The Value of Bank Relationship:
Evidence from China

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Abstract. This study investigates the influence of bank relationship on the firm's preference on liquidity. We address whether previous bank relationship affects firm value by examining how the value of cash holdings varies with bank relationship. Furthermore, we conduct how financial frictions alter the association between bank relationship and firm value. Using a sample of Chinese listed companies approved bank loans over the period 2008–2017, we find two supportive evidences on bank relationship. First, the marginal value of cash holdings decreases with the depth of bank relationship. Second, the negative impact of the bank relationship on the marginal value of cash holdings is more apparent for financial unconstrained companies. The results suggest that bank relationship is useful to alleviate the information asymmetry problem between the borrower and outside investors and thereby decreases a firm's need and valuation of liquidity. The investigation of bank relationship under distinct financial friction scenarios further supports the unique role of banks in dealing with information asymmetry. Compared to financial unconstrained companies, financial constrained firms is more vulnerable to holdup problem making them hard to experience the benefit of bank relationship. In sum, our study contributes to the literature of the value of bank relationship by showing that the marginal value of cash holdings decreases with close tie with banks because of the ease in information asymmetry.

Keywords: Bank relationship · Information asymmetry · Marginal value of cash holdings

1 Introduction

The literature has long recognized banks as the key channel in resolving information asymmetry in financial markets (Campbel and Kracaw 1980; Diamond 1984; Ramakrishnan and Thakor 1984). The uniqueness of banks hinges on their advantage in gathering private information during the lending process and the capability of monitoring borrowers after loans are approved (Diamond 1984; James 1987). The releasing of private information during the lending process can alleviate the information asymmetry problem between the borrower and outside investors and enhance a firm's ability in obtaining external financing. This study attempts to detect the bank relationship from another channel by examining its impact on liquidity preference.

Specifically, we investigate the impact of lending relationship on the value of cash holdings. We expect that banks can alleviate information asymmetry and financial frictions of the borrowers, and thereby reduce their evaluation on liquidity.

We conduct bank relationship by analyzing the value of cash holdings for two reasons. First, cash holdings construct a significant proportion of balance sheet. The average cash to total asset ratio is around 15% in the well-developed counties such as the United States (Bates et al. 2009) as well as in the emerging markets like China (Kusnadi et al. 2015). Given the magnitude of corporate cash holdings, this is a potentially important channel through which bank relationship can affect firm value. Second, theoretical research argues that cash and line of credit are two main sources of funds for precautionary hedge against the unfavorable capital market friction (Lins et al. 2010). These two liquidity funds are applied to hedge against different risks. Cash is viewed as buffer to protect firms from unexpected cash flow shock in the bad time, while line of credit ensures a firm's capability to take profitable investment in good times. Although cash and line of credit offered by banks are not purely substitute (Lins et al. 2010), the investigation of bank relationship by means of cash is reasonable (Hu et al. 2016).

In spite of the well-documented on bank relationship, very little is known about the direct impact of bank relationship on firm value. In this study we count on evidence form by the listed companies in China to conduct this issue. The Chinese setting provides an ideal laboratory to study bank relationship in the presence of financial constraints and bank-based financial system. The banking system is dominated by state-owned banks in China where the government rules the economic development and the firm's investments by disciplining the lending policy of the commercial banks (Chang et al. 2014). Although the Chinese financial markets is on the path of deregulation and expansion, many companies, including small and median size companies and non-state owned companies, still have trouble in raising external funds. Since the external financing is mainly composed by banking system in this market, the bargaining power of banks is apparent in China and explains why banks may generate significantly impact on the valuation of borrowing company.

We employ two competing theories, the information asymmetry argument and holdup argument, to examine the impact of bank relationship on firm value. This study employs three variables in terms of previous bank loan records to identify the depth of bank relationship, and detect change in firm value by analyzing the marginal value of cash holdings. The main finding is that the marginal value of cash holdings decreases with bank relationship. Furthermore, the negative relationship between bank relationship and the value of cash holdings is more prominent for financial unconstrained firms. The results are consistent with the information asymmetry theory that firms view cash as a buffer to against unexpected shocks on cash flows and suggest that firms with bank relationship prefer less cash holdings because they have less concern on obtaining external financing. The aforementioned statements can well explain the behavior of financial unconstrained firms. However, the potential holdup problem enlarges the damage of lack of liquidity and leads the negative impact of bank relationship on firm value to be less pronounced for financial constrained firms.

The reminder of this study is organized as follows. Section 2 develops two hypotheses about the association between bank relationship and the value of cash holdings. Sections 3 describes the sample and the methodology. Section 4 displays the empirical results of the analysis. Section 5 concludes the paper.

2 Literature Review

2.1 Pros and Cons of Lending Relationship

Financial intermediations such as banks play an important role in diminishing the information asymmetry between borrowers and outsider investors. Banks can generate economies of scale in gathering information and supervising the borrowers in the lending process (Diamond 1984; James 1987). The cumulated information obtained in the previous banking transactions such as granting loans or other financial services allows borrowers to build close tie with banks. The close relationship allows banks experience lower operation costs and monitoring costs when lend to borrowers they are familiar with. Accordingly, it is argued that close bank relationship results in lower cost of bank debt (Berger and Udell 1995; Diamond 1991).

However, researchers also notice that keeping a close relationship with the current lenders is costly (Santos and Winton 2008; Schenone 2010). Given that the firm-specific information revealing in the lending process is hard to share with or transfer to other outsiders, it is difficult for firms to switch to another lenders. Furthermore, firms seeking for new lenders may be classified as lemon because of the adverse selection problem. Therefore, firms are forced to grant loans from the bank they are familiar with when they are in need. Lending bank may receive information rent by charging higher cost of debt (Schenone 2010) or asking for stricter covenants with bank loan deals (Prilmeier 2017). It is called the holdup problem of maintaining close tie with bank.

Previous studies document that relationship banks' information advantage can be explored by the bank loan rates, the amount of credit granted from the relation banks, or the choice between private and public debt (Berger and Udell 1995; Diamond 1991; Rajan 1992). They assert that lending banks extract information rent from the borrowers by setting higher cost of bank debt. Meanwhile, firms choose to issue public debts rather than private bank debt to prevent the holdup costs caused by lending relationship. Given the relevance of holdup costs, how to reflect such costs in an appropriate way is critical, particularly, for companies in developing financial markets where the majority of external funds are provided by banks and the monopoly power of banks is apparent.

Building lending relationship is a value creation or destruction policy would depend on the net impact of these offsetting factors. If the value of a relationship tends to increase over time or more and more borrowers choose to lock into one specific bank, the extra cash holdings should be valueless. On the other hand, if relationship becomes less valuable and if the switching costs arise gradually, we should observe that the marginal value of cash holdings increases with relationship. Keeping a close tie with banks is to reduce the financial constraints when firms need external funds to finance their new projects or repay their debt obligation. If firms find banking

relationship has nothing to do with the cheaper source of funds, they have to search other channel to reduce their reliance on the lending relationship. Houston and James (1996) and Santos and Winton (2008) suggest that building multiple bank relationship or borrowing from public debt markets are alternative choices for firms locked-in close lending relationship.

2.2   Liquidity Demand

This study focuses on the information provision function of banks and lock-in issue arising from lending banks in addressing the influence of bank relationship on firms' preference on liquidity. The conventional theorem of liquidity preference can be traced back to the original work of Keynes (1936). From the perspective of shareholder wealth maximization, Opler et al. (1999) summarize two incentives of cash holdings proposed by Keynes (1936): transaction cost motive and precautionary motive. The transaction motive for holding cash arises from the cost of acquiring cash, including raising funds in the capital markets, liquidating existing assets, reducing dividends and investment, renegotiating existing financial contracts. For example, Opler et al. (1999) suggest that firms with specific asset have higher levels of liquid assets.

The precautionary motive, otherwise, emphasizes that holding liquid assets allows the firm to finance its activities and investments without any access of external funds. Hence, holding liquidity assets prevents the possibility of financial constraints when firms need to finance their profitable projects. Following the argument of preference for liquidity asset, I propose that building close tie with banks may decrease the value of cash holdings because of the alleviating financial constraints arising from the less concerns on information asymmetry. However, the marginal value of cash holding is more valuable for firms with lending relationship when the holdup problem worsens and encourages firms to retain more cash to escape from the possible expropriation form by relation banks.

2.3   Hypotheses

In the world of perfect capital markets as stated by Modigliani and Miller (1958), firms can receive sufficient funds from the capital markets to finance their profitable investment projects. The necessity of maintaining internal funds is unclear. However, in practice firms deal with different kinds of external financing constraints due to the information asymmetry problems. Managers are forced to manage their liquidity in an efficient way to ensure the ability to repay debt obligations or to invest profitable projects.

In literature information asymmetry make it harder to raise external funds (Myers and Majluf 1984). When shareholders believe that some value-increasing projects would be forgone due to the financial constraints, they would persuade a company to maintain its financial slackness by hoarding cash at hand (Opler et al. 1999). Faulkender and Wang (2006) argue that if the cash hoarding policy is valuable to the company as well as to shareholders, then a dollar of cash may be worth more than a dollar. In brief, referring to the possible damages or costs from cash flows shortage, shareholders will increase their preference and valuation for liquidity.

Being the most important part of financial intermediations, banks possess the advantage in resolving adverse selection and moral hazard problem in lending process (Diamond 1984; Fama 1985). The critical debate of bank relation is the question of whether the existence of bank relation increases firm value. The uniqueness of bank should rely on the fact that building sustainable relation with a specific bank is beneficial to shareholders. Fama (1985) states that, being the insider lenders, banks can access some proprietary information that are not available to the lenders of arm-length's debts. Lending banks could be the membership of board of directors of the borrowing firm and have the right to guild and monitor the company's decisions. The early evidence of James (1987) supports the argument of Fama (1985) that bank relation is of value. Based on the event study around the bank loans announcement, James finds a significant and positive effect on the stock values of the borrowing firm.

While banks are capable of resolving information asymmetry between borrowers and outsiders, they may use such information advantage to create their own benefits by charging higher loan rates, or intervening borrower's decision making in an inappropriate way. To prevent the possible holdup problem, borrowers may hoard cash in hand and reduce their reliance on bank funds. In this study I attempt to use Chinese companies as my research target to verify my propositions. Khurana et al. (2006) argue that the influence of financial constraints on the external financing is associated with the development of financial markets. Their cross countries evidence reveals that the sensitivity of cash holdings to cash flows decreases with the development of financial markets. Accordingly, we expect that in a less than well-developed financial market such as China, the impact of financial constraints on liquidity will be enlarged.

In this study I address the value of lending relationship by conducting the marginal value of cash holding. The remarkable reward of cash holdings is to be released from the financial constraints set by external capital markets. Referring to the value creation function from reducing information asymmetry, I extend the previous the study of bank loan announcement effect by directly examining the value of bank relation. We propose that bank relationship is associated with lower value of cash holdings due to the ease in information asymmetry. However, the holdup costs associated with close tie with banks encourages firms to retain more cash and increases their evaluation on the excess cash holdings. We expect that financial constrained firms are vulnerable to the holdup problem due to their limitation in finding other channel of external financing. Therefore, in line with the pros and cons of lending relationship, the value of additional cash for financial constrained firms would be less sensitive to the depth of bank relationship. The proposed hypotheses are as follows:

H1: The marginal value of cash holdings decreases with bank relationship.
H2: The negative impact of bank relationship on the marginal value of cash holdings is more pronounced for financial unconstrained firms.

3 Methodology

3.1 The Sample

The required accounting information and stock returns are collected from the China Stock Market & Accounting Research database (CSMAR), including bank loan information, financial statements information, and stock returns. The benchmark returns for the 125 portfolios formed by size, book-to-market ratio of equity, and momentum are also received from CSMAR. The sample covers from 2008 to 2017. We exclude all financial firms and utility firms in the analysis. In addition, we also require firm-year observations should have nonnegative net assets, nonnegative market value of equity, and nonnegative dividends. Since Chinese firms' fiscal reporting calendar is the same as the year/quartet calendar, we use the December financial reports for the analysis (Qian and Yeung 2015). Due to the limitation of bank loans information, the bank loan initiation is available after 1997. Moreover, we only account for the approved loans as our research target. All variables are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. After the aforementioned adjustments, we obtain a final sample of 3,301 firm-year observations.

3.2 Dependent Variable

In line with the long-run event study framework of Faulkender and Wang (2006), the dependent variable is the excess stock return $(r_{it} - R_{it}^B)$ where r_{it} is the stock return for firm i during fiscal year t and R_{it}^B is stock i's benchmark return at year t. We apply the 125 Fama and French portfolio form on size, book-to-market, and momentum as our benchmark portfolio. A stock's benchmark return at a given year is the return of the portfolio to which the stock belongs to at the fiscal year. To avoid the possible noise from trading suspension, monthly returns with less than 10 trading days during a month or observations with two missing monthly returns in a given year are excluded. The excess return is then defined as the cumulative abnormal returns during a fiscal year.

3.3 Bank Relationship

In literature the measurement of bank relation is multiple (Chang et al. 2014). Since the bank loans information is collected from the announcement of bank loans recorded by the borrowing firm, any approved loan deal represents a successful relation building. Accordingly, bank relationship is defined based on a firm's previous bank loan records. In this study bank loans refers to the lending activities offered by the commercial banks. Loans form by other financial intermediations or syndicated loans are excluded from the analysis.

To verify whether bank relationship is valuable to stockholders, we adopt three proxies for the depth a relationship. The first proxy is based on whether a firm is owned or controlled by the state. We introduce a dummy variable, d_SOE, that equal to one when the firm is classified as state-owned company, and zero otherwise. In China the bank relationship were mandated by the government rather than being driven by economic principles. Many of bank loans initiated by state-owned banks to state-owned

enterprise (SOEs) are based on political and policy considerations. To fulfill the duty of SOEs in maintaining social stability by providing consistent disposable income and lowering unemployment rate, state-owned banks provide loans to SOEs even though these companies are unprofitable, non-competitive, or with high default risk. Because the identity of SOEs and state-owned banks were mandated by the Chinese government, such firm-bank relationship is totally exogenous, and is therefore not subjected to the doubt-matching endogeneity problem widely seen in the literature (Chang et al. 2014).

Our second proxy is based on the duration of the bank relationship (*duration*). We utilize the loan approved information offered by the dataset and identify the year when a firm obtained its very first bank loan. The duration variable is then calculated as the difference between the current valuation year and the earliest loan year recorded. Furthermore, we use dummy variable (*d_duration*) to represent a firm has a close tie with bank that equals to one when duration is more than 7 year (sample median in the sample period), and zero otherwise.

The third proxy of bank relationship is the number of lending banks that a firm has received loans five years before the valuation year (*num_bank*). We define a firm has weak relation with one specific bank when it has built relation with different banks. We introduce a dummy variable to represent the multiple bank relation, *d_mulbank*, that equals to one when the company has multiple bank relation, and zero if it only receives loans from single lending bank. Multiple bank relation implies the firm has alternatives in choosing which banks to cooperate with and thereby indicates a weak loyalty of the borrower. In addition, firms with multiple bank relationships are better to absorb financial shocks and have a lower probability of financial distress which lead to firm less reliance on banking. Using the number of bank as an inverse measure of bank relationship, Bonfim et al. (2018) find that conducting another new bank allows borrowing companies to generate lower bank loan rate by 14 to 28 basis points because of the increasing bargaining power of borrowers.

3.4 Control Variables

Referring to the setting of Faulkender and Wang (2006), the control variables can be defined as follows. The market value of equity is defined as the number of shares multiplied by the stock's price at the fiscal year-end.[1] Cash holdings (C_t) is cash plus marketable securities. Earnings (E_t) are calculated as income before tax. Interest expense (I_t) is equal to zero if missing. Net financing (NF_t) is defined as total equity issuance plus debt issuance minus debt redemption.[2] R&D expenditure (RD_t) is equal to zero if missing. Dividend (D_t) is total cash dividends paid to common shareholders, which equals to zero if missing. Leverage (L_t) is defined as market debt ratio, calculated as total debt over the sum of total debt and the market value of equity. To prevent the results

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[1] The market value of equity refers to the value of all issued shares.
[2] Debt issuance includes the issuance of corporate bonds and funds granted from banks or other financial intermediations.

being dominated by large companies, all firm-specific variables, except for leverage (L_t), are deflated by the 1-year lagged market value of equity, M_{t-1}.

3.5   The Model

In this study we employ the regression framework offered by Faulkender and Wang (2006) to detect the value of cash holdings and investigate how firm value varies with bank relation. The primary regression model setting is shown as follows.

$$
\begin{aligned}
r_{i,t} - R_{i,t}^B =& \beta_0 + \beta_1 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \beta_2 d\_BR_{i,t-1} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \beta_3 d\_BR_{i,t-1} + \beta_4 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \beta_5 \frac{\Delta NA_{i,t}}{M_{i,t-1}} \\
&+ \beta_6 \frac{\Delta RD_{i,t}}{M_{i,t-1}} + \beta_7 \frac{\Delta I_{i,t}}{M_{i,t-1}} + \beta_8 \frac{\Delta D_{i,t}}{M_{i,t-1}} + \beta_9 \frac{C_{i,t-1}}{M_{i,t-1}} + \beta_{10} L_{i,t} + \beta_{11} \frac{NF_{i,t}}{M_{i,t-1}} \\
&+ \beta_{12} \frac{C_{i,t-1}}{M_{i,t-1}} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \beta_{13} L_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + Industry\_effect + Year\_effect + \varepsilon_{i,t}
\end{aligned}
\tag{1}
$$

We introduce two variables into the framework, including bank relationship ($d\_BR_{i,t-1}$) and the interaction term of bank relationship and the change in cash holdings ($d\_BR_{i,t-1} \times \Delta C_{i,t}$), and employ this interaction term to detect the impact of bank relationship on the marginal value of cash holdings. $d\_BR_{i,t-1}$ is a dummy variable that equals to one for close bank relation and zero for weak relation when we introduce SOEs and duration in identifying close bank relation. However, we also use the number of lending banks to measure bank relation and define an inverse measure of bank relation, $d\_mulbank$. The inclusion of $d\_BR_{i,t-1}$ in the regression model ensures that the estimated coefficient of the interaction term is the result of the interaction, and not due to bank relation itself. In addition, we employ industry effects and year effects in the analysis to control for unobservable industry characteristics and time effects.

4   Empirical Results

4.1   Preliminary Results

Table 1 reports the summary statistics of the major variables used in this study. The mean (median) value of excess return ($r_t - R_t^B$) on the sample is −16.5% (−16.0%) which is lower that found in Faulkender and Wang (2006). One possibility is that the momentum effect is included in the calculation of benchmark return, while most papers use 25 portfolio formed on size and book-to-market as their benchmark.

The median value of cash change (ΔC_t) is 0.005 which implies that half of the observations attempt to increase their cash holdings. The mean cash holdings level (C_{t-1}) is equilibrium to 15.60% of market equity value at the beginning of the fiscal year, similar to that found in the U.S. of 17.3% shown by Faulkender and Wang (2006). It is noteworthy that the average leverage ratio (L_t) in Chinese listed companies is 35.70%, which is higher than that shown in the U.S of 27.78%. This indicates that Chinese companies utilize more debt financing in support of their business.

Table 1. Summarystatistics.

Variables	Mean	SD	Q1	Median	Q3
Dependent var.					
$r_t - R_t^B$	-0.165	0.440	-0.359	-0.160	0.0402
Bank rel.					
d_SOE	0.553	0.497	0	1	1
num_bank	1.106	1.814	0	1	1
duration	7.633	4.328	4	7	11
Control var.					
ΔC_t	0.022	0.099	-0.021	0.005	0.042
ΔE_t	0.006	0.055	-0.011	0.004	0.020
ΔNA_t	0.147	0.310	0.003	0.062	0.184
ΔRD_t	0.0002	0.001	0	0	0
ΔI_t	0.002	0.009	-0.001	0.0004	0.004
ΔD_t	0	0.002	0	0	0
C_{t-1}	0.156	0.168	0.046	0.097	0.201
L_t	0.357	0.213	0.181	0.325	0.517
NF_t	0.076	0.181	-0.006	0.022	0.103

The mean and median changes in R&D expense and interest expense are close to zero, implying that the distribution of the change in R&D expenses as well as interest expense are relatively symmetric. One common feature of Chinese and U.S companies is that they intend to maintain a constant dividend payout policy because both the mean and median value of changes in dividends are close to zero. In addition, the positive value at the mean and the median of the changes in earnings also reflects the fact that on average Chinese companies experience increasing in profitability over time.

This table displays summary statistics for variables used in this study. $r_t - R_t^B$ is the annul excess return in which r_t is the annual stock return of firm i at time t (fiscal year-end) and the stock benchmark return, R_t^B, refers to the 125 portfolios return formed by size, book-to-market value of equity, and momentum. Bank relationship is measured by three different proxies. A dummy variable, d_SOE, that equal to one when the firm is classified as state-owned company, and zero otherwise. Next, we measure the duration of bank relation by calculating the difference between the current valuation year and the earliest loan year recorded. The third proxy of bank relationship is the number of banks that a firm has received loans five years before the valuation year (num_bank). ΔX_t indicates the change in the variable X from year $t-1$ to t that is standardized by market value of equity at year end $t-1$, M_{t-1}. Cash holdings, C, equals cash plus cash equivalents. E is income before tax. NA stands for net assets, defined as total assets minus cash holdings. RD represents R&D expenses. I is interest expenses. D is total common dividends paid. L stands for leverage ratio, calculated as total debt over the sum of total debt and the market value of equity. NF stands for net new equity issues plus net debt issues.

Table 2. Correlation analysis.

	(1) $r_t - R_t^g$	(2) d_SOE	(3) duration	(4) num_bank	(5) ΔC_t	(6) ΔE_t	(7) ΔNA_t	(8) ΔRD_t	(9) ΔI_t	(10) ΔD_t	(11) C_{t-1}	(12) L_t	(13) NF_t
(2)	-0.04	1.00											
	(0.03)												
(3)	0.00	0.13	1.00										
	(0.94)	(0.00)											
(4)	-0.01	-0.05	-0.33	1.00									
	(0.71)	(0.00)	(0.00)										
(5)	0.08	-0.01	0.00	0.04	1.00								
	(0.00)	(0.62)	(0.85)	(0.01)									
(6)	0.21	-0.02	0.02	0.02	0.21	1.00							
	(0.00)	(0.26)	(0.29)	(0.32)	(0.00)								
(7)	0.05	0.01	-0.03	0.08	0.32	0.24	1.00						
	(0.00)	(0.43)	(0.08)	(0.00)	(0.00)	(0.00)							
(8)	0.02	-0.03	0.03	-0.02	0.00	0.04	0.05	1.00					
	(0.21)	(0.06)	(0.14)	(0.30)	(0.99)	(0.04)	(0.00)						
(9)	-0.02	0.02	-0.02	0.04	0.15	-0.02	0.41	0.02	1.00				
	(0.26)	(0.18)	(0.25)	(0.04)	(0.00)	(0.16)	(0.00)	(0.39)					
(10)	0.05	-0.01	-0.01	-0.01	0.02	0.04	0.06	0.01	-0.01	1.00			
	(0.01)	(0.66)	(0.65)	(0.67)	(0.39)	(0.01)	(0.00)	(0.43)	(0.58)				
(11)	0.11	0.11	0.03	0.09	0.59	0.18	0.45	0.08	0.20	0.03	1.00		
	(0.00)	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)			
(12)	0.03	0.19	0.05	0.11	0.23	0.11	0.49	0.05	0.31	0.03	0.63	1.00	
	(0.15)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.07)	(0.00)		
(13)	0.00	-0.01	-0.04	0.07	0.45	0.04	0.68	0.06	0.35	0.01	0.47	0.42	1.00
	(0.93)	(0.64)	(0.04)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.45)	(0.00)	(0.00)	

Few findings are revealed in the investigation of the three measures of bank relationship. First, more than half of the observations in our sample are classified as stated-owned companies since the median value of *d_SOE* is one, consistent with the advantage of SOEs in bank financing. Next, most companies maintains relationship with one single specific bank since the median value and the third quarter of the number bank (*num_bank*) is one. Third, the mean and median bank relation duration (*duration*) are close to 7, implying that the distribution of duration is relatively symmetric. In brief, the sample is consistent with the understanding that Chinese listed companies have built close tie with banks, particularly for SOEs.

This table displays the pairwise correlation among the variables. Variables definitions are shown in Table 1. *p*-value are reported in the parentheses.

Table 2 reports the correlation analysis among the variables conduct in this study. The correlation coefficient between the number of lending bank (*num_bank*) and duration (*duration*) is −0.33, suggesting that multiple banks is associated with a short-term cooperative relationship with bank. In addition, the number of lending bank (*num_bank*) is negative with the dummy variable of stated-owned companies (*d_SOE*), indicating that multiple bank relation is uncommon among SOEs. Both evidences reveals that multiple bank relationship is a signal of weak bank relation. Most importantly, we find that the three measure of bank relation experience weak correlation with other variables, including the dependent variable and the control variables. However, we do find cash holdings is highly correlated with leverage, suggesting that bank financing provides a significant contribution to a firm's liquidity assets.

4.2 Regression Results

We apply the valuation framework proposed by Faulkender and Wang (2006) to detect the dollar change in shareholder value and examine factors contribute to this value. To highlight the advantage of bank relation in dealing with information asymmetry, I further divide the sample into two subsets, financial constrained and financial unconstrained companies, and reexamine whether the value effect of bank relation varies with financial frictions.

Table 3 displays the regression result of the marginal value of cash holdings for the whole sample. Model 1 of Table 3 shows the results from the benchmark model of Faulkender and Wang (2006). The initial coefficient estimate corresponding to the change in cash holdings (ΔC_t) reveals that for shareholders an additional dollar of cash is only worth $0.67 if the firm has zero cash and no leverage at the beginning of the fiscal year. This is consistent with the argument in the literature that there are pros and cons in cash holdings. However, this value is less than that found in Faulkender and Wang (2006) of $1.466. One possible explanation is associated with the fact that the magnitude of agency costs of extra cash holdings is larger in China than that in the U.S. where the governance mechanism is well-developed. The sign of coefficients on other independent variables are consistent with the finding of Faulkender and Wang (2006). However, we do find in China shareholders are insensitive to the change in R&D expense and the change in net financing while both factors have significant impact on firm value in the US.

The estimated coefficient corresponding to the interaction of the level of cash holdings with the change in cash ($C_{t-1} \times \Delta C_t$) is statistically insignificant, indicating that a firm's current cash position doesn't alter the value of additional dollar of cash. Meanwhile, the coefficient on the interaction of the level of cash holdings with the leverage ratio ($L_t \times \Delta C_t$) is also negative and statistically significant at 1%. That implies the phenomenon of higher leverage impairing the value of extra cash holdings still works in China. The reported R^2 is about 0.17 and is similar with the previous studies (Faulkender and Wang 2006). Meanwhile, Chinese stock markets are more sensitive to the change in earnings and one additional increasing in earnings is valued at \$1.37, compared to that of \$0.53 in the U.S. This implies shareholders might overreact to the increase in earnings. In brief, my dataset and model setting is comparable with that of Faulkender and Wang (2006).

Next, I detect Hypothesis 1 that bank relation is of value through Model 2 to 4. We introduce a new interaction term between bank relation and the change in cash ($d\_BR_{t-1} \times \Delta C_t$) to test Hypothesis 1. The interaction measures the difference in the value of cash between with and without bank relationship firms. The expected sign on this new interaction term is negative if the advantage of bank relation in curing information asymmetry reduces the borrower's reliance on internal funds and preference on liquidity. Model 2 of Table 3 displays the regression result of the inclusion of the interaction term, $d\_BR_{t-1} \times \Delta C_t$, in which bank relation is defined by a dummy variable of SOEs (d_SOE). The estimated coefficient on $d\_BR_{t-1} \times \Delta C_t$ is −0.32 and is statistically significant at the 10% level. This result indicates that the value of one extra dollar holding does vary with bank relation. Model 3 of Table 3 uses the duration dummy to represent bank relationship in which longer duration indicates with close tie with bank ($d\_duration$). The estimated coefficient on $d\_BR_{t-1} \times \Delta C_t$ is negative with value of −0.28 but is less than statistically significant ($t - value = -1.52$). In Model 4 of Table 3 bank relation is proxied by the number of bank a firm has received loans from. We use the dummy variable of multiple bank to represent close bank relation ($d\_mulbank$). We find that the interaction term of bank relation, $d\_BR_{t-1} \times \Delta C_t$, is statistically significant with positive sign because $d\_mulbank$ is an inverse measure of close bank relationship. In brief, our evidences is consistent with Hypothesis 1a that close bank relationship decreases the marginal value of cash holdings due to the lending bank's uniqueness in resolving information asymmetry between the borrowing company and financial markets.

This table presents the regression result of bank relation on the value of cash holdings. Model (1) is the benchmark analysis of Faulkender and Wang (2006). The ordinary least squares regression analysis is applied in Model (1) through Model (4). We conduct the fixed effect regression analysis in Model (5) to Model (7). In Model (2) and (5) bank relationship is measured by a dummy variable, d_SOE, that equals to one when the borrower is SOE and is zero, otherwise. In Model (3) and (6) bank relationship is associated with the duration of bank relationship. A dummy variable, $d\_duration$, represents a firm has a close tie with bank that equals to one when the duration of bank relationship (*duration*) is more than 7 year (sample median in the sample period), and zero otherwise. In Model (4) and (7) bank relationship is measured by the number of bank that a firm has cooperated with. We define a dummy variable to stand for multiple bank relation, $d\_mulbank$, that equals to one for multiple bank

Table 3. Regressionresults for the value of bank relation: Whole sample.

	(1) Benchmark	(2) d_BR_{t-1} $=d\_SOE$	(3) $d\_BR_{t-1}=$ $d\_duration$	(4) $d\_BR_{t-1}=$ $d\_mulbank$	(5) d_BR_{t-1} $=d\_SOE$	(6) $d\_BR_{t-1}=$ $d\_duration$	(7) $d\_BR_{t-1}=$ $d\_mulbank$
ΔC_t	0.67**	0.78***	0.85***	0.60**	0.56**	0.64**	0.33
	(2.57)	(2.92)	(2.91)	(2.30)	(1.99)	(2.14)	(1.20)
$d\_BR_{t-1}\times\Delta C_t$		-0.32*	-0.28	0.39*	-0.35*	-0.35*	0.49**
		(-1.67)	(-1.52)	(1.96)	(-1.85)	(-1.82)	(2.40)
d_BR_{t-1}		-0.040**	0.015	-0.034**	-0.079	-0.0030	-0.029
		(-2.54)	(1.06)	(-2.13)	(-1.22)	(-0.11)	(-1.16)
ΔE_t	1.37***	1.35***	1.38***	1.38***	1.22***	1.24***	1.23***
	(7.47)	(7.36)	(7.56)	(7.54)	(6.58)	(6.69)	(6.70)
ΔNA_t	0.036	0.037	0.041	0.037	-0.012	-0.0079	-0.016
	(0.86)	(0.88)	(0.97)	(0.90)	(-0.27)	(-0.19)	(-0.37)
ΔRD_t	4.72	4.35	4.44	4.07	-0.63	-0.92	-1.57
	(0.78)	(0.72)	(0.73)	(0.67)	(-0.09)	(-0.12)	(-0.21)
ΔI_t	-2.36**	-2.41***	-2.29**	-2.38**	-3.06***	-2.98***	-3.07***
	(-2.55)	(-2.62)	(-2.48)	(-2.57)	(-3.23)	(-3.17)	(-3.22)
ΔD_t	7.40*	7.31*	7.49*	7.23*	8.45*	8.43*	8.06*
	(1.78)	(1.76)	(1.81)	(1.72)	(1.91)	(1.90)	(1.79)
C_{t-1}	0.29***	0.31***	0.29***	0.29***	0.42***	0.43***	0.44***
	(4.27)	(4.60)	(4.28)	(4.26)	(3.80)	(3.88)	(3.90)
L_t	-0.012	0.0100	-0.013	-0.0069	0.46***	0.46***	0.46***
	(-0.23)	(0.19)	(-0.26)	(-0.13)	(4.72)	(4.78)	(4.79)
NF_t	-0.078	-0.096	-0.088	-0.074	-0.14*	-0.14*	-0.12
	(-1.11)	(-1.38)	(-1.24)	(-1.07)	(-1.87)	(-1.88)	(-1.62)
$C_{t-1}\times\Delta C_t$	0.45	0.36	0.46	0.42	0.55	0.56	0.51
	(0.98)	(0.80)	(1.02)	(0.91)	(1.10)	(1.13)	(1.01)
$L_t\times\Delta C_t$	-1.40**	-1.22**	-1.42**	-1.46***	-1.09*	-1.24**	-1.29**
	(-2.50)	(-2.21)	(-2.54)	(-2.65)	(-1.90)	(-2.16)	(-2.27)
_cons	-0.33***	-0.31***	-0.34***	-0.32***	-0.38***	-0.29***	-0.42***
	(-4.18)	(-3.98)	(-4.29)	(-4.18)	(-5.29)	(-7.56)	(-6.48)
Industry effect	Y	Y	Y	Y			
Firm effect					Y	Y	Y
Year effect	Y	Y	Y	Y	Y	Y	Y
Obs.	3301	3301	3301	3301	3301	3301	3301
R^2	0.169	0.172	0.170	0.171	0.187	0.186	0.187

relation, and zero when the firm only has received loans from one specific bank. The definition of all other control variables are shown in Table 1. Both industry fixed effect and year effect are controlled in the regression analysis. t-statistics are calculated based on robust standard errors adjusted for firm-level clustering. ***, **, and * denote the significance level of 1%, 5%, and 10%, respectively.

To account for the potential endogeneity problem arising from bank relationship, we apply fixed effect regression model to reexamine the impact of bank relationship on the value of cash holdings. We introduce a two-way fixed effect estimation to account for the omitted variable problem. Fixed firm effects and year effects are used to control for unobservable firm characteristics and time effects. The results are reported in Model

5 to 7 of Table 3. In Model 7 of Table 3 we find that the coefficient of the interaction term, $d\_BR_{t-1} \times \Delta C_t$, is 0.49 and is statistically significant at 5% level, implying that multiple bank relation, an indicator of weak borrower-bank connection, is associated with higher value on additional cash position. These results are consistent with the interpretation that bank relationship reduces the value of cash holdings controlling for the potential endogeneity problem. In brief, the aforementioned finding is in support of our hypothesis that the value of additional cash decreases with lending relationship.

Furthermore, I detect whether financial constraint alters the impact of bank relation on the value of liquidity. With the presumption that small firms and younger firms are more vulnerable to capital market imperfections (Denis and Sibilkov 2010), we define a firm is financial constrained when the firm age is less than 19 years (the median value of the sample) or when the firm is ranked in the bottom quarter of the size distribution. Firm size is calculated based on book value of total assets. Tables 4 and 5 display the fixed effect regression result of financial unconstraint and financial constraint firms, respectively.

In Model 1 to Model 3 of Table 4 the financial constraint is proxy by firm age, while we use firm size to classify unconstrained firms in Model 4 to Model 6 of Table 4. We find that in Model 1 of Table 4 the estimated coefficient on the interaction term $d\_BR_{t-1} \times \Delta C_t$ is −0.87 and statistically significant at 1% level, suggesting that bank relation, proxy by d_SOE, has significant negative impact on the marginal value of cash holdings for financial unconstraint firms. When we apply $d\_duration$ (Model 2) and $d\_mulbank$ (Model 3) in measuring the depth of bank relation, we also find the estimated coefficient of $d\_BR_{t-1} \times \Delta C_t$ have expected negative sign and positive sign, respectively. The investigation of the performance on $d\_BR_{t-1} \times \Delta C_t$ using firm size as an alternative measure of financial constraint shown in Model 4 to Model 6 of Table 4 also reveals similar results. The finding is in line with the prediction of Petersen and Rajan (1994) that bank relationship is associated the information disclosure and allows firms with less financial frictions to reduce their reliance on internal funds.

By contrast, there is less apparent evidence indicating the impact of bank relation on liquidity value for financial constraint firms. In Model 1 of Table 5 the estimated coefficient of the interaction term $d\_BR_{t-1} \times \Delta C_t$ is 0.33 and statistically insignificant. The investigation of financial constrained firms on the interaction term $d\_BR_{t-1} \times \Delta C_t$ is insignificant in all setting of Table 5 except for Model 3. This suggests that the potential holdup costs reduces the benefit of lending relationship making cash holdings as neutral to financial constrained firms.

This table displays the fixed effect regression result of bank relation on the marginal value of cash holdings for companies with the ease in the external financing. It is presumed that companies with age (Model 1 to 3) or large size (Model 4 to 6) are financial unconstrained. In Model (1) and (4) bank relationship is measured by a dummy variable, d_SOE, that equals to one when the borrower is SOE and is zero, otherwise. In Model (2) and (5) bank relationship is associated with the duration of bank relationship. A dummy variable, $d\_duration$, represents a firm has a close tie with bank that equals to one when the duration of bank relationship (*duration*) is more than

Table 4. Fixed effect regression for the impact of bank relation on marginal value of cash holdings: Subsample of financial unconstrained firms.

	Elder Companies			Large Companies		
	(1) $d\_BR_{t-1} =$ d_SOE	(2) $d\_BR_{t-1} =$ $d\_duration$	(3) $d\_BR_{t-1} =$ $d\_mulbank$	(4) $d\_BR_{t-1} =$ d_SOE	(5) $d\_BR_{t-1} =$ $d\_duration$	(6) $d\_BR_{t-1} =$ $d\_mulbank$
ΔC_t	0.74**	1.03***	0.35	1.04	1.20	0.66
	(2.21)	(2.67)	(1.00)	(1.47)	(1.49)	(0.95)
$d\_BR_{t-1} \times \Delta C_t$	-0.87***	-0.78***	0.37	-0.64**	-0.27	0.48*
	(-3.61)	(-2.95)	(1.23)	(-2.11)	(-0.95)	(1.85)
d_BR_{t-1}	-0.18**	-0.053	-0.021	0.10	-0.056	-0.032
	(-2.29)	(-1.15)	(-0.56)	(0.77)	(-0.98)	(-0.67)
ΔE_t	1.37***	1.36***	1.34***	1.44***	1.44***	1.45***
	(5.84)	(5.74)	(5.68)	(5.32)	(5.42)	(5.31)
ΔNA_t	-0.026	-0.0054	-0.029	-0.030	-0.024	-0.033
	(-0.46)	(-0.10)	(-0.50)	(-0.42)	(-0.35)	(-0.47)
ΔRD_t	-23.0*	-25.4**	-26.3**	2.34	-0.51	-2.12
	(-1.76)	(-2.00)	(-2.06)	(0.21)	(-0.04)	(-0.18)
ΔI_t	-3.81***	-3.76***	-3.90***	-1.14	-1.34	-1.30
	(-2.84)	(-2.90)	(-2.90)	(-0.89)	(-1.04)	(-1.01)
ΔD_t	7.03	4.07	4.63	6.10	4.27	3.48
	(1.61)	(0.89)	(1.00)	(0.95)	(0.68)	(0.55)
C_{t-1}	0.45***	0.50***	0.50***	0.65***	0.64***	0.65***
	(2.87)	(2.96)	(2.94)	(3.77)	(3.67)	(3.74)
L_t	0.45***	0.46***	0.44***	0.76***	0.80***	0.81***
	(3.38)	(3.47)	(3.23)	(4.67)	(4.81)	(5.01)
NF_t	-0.037	-0.047	-0.0070	-0.14	-0.15	-0.13
	(-0.40)	(-0.49)	(-0.07)	(-1.12)	(-1.13)	(-1.03)
$C_{t-1} \times \Delta C_t$	0.15	-0.0010	0.16	-0.035	0.029	0.036
	(0.27)	(-0.00)	(0.27)	(-0.05)	(0.04)	(0.05)
$L_t \times \Delta C_t$	-0.71	-1.07*	-1.14	-1.23	-1.90	-1.60
	(-1.03)	(-1.66)	(-1.62)	(-1.02)	(-1.57)	(-1.37)
_cons	-0.15**	-0.27**	-0.20	-0.69***	-0.71***	-0.64***
	(-2.13)	(-2.19)	(-1.58)	(-4.31)	(-6.73)	(-4.91)
Firm effect	Y	Y	Y	Y	Y	Y
Year effect	Y	Y	Y	Y	Y	Y
Obs.	1434	1434	1434	830	830	830
R^2	0.211	0.205	0.196	0.203	0.198	0.199

7 year (sample median in the sample period), and zero otherwise. In Model (3) and (6) bank relationship is measured by the number of bank that a firm has cooperated with. We define a dummy variable to stand for multiple bank relation, $d\_mulbank$, that equals to one for multiple bank relation, and zero when the firm only has received loans from one specific bank. The definition of all other control variables are shown in Table 1. Year effect is controlled in the regression analysis. t-statistics shown in parentheses are calculated based on robust standard errors adjusted for firm-level clustering. ***, **, and * denote the significance level of 1%, 5%, and 10%, respectively.

relationship is measured by the number of bank that a firm has cooperated with. We define a dummy variable to stand for multiple bank relation, *d_mulbank*, that equals to one for multiple bank relation, and zero when the firm only has received loans from one specific bank. The definition of all other control variables are shown in Table 1. Year effect is controlled in the regression analysis. *t*-statistics shown in parentheses are calculated based on robust standard errors adjusted for firm-level clustering. [***], [**], and [*] denote the significance level of 1%, 5%, and 10%, respectively.

5   Conclusion Remark

In literature banks play an important mechanism in resolving information asymmetry between borrowers and outsiders. The governance function of banks is also verified by exploring the abnormal return during bank loans announcement and the choice between private and public debts (Lin et al. 2011). However, some scholars notice when keeping a close tie with banks the borrower are more likely to be locked-in such relationship. In this study I count on the marginal value of cash holdings to verify whether the impact of lending relation varies with the concern of financial constraints. We contribute to the debate in this literature by offering an under-researched channel through which the depth of bank relationship can affect firm value: corporate cash holdings.

The impact of powerful banks has been verified on the setting of bank loan rates and cash holdings (Pinkowitz and Williamson 2001; Santos and Winton 2008; Schenone 2010). Scholars also point out that the impact of banking relationship diminishes with the access to external capital market and varies with business cycle. Accordingly, I further propose that the impact of lending relationship on the value of cash holdings alter with the severity of financial constraints. The conducting of Chinese listed companies' bank loans activities also offer us a unique venue to examine the pros and cons of lending relationship simultaneously.

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