.42)	(−0.26)		(−2.04)	(−2.70)	(−1.00)
Wedge	0.06**	0.07**			0.05**	0.02**		
	(2.01)	(2.13)			(2.45)	(2.44)		
Wedge*Family		0.08**				0.01**		
		(2.23)				(2.32)		
Sum tests (*F*-values)		6.09**[a]	4.18**[a]	1.13[a]		7.65***[a]	3.92**[a]	1.19[a]
		5.75**[b]				6.11**[b]		
Adjusted R^2	0.37	0.38	0.35	0.45	0.16	0.15	0.13	0.22
No. of firms	612	612	425	187	612	612	425	187
Obs	1855	1855	1285	570	1855	1855	1285	570

This table reports the estimation results of the collateral equation using a simultaneous equation system and a fixed-effects model. Control variables from the collateral equation are also included in each regression. Definitions of all variables are as in the Appendix.
Columns 1, 2, 5 and 6 use the full sample. Columns 3, 4, 7 and 8 use the samples with and without control-ownership wedge.
T-statistics are in parentheses, computed using the Roger (1993) robust standard error clustered at the firm level.
*, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.
[a] Reports the significance of the sum of the coefficients between *Factor* and *Factor*Family* in each regression.
[b] Reports the significance of the sum of the coefficients between *Wedge* and *Wedge*Family* in each regression.

Table 8
Regression results based on financial constraints and limited access to non-collateral loans.

Dependent variable is collateral loan ratio						
	Simultaneous equation system			Fixed-effects		
	1	2	3	4	5	6
Family	0.10***	0.10**	0.11**	0.09**	0.10**	0.10**
	(2.81)	(2.55)	(2.06)	(2.31)	(2.56)	(2.04)
Family*Financial constraints	−0.07			0.01		
	(−0.50)			(0.37)		
Financial constraints	−0.02			−0.03		
	(−1.09)			(−0.96)		
Family*Limited access to non-collateral loan		0.08			0.09	
		(0.69)			(0.06)	
Limited access to non-collateral loan		0.11***			0.10***	
		(2.51)			(3.19)	
Family*Limited access to guaranteed loan			0.02			0.09
			(0.52)			(0.51)
Limited access to guaranteed loan			0.10***			0.05***
			(2.67)			(2.62)
Sum tests (*F*-values)	5.39**	3.92**	4.22**	5.03**	9.53***	4.58**
Adjusted R^2	0.37	0.37	0.37	0.16	0.18	0.16
No. of firms	612	612	612	612	612	612
Observations	1855	1855	1855	1855	1855	1855

This table reports the estimation results of the collateral equation using a simultaneous equation system and a fixed-effects model based on financial constraints and limited access to non-collateral loans/guaranteed loans. *Financial constraints* equals 1 if a firm is defined as financially constrained (Almeida et al., 2004). *Limited access to non-collateral loan* equals 1 if a firm has limited access to non-collateral loans. *Limited access to guaranteed loan* equals 1 if a firm has limited access to guaranteed loans. Control variables from the collateral equation are also included in each regression and the variable definitions are the same as in the Appendix. Sum tests report the significance of the sum of the coefficients between *Family* and *Family*Financial constraints (Limited access to non-collateral loan, Limited access to guaranteed loan)* in each regression.
T-statistics are in parentheses, computed using the Roger (1993) robust standard error clustered at the firm level.
** and *** indicate significance at the 5%, and 1% levels, respectively.

with a 5.8% reduction of the collateral loan ratio in family firms.[19] This result supports the view that dividend payment is able to remove the capital available for controlling shareholders (Pindado et al., 2012).

In Panel C, we use the difference-in-difference method to capture the effect of family control on the use of collateral after the completion of the split-share structure reform.[20] As can be seen in column 2, the coefficient of *Reform*family* is negative and significant, indicating that the family-collateral relationship becomes weaker after the reform. This result is consistent with the view that divergence between controlling shareholders and minority shareholders was mitigated after the reform (Li et al., 2011). Finally, Panel D shows evidence that market competition is effective in weakening the positive relationship between family control and the use of collateral, reflected by the significantly negative coefficient on *Market*Family*.[21] This result corroborates theoretical arguments by Hainz et al. (2013) and empirical evidence in China by Chen et al. (2013). Overall, the results from Table 7 offer supportive evidence for our hypothesis H2.

4.4. Additional analysis and evidence

This section presents some additional analyses to support our main arguments. The first analysis is conducted to rule out some alternative explanations, and the second analysis is to provide direct evidence that family control is associated with severe expropriation.

4.4.1. Alternative explanations

There are alternative explanations which indicate that our main findings are driven by the fact that family firms are usually financially constrained or have limited access to non-collateral loans, especially guaranteed loans.[22] If this is the case, we would observe that the positive relationship between family control and the use of collateral is stronger for firms having financial constraints or limited access to non-collateral loans/guaranteed loans. To address these concerns, we conduct three sets of regression analysis. First, following Almeida et al. (2004), in each year we rank firms based on their dividend payout ratio and define a firm as financially constrained as when a firm's dividend payout ratio is within the bottom three deciles. Second, a firm is defined as having limited access to non-collateralized loans if the firm's non-collateral loan ratio is below the median level of the industry in which the firm operates for a given year. Third, a firm is defined as having limited access to guaranteed loans if the firm's guaranteed loan ratio is below the median level of the industry in which the firm operates for a given year. Then, we re-estimate the collateral equation by including interaction terms between *Family* and indicators for financial constraints and limited access to non-collateral loans/guaranteed loans. From the results reported in Table 8, we observe that estimated coefficients on *Family* are positive and statistically significant for all specifications, and the significant sum tests indicate that the influence of family control holds for all groups of firms. We also find that the interaction terms are insignificant, indicating that the effect of family control on the use of collateral does not differ significantly between the two groups of firms in each column. These results suggest that whether firms are financially constrained or have limited access to non-collateral loans/guaranteed loans does not affect our main findings.[23]

[19] The full sample size for dividend analysis reduces to 1,788, due to the missing information on variable dividend. Moreover, our main results in Panel B are robust to alternative measurements of dividend payment, including dividend/earnings ratio and dividend/cash flow ratio, following Faccio et al. (2001) and Brockman and Unlu (2009).

[20] The full sample size for market reform analysis reduces to 1,752, as we use the two-year lock-up as the post-reform period.

[21] We construct a Herfindahl index to indicate the level of market competition, and create a dummy variable, *Market*, for empirical analysis. The construction and interpretation of the Herfindahl index can be found in the online version of this article.

[22] We thank the referee for pointing out these issues.

[23] In unreported results, we also use the KZ index (Lamont et al., 2001) and WW index (Whited and Wu, 2006) as the alternative proxies for financial constraint status, and our main findings still hold. In addition, we have also repeated the estimation for firms with the presence of blockholders, for family firms and for firms with family management, and our main results do not vary significantly across subsamples.

Table 9
The effect of family control on the use of collateral based on bank types.

	Simultaneous equation system	Fixed-effects
Panel A: dependent variable is the collateral loan ratio		
Family (α_1)	0.10***(3.65)	0.14***(4.74)
Family*Government bank (α_2)	−0.06(−1.05)	−0.13(−1.01)
Family*Joint-equity bank (α_3)	0.13(0.72)	−0.05(−1.15)
Family*City commercial bank (α_4)	−0.06(−1.33)	−0.07(−1.22)
Government bank	0.07(1.45)	0.18(1.60)
Joint-equity bank	−0.02(−0.50)	0.03(0.74)
City commercial bank	0.03(0.61)	0.08(1.40)
Adjusted R^2	0.30	0.17
No. of firms	612	612
Observations	4291	4291
Panel B: sum tests (F-values)		
	$\alpha_1 + \alpha_2$: 4.11**	5.70**
	$\alpha_1 + \alpha_3$: 5.53**	4.49**
	$\alpha_1 + \alpha_4$: 4.78**	3.63**
Panel C: difference tests (F-value)		
	$\alpha_2 - \alpha_3$: 0.00	0.55
	$\alpha_2 - \alpha_4$: 1.86	1.07
	$\alpha_3 - \alpha_4$: 1.40	0.06

This table reports the estimation results of the collateral equation using a simultaneous equation system and a fixed-effects model based on bank types. Control variables from the collateral equation are also included in each regression. The definitions of these variables are the same as in the Appendix.
T-statistics are in parentheses, computed using the Roger (1993) robust standard error clustered at the firm level.
, and * indicate significance at the 5% and 1% levels, respectively.

Our main findings could also be explained by the fact that some banks may specialize in family firms for collateral loans. In other words, they may depend on the heterogeneity of bank ownership. To address this issue, we re-estimate our regressions by dividing bank loans into loans from government-owned banks, joint-equity banks, city commercial banks and non-state-owned banks. As we identify four types of bank loans, in each year, a firm may have up to four observations of bank loans (if this firm receives loans from all four types of banks). For this reason, our sample size increases to 4291 observations. The results in Panel A of Table 9 show that the *Family* coefficient and sum tests in Panel B are all significant, indicating that the effects of family control are significant for loans from all types of banks. In addition, the insignificant coefficients of interaction terms (Panel A) and insignificant difference tests (Panel C) indicate that the effects of family control do not differ significantly across these groups. These results indicate that our main findings hold for all bank types and the heterogeneity of bank ownership does not affect our findings.

4.4.2. Family control and expropriation

In this section, we provide direct evidence that family control is associated with severe expropriation. We apply related party transactions (RPTs), the connected transactions between firms and related parties, as the proxy for potential expropriation (Cheung et al., 2006). We include an interaction term between family control and RPTs in the collateral equation, and the RPTs equation is expressed as follows:

$$RPTs_{it} = \alpha_0 + \alpha_1 Family_{it} + \alpha_2 Wedge_{it} + \alpha_3 Size_{it} + \alpha_4 Lev_{it} + \alpha_5 Board_{it} + \alpha_6 Indep_{it} + \alpha_7 Largest_{it} + \alpha_8 Duality_{it} + \varepsilon_{it} \quad (6)$$

where *RPTs* is related party transactions. We also include control variables, consistent with Berkman et al. (2011).

Results in Panel A of Table 10 show that the interactions between *RPTs* and family control proxies are positive, indicating that RPTs enhance the relationship between family control and the use of collateral. In particular, in column 1, a one-standard-deviation increase in RPTs creates 3.7% more increase in the collateral loan ratio in family firms.

Our results that RPTs increase the use of collateral may suggest that detrimental RPTs dominate beneficial RPTs. Following the existing literature (Cheung et al., 2006; Berkman et al., 2011), we further split total RPTs into beneficial RPTs (*BRPTs*) and detrimental RPTs (*DRPTs*) and re-estimate the regressions. Beneficial RPTs promprise those transactions that are beneficial for firms when they receive cash, loans or guarantees from the related parties, and all remaining transactions are categorized as detrimental RPTs which may tunnel firms. The results in Panel B show that only *DRPTs* matter for expropriation and enhance the relationship between family control and the use of collateral, while the effect of *BRPTs* is less significant.

4.5. Robustness tests

This section presents various robustness tests. The first applies the bank loan dataset, and the second examines the market reaction to bank loan announcements. Finally, we also include some other robustness tests.

4.5.1. Bank loan level analysis

In order to control for the unobserved heterogeneity existing at bank level, we conduct a multivariate analysis using bank loan level data. From the initial 491 bank loan announcements that we collected from the CSMAR database, we delete 22 announcements with missing information on whether collateral is pledged, which leaves a total of 469 observations for this analysis. However, since we are not able to obtain the value of the pledged collateral, we redefine our dependent variable, *Collateral*, as a dummy variable equal to 1 if the bank loan is granted by pledging collateral and 0 otherwise. We then estimate the collateral equation using a Logit model estimated with the fixed-effects technique by including bank dummies in order to properly control for unobserved heterogeneity at the bank level. The results reported in Table 11 show that the use of collateral is higher for family firms which have a larger control-ownership wedge, family representation in management and are led by a descendant chairman/CEO. Overall, the results based on the bank loan level data are broadly similar

Table 10
The effect of related party transactions on the relationship between family control and the use of collateral.

Dependent variable is collateral loan ratio						
	Simultaneous equation system			Fixed-effects		
	1	2	3	4	5	6
Panel A: total RPTs evidence						
Family	0.10***			0.09***		
	(3.07)			(2.86)		
Family*RPTs	0.13**			0.03**		
	(1.98)			(2.19)		
Family_CEO		0.07**			0.05**	
		(2.18)			(2.41)	
Family_CEO*RPTs		0.07*			0.02*	
		(1.68)			(2.26)	
Descendant_CEO			0.12**			0.08**
			(2.22)			(2.55)
Descendant_CEO*RPTs			0.05			0.02
			(1.49)			(1.20)
RPTs	0.13**	0.07**	0.06	0.03**	0.02**	0.01
	(2.37)	(2.14)	(0.63)	(2.21)	(2.25)	(0.10)
Sum tests (*F*-values)	4.88**	4.05**	2.07	5.00**	4.01**	2.03
Adjusted R^2	0.36	0.38	0.42	0.14	0.16	0.22
No. of firms	612	447	404	612	447	404
Observations	1855	1336	798	1855	1336	798
Panel B: beneficial RPTs and detrimental RPTs evidence						
Family	0.10***			0.09***		
	(2.60)			(2.93)		
Family*BRPTs	−0.15*			−0.05*		
	(−1.75)			(−2.03)		
Family*DRPTs	0.08**			0.06**		
	(2.11)			(1.69)		
Family_CEO		0.06**			0.05**	
		(2.39)			(2.40)	
Family_CEO*BRPTs		−0.03			−0.09	
		(−0.76)			(−0.40)	
Family_CEO*DRPTs		0.07***			0.06***	
		(2.85)			(2.16)	
Descendant_CEO			0.12**			0.15**
			(2.47)			(2.58)
Descendant_CEO*BRPTs			−0.01			−0.03
			(−0.39)			(−0.59)
Descendant_CEO*DRPTs			0.02**			0.03**
			(2.24)			(2.51)
BRPTs	−0.10**	−0.05	−0.08	−0.02**	−0.02	−0.01
	(−2.52)	(−0.64)	(−1.31)	(−2.11)	(−0.18)	(−0.57)
NRPTs	0.08	0.03*	0.02	0.06	0.03*	0.03
	(0.11)	(1.66)	(0.31)	(1.68)	(1.69)	(0.55)
Sum tests (*F*-values)	2.76*	1.63	2.37	3.13*	1.23	0.37
	3.12*	4.99**	3.96**	3.09*	4.12**	4.27**
Adjusted R^2	0.35	0.35	0.48	0.19	0.19	0.17
No. of firms	612	447	404	612	447	404
Observations	1855	1336	798	1855	1336	798

This table reports the estimation results of the collateral equation using a simultaneous equation system and a fixed-effects model by considering related party transactions. Control variables from the collateral equation are also included in each regression. Definitions of all the other variables are the same as in the Appendix.
In Panel A, sum tests report the significance of the sum of the coefficients between *RPTs* and *RPTs**Family control proxies. In Panel B, first row sum tests report the significance of the sum of the coefficients between *BRPTs and BRPTs**Family control proxies, and second row sum tests report the significance of the sum of the coefficients between *NRPTs and NRPTs**Family control proxies. Family control proxies include *Family*, *Family_CEO* and *Descendant_CEO*.
Columns 1 and 4 use the full sample. Columns 2 and 5 use the family firm sample and columns 3 and 6 use the sample of firms with family representation in management. *T*-statistics are in parentheses, computed using the Roger (1993) robust standard error clustered at the firm level.
*, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

to our results in Table 4 and support our main hypotheses that in China, with weak protection for investors, family control leads to more expropriation of outside investors, which is associated with higher credit concerns and more collateral use.

4.5.2. Market reaction to bank loan announcements

If family control is associated with severe expropriation, investors will discount the value of bank loans granted to family firms (Huang et al., 2012). We thus examine the market reaction to provide further evidence. The market reaction is measured by the market-adjusted cumulative abnormal returns (CARs) around the bank loan announcements, using the market-adjusted excess return model. We choose two days in the event window (i.e., 0, +1), and 230 days as the estimation window (i.e., −240, −10).

From the initial 491 bank loan announcements, we delete 69 announcements with missing trading information (from 240 days before the bank loan announcements). We further exclude 71 announcements[24] surrounded by other announcements during our estimation and event window to ensure that our sample is not contaminated by other major events. Finally, we have 351 bank loan

[24] These 71 excluded announcements include split-share reform (33), turnover of chairman or CEO (13), structural change of management team (5), dividend announcement (13) and announcements of mergers and acquisitions (7).

Table 11
The effect of family control on the use of collateral: Bank loan level evidence.

Dependent variable is a dummy variable equal to 1 if the loan is secured by collateral and 0 otherwise				
	1	2	3	4
Family	0.59**(2.24)	0.62**(2.32)		
Family*Wedge		0.86***(4.04)		
Family_CEO			1.09**(2.08)	
Descendant_CEO				2.16**(2.22)
Wedge	0.97**(2.55)	0.85**(2.29)	0.95***(2.65)	0.65**(2.49)
Sum tests (*F*-value)		4.69**		
Pseudo R^2	0.26	0.27	0.43	0.42
Observations	469	469	287	173

This table reports the estimation results (odd ratios and *z*-values in brackets) using the bank loan level data. The dependent variable is the use of collateral, which is redefined as a dummy variable equal to 1 if the bank loan is granted by pledging collateral and 0 otherwise. Control variables from the collateral equation are also included in each regression. We also include bank dummies to control for bank fixed effects. Definitions of all variables are the same as in the Appendix. Sum tests report the significance of the sum of the coefficients between *Family*Wedge* and *Wedge*.
Columns 1 and 2 use the full sample. Column 3 uses the family firm sample and column 4 uses the sample of firms with family representation in management.
Z-statistics are in parentheses, computed using the Roger (1993) robust standard error clustered at the firm level.
, and * indicate significance at the 5% and 1% levels, respectively.

Table 12
The effects of family control on market reaction to bank loan announcements.

Dependent variable	CARs (0, +1) around bank loan announcements			
	1	2	3	4
Family	−0.007*(−1.75)	−0.002(−1.05)		
Family*Wedge		−0.008**(−2.76)		
Family_CEO			−0.013(−1.38)	
Descendant_CEO				−0.009**(−2.25)
Wedge	−0.006***(−2.12)	−0.004**(−2.51)	−0.002**(−2.32)	−0.001***(−3.19)
Sum tests (*F*-values)		6.23**		
Adjusted R^2	0.13	0.14	0.23	0.23
Observations	351	351	258	145

This table reports the estimation results of the market reaction to bank loan announcements. The dependent variable is the two-day CARs around bank loan announcements. Control variables from the collateral equation are also included in each regression. Definitions of these variables are the same as in the Appendix. Sum tests report the significance of the sum of the coefficients between *Family*Wedge* and *Wedge*.
Columns 1 and 2 use the full sample. Column 3 uses the family firm sample and column 4 uses the sample of firms with family representation in management.
T-statistics are in parentheses, computed using the Roger (1993) robust standard error clustered at the firm level. *, **, and *** indicate the significance levels at 10%, 5% and 1%, respectively.

announcements, and 351 matching CARs observations for our analysis. We regress two-day CARs against family control and a set of control variables and report the results in Table 12. The results show that our key variables all have negative coefficients, suggesting that the abnormal return is significantly lower for family firms associated with a severe risk of expropriation. These results indicate that investors usually treat bank loan announcements as potential expropriations if the firm is controlled by families with a larger control-ownership wedge (Huang et al., 2012), which supports our main hypotheses.

4.5.3. Other robustness tests

One concern is that our main findings may not hold for some particular types of blockholders. Consequently, we compare the use of collateral between family firms and non-family firms owned by particular types of blockholders, including collective organizations, co-founders, and financial institutions. To conduct the empirical analysis, we add two dummy variables, *Collective* and *Group*, which represent firms controlled by collective organizations and by co-founders, to the collateral equation. We re-estimate this equation for the sample of firms with the presence of blockholders. The results show that the *Family* coefficient is significantly positive, indicating that the use of collateral is significantly higher for family firms compared with any other type of non-family firms.[25] The insignificant coefficients of *Collective* and *Group* indicate that the use of collateral is not significantly different among other types of non-family firms. We also conduct the difference tests of coefficients to validate our findings.

Another concern is that when creditors observe that potential borrowers are involved in more expropriations and have a higher credit risk, they may request borrowers to secure tangible assets on their loans (through mortgage loans) rather than intangible assets (through pledged loans) because the market value of tangible assets is more stable than intangible assets. Thus, we redefine the dependent variable, the use of collateral, as the ratio of mortgage loans to total bank loans, and rerun our regressions. The results show that the estimated coefficients on our key variables are quantitatively the same as reported in Table 4, indicating that our main findings still hold. Furthermore, when we use the pledged loan ratio as the dependent variable, coefficients of our key variables become insignificant, indicating that mortgaged loans contribute to our main findings, which is consistent with the argument by Chen et al. (2013)[26].

We further apply alternative measures of excess control rights for a robustness check. Consistent with Faccio et al. (2001), we use the ratio of control rights to cash flow rights as the proxy for excess control rights. Finally, following Amit et al. (2014), who treat family firms and entrepreneur (individual founder) firms

[25] The results of these robustness tests can be found in the online version of this article.

[26] The results of these robustness tests can be found in the online version of this article.

separately, we also check the robustness of our results by excluding individual-controlled firms from our family-controlled firm group. Our unreported results suggest that our main results are robust.

5. Conclusion

The objective of this study is to examine the financial and economic implications of family control on the use of collateral. We find that family control entails more collateral compared with non-family firms, and this difference is more pronounced when family firms face more severe conflicts of interest with banks, such as when family firms have a larger control-ownership wedge, family representation in management and are led by a descendant chairman/CEO. We further document that having multiple large shareholders, paying higher dividends, having completed the split-share structure reform and being located in provinces with more competitive credit markets, may mitigate the incentives of controlling families to expropriate other investors and reduce firms' use of collateral. Our results are robust to using alternative estimation methods, a bank loan level dataset, an analysis of the CARs and alternative measurements of family control and the use of collateral. As we do not have access to data on collateral value, we use the collateral loan ratio as a proxy for the collateral value. In this sense, we suggest that caution should be exercised when interpreting our results. We also acknowledge that our sample is taken from a short period, which means that our findings are limited in their generalization to other countries and markets. However, as our sample covers both normal times and a period of financial crisis, our findings can still be generalized to some extent.

Our findings complement the existing debate on family ownership. In countries with better creditor protection and institutional environments, controlling families as long-term investors are more concerned about survival, preserving reputation and building long-term relationships with creditors, in order to mitigate agency conflicts, so that they can benefit from lower costs of debt (Anderson et al., 2003; Ellul et al., 2007). However, we argue that in an emerging market like China, with weak legal protection for creditors and a poor institutional environment, concentrated family control leads to higher levels of expropriation and credit risks, and in turn a more severe agency problem with creditors. Our study reveals important implications for policy makers in emerging markets, namely that they should strengthen monitoring through external governance to constrain the incentives of controlling families to engage in expropriation and exert efforts to limit the divergence between control rights and cash flow rights in family firms. More importantly, policy makers should improve the institutional environment to strengthen the protection for property rights, so that family business succession is much more likely to proceed smoothly. In this environment, family firms will in turn take more care for their long-term survival and relationships with creditors, and ultimately mitigate the agency problem with creditors.

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Appendix A

Variable definitions

Variable name	Variable definition
Collateral	Collateral loans/total loans outstanding
Family	Dummy variable equal to 1 for family firms and 0 for non-family firms
Family_CEO	Dummy variable equal to 1 for family firms that have a member of the family as the chairman or CEO and 0 for family firms that hire a professional chairman and CEO
Descendant_CEO	Dummy variable equal to 1 for family firms where second or third generation of the founder acts as the chairman or CEO and 0 otherwise
Wedge	Divergence between control rights and cash flow rights of controlling shareholders
Cash-flow rights	The cash flow rights held by the controlling shareholders
MLS	Dummy variable equal to 1 if at least one of the large shareholders, except the largest shareholders, holds at least 10% of ownership and 0 otherwise
Dividend	Dividend payment/sales
Market	Dummy variable equal to 1 if a firm is located in a highly competitive credit market where the Herfindahl index of the province is higher than the median level, and equal to 0 for a less competitive credit market
Reform	Dummy variable equal to 1 for observations falling in the period after the split-share structure reform and 0 otherwise
RPTs	The sum of values of related party transactions scaled by firm total assets
BRPTs	The sum of values of beneficial related party transactions scaled by firm total assets
DRPTs	The sum of values of detrimental related party transactions scaled by firm total assets
Firm size (Size)	Natural log of firm total assets
Tangibility	Net property, plant and equipment/total assets
Sales growth (sales)	Growth rate of sales for each year
Guaranteed loans (Guaranteed)	Guaranteed loans/total debts
Return on assets (ROA)	Net income/total assets
Age_Est	Number of years since the firm was established
Age_List	Number of years since the firm was listed on the stock market

Appendix A (*continued*)

Variable name	Variable definition
Board size (Board)	Natural log of total number of directors on a firm's board
Independent director ratio (Indep)	Ratio of independent directors to total directors
Political connection (Political)	Dummy variable equal to 1 if a firm's CEO or chairman is a current or former government officer and 0 otherwise
Privatization	Dummy variable equal to 1 if a firm is privatized from a former SOE and 0 otherwise
Leverage (Lev)	Total debts/total assets
Long-term debt structure (LtDebt)	Long-term bank loans/total debts
Beta	Firm's beta value reflecting systematic risk
Cash-flow volatility (CFVol)	The volatility of cash flows for the previous three years
Stock return volatility (RetVol)	Standard deviation of firm monthly stock return for the previous three years
Interest rate (Interest)	Interest payment/total debts
Bankruptcy probability (Bankrupt)	Probability of bankruptcy
Crisis	Dummy variable equal to 1 for both 2008 and 2009, the post-crisis period, and 0 otherwise
Prime rate (Prime)	Prime lending rate set by the People's Bank of China
Largest	The ownership held by the largest shareholders
Duality	Dummy variable equal to 1 if the CEO is also the chairman
Cycle	Retained earnings/total equity
Cash	Cash/total assets
SHSE	Dummy variable equal to 1 if a firm is listed on Shanghai stock exchange and 0 otherwise

References

Allen, F., Qian, J., Qian, M., 2005. Law, finance and economic growth in China. Journal of Financial Economics 77 (1), 57–116.

Almeida, H., Campello, M., Weisbach, M.S., 2004. The cash flow sensitivity of cash. Journal of Finance 59, 1777–1804.

Amit, R., Ding, Y., Villalonga, B., Zhang, H., 2014. The role of institutional development in the prevalence and performance of entrepreneur and family-controlled firms. Working paper.

Anderson, R.C., Reeb, D.M., 2003. Founding-family ownership and firm performance: evidence from the S&P 500. The Journal of Finance 58 (3), 1301–1327.

Anderson, R.C., Mansi, S.A., Reeb, D.M., 2003. Founding family ownership and the agency cost of debt. Journal of Financial Economics 68, 263–285.

Atmaja, L., Tanewski, G., Skully, M., 2009. The role of dividends, debt and board structure in the governance of family controlled firms. Journal of Business, Finance and Accounting 36 (7), 863–898.

Bae, K.H., Goyal, V.K., 2009. Creditor rights, enforcement and bank loans. Journal of Finance 64 (2), 823–860.

Bennedsen, M., Wolfenzon, D., 2000. The balance of power in closely held corporations. Journal of Financial Economics 58, 113–139.

Bennedsen, M., Fan, J., Jian, M., Yeh, Y., 2015. The family business map: framework, selective survey, and evidence from Chinese family firm succession. Journal of Corporate Finance 33, 212–226.

Berkman, H., Cole, R.A., Fu, L.J., 2009. Expropriation through loan guarantees to related parties: evidence from China. Journal of Banking and Finance 33, 141–156.

Berkman, H., Cole, R.A., Fu, L.J., 2011. Political connections and minority-shareholder protection: evidence from securities-market regulation in China. Journal of Financial and Quantitative Analysis 45, 1391–1417.

Bertrand, M., Johnson, S., Samphantharak, K., Schoar, A., 2008. Mixing family with business: a study of Thai business groups and the families behind them. Journal of Financial Economics 88 (3), 466–498.

Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. Journal of Econometrics 87, 115–143.

Boubakri, N., Ghouma, H., 2010. Control/ownership structure, creditor rights protection, and the cost of debt financing: international evidence. Journal of Banking and Finance 34, 2481–2499.

Brandt, L., Li, H.B., 2003. Bank discrimination in transition economies: ideology, information, or incentives? Journal of Comparative Economics 31, 387–413.

Brockman, P., Unlu, E., 2009. Dividend policy, creditor rights and the agency costs of debt. Journal of Financial Economics 92, 276–299.

Cao, J., Cumming, D., Wang, X., 2015. One-child policy and family firms in China. Journal of Corporate Finance 33, 317–329.

Chen, D., Jian, M., Xu, M., 2009. Dividends for tunnelling in a regulated economy: the case of China. Pacific Basin Finance Journal 17 (2), 209–223.

Chen, J.P., Li, Z., Su, X., Sun, Z., 2011. Rent-seeking incentives, corporate political connections, and the control structure of private firms: Chinese evidence. Journal of Corporate Finance 17 (2), 229–243.

Chen, Q., Chen, X., Schipper, K., Xu, Y., Xue, J., 2012. The sensitivity of corporate cash holdings to corporate governance. Review of Financial Studies 25 (12), 3610–3644.

Chen, Z., Lobo, G.J., Wang, Y., Yu, L., 2013. Loan collateral and financial reporting conservatism: Chinese evidence. Journal of Banking and Finance 37, 4989–5006.

Cheung, Y., Rau, P.R., Stouraitis, A., 2006. Tunneling, propping, and expropriation: evidence from connected party transactions in Hong Kong. Journal of Financial Economics 82, 343–386.

Chung, W.C., Yuen, P.K., 2003. Management succession: a case for Chinese family-owned business. Management Decision 41 (7), 643–655.

Claessens, S., Djankov, S., Fan, J.P.H., Lang, L.H.P., 2002. Disentangling the incentive and entrenchment effects of large shareholdings. Journal of Finance 57, 2741–2771.

Cull, R., Xu, L., 2003. Who gets credit? The behaviour of bureaucrats and state banks in allocating credit to Chinese state-owned enterprises. Journal of Development Economics 71, 533–559.

DeAngelo, H., DeAngelo, L., Stulz, R., 2006. Dividend policy and the earned/contributed capital mix: a test of the lifecycle theory. Journal of Financial Economics 81 (2), 227–254.

Demsetz, H., Lehn, K., 1985. The structure of corporate ownership: causes and consequences. Journal of Political Economy 93, 1155–1177.

Denis, D., Osobov, I., 2008. Why do firms pay dividends? International evidence on the determinants of dividend policy. Journal of Financial Economics 89, 62–82.

Ellul, A., Guntay, L., Lel, U., 2007. External governance and debt agency costs of family firms. International Finance Discussion Paper.

Faccio, M., Lang, L.H.P., Young, L., 2001. Dividends and expropriation. American Economic Review 91 (1), 54–78.

Fan, J.P.H., Wong, T.J., Zhang, T., 2012. Founder succession and accounting properties. Contemporary Accounting Research 29 (1), 283–311.

Fan, J.P.H., Wong, T.J., Zhang, T., 2013. Institutions and organizational structure: the case of state-owned corporate pyramids. Journal of Law, Economics and Organization 29 (6), 1217–1252.

Firth, M., Lin, C., Wong, M.L., 2008. Leverage and investment under a state-owned bank lending environment: evidence from China. Journal of Corporate Finance 14, 642–653.

Franks, J., Mayer, C., Volpin, P., Wagner, H., 2012. The life cycle of family ownership: international evidence. Review of Financial Studies 25 (6), 1675–1712.

Hainz, C., Weill, L., Godlewski, C.J., 2013. Bank competition and collateral: theory and evidence. Journal of Financial Services Research 44 (2), 131–148.

Hainz, C., 2003. Bank competition and credit markets in transition economies. Journal of Comparative Economics 31 (2), 223–245.

Hermalin, B., Weisbach, M., 1991. The effects of board composition and direct incentives on firm performance. Financial Management 20 (4), 101–112.

Huang, W., Schwienbacher, A., Zhao, S., 2012. When bank loans are bad news: evidence from market reactions to loan announcements under the risk of expropriation. Journal of International Financial Market, Institutions and Money 22, 233–252.

Huyghebaert, N., Wang, L., 2012. Expropriation of minority investor in Chinese listed firms: The role of internal and external corporate governance mechanisms. Corporate Governance: An International Review 20 (3), 308–332.

Jian, M., Xu, M., 2012. Determinants of the guarantee circles: the case of Chinese listed firms. Pacific-Basin Finance Journal 20, 78–100.

Jimenez, G., Salas, V., Saurina, J., 2006. Determinants of collateral. Journal of Financial Economics 81, 255–281.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 1999. Corporate ownership around the world. Journal of Finance 54 (2), 471–517.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2000. Investor protection and corporate governance. Journal of Financial Economics 58, 3–27.

Laeven, L., Levine, R., 2008. Complex ownership structures and corporate valuations. Review of Financial Studies 21 (2), 579–604.

Lamont, O., Polk, C., Saa-Requejo, J., 2001. Financial constraints and stock returns. Review of Financial Studies 14 (2), 529–554.
Lee, E., Ho, K., 2010. China's New Enterprise Bankruptcy Law — a great leap forward, but just how far? International Insolvency Review 19, 145–177.
Li, J., Hsu, S., 2012. Shadow banking in China. Working paper.
Li, K., Wang, T., Cheung, Y.L., Jiang, P., 2011. Privatization and risk sharing: evidence from the split share structure reform in China. Review of Financial Studies 24, 2499–2525.
Lin, C., Ma, Y., Malatesta, P., Xuan, Y., 2011. Ownership structure and the cost of corporate borrowing. Journal of Financial Economics 100, 1–23.
Maug, E., 2001. Ownership structure and the life-cycle of the firm: a theory of the decision to go public. European Finance Review 5 (3), 167–200.
Menkhoff, L., Neuberger, D., Suwanaporn, C., 2006. Collateral-based lending in emerging markets: evidence from Thailand. Journal of Banking and Finance 30, 1–21.
Mo, P.L.L., Rui, O., Wu, X., 2015. Auditors' going concern reporting in the pre- and post-bankruptcy law eras: Chinese affiliates of big 4 versus local auditors. The International Journal of Accounting 50 (1), 1–30.
Pindado, J., Requejo, I., Torre, C., 2012. Do family firms use dividend policy as a governance mechanism? Evidence from the Euro zone. Corporate Governance: an International Review 20 (5), 413–431.
Rogers, W.H., 1993. Regression standard errors in clustered samples. Stata Technical Bulletin 13, 19–23.
Sun, Q., Tong, W.H.S., 2003. China share issue privatization: the extent of its success. Journal of Financial Economics 70, 183–222.
Villalonga, B., Amit, R., 2006. How do family ownership, control and management affect firm value? Journal of Financial Economics 80, 385–417.
Whited, T., Wu, G., 2006. Financial constraints risk. Review of Financial Studies 19 (2), 531–559.
Windmeijer, F., 2005. A finite sample correction for the variance of linear efficient two-step GMM estimators. Journal of Econometrics 126, 25–51.
Xu, N., Yuan, Q., Jiang, X., Chan, K., 2015. Founder's political connections, second generation involvement and family firm performance: evidence from China. Journal of Corporate Finance 33, 243–259.
Yang, J.Y., Qian, H., 2008. Survey evidence on commercial bank mortgage loans. Journal of Financial Research 333, 79–87 (in Chinese).
Yao, S., Jiang, C., Feng, G., Willenbockel, D., 2007. On the efficiency of Chinese banks and WTO challenges. Applied Economics 39, 629–643.
Yen, J., Lin, C., Chen, Y., Huang, Y., 2015. Founding family firms and bank loan contracts. Journal of Financial Service Research 48 (1), 53–82.
Yeung, G., 2009. How banks in China make lending decisions. Journal of Contemporary China 18 (59), 285–302.
Zou, H., Adams, M., 2008. Debt capacity, cost of debt, and corporate insurance. Journal of Financial and Quantitative Analysis 43 (2), 433–466.