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跨境上市與現金持有價值之關係：以中國上市公司為例

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摘要

本研究從財務限制與代理問題的角度，探討跨境上市對現金持有價值的影響。利用 2006 到 2013 年中國上市公司的資料，本研究發現，在只考慮財務限制的情況下，跨境上市公司相對於非跨境公司，其現金持有價值較低，而此一效果在有財務限制的公司比沒有財務限制的公司明顯，且非國有企業比國有企業更為明顯。另外，在只有考慮代理問題的情況下，跨境上市公司的現金持有價值比非跨境公司高，而且此效果以國有企業較明顯。最後，在同時考慮財務限制與代理問題的情況下，前者的效果比後者高。本研究的結果顯示，中國上市公司跨境上市能有效降低資訊不對稱與代理問題，因而影響其現金持有之價值，而最重要的是，財務限制改善的效果高於代理問題降低的效果，此反映了中國金融市場的特殊性。

關鍵詞：跨境上市、現金持有價值、財務限制、代理問題

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Cross-Listing and The Value of Cash Holdings:Evidence from Chinese Cross-Listed Firms

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ABSTRACT

This study investigates the effects of cross-listing on the value of cash holdings through the mitigation of financial constraints and agency problems. Using a sample of Chinese cross-listed firms from 2006 to 2013, we find that cash holdings are less valuable for financially constrained cross-listed firms than for unconstrained cross-listed firms. Moreover, the decrease of the value of cash holdings is more pronounced for non-state-owned enterprises (non-SOEs) than for SOEs. When taking agency problems into consideration, we find that cross-listed firms have higher value of cash

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holdings than non-cross-listed firms and this is stronger for SOEs than for non-SOEs, consistent with the bonding hypothesis. Finally, we find that the effect of mitigating financial constraints dominates the effect of alleviating agency problems. Our results suggest that the cross-listing of Chinese firms influences the value of their cash holdings through the channels of the amelioration of information asymmetry and agency problems, with the effect of the former being stronger than that of the latter due to the unique financial system in China.

Keywords: *Cross-listing, Value of cash holdings, Financial constraints, Agency problems*

Data Availability: *All data are available from the China Stock Market and Accounting Research (CSMAR) database and the Taiwan Economic Journal (TEJ) database*

1. INTRODUCTION

The Chinese market is one of the most dynamic markets in the world. Since it has been opened up to foreign trade and investment and the implementation of free market reforms in 1979, China has been among the world's quickest-growing economies, with annual gross domestic product (GDP) growth, averaging about 10% through 2013 (Morrison 2014). Moreover, the rapid growth in the cross-listing of firms since the 1990s has provided a complementary source of foreign capital inflow into the Chinese economy through the international stock markets in addition to inward foreign direct investment. At the end of 2013, the total number of domestic firms also listed in overseas markets was about 185, for a total of 208.08 billion USD, according to a report by the China Securities Regulatory Commission (CSRC) (2013). A number of issuances (351) were completed through the Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE), increasing the value of issuances to a total of 414.79 billion Renminbi (hereafter, RMB) in 2013, including 224.66 billion RMB worth of private placements with cash consideration. Cash holdings in Chinese listed firms are large and still increasing. At the end of 2012, the total amount of liquid assets held by Chinese listed non-financial firms was approximately 2.95 trillion RMB (about 469 billion USD). The cash ratio has increased significantly over the same time period, from a mean of 18.7% in 2000 to 32.8% in 2012 (Megginson, Ullah and Wei 2014). These numbers show that such investments are important for Chinese firms, because large amounts of cash holdings are available for investment and could enhance firm performance, however, excess cash could also give managers more opportunities to perform wasteful activities which would harm firm value. In other words, with cash holdings, there is a tradeoff between costs and benefits.

Cash is viewed as a quick liquidity asset. The benefits of cash holdings are not only for the maintenance of the firm's capital, but also to ensure timely investment, faster than their competitors. According to the pecking order theory proposed by Myers and Majluf (1984), retaining cash holdings is a quick way to fund gainful expansion opportunities, without switching to expensive external

financing. Retaining cash holdings allows firms to pursue a positive Net Present Value (NPV) investment when financial constraints are met and to minimize the cost of raising external financing. On the other hand, cash is also viewed as an unproductive asset that produces a lower rate of return, when it is not being used to earn benefits for the firm. Furthermore, cash is also the main cause of agency conflicts (agency problems) between insiders and outsiders (Jensen 1986); large cash holdings can be expropriated or used for over-investment, even for projects with a negative NPV (Jung, Kim and Stulz 1996). The value of corporate cash holdings is lessened when outside investors recognize that management has the incentive to use free cash flow to generate private benefits.

One of the benefits of cross-listing is that agency problems can be mitigated. Consistent with the argument of Huang, Elkinawy and Jain (2013) that cross-listing helps to reduce agency problems by improving corporate governance. They suggest that firms in emerging markets can achieve better corporate governance through cross-listing, because the better investor protection in foreign markets prevents managers from extracting private benefits from control (Coffee 1999, 2002; Stulz 1999).

Another benefit of cross-listing is the lower cost of raising capital. In China, the financial market is dominated by stated-owned banks, so it is more difficult for firms to raise funds from banks, especially for non-state-owned enterprises (non-SOEs) compared to SOEs. Cash holdings are more valuable for financially constrained firms than for financially unconstrained firms. Because of the difficulty in raising capital, firms with hard budget constraints will invest their funds more efficiently and receive higher returns, leading to higher valuation of cash (Megginson et al. 2014). In other words, financially constrained firms use their cash more efficiently than unconstrained firms. Financial constraints are therefore positively associated with the value of cash holdings. However, cross-listing makes it easier for firms to raise external funds and with the lower cost of raising capital, it is unnecessary for firms to pursue all positive NPV projects which would lower the value of their cash holdings. Determining the overall positive or negative effect caused by cross-listing is an empirical issue. In this

study, we include financial constraints and agency problems in our examination of whether cross-listing affects the value of cash holdings through these two channels.

China is the focus in this examination of the effect of cross-listing on the value of cash holdings for the following reasons: First, China is the largest emerging market and the second largest economy in the world, although imperfections in its capital market are present (Poncet, Steingress and Vandenbussche 2010). China's laws and legal institutions - investor protection, corporate governance, accounting standards and quality of government - are less developed (Megginson et al. 2014). According to previous research, the bonding effect[1] of cross-listing is more pronounced for firms in emerging markets. China is thus an ideal setting for a study about the impact of the bonding effect resulting from cross-listing on the value of cash holdings. Second, the financial environment in China is unique compared with most other countries, for example, there is a soft budget constraint (hereafter, SBC) in China. The SBC effect exacerbates agency problems inherent in the SOEs, leading to a lower value for their cash holdings (Megginson et al. 2014) while these problems may be less pronounced in non-SOEs. We therefore, examine the possible effects of cross-listing on the value of cash holdings and the difference between SOEs and non-SOEs. Third, economic relations between Taiwan and China are very close. China was Taiwan's largest trading partner in 2007, with 30% of Taiwan's exports being sold to China. Likewise, Taiwan ranks in the top ten of China's trading partners. Taiwanese businesses have invested an estimated $150 billion (USD) in the mainland since 1988 (Roberge and Lee 2009). Understanding China's stock markets, including the financing decisions of their listed firms and the effects is thus important.

Various descriptions of cross-listing, cross-country, cross-section, and time-series variations in corporate cash holdings have been developed in previous

[1] Firms cross-listed on US stock exchanges are better governed than their domestic peers, because they are subject to the more stringent American laws and regulations designed to protect the interests of minority shareholders. This limits managerial ability to manipulate reported earnings or misappropriate corporate resources for private benefits (Huang et al. 2013). This is called the bonding effect.

studies (Kim, Mauer and Sherman 1998; Harford 1999; Opler, Pinkowitz, Stulz and Williamson 1999; Dittmar, Mahrt-Smith and Servaes 2003; Almeida, Campello and Weisbach 2004; Pinkowitz, Stulz and Williamson 2006; Faulkender and Wang 2006; Dittmar and Mahrt-Smith 2007; Kalcheva and Lins 2007; Harford, Mansi and Maxwell 2008; Bates, Kahle and Stulz 2009; Liu and Mauer 2011), but to the best of our knowledge, there has been no study examining the effects of cross-listing on the value of cash holdings for Chinese firms. There are three studies most closely linked to this research. First, Megginson et al. (2014) who investigated the effect of state ownership and SBC on cash holdings based on China's privatization from the aspect of agency problem. They find that the marginal value of cash increases as state ownership declines and the SBC effect exacerbates agency problems inherent in state-controlled enterprises in China, leading to a lower value for cash. Our study examines another practice, cross-listing. Compared with privatization, cross-listing can limit cross-listed firm managers' misbehavior through formal and informal monitoring by foreign institutions. The effect of cross-listing on the value of cash holdings is interesting and worth investigating. Second, although Huang et al. (2013) examined whether the enhancement of investor protection resulting from cross-listing affects cash holdings, from the aspect of the agency problem, they focused more on the level of cash holdings rather than the value of cash holdings. Using a sample with data from 39 different countries, not including China, they documented that lower agency costs reduced the valuation discount applicable to a firm's cash holdings for cross-listed firms. In our paper, we investigate whether cross-listing affects the value of cash holdings and the channel(s) through which the effects occur. We focus on China, the largest emerging market in the world, whose financial system is dominated by state-owned banks. This is why the findings of Huang et al. (2013), for other countries may not be generalizable to the Chinese capital market. In addition to taking agency problems into account, we also include financial constraints, further dividing our sample into SOE and non-SOE subsamples. This differentiation is made because in China non-SOEs are more financially constrained than SOEs. Finally, in the third related study, Fresard and Salva (2010) examined whether

US cross-listing mitigates agency problems and in turn increases the value of excess cash. Their samples include more than 40 countries, including China, but the sample size from China was very small[2] . They found that the value investors attach to excess cash reserves is substantially larger for cross-listed firms. However, those findings may not be generalized to China.

In summary, Megginson et al. (2014) investigated a sample from China. Based on the agency and SBC theories they find that marginal value of cash increases as state ownership declines after privatization. Huang et al. (2013) examined the sample from 39 countries. Based on the agency theory and the bonding hypothesis, they found that cross-listing increases the value of cash holdings. Fresard and Salva (2010) investigated a sample containing data from more than 40 countries, including China. Based on the agency theory and the bonding hypothesis, they reported that cross-listed firms have much higher value cash holdings. In contrast, in this study, we examine sample from China which has a very unique financial system. The findings from previous similar research may not be generalizable to China. Our research is based on the agency theory, the SBC theory, the bonding hypothesis and, especially, the financial constraint theory and we find that cross-listing affects the value of cash holdings through two channels, the mitigation of agency problem and financial constraints. Consistent with previous studies, we find that the mitigation of agency problem leads to a higher value of cash holdings for cross-listed firms, however, the amelioration of financial constraints lowers the values of cash holdings with the latter effect dominating the former. Our study thus complements the existing literature and makes contributions.

To examine the impact of cross-listing on the value of cash holdings, we use a sample of Chinese cross-listed firms from 2006 to 2013. The findings are generally consistent with our hypotheses. First, we take financial constraints into consideration and find that cash holdings are less valuable for cross-listed firms than for non-cross-listed firms and the decrease in value is more pronounced for non-SOEs than for SOEs. Second, taking into account agency problems, the

[2] They included only 16 Chinese firms in their study.

value of cash holdings is higher for cross-listed firms than for non-cross-listed firms and this effect is more pronounced for SOEs than for non-SOEs. Finally, considering both financial constraints and agency problems, we find that the effect of financial constraints dominates the effect of agency problems, leading to a decrease in value of cash holdings.

This study contributes to the literature in several ways. First, it sheds light on what leads to changes in the value of cash holdings. We find that, in addition to privatization (Megginson et al. 2014), cross-listing can also increase the value of cash holdings through the mitigation of agency problems. In other words, we identify another factor, cross-listing, which also affects the value of cash holdings. Second, our findings indicate that cross-listing can also increase the value of cash holdings for listed firms in China, which complements the evidence of Huang et al. (2013), whose sample included data from 39 countries, but not China. In other words, their findings can also be applied to China where the financial system is unique. Third, we take both financial constraints and agency problems into consideration, in contrast to Huang et al. (2013) and Fresard and Salva (2010) who focused only on the effect of agency problems. We find that cross-listing affects the value of cash holdings by mitigating both financial constraints and agency problems with the effect of the former dominating that of the latter. That is, we disentangle the effect of mitigating financial constraints on the value of cash holdings from the effect of ameliorating agency problems due to the cross-listing and find that the former dominates the latter. Fourth, this study is related to the existing literature on capital market imperfections and cash holdings. We find that cross-listing can mitigate the market frictions arising from government involvement in China. Finally, the sample is divided into SOEs and non-SOEs to investigate the effect of cross-listing on the value of cash holdings because in China SBC means big differences between these two types of firms in fund raising. We find that cross-listing affects the value of cash holdings in different ways in these two types of firms.

The remainder of this paper is organized as follows. In Section 2, a literature review is provided and the hypotheses on the relationships between cross-listing and the value of cash holdings are stated. Section 3 contains a description of the data while the research design is discussed in Section 4. Section 5 shows the results and some conclusions are offered in Section 6.

2. LITERATURE REVIEW AND HYPOTHESES

To ensure economic growth, firms world-wide are looking for new ways to grow and gain competitive advantages. Therefore, more and more companies are choosing to list their shares on foreign stock exchanges. However, it is costly for firms from emerging countries to cross list in developed markets, as cross-listed firms have to comply with more stringent listing requirements and securities regulations. Despite the cost, since the early 1990s, numerous Chinese firms have been seeking cross-listing on foreign stock exchanges in the US, Britain, and especially Hong Kong. In this study, we examine the effects of cross-listing on the value of cash holdings from two aspects: financial constraints and agency problems.

2.1 Cross-listing, financial constraints and the value of cash holding

In the real world, capital markets are not perfect and due to financing friction, firms could be constrained from undertaking valuable projects. As pointed out by Kaplan and Zingales (1997), firms facing with a wedge between internal and external costs for funds can be classified as financially constrained. Capital market friction can increase the cost of external capital relative to internally generated funds. Consequently, firms that have attractive growth opportunities will invest less than the first-best optimum, leading to lower future growth and reduced operating performance and firm value. One way to mitigate these adverse effects is for those firms facing high costs for external financing (i.e., financially constrained firms) to rely more on internal financial resources: i.e., cash flow and cash holdings (Myers and Majluf 1984; Dennis and Sibilkov 2010). Thus, a financially constrained firm can hold onto cash for future positive NPV projects which can increase firm value. However, holding cash also has its costs because it gives managers opportunities to make decisions that benefit

themselves at the expense of minority shareholders' interests. Kyröläinen et al. (2013) pointed out that the dark side of financial constraints is underinvestment because of costly and limited external financing. In this case, cash holdings can alleviate the underinvestment problem for financially constrained firms and create savings in external financing costs. If a firm has positive NPV projects but insufficient current cash holdings, and faces financial constraints in the form of costly and limited external funding, then the value of an additional dollar of cash reserves could be relatively high, even exceeding $1.

Luo (2011) argued that the more the resources under the managers' control, the larger the compensation and the more power or prestige that managers can obtain. A self-interested manager would thus try to accept as many projects as possible, whether they are positive or negative NPV projects, that is, unconstrained managers will invest beyond the optimal level (leading to overinvestment) in the current period, because they value investment more than the shareholders. At the same time, unconstrained managers may have less incentive to save cash, because they can raise external funds to finance any growth opportunities that might come along in the future. In contrast, managers anticipating financial constraints have the motivation to save cash for the next period. They would rather avoid negative NPV projects now in order to conserve cash resources for investments in positive NPV projects in the future. The result is that financially constrained firms are less likely to spend cash on negative NPV projects than financially unconstrained firms would be (Luo 2011). Faulkender and Wang (2006) argued that the value of cash lies in the expected reduction of financing costs and underinvestment. They found that each extra dollar of cash is more valuable for constrained firms than for unconstrained firms, especially for those with growth opportunities. Thus, constrained managers would be more likely to incur higher opportunity costs by using one dollar of cash inefficiently. They thus would be less likely to engage in negative NPV projects than similar firms with unconstrained managers (Luo 2011). Cash holdings in financially constrained firms therefore are more likely to be value-increasing.

Empirical evidence reported in several studies has shown that cash holdings are more valuable for financially constrained firms than for unconstrained firms (Faulkender and Wang 2006; Pinkowitz et al. 2006). Dennis and Sibilkov (2010) documented that greater cash holdings are associated with higher levels of investment for constrained firms and that the association between investment and value is stronger for constrained firms than for unconstrained firms. This implies that higher cash holdings allow constrained firms to undertake value-increasing projects that might otherwise be bypassed. Kyröläinen et al. (2013) investigated the effect of financial constraints on the value of cash holdings to find that in countries with weak investor protection, firms tend to face more financial constraints and place more value on cash holdings, indicating that marginal investment is more valuable for firms in countries with weaker investor protection. This is because for financially constrained firms, cash holdings alleviate the underinvestment problem and create savings in external financing costs. In addition, when it is difficult to raise capital, firms with more severe budget constraints are less likely to invest funds in negative NPV projects, leading to higher valuation of cash (Kornai 2001; Denis and Sibilkov 2010).

Firms choose to cross list for a variety of reasons: some decide to list for financial reasons such as raising capital or increasing stock liquidity, others list for strategic reasons such as improving corporate governance or enhancing corporate reputation. There are general benefits from cross-listing. Previous studies have shown that by listing abroad, firms obtain greater access to foreign capital markets, thereby overcoming the financial constraints they might face in their home countries. In addition, cross-listing increases the liquidity of the firms' shares by making them easier for investors to trade. Similarly, Lang et al. (2003) found that firms in emerging markets may choose to cross list on foreign stock exchanges in countries with better investor protection in order to protect their minority shareholders and increase the trading of their shares. These findings are consistent with conventional theories that cross-listing provides firms with better access to global capital, enhances liquidity and provides a broader investor base which leads to a reduction in the cost of raising capital

(Karolyi 2012). Therefore, cross-listing becomes a good way for firms to mitigate financial constraints in their home markets. However, financial constraints are sometimes in fact beneficial because they can alleviate agency problems between corporate insiders and minority shareholders (Kyröläinen et al. 2013). After cross-listing, financial constraints become less severe, and cash holdings can provide funds for corporate insiders to invest in projects that offer private benefits but destroy minority shareholders value. That is, conflicts are particularly severe when there is free cash flow, making it more likely that managers will utilize cash for negative NPV projects, or facilitating some other types of organizational inefficiency (Kyröläinen et al. 2013).

Overall, one significant disadvantage of cash holdings is that managers may be able to engage in wasteful spending that provides benefits to themselves at the expense of firms' shareholders – empire-building (Opler et al. 1999; Luo 2011). On the other hand, cash holdings can also be of benefit to shareholders. Firm facing friction in capital markets, which can increase the costs of raising external funds, might not generally be able to undertake all positive NPV projects when internal funds are in short supply (Fazzari, Hubbard and Petersen 1988; Luo 2011). Cash holdings can alleviate binding financial constraints, thereby allowing firms to invest closer to the first best level (Luo 2011). When cross-listing mitigates financial constraints, the benefits for cash holdings become less important because it is now easier for firms to raise external funds, however, the negative costs of cash holdings still exist, thereby lowering their value. We thus propose the first hypothesis as follows:

H1a: Cross-listing reduces the value of cash holdings for financially constrained firms.

In emerging markets, especially in the Chinese market, the financial system is dominated by state-owned banks. According to Cull, Li, Sun, and Xu (2014), government connections play a key role in explaining the financial constraints that Chinese firms face. The Chinese government has the power to decide on the deployment of financial resources and it tends to favor SOEs. This is the reason why SOEs face fewer financial constraints, especially in times of financial crisis.

Furthermore, China maintains a state-dominated financial system, giving SOEs better access to credit in state-owned banks (Qian and Yeung 2014). As a result, SOEs tend to rely on bank debt and do not have to bear the burden of finding the resources for investments. They are always rescued or bailed out by government subsidies. This is called the soft budget constraint (SBC) effect Kornai (1979, 1980). In addition, Firth, Malatesta, Xin and Xu (2012) argued that listed firms having a unit of the state as the major stockholder (government-controlled firms) may have complex objective functions that reflect government preferences, for example, socioeconomic considerations such as maintaining high employment levels. Consequently, even when investment opportunities are poor investments in pursuit of these socioeconomic objectives are still made, leading to inefficient investment (i.e. overinvestment). Chen, Sun, Tang and Wu (2011) found the sensitivity of investment expenditure to investment opportunities to be weaker in SOEs than non-SOEs, suggesting investment inefficiency in SOEs.

The greater difficulty for non-SOEs to secure financing within a state-controlled financial system means that they suffer from more severe financial constraints, which gives them a stronger incentive to hold onto more cash. Generally, non-SOEs do not have as strong ties to the government as SOEs, so they may not receive government support and therefore may not have access to credit from state-owned banks, resulting in higher cost of capital in the home market (Megginson et al. 2014). Poncet, Steingress and Vandenbussche (2010) documented that credit constraints for private Chinese firms are reinforced when the presence of state-owned firms is strong. Non-SOEs hold onto more cash than SOEs because of their limited access to domestic financial resources and the need to prepare for future investment opportunities (Chen, Li, Xiao and Zou 2014). Managers in non-SOEs thus tend to use their cash more effectively than SOEs, leading to less over-investment. Also, according to Faulkender and Wang (2006), the value of cash holdings for those firms that are less likely to be able to raise external capital is higher than for less financially constrained firms because, when access to capital becomes more difficult, in the absence of internal funds, the forgoing of positive NPV projects is more likely. Therefore, for constrained firms, higher cash holdings increase the likelihood of taking on positive NPV

projects that would otherwise be foregone, whereas liquidity provides no such benefits for unconstrained firms.

According to Zhang and King (2010), it is the demand to raise capital that motivates firms to cross list abroad, therefore, the more financially constrained non-SOEs choose to cross list in order to overcome financial constraints. However, cross-listing makes it easier for these financially constrained non-SOEs to raise funds from foreign capital markets at a lower cost, which relaxes the constraint giving them less incentives to save cash, and they are thus more likely to undertake negative NPV projects than before cross-listing. The implication is that the value of cash holdings decreases as financial constraints relax. Accordingly, we predict that cross-listing decreases the value of cash holdings by mitigating financial constraints, and this effect is more pronounced for non-SOEs than for SOEs. Therefore we propose the following hypothesis:

H1b:The value of cash holdings decreases more for non-SOEs than for SOEs cross-listed firms.

2.2 Cross-listing, agency problems and the value of cash holdings

Agency conflicts involve the expropriation of corporate resources by controlling shareholders. Agency theory suggests that in a weak governance environment, managers or controlling shareholders tend to exploit corporate resources for their own interests (Jensen 1986). Among the many types of assets that firms possess, cash holdings are particularly vulnerable (Myers and Rajan 1998). When the governance mechanism is weak, managers or controlling shareholders have a good opportunity to convert cash holdings into private benefits by over-investing in projects that benefit them personally at the expense of minority shareholders (Jensen and Meckling 1976). Investors recognize that the risk associated with cash reserves is substantial when institutions preventing controlling insiders from expropriating outsiders are weak or when external monitoring instruments are ineffective in aligning insider’s interests, or both (Fresard and Salva 2010). As a result, investors usually discount the value of cash holdings held by firms with poor corporate governance (Dittmar and Mahrt-Smith 2007). In addition, according to the free cash flow hypothesis, managers,

acting in their own interests might seek to grow a firm beyond its optimal size (Jensen 1986). Managers of larger firms could enjoy more pecuniary (compensation) and non-pecuniary benefits such as increased power and prestige (Luo 2011), which would result in a lower value for cash holdings.

Cross-listings are associated with increased media attention, greater analyst coverage, better analyst forecasting accuracy and a higher quality of accounting information (Lang et al. 2003), all of which enhance the information environment and reduce the information asymmetry, which in turn increases the power of investors to monitor firms and lowers the cost of capital. When cross listing in more regulated markets, firms are required to comply with higher disclosure and monitoring standards, which helps to improve investor protection (Coffee 1999, 2002; Stulz 1999). Huang et al. (2013) argued that strong investor protection makes it very costly for managers to pursue their conflicting personal interests over shareholders' interests, thus mitigating agency problems. Firms cross listed on US stock exchanges have unique governance benefits and are better governed than their domestic peers, because they are subject to more stringent US laws and regulations designed to protect the interests of minority shareholders. In addition, US listed firms must adhere to the disclosure requirements in the US markets, thereby greatly reducing the problem of information asymmetry between managers and investors. Furthermore, cross-listing also exposes a firm to closer scrutiny by expert analysts who can more accurately forecast the firm's future prospects. Resolution of agency problems by cross-listing in the US markets allows the firm to increase its cash holdings to the optimal level. Cross-listing serves as an effective mechanism because investors can now trust that the firm will use their cash effectively (Huang et al. 2013). Cross-listing subjects firms thus: (1) increases enforcement by the SEC; (2) exposes them to a more demanding litigation environment; and (3) enhanced disclosure and reconciliation to U.S. GAAP. In addition, such firms face greater scrutiny from investors, giving more pressure to provide guidance than they did in their home markets, and increased scrutiny from auditors. Firms that are listed in the US markets are, in effect, "bonding" themselves to an increased level of disclosure and scrutiny. These changes in transparency could affect firm value

by decreasing the cost of capital and/or, increasing the cash flow that ultimately accrues to shareholders (Coffee 2002; Lang et al. 2003).

It has been shown in various studies that cross-listing in a foreign market with more stringent disclosure and regulatory requirements is a signal to the market that these are high-quality firms, increasing investor confidence that cash reserves will be used efficiently, thereby resulting in a higher valuation of cash. In addition, as indicated in Huang et al. (2013), cross-listing can improve investor protection making it more difficult for controlling shareholders to exploit corporate cash. Cross-listing gives investors the opportunity to access higher-quality information disclosure and governance standards (Burns, Francis and Hasan 2007). As a result, insiders in cross-listed firms face more constraints in their consumption of private benefits and investors will value more highly the assets that are particularly at risk of being wasted or expropriated – the excess cash of cross-listed firms (Fresard and Salva 2010). In summary, cross-listed firms with severe agency problems will increase the value of cash holdings due to the more stringent disclosure and regulatory requirements they face. On this basis, we develop the following hypothesis:

H2a:Cross-listing increases the value of cash holdings for firms with severe agency problems.

In China, SOEs are usually viewed as firms with higher agency problems and weaker corporate governance, a point of view supported by stories about insider trading, related-party transactions, the expropriation of minority shareholders, as well as accounting and disclosure irregularities (Berkman, Cole and Fu 2009; Liu and Lu 2007). In addition, it is easier for SOEs to access state-owned banks, so managers more inclined to misuse the funds raised for their own personal interests or to invest in politically expedient projects (Hung, Wong and Zhang 2012). Furthermore, Chen et al. (2014) investigated the effects of state and foreign ownership on corporate investment efficiency to find that state ownership has a negative effect on investment efficiency. This is because state ownership is related to lower financial quality and financial transparency, which lead to more information asymmetry problems. High state ownership leads to

SBC, which exacerbates agency problems and lowers the value of cash holdings (Megginson et al. 2014). As a result, SOEs have more agency problems than non-SOEs. In order to reduce agency problems, Chinese SOEs often choose to cross list their shares in developed overseas markets (Sun et al. 2013). By cross listing in more regulated markets, firms bind themselves to better legal, disclosure and monitoring standards that improve corporate governance which mitigates agency problems, and the enhanced transparency associated with cross-listing may influence value through pure cash flow effects by reducing agency costs, thereby increasing the value of cash holdings. In line with the above arguments, Megginson et al. (2014) examined the relationship between state ownership and the value of cash holdings to find that the latter increases as state ownership declines. This helps to explain why the value of cash holdings is lower in SOEs than in non-SOEs. Cross-listing reduces the degree of state ownership[3], improving the corporate governance of SOEs, therefore agency problems will in turn be ameliorated, leading to a higher value of cash holdings. Based on the above, we predict that cross-listing will affect the value of cash holdings by reducing agency problems, and this effect will be more pronounced for SOEs than for non-SOEs, leading to the following hypothesis:

H2b:The value of cash holdings in cross-listed firms increases more for SOEs than for non-SOEs because SOEs have more severe agency problems.

One of the benefits of cross-listing is that it can help the firm to overcome financial constraints in the home market, meaning it should be easier for cross-listed firms to raise external funds, leading to a lower value for cash holdings. Another benefit is that by cross listing on more regulated markets, firms are required to comply with higher disclosure and monitoring standards, which should help to improve investor protection and mitigate potential agency conflicts (Coffee 1999, 2002; Stulz 1999), leading to a higher value for cash holdings. Cross-listing therefore has two opposing effects on the value of cash

[3] Ayyagari and Doidge (2010) documented that after cross-listing, the controlling shareholders' voting rights decreased by about half.

holdings and which effect dominates is an empirical issue. We thus include both financial constraints and agency problem proxies to test the hypothesis. Assuming that financial constraints and agency problems are closely associated with the value of cash holdings, we extend our study to examine both channels together in our analysis, to determine overall which channel affects the value of cash holdings. We thus hypothesize that:

H3: Overall, cross-listing influences the value of cash holdings through the channels of the mitigation of financial constraints and/or agency problems

3. DATA

The main purpose of this study is to investigate the relation between cross-listing and the value of cash holdings, by comparing the difference in value of cash holdings between Chinese firms cross-listed on both Chinese and foreign stock markets with those listed only on Chinese markets (non-cross-listed firms). The sample employed includes data for Chinese cross-listed firms from 2006 to 2013. Data were collected from the China Stock Market & Accounting Research (CSMAR) database and the Taiwan Economic Journal (TEJ) database.

The differences in the value of cash holdings between cross-listed firms and non-cross-listed firms is estimated by constructing a matched sample of non-cross-listed firms classified based on size and industry as in Ayyagari and Doidge (2010). The matched sample of benchmark firms comprises firms whose shares that are publicly traded in their home markets but are not cross-listed on foreign stock exchanges. In other words, the matched sample includes purely domestic listed firms. In addition, the matching process includes cross-listed and non-cross-listed firms from the same year and the same industry. Finally, firms for which we do not have data on the book value of total assets and financial firms, which may hold onto cash in order to meet capital requirements, are excluded.

3.1 Methodology

To test how cross-listing affects the value of cash holdings, we include both financially constrained and financially unconstrained firms as well as firms both with and without agency problems. Financial constraint has been measured in different ways. In this study, we use firm size as a measure of financial constraint. According to previous studies, large firms have better capital knowledge and easier access to capital markets than small firms and therefore are less likely to be financially constrained. Following Luo (2011), yearly data are utilized and financially constrained firms are sorted by firm size, firms with total assets greater than the median are classified as financially unconstrained (i.e., large-size firms set to a value of one); firms with total assets lower than median are classified as financially constrained (i.e., small-size firms, with a value set to zero). Even though firm size has been widely utilized as a proxy for financial constraint in previous studies (such as that by Luo in 2011), considering the stronger connection of SOEs to the financial system for funding[4] that is characteristic of China and given that non-SOEs are crowded out for receiving loans from banks which are dominated by the Chinese government, we thus use non-SOE as a proxy for financial constraint, setting its value to one and zero otherwise (that is SOEs) in the robustness test.

In addition, as has been documented in numerous previous studies, the deviation between cash flow rights and control rights has a negative impact on firm performance. We therefore follow LaPorta, Lopez-de-Silane, Shleifer and Vishny (1998) and use the deviation of cash flow rights and control rights held by controlling shareholders as a proxy for examining agency problems. Firms with a yearly deviation higher than the median are classified as having high-agency problems (set to a value of one), whereas firms with a deviation lower than the median are classified in the low-agency problem group (the value is set to zero). In the robustness tests, zero is used as a new cutoff point and the dummy variable of agency problems is set to one when the deviation is higher than zero (i.e., with agency problems) and zero otherwise.

[4] We thank the referee for suggesting this idea.

4. RESEARCH DESIGN

The important variable measured in this study is excess cash (*Excash*). According to Fresard and Salva (2010), firms from different countries have different reasons to hold onto cash, such as operational needs and investment opportunities. If we were to use total cash instead of excess cash, this might be affected by investment opportunities that are correlated with firm value and vice versa (Dittmar and Mahrt-Smith 2007). In addition, excess cash is viewed as cash that is not directly related to the firms' operations or investments. We therefore use excess cash as the main independent variable in order to capture the effects of cross-listing on the valuation of cash. To compute excess cash holdings, we follow the approach of Fresard and Salva (2010). The specifications for measuring excess cash are as follows:

$$Ln(Cash_{i,t}) = \beta_1 ln(TA_{i,t}) + \beta_2 CF_{i,t} + \beta_3 NWC_{i,t} + \beta_4 MV_{i,t} + \beta_5 Capex_{i,t} + \beta_6 Leverage_{i,t} + \beta_7 DIV_{i,t} + \phi + \upsilon_{i,t,} \quad (1)$$

where *Cash* is defined as cash and cash equivalents divided by total assets, *TA* is total assets, and *CF* is defined as operating income minus interest and taxes divided by total assets. *NWC* is computed by using current assets minus the sum of current liabilities and cash divided by total assets, and *MV* (market to book ratio) is defined as the market value of equity divided by the book value of equity. *Leverage* is defined as the sum of short-term and long-term debt divided by total assets. *Capex* is defined as capital expenditures divided by total assets, and *DIV* is common dividends paid divided by total assets. An *industry dummy* (ϕ) and *year dummy* ($\upsilon_{i,t}$) are also included in the regression.

Furthermore, we investigate how cross-listing affects the value of corporate cash holdings, by extending the valuation regressions of Dittmar and Mahrt-Smith (2007) and Fresard and Salva (2010) and using the market-to-book ratio to estimate the value of cash holdings. This framework has become a general measurement which is used to measure the value of cash holdings. Therefore, our main regression specification is:

$$MV_{i,t} = \alpha + \beta_0 ExCash_{i,t} + \beta_1 Cross + \beta_2 (Cross \times ExCash_{i,t}) + \beta_3 E_{i,t} + \beta_4 dE_{i,t} + \beta_5 dE_{i,t+1} + \beta_6 dNA_{i,t} + \beta_7 dNA_{i,t+1} + \beta_8 I_{i,t} + \beta_9 dI_{i,t} + \beta_{10} dI_{i,t+1} + \beta_{11} DIV_{i,t} + \beta_{12} dDIV_{i,t} + \beta_{13} dDIV_{i,t+1} + \beta_{14} dV_{i,t+1} + \phi + \upsilon_{i,t,,} \quad (2)$$

where *MV* (market to book ratio) is our primary dependent variable, which is defined as the market value of equity divided by the book value of equity. Following Fresard and Salva (2010), Excess cash (*Excash*) is defined as cash that is not needed for operations or investments, meaning the cash held above a predicted "normal" (or "optimal") level. Model (1) is used to compute the normal level, regressing the firms' total cash on variables as a proxy for genuine motives for cash holdings; X_t is the level of variable *X* in year *t;* and dX_t refers to the change in variable X_t from year *t-1* to year *t*. In the same way, dX_{t+1} represents the change in variable X_{t+1} from year t to year *t+1*. In addition, we also include *Cross* as the dummy variable in the regression model to proxy for cross-listed and non-cross-listed firms. The value of the *Cross* variable is equal to one for firms with shares listed in both Chinese stock markets and foreign stock exchange at the same time and zero for firms whose shares are listed only in the Chinese stock markets. We also include the *industry dummy* (ϕ) and year *dummy* ($\upsilon_{i,t}$) in the regression.

As has been done in previous studies (Drobetz, Grüninger and Hirschvogl 2010, Fresard and Salva 2010), we include some control variables for the main research model such as: *Earnings before interest and taxes (E), Net Assets (NA), Interest expenses (I), Cash dividend paid (DIV)*. Specifically, *E* is the ratio of net income plus all noncash charges or credits, extraordinary items and interest to the book value of total assets. It is known to be positively associated with the increase in the value of cash holdings (Drobetz et al., 2010). *NA* is defined as the book value of total assets minus cash and cash equivalents over total assets. *I* is defined as interest expenses divided by total assets and suggests a negative relationship with the valuation of cash (Drobetz et al., 2010). *DIV* is measured as common dividends paid divided by total assets. Findings on the impact of dividends on the value of cash holdings have been mixed. Drobetz et al. (2010)

found a positive relationship, whereas Harford et al. (2008) documented a negative relationship between dividend payouts and the value of cash. Here, we also *include the industry dummy (α_i) and year dummy (η_t)* in the regression.

5. RESULTS

5.1 Univariate analysis

The descriptive statistics for the variables are shown in Table 1. Examination of the table shows that the mean (median) market-to-book ratio is approximately 0.946 (0.623) with a standard deviation of 1.086. The mean (median) ratio of excess cash holdings is 0.000 (0.069) with a standard deviation of 0.731. The mean value of excess cash is close to zero. The mean (median) ratio of earnings is 0.058 (0.050) with a standard deviation of 0.057. Notably, the minimum ratio of interest expenses is negative (-0.005) since interest expenses are sometimes combined with interest income. The negative number means that firms have paid less interest for loans than the interest received from investments. The mean (median) ratio of dividend payout is 0.013 (0.007) with a standard deviation of 0.019.

Table 1 Descriptive statistics for all variables used in the excess cash value estimation

	N	Mean	Median	Minimum	Maximum	Std. Deviation
MV	2,580	0.946	0.623	0.005	15.353	1.086
Excash	2,570	0.000	0.069	-4.959	1.838	0.731
$E_{i,t}$	2,482	0.058	0.050	-0.488	0.614	0.057
$I_{i,t}$	2,483	0.013	0.010	-0.005	0.065	0.010
$Div_{i,t}$	2,578	0.013	0.007	0.000	0.250	0.019

This table shows the descriptive statistics of all variables used for excess cash value estimation from 2006 to 2013. The variables include Market value (*MV*) which is defined as the market value of equity divided by the book value of equity; Excess cash (*Excash*) is defined as cash that is not needed for operations or investments, meaning the cash held above a predicted "normal" (or "optimal") level; Earnings before interest and taxes (*E*) is the ratio of net income plus all noncash charges or credits, extraordinary items and interest to the book value of total assets; Interest expenses (*I*) is defined as interest expenses divided by total assets; Cash dividends paid (*Div*) is the common dividends paid divided by total assets.

Table 2 reports the mean and median value of our variables for cross-listed firms and non-cross-listed firms. We find that the mean (median) excess cash is -

8.1% (-3.4%) for cross-listed firms while it is 2.0% (10.3%) for non-cross-listed firms. On average, cross-listed firms hold less excess cash than non-cross-listed firms with the difference significant at the 1% level. The results indicate that cross-listed firms, for whom it is easier to raise funds from external financing, are likely to hold less excess cash in comparison with their domestic peers. We find that the mean ratio for dividend payouts is 0.013 for both cross-listed and non-cross-listed firms (not reported). Thus, there is no significant difference in dividend payout between cross-listed and non-cross-listed firms.

Table 3 presents the Spearman correlation coefficients among the variables used in the excess cash estimations. The correlation coefficient between Earnings and Dividends is 0.582 and significant at the 1% level. This result is consistent with previous studies which show that more earnings generally mean more dividend payouts (Drobetz et al. 2010). However, most correlation coefficients among the variables are lower than 0.3. Therefore, multicollinearity may not be a problem for our regression results.

Table 2 Summary of the means and medians of the variables for cross-listed and non-cross-listed firms

Variables	Mean			Median			Differences	
	All	Cross	Non-cross	All	Cross	Non-cross	t-Test	Mann-Whitney U
MV	0.946	0.705	1.006	0.623	0.518	0.655	-5.670***	5.877***
Excash	0.000	-0.081	0.020	0.069	-0.034	0.103	-2.823***	3.088***

*, **, *** represent significance at the 10 %, 5 %, and 1 % levels, respectively. This table reports the mean and median of Chinese cross-listed and non-cross-listed firms between 2006 and 2013. We construct a matched sample of non-cross-listed firms based on size and industry according to Ayyagari and Doidge (2010). The matched sample of benchmark firms is comprised of firms that are publicly traded in the Chinese home market but are not cross-listed on the foreign stock exchange. We exclude those firms that do not have data on the book value of total assets and financial firms since they may hold cash in order to meet capital requirements. The variables include Market value (*MV*) which is defined as the market value of equity divided by the book value of equity; Excess cash (*Excash*) is defined as cash that is not needed for operations or investments, meaning that the cash is held above a predicted "normal" (or "optimal") level.

Table 3 Correlation coefficients

	MV	Excash	Cross	FC	Deviation	E	I	Div
MV	1.000							
Excash	-0.011	1.000						
Cross	-0.102***	-0.061***	1.000					
FC	0.317***	-0.009	-0.197***	1.000				
Deviation	0.045**	0.013	-0.134***	0.070***	1.000			
E	0.369***	0.104***	-0.038*	0.020	0.012	1.000		
I	-0.278***	-0.178***	-0.082***	-0.051**	0.074***	-0.275***	1.000	
Div	0.315***	0.067***	0.011	0.034	-0.058***	0.582***	-0.298***	1.000

*, **, *** represent significance at the 10 %, 5 %, and 1 % levels, respectively. This table reports the correlations between the variables used in excess cash value estimation. The variables include Market value (*MV*) which is defined as the market value of equity divided by the book value of equity; Excess cash (*Excash*) is defined as cash that is not needed for operations or investments, meaning that the cash is held above a predicted "normal" (or "optimal") level; *Cross* is a dummy variable, which is equal to 1 for cross-listed firms and 0 for non-cross-listed firms; Financial constraint (*FC*) is equal to 1 for financially constrained firms and 0 for financially unconstrained firms; *Deviation* is representative of agency problems, and is equal to 1 for firms with agency problems and 0 for firms without agency problems; Earnings before interest and taxes (*E*) is the ratio of net income plus all noncash charges or credits, extraordinary items and interest for the book value of total assets; Interest expenses (*I*) is defined as interest expenses divided by total assets; Cash dividends paid (*Div*) are common dividends paid divided by total assets.

Table 4 Distribution of excess cash across years

Year	Full sample		Cross-listed firms		Non-cross-listed firms	
	N	Mean (%)	N	Mean (%)	N	Mean (%)
2006	230	-0.005	46	-9.338	184	2.328
2007	280	-0.015	56	-8.002	224	1.982
2008	305	-0.005	61	0.924	244	-0.238
2009	320	-0.011	64	-8.191	256	2.034
2010	335	-0.005	67	-11.886	268	2.965
2011	350	-0.003	70	-9.935	280	2.480
2012	375	-0.003	75	-7.436	300	1.856
2013	375	-0.002	75	-10.504	300	2.624
Total	**2,570**		**514**		**2,056**	

*, **, *** represent significance at the 10 %, 5 %, and 1 % levels, respectively. This table reports the mean value of excess cash for the sample from 2006 to 2013. The table also reports the distribution of excess cash (*ExCash*) in cross-listed firms and non-cross-listed firms across the years, as a dependent variable (Eq.1). Excess cash (*Excash*) is defined as cash that is not needed for operations or investments, meaning that the cash is held above a predicted "normal" (or "optimal") level, *TA* is total assets, and *CF* is defined as operating income minus interest and taxes divided by total assets. *NWC* is computed by using current assets minus the sum of current liabilities and cash divided by total assets, and *MV* (market to book ratio) is defined as the market value of equity divided by the book value of equity. *Leverage* is defined as short-term and long-term debt divided by total assets. *Capex* is defined as capital expenditure divided by total assets, and *DIV* is common dividends paid divided by total assets. An industry dummy (ϕ), and year dummy ($\upsilon_{i,t}$) are also included in the regression.

The distribution of excess cash across the years from 2006 to 2013 is summarized in Table 4. The results show that the means of excess cash for the full sample and cross-listed firms are negative in each year except for cross-listed firms in the year 2008; whereas they are positive for non-cross-listed firms except in 2008. These results are consistent with those in Table 2, showing that cross-listed firms tend to hold less excess cash than non-cross-listed firms, because they are more likely to gain access to external capital markets at a lower cost.

5.2 Multivariate regression analysis

Table 5 reports the regression results of the cross-listing effect on the value of cash holdings between cross-listed versus non-cross-listed firms, under the same financial constraint conditions. We include all variables, cross-listing (*Cross*), excess cash (*Excash*), financial constraints (*Fc*) and some interactions of

variables in our regression. To learn how cross-listing affects the value of cash holdings through financial constraints, we focus on the interaction between cross-listing, excess cash and financial constraints (*Cross*Excash*Fc*) variables in our regression model. The impact of cross-listing on the value of cash holdings is evaluated by comparing the difference in cash valuation between cross-listed and non-cross-listed firms.

As shown in Table 5, the coefficient of *Cross*Excash*fc* is -0.206, significant at the 1% level, which indicates that cross-listing reduces the value of cash holdings for financially constrained firms. This result suggests that financially constrained non-cross-listed firms have greater precautionary motive and value of cash holdings; in contrast, financial constraints are mitigated for cross-listed firms due to increased accessibility to external financing, that is, cross-listing lowers the precautionary motives for cash holdings, leading to lower value of cash holdings[5]. The results support our hypothesis (H1a). The coefficient of *Cross*Excash* is significantly positive. One possible explanation for this is that cross-listed firms are exposed to strict formal and informal monitoring from foreign institutions, thereby ameliorating agency costs, cash holdings are therefore more valuable than in non-cross-listed firms. Finally, the coefficient of *Excash*Fc* is significantly negative, a possible reason for this being that in China, investors would like financially constrained firms to undertake positive NPV projects now rather than maintaining a higher level of cash holdings, therefore reducing cash value.

Table 5 Financial constraints and the impact of cross-listing on the value of cash holdings

	Full Sample
C	0.327***
	(3.187)
Cross	-0.093***
	(-2.578)
Excash	-0.008
	(-1.148)
Fc	0.334***
	(6.198)

[5] We thank the referee for suggesting this idea.

Table 5 Financial constraints and the impact of cross-listing on the value of cash holdings (Cont'd)

	Full Sample
Cross*Excash	0.049***
	(3.581)
Cross*Fc	0.034
	(0.855)
Excash*Fc	-0.088***
	(-2.785)
Cross*Excash*Fc	-0.206***
	(-5.040)
E_t	2.539***
	(2.624)
dE_t	-0.194
	(-0.448)
dE_{t+1}	1.496***
	(2.889)
dNA_t	-0.431***
	(-3.742)
dNA_{t+1}	-0.068
	(-0.538)
I_t	-10.536***
	(-5.136)
dI_t	3.665
	(1.174)
DI_{t+1}	-3.931**
	(-2.477)
Div_t	1.900
	(1.530)
$dDiv_t$	1.405*
	(1.317)
$dDiv_{t+1}$	2.439*
	(1.704)
dV_{t+1}	-0.382***
	(-7.715)
Year effects	Yes
Industry effects	Yes
Adjusted R-squared	0.699
F-statistic	166.026***
Observations	1,988

*, **, *** represent significance at the 10 %, 5 %, and 1 % levels, respectively. This table shows the results of regression of the cross-listing effect and cash valuation through its effect on financial constraints in the full sample. The dependent variable is Market value (*MV*) which is defined as the market value of equity divided by

the book value of equity. The other variables include Excess cash (*Excash*) which is defined as cash that is not needed for operations or investments, meaning that the cash that is held above a predicted "normal" (or "optimal") level; Financial constraint (*FC*) is a dummy variable, which is equal to 1 for financially constrained firms and 0 for financially unconstrained firms; *NA* is defined as the book value of total assets minus cash and cash equivalents over total assets; Earnings before interest and taxes (*E*) is the ratio of net income plus all noncash charges or credits, extraordinary items and interest compared to the book value of total assets; Interest expenses (*I*) is defined as interest expenses divided by total assets; Cash dividends paid (*Div*) is common dividends paid divided by total assets; *dXt* refers to the change in variable *Xt* from year t-1 to year t. *dXt+1* representing the change in variable *Xt+1* from year t to year *t+1*; t-statistics (*t-value*) are reported in parentheses.

In China, the precautionary motives differ from SOEs to non-SOEs, which is related to the control of the financial system by state-owned banks. SOEs are viewed as unfinancially constrained, being able to obtain support from the government. As a result, financial constraints may not be the main reason that SOEs would obtain cross-listing. In contrast, non-SOEs, which do not have as such strong ties to government, gain less support from the government and thus may not have easy access to credit from state-owned banks. Consequently, they may suffer more severe financial constraints and thus cross list mainly for mitigation of financial constraints. It follows that cross-listing as a means to decrease the motive to hold onto precautionary cash holdings for financial constrained firms should have a greater impact on non-SOEs than on SOEs[6]. To investigate whether cross-listing has a different effect on SOEs than non-SOEs, we further divide the full sample into SOE and non-SOE subgroups. A comparison of the coefficients of *Cross*Excash*Fc* obtained for Model I and Model II (in Panel A of Table 6) shows that the coefficient of *Cross*Excash*Fc* in Model I is negative but insignificant, whereas it is significantly negative in Model II. This indicates that cross-listing reduces financial constraints for non-SOEs, lessening the precautionary motive, thereby leading to less value of cash holdings. However, for SOEs, the precautionary motive to hold onto cash holdings is low, so cross-listing does not significantly affect the value of cash holdings. These findings partly support the research of Hung et al. (2012) who suggested that Chinese SOEs cross list because of political considerations.

For Model I (see Panel A), the coefficient of *Cross*Excash*Fc* is insignificant at conventional levels, while for Model II, the value is negatively

[6] We thank the referee for suggesting this idea.

significant at the 1% level. As shown in Panel B, the Wald test on the difference between SOEs and non-SOEs is significant at the 1% level. In summary, the results in Table 6 support our hypothesis (H1b) that the value of cash holdings decreases more for non-SOEs than for SOEs in cross-listed firms.

Table 6 Financial constraints and the impact of cross-listing on the value of cash holdings, Comparison between SOEs and non-SOEs

Panel A	**SOEs**	**Non-SOEs**
Model	**I**	**II**
C	0.232	0.479***
	(1.625)	(4.650)
Cross	-0.074***	-0.086
	(-2.990)	(-1.180)
Excash	0.017	-0.018
	(0.741)	(-0.734)
Fc	0.321***	0.365***
	(4.585)	(6.518)
Cross*Excash	0.029	0.038
	(1.189)	(0.416)
Cross*Fc	0.013	-0.008
	(0.158)	(-0.114)
Excash*Fc	0.014	-0.205***
	(0.221)	(-5.036)
Cross*Excash*Fc	-0.101	-0.233*
	(-0.920)	(-1.669)
E_t	3.578***	1.955
	(2.977)	(1.579)
dE_t	-0.881*	0.320
	(-1.779)	(0.687)
dE_{t+1}	1.474	2.067***
	(1.422)	(4.877)
dNA_t	-0.233	-0.580***
	(-1.185)	(-2.893)
dNA_{t+1}	0.078	-0.264**
	(0.478)	(-2.202)
I_t	-3.810**	-18.810***
	(-1.972)	(-7.271)
dI_t	-1.504	8.261**
	(-0.312)	(2.033)
dI_{t+1}	-3.471	-2.965
	(-1.161)	(-0.827)
Div_t	-0.141	4.030
	(-0.064)	(1.384)

Table 6 Financial constraints and the impact of cross-listing on the value of cash holdings, Comparison between SOEs and non-SOEs (Cont'd)

Panel A	**SOEs**	**Non-SOEs**
Model	**I**	**II**
$dDiv_t$	1.619	4.184**
	(1.294)	(2.032)
dV_{t+1}	-0.401***	-0.382***
	(-5.737)	(-11.697)
Year effects	Yes	Yes
Industry effects	Yes	Yes
Adjusted R-squared	0.664	0.750
F-statistic	103.343***	73.181***
Observations	1,345	628
Panel B	**Prob.**	
Cross-listed firms - Non-cross-listed firms	-0.351***	
	(-2.468)	

*, **, *** represent significance at the 10 %, 5 %, and 1 % levels, respectively. This table compares the difference in the effect of cross-listing on the value of cash holdings between SOEs and non-SOEs through its effect on financial constraints. The total number of observations is not the same as in Table 5. The number of observations is reduced during the process of regression. The dependent variable is Market value (*MV*) which is defined as the market value of equity divided by the book value of equity. The other variables include Excess cash (*Excash*) which is defined as cash that is not needed for operations or investments, meaning that the cash is held above a predicted "normal" (or "optimal") level; Financial constraint (*Fc*) is the dummy variable, which is equal to 1 for financially constrained firms and 0 for financially unconstrained firms; *NA* is defined as the book value of total assets minus cash and cash equivalents over total assets; Earnings before interest and taxes (*E*) is the ratio of net income plus all noncash charges or credits, extraordinary items and interest compared to the book value of total assets; Interest expenses (*I*) is defined as interest expenses divided by total assets; Cash dividend paid (*Div*) is the average dividend amount paid out divided by total assets; *dXt* refers to changes in variable *Xt* from year *t-1* to year *t; dXt+1* represents changes in variable *Xt+1* from year t to year *t+1*; t-statistics (*t-value*) are reported in parentheses.

5.3 Consideration of agency problems when determining the value of cash holdings

The results in Table 7 show the linkage between cross-listing and the value of cash holdings in the full sample. Cross-listing lowers agency problems because of more stringent monitoring and increases the value of cash holdings. As Frésard and Salva (2010) showed, firms enjoy a higher valuation of cash and other liquid assets by shareholders when they have better governance and lower agency costs. Similarly, while larger cash holdings can be subject to expropriation, the stronger governance of cross-listed firms suggests that such negative effects are minimized (Huang et al. 2013). Cross-Listing (*Cross*),

Excess Cash (*Excash*), Agency Problems (*Ag*) and the interactions between or among them as well as control variables which could also influence the value of cash holdings are included in the regression. The focus is more on the interaction item, *Cross*Excash*Ag*. The results show that the coefficient of *Cross*Excash*Ag* is 0.195, significant at the 5% level, indicating that cross-listing increases the value of cash holdings for firms with severe agency problems. In addition, the economic significance is 6.8 million RMB (0.195*35.055 (mean of total assets)). This result implies that the value of cash holdings is higher for cross-listed firms than for non-cross-listed firms, consistent with the findings of previous research, where agency problems are associated with the discount of the value of cash holdings (Fresard and Salva 2010). Excess cash in particular is closely related to expropriation risks and supports our hypothesis (H2a) that cross-listing increases the value of cash holdings for firms with severe agency problems.

Table 7 Agency problems and the impact of cross-listing on the value of cash holdings

	Full Sample
C	0.435***
	(4.493)
Cross	-0.127**
	(-1.941)
Excash	-0.034
	(-1.422)
Ag	0.060***
	(2.930)
Cross*Excash	0.011
	(0.247)
Cross*Ag	-0.085
	(-1.587)
Excash*Ag	-0.104**
	(-2.418)
Cross*Excash*Ag	0.195**
	(2.083)
E_t	1.666**
	(1.952)
dE_t	0.137
	(0.280)
dE_{t+1}	1.226**
	(2.330)

Table 7 Agency problems and the impact of cross-listing on the value of cash holdings (Cont'd)

	Full Sample
dNA_t	-0.547***
	(-4.842)
dNA_{t+1}	-0.022
	(-0.169)
I_t	-11.437***
	(-6.730)
dI_t	1.769
	(0.584)
dI_{t+1}	-5.664**
	(-5.888)
Div_t	4.173***
	(4.234)
$dDiv_t$	0.256
	(0.196)
$dDiv_{t+1}$	2.621*
	(1.717)
dV_{t+1}	-0.381***
	(-5.777)
Year effects	Yes
Industry effects	Yes
Adjusted R-squared	0.668
F-statistic	126.420
Observations	1,744

*, **, *** represent significance at the 10 %, 5 %, and 1 % levels, respectively. This table reports the regression results of the cross-listing effect and cash valuation through its effect on agency problems. The dependent variable is Market value (*MV*) which is defined as the market value of equity divided by the book value of the equity. The other variables include Excess cash (*Excash*) which is defined as cash that is not needed for operations or investments, meaning that the cash is held above a predicted "normal" (or "optimal") level; Agency problems (*Ag*) is a dummy variable, which is equal to 1 for firms with agency problems and 0 for those without agency problems; *NA* is defined as the book value of total assets minus cash and cash equivalents over total assets; Earnings before interest and taxes (*E*) is the ratio of net income plus all noncash charges or credits, extraordinary items and interest to the book value of total assets; Interest expenses (*I*) is defined as interest expenses divided by total assets; Cash dividend paid (*Div*) is common dividends paid divided by total assets; *dXt* refers to the change in variable *Xt* from year *t-1* to year *t. dXt+1* represent the change in variable *Xt+1* from year *t* to year *t+1;* t-statistics (*t-value*) are reported in parentheses.

In China, SOEs may have different agency motives than non-SOEs. SOEs are normally exposed to greater agency problems, and according to Megginson et al. (2014), high state ownership of SOEs leads to the soft budget constraints effect[7] which exacerbates agency problems. Cross-listing may mitigate these

[7] Budget constraints are soft if the state helps the firm out of trouble which can be done by various means: subsidies; individual exemptions from the payment of taxes or other charges (their full or partial remission or

agency problems and enhance the value of cash holdings. On the other hand, non-SOEs may have fewer agency problems. Therefore, the decreased agency problem effect from cross-listing would be higher for SOEs than for non-SOEs[8]. In order to examine the difference in the effect of cross-listing on cash valuation between SOEs and non-SOEs, and to analyze which contributes the most to an increase of cash valuation, we divided the full sample into two subsamples comprising observations from SOEs and non-SOEs. In Model I (Panel A, Table 8), for the SOE subsample, the coefficient of the interactions among cross-listing (*Cross*), excess cash (*Excash*), and agency problems (*Ag*), namely *Cross*Excash*Ag*, is positive, indicating that cross-listing has the effect of enhancing the firm's corporate governance, resulting in an increase in the value of cash holdings. However, it is insignificant (0.044) at conventional levels. This result is consistent with Hung et al. (2012) who suggested that Chinese SOEs cross list because of political considerations. That is, mitigating agency problems is not the main motivation for Chinese SOEs to cross list overseas. In Model II, as shown in Panel A, Table 8, the coefficient of the interactions for the non-SOE subsample among the three: *Cross*Excash*Ag* is negative and insignificant (-0.116). Apparently, cross-listing does not ameliorate agency motive of cash holdings and the value of cash holdings thus is not increased. This is likely because non-SOEs suffer from less agency problems. Interestingly, the results for the overall sample in Table 7 show that the coefficient (0.195) of the interaction *Cross*Excash*Ag* is significantly positive at the 5% level, however, the results in Table 8 show that neither the coefficient of the interaction *Cross*Excash*Ag* for SOEs nor that for non-SOEs is significant. One possible reason is that the observations for the SOEs (1,164) are more or less double those for non-SOEs (580), so that the positive effect from SOEs dominates that of non-SOEs. Panel B of Table 8 shows the difference in the coefficients between SOEs and non-SOEs for cross-listed firms with severe agency problems, which is 0.343, significant at the 5% level, in line with our hypothesis (H2b).

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postponement); allowance on the centrally fixed price of an input; open increase of the centrally fixed selling price or toleration of a hidden price increase; credit granted for soft conditions; prolongation for credit repayment, etc. (Kornai, 1979).

[8] We thank the referee for suggesting this idea.

The results suggest that the value of cash holdings increases more for cross-listed SOEs than for non-SOEs. Therefore, cross-listing may play a more effective monitoring role in alleviating agency problems in SOEs than in non-SOEs. Finally, there is an increase in the economic significance of the value, of about 12.0 million RMB more for cross-listed SOEs than for cross-listed non-SOEs.

Table 8 Agency problems and the impact of cross-listing on the value of cash holdings between SOEs and non-SOEs

Panel A	**SOEs**	**Non-SOEs**
Model	**I**	**II**
C	0.288**	0.583***
	(2.193)	(4.799)
Cross	-0.111	-0.165*
	(-1.609)	(-1.905)
Excash	-0.005	-0.052
	(-0.248)	(-0.619)
Ag	0.074**	0.034
	(2.178)	(0.649)
Cross*Excash	0.030	-0.125
	(0.957)	(-0.738)
Cross*Ag	-0.186*	0.073
	(-1.702)	(0.549)
Excash*Ag	0.019	-0.165
	(0.351)	(-1.288)
Cross*Excash*Ag	0.044	-0.116
	(0.625)	(-0.466)
E_t	1.914**	1.547
	(2.229)	(1.288)
dE_t	-0.356	0.523
	(-0.679)	(0.970)
dE_{t+1}	0.867	2.250***
	(1.141)	(4.065)
dNA_t	-0.314*	-0.769***
	(-1.811)	(-3.560)
dNA_{t+1}	0.124	-0.266***
	(0.784)	(-2.841)
I_t	-3.849**	-24.181***
	(-2.567)	(-6.296)
dI_t	-3.021	11.393**
	(-0.674)	(2.057)
dI_{t+1}	-4.851**	-4.974
	(-1.966)	(-1.604)

Table 8 Agency problems and the impact of cross-listing on the value of cash holdings between SOEs and non-SOEs (Cont'd)

Panel A	**SOEs**	**Non-SOEs**
Model	**I**	**II**
Div_t	3.270***	4.482*
	(3.107)	(1.772)
$dDiv_t$	-0.033	2.085
	(-0.069)	(0.935)
$dDiv_{t+1}$	0.392	4.341*
	(0.216)	(1.791)
dV_{t+1}	-0.378	-0.387***
	(-4.235)	(-10.721)
Year effects	Yes	Yes
Industry effects	Yes	Yes
Adjusted R-squared	0.640	0.733
F-statistics	74.976	57.809
Observations	1,164	580
Panel B	**Prob.**	
Cross-listed firms - Non-cross-listed firms	0.343**	
	(1.833)	

*, **, *** represent significance at the 10 %, 5 %, and 1 % levels, respectively. This table compares the difference in the effect of cross-listing on the value of cash holdings between SOEs and non-SOEs through its effect on agency problems. The dependent variable is Market value (*MV*) which is defined as the market value of the equity divided by the book value of the equity. The other variables include Excess cash (*Excash*) which is defined as cash that is not needed for operations or investments, meaning that cash is held above a predicted "normal" (or "optimal") level; Agency problems (*Ag*) is a dummy variable, which is equal to 1 for firms with agency problems and 0 for firms without agency problems; *NA* is defined as the book value of total assets minus cash and cash equivalents over total assets; Earnings before interest and taxes (*E*) is the ratio of net income plus all noncash charges or credits, extraordinary items and interest compared to the book value of total assets; Interest expenses (*I*) is defined as interest expenses divided by total assets; Cash dividend paid (*Div*) is the common dividend paid divided by total assets; *dXt* refers to the change in variable *Xt* from year *t-1* to year *t*. *dXt+1* represent the change in variable *Xt+1* from year *t* to year *t+1*; t-statistics (*t-value*) are reported in parentheses.

The empirical results show that cross-listing impacts the value of cash holdings through two channels – the mitigation of financial constraints and agency problems. We further investigate whether the effect of cross-listing on financial constraints dominates its effect on agency problems or vice versa. The results in Table 9 show the coefficient of interaction among the three: cross-listing, excess cash, and financial constraints (*Cross*Excash*Fc*) is -0.198, significant at the 5% level. Meanwhile, the coefficient of interaction among the three: cross-listing, excess cash, and agency problems (*Cross*Excash*Ag*) is 0.071, which is insignificant at conventional levels. The results suggest that after

cross-listing, the decrease in the value of cash holdings due to the mitigation of financial constraints dominates the increase in the value of cash holdings resulting from the improvement in agency problems. In China, non-SOEs cross list mainly for the mitigation of financial constraints. It is difficult for non-SOEs to obtain financing from the state-controlled financial system, so they suffer from financial constraints. Cross-listing thus ameliorates the precautionary motive and enhances the value of cash holdings. In contrast, SOEs are normally exposed to higher agency problems, and according to Megginson et al. (2014), high state ownership of SOEs leads to the soft budget constraints effect which exacerbates agency problems. Cross-listing may mitigate these agency problems and enhance the value of cash holdings. However, the effect is not significant, because cross-listed SOEs are prone to give priority to political considerations rather than decreasing agency problems even though these problems are severe. In summary, the benefits of cross-listing include the mitigation of financial constraints and agency problems. The findings show that in China, cross-listing effectively ameliorates the problem of financial constraints due to the greater accessibility to external financing, thereby decreasing the value cash holdings. This is expected because the improvement of financial constraint for non-SOEs lessens the precautionary motive. However, the value of cash holdings for firms with severe agency problems is not significantly enhanced. A possible explanation could be that SOEs, which normally have severe agency problems, cross list mainly for political considerations rather than improving agency problems.

Table 9 Financial constraints, agency problems and the impact of cross-listing on the value of cash holdings

	Full Sample
C	0.295***
	(3.140)
Cross	-0.036
	(-0.690)
Excash	0.010
	(0.513)
Fc	0.375***
	(8.128)

Table 9 Financial constraints, agency problems and the impact of cross-listing on the value of cash holdings (Cont'd)

	Full Sample
Ag	0.044***
	(2.696)
Cross*Excash	0.034
	(1.178)
Cross*Fc	0.023
	(0.400)
Cross*Ag	-0.112**
	(-1.961)
Excash*Fc	-0.095***
	(-3.422)
Excash*Ag	-0.079**
	(-1.781)
Cross*Excash*Fc	-0.198***
	(-2.620)
Cross*Excash*Ag	0.071
	(0.858)
E_t	2.077**
	(2.540)
dE_t	-0.234
	(-0.523)
dE_{t+1}	1.175**
	(2.270)
dNA_t	-0.372***
	(-3.451)
dNA_{t+1}	-0.047
	(0.364)
I_t	-9.892***
	(-5.713)
dI_t	4.212
	(1.232)
dI_{t+1}	-4.065***
	(-3.236)
Div_t	4.509***
	(4.952)
$dDiv_t$	0.504
	(0.434)
$dDiv_{t+1}$	2.672**
	(2.009)
dV_{t+1}	-0.366***
	(-6.047)
Year effects	Yes
Industry effects	Yes

Table 9 Financial constraints, agency problems and the impact of cross-listing on the value of cash holdings (Cont'd)

	Full Sample
Adjusted R-squared	0.695
F-statistics	124.937
Observations	1,744

*, **, *** represent significance at the 10 %, 5 %, and 1 % levels, respectively. This table reports the regression results showing the impact of cross-listing on the value of cash holdings through its effect on financial constraints and agency problems. The dependent variable is Market value (*MV*) which is defined as the market value of equity divided by the book value of equity. The other variables are: Excess cash (*Excash*) which is defined as cash that is not needed for operations or investments, meaning that the cash is held above a predicted "normal" (or "optimal") level; Agency problems (*Ag*) is a dummy variable, which is equal to 1 for firms with agency problems and 0 for firms with non-agency problems; *NA* is defined as the book value of total asset minus cash and cash equivalents over total assets; Earnings before interest and taxes (*E*) is the ratio of net income plus all noncash charges or credits, extraordinary items and interest in relation to the book value of total assets; Interest expenses (*I*) is defined as interest expenses divided by total assets; Cash dividends paid (*Div*) is common dividends paid divided by total assets; *dXt* refers to the change in variable *Xt* from year *t-1* to year *t*. *dXt+1* represent the change in variable *Xt+1* from year *t* to year *t+1*; t-statistics (*t-value*) are reported in parentheses.

5.4 Robustness Test

In the main analysis, firm size is used as a proxy for financial constraint. Considering that in China, SOEs have stronger connections to the financial system making it easier for them to obtain the funds needed[9] and that non-SOEs often cannot obtain loans from banks which are dominated by the Chinese government, we thus use non-SOE status as a proxy for financial constraint with its value set to one if a firm is a non-SOE, and zero otherwise. The results are shown in Table 10 (The coefficients of control variables are not tabulated to save space). In Panel A, the coefficient of *Cross*Excash*Fc* is -0.235, significant at the 10% level; in Panel B, the coefficient of *Cross*Excash*Ag* is 0.195, significant at the 5% level; in Panel C, the coefficients on *Cross*Excash*Fc* and *Cross*Excash*Ag* are -0.318 and 0.148, respectively, both are significant at the 1% level. These results are consistent with our main findings, indicating that cross-listing affects the value of cash holdings through both the channels of mitigating financial constraints and agency problems. Interestingly, when including both financial constraints and agency problems in the regression analysis, the main findings show that the coefficient of *Cross*Excash*Ag* is

[9] We thank the referee for suggesting this idea.

positive, but insignificant at conventional levels, however, in robustness tests, this coefficient is positive and significant, suggesting the agency problem effect still exists after considering the financial constraint effect. Additionally, in our main analysis we use the median of deviation to divide the sample into high- and low-agency problem subsamples; here, for the robustness test, we use 0 as the new cutoff point and set the dummy variable of the agency problem as one when the deviation is higher than 0 (with agency problems) and zero otherwise, that is, when deviation is 0 (without agency problems). The re-estimation results of the regression models show that the coefficient of *Cross*Excash*Fc* is -0.225, significant at the 1% level while the coefficient of *Cross*Excash*Ag* is 0.098, insignificant at conventional levels. (Not all coefficients are tabulated to save space.) Overall, the additional tests show that our main results are robust to alternative proxies for financial constraints and agency problems.

Table 10 Robustness Test – Non-SOE as the proxy for financial constraint

Panel A	**Full Sample**
C	0.391***
	(6.334)
Cross	-0.203***
	(-4.661)
Excash	0.002
	(-0.056)
Fc	0.061
	(1.382)
Cross*Excash	0.062
	(1.129)
Cross*Fc	0.012
	(0.135)
Excash*Fc	-0.206***
	(-3.768)
Cross*Excash*Fc	-0.235*
	(-1.685)
Control Variables	Yes
Year effects	Yes
Industry effects	Yes
Adjusted R-squared	0.732
Observations	1,129

Table 10 Robustness Test – Non-SOE as the proxy for financial constraint (Cont'd)

Panel B	**Full Sample**
C	0.435***
	(4.493)
Cross	-0.127**
	(-1.941)
Excash	-0.034
	(-1.422)
Ag	0.060***
	(2.930)
Cross*Excash	0.011
	(0.247)
Cross*Ag	-0.085
	(-1.587)
Excash*Ag	-0.104**
	(-2.418)
Cross*Excash*Ag	0.195**
	(-5.777)
Control Variables	Yes
Year effects	Yes
Industry effects	Yes
Adjusted R-squared	0.668
F-statistic	126.420
Observations	1,744
Panel C	**Full Sample**
C	0.486***
	(4.908)
Cross	-0.156***
	(-2.312)
Excash	-0.025
	(-0.623)
Fc	0.009
	(0.177)
Ag	0.145***
	(7.418)
Cross*Excash	0.051
	(1.027)
Excash*Fc	-0.188***
	(-2.368)
Excash*Ag	-0.052
	(-1.151)
Cross*Fc	0.061
	(1.310)
Cross*Ag	-0.134***
	(-5.018)

Table 10 Robustness Test – Non-SOE as the proxy for financial constraint (Cont'd)

Panel C	**Full Sample**
Cross*Excash*Fc	-0.318***
	(-2.844)
Cross*Excash*Ag	0.148***
	(2.855)
Control Variables	Yes
Year effects	Yes
Industry effects	Yes
Adjusted R-squared	0.728
F-statistic	91.627
Observations	984

*, **, *** represent significance at the 10 %, 5 %, and 1 % levels, respectively. This table reports the regression results showing the impact of cross-listing on the value of cash holdings through its effect on financial constraint and agency problems. The dependent variable is Market value (*MV*) which is defined as the market value of equity divided by the book value of equity. The other variables are: Excess cash (*Excash*) which is defined as cash that is not needed for operations or investments, meaning that the cash is held above a predicted "normal" (or "optimal") level; Non-SOE status is used as a proxy for financial constraints, we set its value to one for non-SOEs and zero otherwise; Agency problems (*Ag*) is a dummy variable, which is equal to 1 for firms with agency problems and 0 for firms without agency problems; *NA* is defined as the book value of total asset minus cash and cash equivalents over total assets; Earnings before interest and taxes (*E*) is the ratio of net income plus all noncash charges or credits, extraordinary items and interest in relation to the book value of total assets; Interest expenses (*I*) is defined as interest expenses divided by total assets; Cash dividends paid (*Div*) is common dividends paid divided by total assets; *dXt* refers to the change in variable *Xt* from year *t-1* to year *t. dXt+1* represent the change in variable *Xt+1* from year *t* to year *t+1*; t-statistics (*t-value*) are reported in parentheses.

5.5 Discussion

In this study, we examine the effects of cross-listing on the value of cash holdings for Chinese listed firms. We find that, in China, cross-listing affects the value of cash holdings through two channels: the mitigation of agency problems and the amelioration of financial constraints. The mitigation of agency problems increases the value of cash holdings, which is consistent with previous research (Huang et al. 2013; Fresard and Salva 2010). More importantly, it is shown that the amelioration of financial constraints decreases the value of cash holdings. Our findings show that the effect of financial constraints appears to dominate the effect of agency problems. In China, the financial system is dominated by the state-owned banks and government has the power to decide on the deployment of financial resources which tends to favor SOEs. In contrast, it is difficult for non-SOEs to secure financing from the state-controlled financial system, so they suffer from more severe financial problems. To the best of our knowledge, this

issue has not been examined previously, our study therefore makes a significant contribution to the literatures on cross-listing, the value of cash holdings and capital imperfections.

Our findings can be generalized to countries or economies where the situation is similar to China, that is, where soft budget constraints exist or where financial constraints arise from a less developed financial system. Emerging markets pursue rapid growth but generally suffer from severe financial constraints and agency problems due to less developed institutions, especially poor financial systems. In these circumstances our study suggests that cross-listing can mitigate both financial constraints and agency problems that affect the value of cash holdings, which, in turn, increases the firm's value, moving toward the goal of maximization of shareholder wealth.

6. Conclusion

This study examines how cross-listing affects the value of cash holdings which occurs through two channels: by alleviating financial constraints and by mitigating agency problems. The sample comprises Chinese firms cross listed from 2006 to 2013. We find that under financial constraints, cash holdings are of less value to cross-listed firms than non-cross-listed firms, since it is easier for the former to raise external funds than their domestic peers. In other words, less financially constrained firms are associated with a discount in cash valuation. Cross-listing may reduce the value of cash holdings by reducing financial constraints with the decrease being more pronounced for non-state-controlled firms than for state-controlled firms. In addition, taking agency problems into consideration, we find that cross-listing increases the value of cash holdings for firms with severe agency problems. This is consistent with prior findings that indicate that cross-listed firms have better corporate governance than non-cross-listed firms and the value of cash holdings is higher when firms have better corporate governance. Moreover, the increase is more pronounced for state-controlled firms than for non-state-controlled firms. Finally, we find that the financial constraint effect dominates the agency problem effect. This study

contributes to the literature related to cross-listing and the value of cash holdings, especially in providing evidence for Chinese cross-listed firms.

There are also some managerial implications. Firms in emerging markets can alleviate agency problems by listing their shares in developed overseas stock markets. Cross-listing plays an important role in enhancing corporate governance. Finally, cross-listed firms are likely to have better access to external capital markets thereby mitigating financial constraints, which in turn makes cash holdings less necessary.

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