Does the market understand the ex ante risk of expropriation by controlling shareholders?

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Abstract

We examine how the market values operating assets in the presence of time-varying ex ante risk that these assets may be tunneled away. We analyze pairs of Chinese publicly listed firms and their non-listed parents and examine the market valuation of current assets (cash balances, trade receivables, receivables due from the controlling shareholders, inventories) and fixed assets on the publicly listed firm's balance sheet. Our results show that in periods when the risk of tunneling from the publicly listed firm to its controlling shareholder increases, operating assets that are easy to tunnel (cash and receivables due from the controlling shareholder) are valued at larger discounts, while operating assets that are not easy to tunnel (trade receivables, inventories, fixed assets) are not valued at such discounts.

Keywords: International corporate governance; Expropriation; Operating assets; Cash holdings; Intra-group loans; Pyramids; Tunneling

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1. Introduction

There is widespread evidence that, in publicly listed companies with concentrated ownership, controlling shareholders can tunnel wealth away for their private benefit through related party transactions.[1] Many studies have shown that firms with poor corporate governance trade at discounted valuations.[2] There is less evidence, however, on whether the market appropriately discounts the value of assets on the balance sheet *ex ante* when the risk of expropriation of these assets is perceived to be high, and on *which* assets are discounted. The design of optimal debt covenants and disclosure mechanisms requires an understanding of which assets are at a higher risk of being tunneled away.

Previous studies typically use time-invariant measures of expropriation risk, such as levels of corporate governance or ownership structure characteristics that change infrequently and may suffer from endogeneity concerns.[3] Studies that recognize the time-varying nature of expropriation risk typically focus on economy-wide crises that affect all firms in the same way or show that firms subject to expropriation are those with higher profitability.[4] Only a handful of studies note that the time-varying risk of expropriation may be dependent on the financial performance of the controlling shareholder.[5]

In this paper, we relate the market value of balance sheet assets in a sample of Chinese firms to a *firm-level* time-varying ex ante risk of expropriation or propping based on the incentives of their controlling shareholders. We use the controlling shareholders' financial health to proxy for this time-varying risk and study its effect on the ex ante market valuation of five different operating assets of subsidiary listed companies.[6] Most Chinese publicly listed

[1] Bertrand, Mehta, and Mullainathan (2002); Baek, Kang, and Lee (2006); or Berkman, Cole, and Fu, (2009).
[2] Claessens, Djankov, Fan, and Lang (2002), or Lemmon and Lins (2003).
[3] Kalcheva and Lins (2007); or Dittmar and Mahrt-Smith (2007).
[4] Mitton (2002); Friedman, Johnson, and Mitton (2003); Lemmon and Lins (2003); Baek, Kang, and Park (2004); Bae, Baek, Kang, and Liu (2012); Cheung, Rau, and Stouraitis (2006); or Peng, Wei, and Yang (2011).
[5] Johnson, Boone, Breach, and Friedman (2000); Fisman and Wang (2010); or Jia, Shi, and Wang (2013).
[6] Jiang, Lee, and Yue (2010) analyze intra-group loans but do not examine whether the receivables generated by these loans are discounted, which is the focus of our study.

firms have non-listed state- (SOE) and non-state-owned enterprises as controlling shareholders, whose operating performance can be measured. Operating performance is important for the managers of these SOEs. Political promotions are linked to the return on assets (ROA) of the non-listed SOEs they manage.[7] On the basis of this literature, we proxy ex ante time-varying expropriation risk for the subsidiary's assets by the operating performance (ROA or cash flow) of the non-listed parent firm.

Specifically, we relate the market valuation of balance sheet assets at 705 firms listed on the Shanghai and Shenzhen stock exchanges during 1999-2013 to the operating performance of their non-listed controlling shareholders (parents), representing 3,746 paired firm-year observations for listed firms and their parents. We investigate three questions: (1) Does the market discount the value of the subsidiary's assets when the parent is poorly performing? (2) Is the market correct? In other words, do actual changes in the levels of liquid assets back up the market's expectations that these assets will be expropriated? (3) Is parent performance really a good proxy for ex ante expropriation risk? The answers to all three questions appear to be a strong yes.

To answer the first question, we link market valuations of five balance sheet assets for publicly listed subsidiaries to parent performance. We use the Faulkender and Wang (2006) model for estimating the value of cash holdings, which we adapt to also value intra-group loan receivables, regular trade receivables, inventories, and fixed assets. We find that the market value of an incremental $1 of cash declines from $0.44 when its non-listed parent's ROA is in the top quartile of parent performance to less than zero when its parent's ROA is in the bottom quartile (a discount of 132% during periods of high ex ante expropriation risk). The marginal value of the receivables of intra-group loans declines from $1.33 to $0.15 (an 89% discount). In contrast, the value of regular trade receivables, inventories, and fixed assets is not sensitive

[7] Chen, Jiang, Ljungqvist, Lu, and Zhou (2015); or Cao, Lemmon, Pan, Qian, and Tian (2019).

to parent performance. Our results are robust to controls for the type of government controlling shareholder (SOE controlled by the Central or local government), and are driven by parents where the Chairman is likely subject to performance evaluation for promotion.

Are market expectations that cash and intra-group loans are more likely to be expropriated backed up by actual changes in the level of these assets? We show that publicly listed firms hold *smaller* cash reserves and *increase* intra-group loans to their controlling shareholder by four times as much when their controlling shareholders have larger incentives to expropriate (they are under-performing). The implied negative correlation between the likelihood of expropriation and the level of cash holdings is consistent with the similar correlation documented between cash holdings and the likelihood of political extraction.[8]

Our results are not driven by a correlation between parent and subsidiary performance and are robust to a battery of additional tests. Though our hypotheses are based on the findings of previous studies, we attempt to rule out alternative explanations for the relation between parent performance and market asset valuations. We note that our specifications do not examine whether group affiliation is good or bad for firms. We simply identify periods when expropriation risk is higher. To put it another way, even if group affiliation is beneficial for the group as a whole, it is not beneficial to the shareholders in the public subsidiary *during the specific periods when* the controlling shareholder has incentives to expropriate. In that sense, the phenomenon is more akin to firms that do not belong to business groups, where funds may be transferred from the firm to the pockets of the individual controlling shareholder.

Our paper contributes to two general streams of literature. First, it contributes to a growing body of research on the market valuation of cash holdings.[9] Our aim is not to examine

[8] Stulz (2005); Caprio, Faccio, and McConnell (2013). It is also in line with studies that find a negative relationship between earnings quality and the likelihood of extraction by the state (Bushman and Piotroski, 2006; Batta, Heredia and Weidenmier, 2017).

[9] Faulkender and Wang (2006); Kalcheva and Lins (2007); Dechow, Richardson, and Sloan (2008); Louis, Sun and Urcan (2012); or Chen and Shayne (2014).

whether corporate governance affects the value of cash holdings but its *timing*, that is, *when cash holdings are worth more*. We extend the methodologies developed to value cash holdings for the valuation of other operating assets, a topic that has received much less attention.

Second, our study contributes to the literature on how controlling shareholders tunnel wealth away for their private benefits. Studies analyzing the relationship between corporate governance and economic outcomes suffer from the difficulty of measuring corporate governance. Measures of expropriation risk that are based on stable ownership structure characteristics (such as the commonly used ownership-control ratio) suffer from endogeneity concerns (Siegel and Choudhury, 2012) or have been shown to be unrelated to actual expropriation incidents (Cheung, Rau, and Stouraitis, 2006). Our study concentrates on time-varying controlling shareholder incentives, where ex ante risk is easier to identify.

Our paper is organized as follows. Section 2 states the hypotheses. Section 3 describes the data. Section 4 relates the market valuation of operating assets to the performance of the controlling parent. Section 5 examines whether the market expectations of expropriation risk are backed up by actual changes in the level of assets. Section 6 investigates if parent performance is a good proxy for expropriation risk. Section 7 concludes.

2. Hypotheses

Prior studies have not typically considered that ex ante expropriation risk might vary over time though there is evidence that expropriation incidents occur when controlling shareholders are underperforming. Johnson, Boone, Breach, and Friedman (2000, page 143) suggest that controlling shareholders transferred assets away from publicly listed companies during the 1997 Asian financial crisis "perhaps to pay the management's personal debts [or] to shore up another company with different shareholders." In more than a third of the incidents they report the motive behind the tunneling was to assist an underperforming parent. We hypothesize that

controlling shareholders are more likely to transfer assets from the publicly listed firm to their own balance sheets when these controlling shareholders are underperforming.[10]

Different assets are likely to have different risks of expropriation. Our main hypothesis is that assets that are easier to transfer away from the balance sheets of publicly listed companies to those of their controlling shareholders (parents) will be valued by the market at a discount when these controlling shareholders are ex ante more likely to transfer these assets.

There is a growing body of research on the market valuation of cash holdings (Faulkender and Wang, 2006; Kalcheva and Lins, 2007; Dechow, Richardson, and Sloan, 2008; Louis, Sun and Urcan, 2012; or Chen and Shayne, 2014). Since cash is the most liquid asset, its use is discretionary, and it's easier to transfer compared to other assets (Myers and Rajan, 1998), its value is likely to be sensitive to expropriation risk (Dittmar and Mahrt-Smith, 2007). Our aim is not to examine whether corporate governance affects the value of cash holdings, as the previous literature has done, but its *timing*, that is, *when* cash holdings are worth more.

To illustrate our methodology, consider a hypothetical publicly listed firm *Subsidiary Inc*, which is majority-controlled by its non-listed controlling shareholder *Parent Inc*. If assets on the balance sheet of *Subsidiary* are likely to be expropriated, the market valuation of these assets would be less than their book value on *Subsidiary*'s balance sheet. In other words, the market will value $1 of cash or other assets on *Subsidiary*'s balance sheet at less than $1 if this asset is in greater danger of being tunneled away. Based on findings from previous studies, we argue that *Parent* has larger incentives to expropriate when its own operating performance is poor. In other words, we expect a link between the operating performance of *Parent* and the market valuation of $1 of cash on *Subsidiary*'s balance sheet.

[10] Fisman and Wang (2010) and Jia, Shi, and Wang (2013) show that controlling shareholders receive intra-group loans from their publicly listed subsidiaries when they are underperforming but conduct other types of related party transactions (RPTs) at other times. However, in the absence of valuation effects for these RPTs, we cannot determine whether they represent tunneling or not. Studies that examine the valuation effects of RPTs find no difference in the valuation effects of intra-group loans and these other types of RPTs (Cheung, Rau, and Stouraitis, 2006), which casts doubt on whether these later studies documented time-varying expropriation risk.

Hypothesis 1a. The market valuation of cash on the balance sheet of publicly listed companies is positively related to the performance of their controlling shareholders.

Chinese firms are known to generate receivables when they make discretionary intra-group loans. These loans represent direct fund transfers from the publicly listed firm to its controlling shareholders, and often have high default rates. They represent the most direct way for controlling shareholders to tunnel cash from the publicly listed company to their pockets. Jiang, Lee, and Yue (2010) show that firms making such loans subsequently suffer performance deterioration but do not provide evidence on the ex ante valuation of the loans. The receivables generated when listed firms make intra-group loans to their parents (recorded on their balance sheet as "other receivables"; *OREC*) are also likely to be sensitive to expropriation risk.[11] Because of the higher default risk of these intra-group loans, we expect that investors discount them heavily ex ante. As with cash, we hypothesize that the market valuation of the receivables generated from these loans is likely very sensitive to the controlling shareholder's incentives to expropriate.

Hypothesis 1b. The market valuation of intra-group loan receivables on the balance sheet of publicly listed companies is positively related to the performance of their controlling shareholders.

In contrast, regular receivables and inventories are related to day-to-day operations. While they have long been recognized as liquid assets (Carpenter, Fazzari, and Petersen, 1994),

[11] These loans are unrelated to ordinary business transactions, and they are mostly made to related parties. Although they are recorded as current assets, they are persistent, suggesting that they are essentially a permanent feature. Using hand-collected data, both Jiang, Lee, and Yue (2010) and Fan, Jin and Zheng (2016) trace a large proportion of the amounts recorded as "other receivables" directly to the controlling shareholders of Chinese listed firms. However, they find very high correlations between OREC and their hand-collected measure (well over 0.7), and their results are not affected when using one or the other. It is likely that the hand-collected measures significantly understate the true magnitude of intra-group loans because of the difficulty of tracing all the relationships between publicly listed firms, controlling shareholders, and their affiliates. Therefore, we focus on the entire amount as recorded on the balance sheet.

they are a little more difficult than the previous two to transfer directly to the parent's pockets. So, a priori, it is not clear whether they will be as sensitive to expropriation risk as cash and other receivables. Similarly, although fixed assets can also be expropriated (Cheung, Rau, and Stouraitis, 2006; 2010), these transactions are larger, more subject to scrutiny, take more time to complete, and are therefore less likely to be convenient ways to expropriate in the short-run. It is not clear how sensitive their valuation may be to the parent's short-term incentives.[12]

Hypothesis 2. The market valuations of trade receivables, inventories, and fixed assets on the balance sheet of publicly listed companies are not related to the performance of their controlling shareholders.

Finally, publicly listed firms will keep less cash on their balance sheets and will make more intra-group loans to their controlling shareholders, when these shareholders have larger incentives to expropriate. Previous studies show a negative correlation between the level of cash holdings and the likelihood of political extraction (Stulz, 2005; Caprio, Faccio, and McConnell, 2013) or between earnings quality and the likelihood of extraction by the state (Bushman and Piotroski, 2006; Batta, Heredia and Weidenmier, 2017). Furthermore, Fisman and Wang (2010) and Jia, Shi, and Wang (2013) show that controlling shareholders receive more intra-group loans from their publicly listed subsidiaries when they are underperforming.

Hypothesis 3a. Publicly listed firms hold smaller cash balances on their balance sheet when their controlling shareholders are underperforming.

[12] Previous studies that examine the value-relevance of financial statement information typically focus on the income statement (earnings and selected expenses, such as R&D) and the book value of equity from the balance sheet. There is less analysis on how the market values individual operating assets (exceptions include Abarbanell and Bushee, 1998, Thomas and Zhang, 2002, Hand, 2005, and Barth, Li, and McClure, 2017).

Hypothesis 3b. Publicly listed firms make more intra-group loans to their controlling shareholders (increase the level of intra-group loan receivables on their balance sheet) when these controlling shareholders are underperforming.

3. Data

We obtain financial information, governance, and return data for China's listed firms from the China Stock Market and Accounting Research (CSMAR) database, and financial information for controlling shareholders from the National Bureau of Statistics' (NBS) Annual Industrial Survey Database. The latter database provides non-consolidated balance sheet and income statement information for all industrial firms with total annual sales exceeding RMB5 million, so-called large- and medium-sized enterprises.[13]

For each publicly listed firm, we match the financial information from CSMAR to that of its controlling shareholder (parent) from NBS. We start from the universe of listed firms in CSMAR. We obtain information on the listed firm's controlling shareholder from the annual report of the listed company to match with parent company financial data in the NBS database. We drop pair-years for which we have missing data or for which the parent firm cannot be identified. Brandt, Van Biesebroek, and Zhang (2014) identify challenges when working with NBS data after 2008. Our parent data does not suffer from these problems.[14]

[13] The database has been used by Cull, Xu, and Zhu (2009), Li, Yue, and Zhao (2009), Brooks, Kaboski, Li, and Qian (2021) and Kong, Peng, Zhang, and Wong (2021) among others.

[14] Brandt, Van Biesebroek, and Zhang (2014) identify many challenges when working with NBS data. While most of these issues are not applicable to the data that we are using for parents, a handful are relevant. (1) The minimum size for inclusion in the database increased from RMB5 million to RMB20 million in 2011. However, when we compare our sample of publicly listed subsidiaries with the universe of Chinese publicly listed firms (not reported), our sample firms are larger, they have higher ROA and larger capital expenditures, and their controlling shareholders have larger shareholdings. They extend fewer intra-group loans and earn lower stock returns. Consequently, their parents are also large companies, and they are not affected by the change in the threshold. (2) After 2008, there are missing values for variables such as revenue, wages, inputs, fixed assets, and incorrect values for employment. We do not use any of these variables. Furthermore, to the extent that there are missing values, the observations are dropped from our sample. As an additional robustness test, we drop parent firms which exhibit large swings in reported total assets in the database (greater than 20%) during 2007-2009. Our results are qualitatively similar. (3) Up to 20% of NBS-covered firms experience changes in industrial classification. Our industry fixed effects are at the publicly listed firm (not parent) level, based on 2-digit industrial classification obtained from CSMAR, not NBS. In addition, we do not observe industry changes among our sample firms. Overall, given that our sample comprises larger parent firms (who own publicly listed subsidiaries), our data does

Our matching procedure results in a final sample of 705 firms listed on the Shanghai and Shenzhen stock exchanges during 1999-2013 and their non-listed controlling shareholders (parents), representing 3,746 paired firm-year observations for listed firms and their parents. Our sample is evenly spread over this period (8-13% of sample observations annually).

Our identification strategy necessitates linking each publicly listed firm with its controlling shareholder, so that incentives to tunnel and the target of tunneling can be clearly identified. During 1999-2007, 96% of our sample parents control only one publicly listed subsidiary but this percentage drops to 30% by 2013. As Chinese business groups become larger, intra-group transfers are possible in many directions, confounding parent incentives with those of other publicly listed sister companies in the group. In addition, controlling shareholders with incentives to tunnel have more publicly listed firms to choose from. Cross-shareholdings have also become more prevalent, which complicates the identification of a firm's ultimate controlling shareholder. Hence, we do not extend our sample beyond 2013.

We report descriptive statistics in Table 1. Financial variables are winsorized at the 1% and 99% levels in order to minimize the effect of outliers. The 12-month excess return is based on Liu, Stambaugh, and Yuan's (2019) model, estimated using data for the universe of Chinese listed firms. Based on the averages, publicly listed firms in our sample hold 15.9% of their net assets in cash (representing 14.2% of the listed firms' market value). Intra-group loans (OREC) represent 2.9% of the listed firms' market value. About 74% of the publicly listed firms in our sample are SOEs (controlled by the State-Owned Assets Supervision and Administration Commission SASAC), and the average percentage of shares held by the largest shareholder is 44%. On average, the return on assets (ROA) of the controlling shareholders is 2.2%, and the cash flow of the controlling shareholder 9.4% of net assets.

not appear to be affected by these reliability problems. Finally, we report results separately for the period 1999-2007 in Section 6.1. While our results are stronger for this earlier period, regulatory changes and incentive issues related to the size of business groups (which we discuss later) over the later period are more likely to explain these differences rather than issues of data reliability.

4. Is the market value of the listed firm's current and fixed assets related to parent performance?

4.1. Parent performance and the value of current and fixed assets

Our first step is to examine whether minority shareholders attach lower valuations to the firm's operating assets when these assets are at a higher risk of being expropriated, which we hypothesize to occur when controlling shareholders are underperforming. We examine whether the controlling shareholder's performance has incremental explanatory power for the market valuation of $1 of cash, receivables from intra-group loans, regular trade receivables, inventories, and fixed assets on the publicly listed subsidiary's balance sheet.

We modify the Faulkender and Wang (2006) cash valuation model (used by Dittmar and Mahrt-Smith, 2007, and Denis and Sibilkov, 2010) as follows (we retain the original notation):

$$r_{i,t} - R^{B}_{i,t} = \gamma_0 + \gamma_1 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_2 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \gamma_3 \frac{\Delta NA_{i,t}}{M_{i,t-1}} + \gamma_4 \frac{\Delta D_{i,t}}{M_{i,t-1}} + \gamma_5 \frac{C_{i,t-1}}{M_{i,t-1}} + \gamma_6 L_{i,t}$$

$$+\gamma_7 \frac{NF_{i,t}}{M_{i,t-1}} + \gamma_8 \frac{C_{i,t-1}}{M_{i,t-1}} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_9 L_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t-1}}$$

$$+\gamma_{10} PROA_{i,t} + \gamma_{11} PROA_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \text{firm fixed effects} + \text{year fixed effects} + \varepsilon_{i,t} \qquad (1)$$

The change in the publicly listed firm's market value is measured by the excess return for firm *i* in fiscal year *t* less the return of its benchmark portfolio ($r_{i,t} - R^{B}_{i,t}$), where the latter is constructed following Liu, Stambaugh, and Yuan (2019). The model examines returns in excess of the benchmark portfolios to control for risk-related factors that may impact a firm's return and discount rate. To control for idiosyncratic firm characteristics that may affect the cross-sectional variation of firm returns, we control for factors that are likely to be correlated

with both stock returns and cash holdings ($C_{i,t}$), such as dividends ($D_{i,t}$), leverage ($L_{i,t}$), net financing ($NF_{i,t}$), earnings before interest and extraordinary items ($E_{i,t}$), and total assets excluding cash ($NA_{i,t}$). All explanatory variables except leverage are scaled by lagged market value of equity ($M_{i,t-1}$). Since stock returns can also be expressed as $\frac{\Delta M_{i,t}}{M_{i,t-1}}$, the estimated coefficient associated with the annual changes in cash, $\frac{\Delta C_{i,t}}{M_{i,t-1}}$, can be interpreted as the change in the listed firm's market value (in dollar terms) that results from a one dollar increase in the firm's cash balances.[15] Coefficients γ_1 to γ_9 are from Faulkender and Wang (2006).

Our main interest is to examine whether the valuation of cash depends on the financial performance of the listed firm's *controlling shareholder*. Therefore, we expand the model to include *parent ROA* (*PROA*) (coefficient γ_{10}), and interact the parent performance with annual changes in cash $\frac{\Delta C_{i,t}}{M_{i,t-1}}$ (coefficient γ_{11}). Coefficient γ_{11} is a direct test of Hypothesis 1a. Unlike Faulkender and Wang (2006), we include firm and year fixed effects. Firm fixed effects may capture unobservable firm characteristics, such as the quality of corporate governance, which may affect stock returns and the valuation of operating assets. Although we discuss coefficient values, to make our results more intuitive, our emphasis is on differences between samples, without putting much weight on the value of the coefficient itself.[16]

Table 2 Panel A column 1 reports the baseline model – without parent performance or fixed effects. The results for China are in line with those for the U.S. An incremental dollar of cash for a firm with zero cash and zero debt in Table 2, Panel A, column 1 is worth \$1.298 (row 7). The equivalent figure for the U.S. from Faulkender and Wang (2006), Table II, Model

[15] Faulkender and Wang (2006), and Dittmar and Mahrt-Smith (2007) do not find differences when using *realized* or *unexpected* changes in cash. Hence they report results with realized changes, as we do. In addition, their model includes R&D and interest expenses. Our sample has missing values for most firms, so we do not include them.
[16] It is not possible to include industry fixed effects due to multicollinearity concerns. We note that none of the firms in our sample changes industrial classification during our sample period.

II is \$1.466.[17] The signs and magnitudes of the coefficients in our Chinese sample are qualitatively similar to those estimated for the U.S. However, the average Chinese firm has both cash holdings and debt.[18] Based on average values from Table 1, one additional dollar of cash is valued at \$0.70 [= \$1.298 + (−0.283×14.2%) + (−1.184×47.4%)] for the average Chinese firm. The equivalent value in the U.S. is \$0.94 (Faulkender and Wang, 2006). Therefore, cash on the average Chinese firm's balance sheet, which faces a higher ex ante risk of expropriation compared to the average U.S. firm, is valued at a 26% discount (Figure 1).

After establishing that the baseline model performs in China as it does in the U.S., our main interest is in the incremental explanatory power of parent performance for cash valuation, captured by the coefficient associated with the interaction term γ_{11} between parent performance and change in cash. We measure parent performance by the parent's return on assets (*parent* $ROA_{i,t}$, defined as net income over total assets), and by the parent's cash flow (*parent cash flow* $CF_{i,t}$, defined as the ratio of cash flow to net assets, where cash flow is operating income plus depreciation and amortization minus interest minus taxes minus dividends). Adding parent performance in the specifications in columns 2-3 improves the adjusted R^2 relative to the baseline model in column 1, without affecting the coefficients.

We find strong evidence that parent performance has significant incremental explanatory power for the value of cash holdings. The market value of a dollar of cash on the publicly listed firm's balance sheet increases significantly when the firm's parent has better operating performance, as suggested by the significant and positive coefficient on the interaction between *Parent ROA* and $\frac{\Delta C_{i,t}}{M_{i,t-1}}$. Based on column 2 and Figure 2, assuming average parent performance,

[17] These values exceed one because firms with zero cash holdings will need to raise external financing in order to pursue investment opportunities, and so incur direct and indirect transactions costs.

[18] A firm with existing cash holdings has less need to raise external financing and incur transactions costs, suggesting a negative relationship between the value of an additional dollar of cash and existing cash balances. When a firm with existing debt increases its cash balances, the probability of default declines and part of the benefits accrue to debtholders, suggesting a negative relationship between the value of cash and debt levels.

the market value of an additional dollar of cash on the listed firm's balance sheet is \$0.33 [= \$0.718 + (0.110×14.2%) + (−0.967×47.4%) + (2.568×2.2%)]. This value increases from -\$0.14 when the firm's parent ROA is at the cut-off for the bottom 25% quartile (*Parent ROA*=−16.2%) to \$0.44 when the firm's parent ROA is at the cut-off for the top 25% quartile (*Parent ROA*=+6.3%). The difference in the two values is \$0.58 (representing a discount of 132% in the value of cash holdings). Effectively, the market expects that cash holdings of firms with underperforming parents are worthless. Furthermore, controlling shareholders may transfer out of the listed firm more than the current value of cash holdings. In model 3, the coefficient associated with the interaction between *Parent cash flow* and $\frac{\Delta C_{i,t}}{M_{i,t-1}}$ in row 5 is positive but insignificant at conventional levels, though this interaction is significant in the remaining columns and tables. These results show support for Hypothesis 1a.

We next examine Hypothesis 1b, that is, whether parent performance affects the market valuation of one additional dollar of other receivables (intra-group loans) on the publicly listed firm's balance sheet. Other receivables (OREC) can be converted into cash within the current fiscal year. So, it is plausible that they can be valued in the same way as cash. Adapting the model estimated previously, we estimate the following specification:

$$r_{i,t} - R^{B}_{i,t} = \gamma_0 + \gamma_1 \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_2 \frac{\Delta E_{i,t}}{M_{i,t-1}} + \gamma_3 \frac{\Delta NA_{i,t}}{M_{i,t-1}} + \gamma_4 \frac{\Delta D_{i,t}}{M_{i,t-1}} + \gamma_5 \frac{C_{i,t-1}}{M_{i,t-1}} + \gamma_6 L_{i,t}$$

$$+\gamma_7 \frac{NF_{i,t}}{M_{i,t-1}} + \gamma_8 \frac{C_{i,t-1}}{M_{i,t-1}} \times \frac{\Delta C_{i,t}}{M_{i,t-1}} + \gamma_9 L_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t-1}}$$

$$+\gamma_{10} \frac{\Delta OREC_{i,t}}{M_{i,t-1}} + \gamma_{11} \frac{OREC_{i,t-1}}{M_{i,t-1}} + \gamma_{12} \frac{OREC_{i,t-1}}{M_{i,t-1}} \times \frac{\Delta OREC_{i,t}}{M_{i,t-1}}$$

$$+\gamma_{13} PROA_{i,t} + \gamma_{14} PROA_{i,t} \times \frac{\Delta OREC_{i,t}}{M_{i,t-1}} + \text{firm fixed effects} + \text{year fixed effects} + \varepsilon_{i,t} \qquad (2)$$

We expand the original model to include proxies for other receivables (coefficients γ_{10} to γ_{12}), as well as parent performance (coefficient γ_{13}), and interact parent performance with annual changes in other receivables (coefficient γ_{14}).[19] The coefficient associated with the term $\frac{\Delta \mathrm{OREC}_{i,t}}{\mathrm{M}_{i,t-1}}$ can be interpreted as the dollar change in the listed firm's market value that results from a one dollar increase in the intra-group loans on the firm's balance sheet. The sign of the coefficient γ_{14} is our main interest here. It is a direct test of Hypothesis 1b.

In Table 2, Panel A, columns 4-5, the coefficients of the interaction terms between parent ROA or cash flow and $\frac{\Delta \mathrm{OREC}_{i,t}}{\mathrm{M}_{i,t-1}}$ are positive (rows 3 and 6), indicating that the marginal value of intra-group loans to the listed firm's minority shareholders is increasing in the performance of the listed firm's parent. The differences are striking. Based on estimates from column 4, for a firm with average levels of intra-group loans on its balance sheet (2.9% of the firm's market capitalization in Table 1), whose parent performs in the top quartile, the market values one additional dollar of intra-group loans at \$1.33 [=1.014 + (−0.558×2.9%) + (5.209×6.3%)]. The corresponding value for a firm with an under-performing parent is \$0.15 cents, which is equivalent to an 89% discount (see Figure 3). Therefore, the receivables generated from intra-group loans are heavily discounted by investors when expropriation risk is high. In column 5, the results are qualitatively similar when we use parent cash flow as our measure of parent performance. In unreported tests, we obtain qualitatively similar results when scaling OREC by total assets. These results support Hypothesis 1b.[20]

In contrast, when we adapt the model in order to estimate the value of regular receivables, inventories, and fixed assets in Table 2, Panel B (Hypothesis 2), we find that the value of the

[19] We do not include the interaction between leverage and change in OREC in the reported results because it is difficult to compute meaningful t-statistics in a two-way clustering procedure. The magnitude of the coefficients is not affected if the interaction is included.

[20] They are also in line with anecdotal evidence about the low recovery rates behind intra-group loans in China. Jiang, Lee, and Yue (2010) discuss how Feng Hua Co. made a RMB52.2 million intra-group loan to Beijing Hanqi, a non-listed firm sharing the same controlling shareholder, in 2002. Two years later, the entire amount of the loan was written off, because in the meantime, Beijing Hanqi had gone bankrupt.

first two is not sensitive to ex ante expropriation risk. The interactions between parent ROA (or cash-flow) and incremental receivables or inventories are not statistically significant. Our results for fixed assets in columns 5-6 suggest that their market value is either not sensitive to the performance of the controlling shareholder (column 5) or is inversely related (column 6). Overall, the coefficients indicate a significant discount relative to par value (similar in magnitude to that for cash in Figure 1), which suggests that fixed assets may also be subject to expropriation. Cheung, Rau, and Stouraitis (2006; 2010) document negative market reactions at the announcement of RPTs involving asset transfers. Our results suggest that this discount is not sensitive to short-term parent incentives (in the same way that cash and other receivables are), possibly because fixed asset transfers take longer to complete and may not have an immediate effect on parent performance.

In analysis that we do not report in the tables, we perform a number of robustness tests. We include all operating assets in the same regression; we estimate specifications without fixed effects; we replace parent ROA and cash flow with their industry-adjusted measures (the correlation between the adjusted and the un-adjusted measures is 0.92-0.93), and with parent cash holdings; we estimate 12-month excess returns based on Carhart's (1997) four-factor model, Fama and French (1993) size and book-to-market portfolios, market-adjusted cumulative abnormal returns, and buy-and-hold excess returns, we estimate the value of cash holdings using Tobin's Q and the market-to-book ratio as proxies for firm value, following the methodology by Pinkowitz, Stulz, and Williamson (2006), Dittmar and Mahrt-Smith (2007), and Kalcheva and Lins (2007), and finally, we eliminate firms that share the same controlling shareholders. We obtain qualitatively similar results.

We discuss three immediate concerns with our findings here. We report further robustness tests in Section 6. First, in business groups, there may be a correlation between the operating performance of the publicly listed subsidiary, the market valuation of operating assets

on its balance sheet, and the operating performance of its non-listed parent. Our regressions include controls for the performance of the publicly listed subsidiary, which are highly significant in all specifications. Adding parent ROA has incremental explanatory power (and improves the R^2), without affecting the magnitude or the significance of the coefficients of the subsidiary's performance proxies (for example, compare column 1 with the rest in Table 2, Panel A). Furthermore, while the value of cash and intra-group loan receivables is sensitive to parent performance, the value of regular receivables, inventories and fixed assets is not, which casts doubt on an overall correlation between firm performance, parent performance, and the value of operating assets. Such a correlation should apply to *all* operating assets.

Second, intra-group loans may function as a type of dividend payment to controlling shareholders, not a measure of expropriation. Since our regressions control for dividend payments, and the parent's ROA has incremental explanatory power, there must be non-dividend related transfers between subsidiaries and parents, which is what we hypothesize.[21]

Third, if the profitability of the parent is correlated with its corporate governance, under-performing parents may be those with poor corporate governance. Alternatively, managerial "competence" in listed firms and their parents may be correlated, so under-performing firms may be less competent. Our analysis includes firm fixed effects, which may capture unobservable firm characteristics. In unreported tests, we control for the proportion of independent non-executive directors on the board, board size, CEO and Chairman being the same person or having political connections to the Central/local government, and interactions between the value of cash holdings and these variables. The results are qualitatively similar.

Pinkowitz, Stulz, and Williamson (2006), Kalcheva and Lins (2007), and Dittmar and Mahrt-Smith (2007) show that the value of cash holdings is positively related to proxies for

[21] Dividend payments are relatively rare among Chinese firms, and payout ratios are low. Dividends are not a significant channel for transferring funds from subsidiaries to parents.

corporate governance. Our results measure ex ante expropriation risk more directly and are broadly in line with these findings. Investors value cash and intra-group loan receivables at significant discounts (89-132%) when their controlling shareholders have higher ex ante incentives to expropriate. In contrast, the values of regular receivables, inventories, and fixed assets are not sensitive to the parent's incentives to expropriate.

4.2. Controlling for the type of controlling shareholder

Previous studies have documented differences in the risk of tunneling between SOEs. They find the highest tunneling risk among non-SOE firms, lower in local government SOEs, and lowest in Central government SOEs (Jiang, Lee, and Yue, 2010; Cheung, Rau, and Stouraitis, 2010). In this section, we control for the presence of SOE parents, and for SOE parents controlled by the Central or a local government. In Table 3, columns 1 and 3, we report results where parent performance is measured by ROA (the results using parent cash flow are not significant). The coefficient of the interaction between parent ROA and $\frac{\Delta C_{i,t}}{M_{i,t-1}}$ retains its significance when we control for SOE parents. We also obtain significant results for the valuation of an incremental dollar of intra-group loan receivables (columns 2 and 4). The coefficients associated with the type of controlling shareholder are not statistically significant. Our results appear robust to controls for the type of controlling shareholder.

4.3. Managerial turnover, firm performance, and valuation of operating assets

Previous studies have shown that the operating performance of SOEs influences the subsequent political appointments of their managers (Cao, Lemmon, Pan, Qian, and Tian, 2019; Chen, Jiang, Ljungqvist, Lu, and Zhou, 2015).[22] Therefore, we would expect the motivation to transfer resources to the parent to be stronger when it matters most for the parent's managers,

[22] Many studies show that managerial career concerns influence real economic outcomes in Chinese SOEs. For example, Hung, Wong and Zhang (2012) show that they influence the choice to list overseas as opposed to the domestic Chinese stock market.

when these managers face promotion evaluation. We expect expropriation risk to be higher (cash and intra-group loan receivables valuation more sensitive to parent ROA) in parents whose Chairmen face promotion decisions.

Whilst we cannot observe contract details for the top managers of non-listed parents, these contracts typically last for 5 years. We use an ad hoc cut-off to split the sample into parents whose Chairmen are early in their tenure and those near the end of the first contract (or in their second contract, which again increases the likelihood of a promotion decision). We obtain Chairman data from the Chinese Industrial Statistics Database (they are available only until 2007, so the sample in these tables is 1999-2007).

In Table 4, we split the sample into parents whose Chairmen have been on the job for more than 3 years (Panel A), and parents whose Chairmen have been on the job for 3 years or less (Panel B). As expected, for firms whose parents' Chairmen are in the latter half of their tenures in Panel A, parent ROA and cash-flow are statistically significant in explaining the value of an incremental dollar of intra-group loan receivables (columns 3-4, rows 3-6) (the coefficients associated with the value of cash are not statistically significant, although one is only marginally so). These are similar to the results for the whole sample obtained in Table 2, Panel A. In contrast, for firms whose parents' Chairmen are early in their tenures in Panel B, parent ROA and cash-flow are *not* statistically significant in explaining the value of cash (columns 1-2, rows 2 and 5), or intra-group loan receivables (columns 3-4, rows 3-6).[23]

These results offer partial support to our conjecture that variations in ex ante expropriation risk, proxied by parent performance, have a significant impact on the valuation of an incremental dollar of intra-group loan receivables on a Chinese firm's balance sheet.

[23] In unreported tests, we use 5 and 1 years or 4 and 2 years as alternative cut-offs for CEO tenure. The results are not statistically significant in these specifications (they are significant if we exclude fixed effects).

5. Is the market correct? Are levels of balance sheet assets at subsidiaries related to parent performance?

5.1. The level of cash holdings and intra-group loan transfers

If cash can be tunneled away by the controlling shareholders, through intra-group loans or other RPTs, firms may prefer to keep less of it on their balance sheet (or part of it has *already* been tunneled away) when the perceived expropriation risk is high. We estimate the following regressions of cash holdings on the operating performance of the controlling shareholder:

$$\mathrm{Log}\left(1+\frac{\mathrm{C_{i,t}}}{\mathrm{NA_{i,t}}}\right)=\gamma_0+\gamma_1\mathrm{Log}\left(\mathrm{TA_{i,t}}\right)+\gamma_2\mathrm{ROA_{i,t}}+\gamma_3\mathrm{SOE_{i,t}}$$

$$+\gamma_4\mathrm{Marketization\ Index_{i,t}}+\gamma_5\mathrm{Ownership\ by\ Largest\ Shareholder_{I,t}}$$

$$+\gamma_6\mathrm{PROA_{i,t}}+\mathrm{firm\ fixed\ effects}+\mathrm{year\ fixed\ effects}+\varepsilon_{i,t} \qquad (4)$$

The dependent variable is the natural logarithm of one plus the ratio of cash and equivalents to net assets, total assets, and market capitalization respectively. Coefficient γ_6 is a direct test of Hypothesis 3a. A negative sign would suggest that firms whose parent has poor performance (higher ex ante expropriation risk) hold less cash. Following Jiang, Lee, and Yue (2010), we control for characteristics of the publicly listed firm that may affect the level of cash holdings, namely firm size, ROA, a dummy variable for SOE firms, percentage ownership by the controlling shareholder, and the marketization index developed by Fan, Wang, and Zhu (2009), which measures the development of the regional market in which the firm is registered.

In Table 5 Panel A, we measure parent performance by parent ROA (columns 1-3), and parent cash flow (columns 4-6). In 5 out of 6 specifications, we find a statistically significant positive relation between parent performance and the level of cash holdings on the listed firm's

balance sheet. Firms hold more cash when their parents have lower ex ante incentives to expropriate, and *less* cash when their parents have higher incentives to expropriate. The coefficients on the control variables are largely in line with the prior literature.[24]

The negative correlation between expropriation risk and the level of cash holdings is consistent with the correlation documented in previous studies between cash holdings and the risk of political extraction. Stulz (2005) argues that firms may become more opaque in order to shield themselves from political extraction. Caprio, Faccio, and McConnell (2013) show that cash balances held by firms are negatively correlated with proxies for political corruption. Other studies find a negative relationship between earnings quality and the likelihood of extraction by the state (Bushman and Piotroski, 2006; Batta, Heredia and Weidenmier, 2014).

Assets can be transferred from publicly listed firms to controlling shareholders in a number of ways. Cheung, Rau, and Stouraitis (2006) discuss a number of RPTs that controlling shareholders use to expropriate minority shareholders. Hence, the level of cash holdings is only an indirect proxy for the level of overall assets that can be tunneled away from the publicly listed firm. We next examine a *direct* channel through which cash can be transferred, intra-group loans from the subsidiary to its parent. We estimate the following regressions of the level of intra-group loans on the operating performance of the controlling shareholder:

$$\frac{\Delta \mathrm{OREC}_{i,t+1}}{\mathrm{M}_{i,t}} = \gamma_0 + \gamma_1 \frac{\Delta \mathrm{C}_{i,t}}{\mathrm{M}_{i,t}} + \gamma_2 \frac{\mathrm{C}_{i,t}}{\mathrm{M}_{i,t}} + \gamma_3 \mathrm{Log}\left(\mathrm{TA}_{i,t}\right) + \gamma_4 \mathrm{ROA}_{i,t}$$

[24] Jiang, Lee, and Yue (2010) argue that larger and more profitable firms are less subject to tunneling (so, they will hold more cash), as will SOEs who have better access to loans from state-owned banks. This is what we find as well. Firms with larger controlling stakes are hypothesized as being less subject to tunneling. Here, we find a negative coefficient for controlling shareholder ownership, which is the opposite of this prediction. However, the study by Jiang, Lee, and Yue (2010) analyzes intra-group loans, not cash holdings. A priori, the effect of marketization is not clear. On the one hand, firms in more developed regions may be more profitable and have better access to financing options, and may be less subject to tunneling, as hypothesized by Jiang, Lee, and Yue (2010). On the other hand, firms in less developed regions may hoard more cash due to their more limited financing options. In our results, the coefficient of the marketization index is not significant.

$$+\gamma_5 \text{Marketization Index}_{i,t} + \gamma_6 \text{Ownership by Largest Shareholder}_{i,t}$$

$$+\gamma_7 \text{SOE}_{i,t} + \gamma_8 \text{PROA}_{i,t} + \gamma_9 \text{PROA}_{i,t} \times \frac{\Delta C_{i,t}}{M_{i,t}} + \gamma_{10} \frac{\text{OREC}_{i,t-1}}{M_{i,t}}$$

$$+ \text{firm fixed effects} + \text{year fixed effects} + \varepsilon_{i,t} \quad (5)$$

Our dependent variable is $\frac{\Delta \text{OREC}_{i,t+1}}{M_{i,t}}$, defined as the change in other receivables from year *t* to year *t*+1, scaled by the firm's market capitalization. We regress this variable on listed firm cash balances $\frac{C_{i,t}}{M_{i,t}}$ and changes in cash balances $\frac{\Delta C_{i,t}}{M_{i,t}}$. Since these variables are scaled by the same number, their coefficients can be interpreted as the dollar increase in intra-group loans in year *t*+1 that results from a $1 increase in cash balances in year *t*. If increases in the subsidiary's cash balances in year *t* are associated with higher volume of intra-group loans from the subsidiary to its parent in year *t*+1, then cash generated by the listed firm is transferred to its parent. Our emphasis is on the coefficient γ_9 (associated with the interaction term between *parent ROA* or *parent cash-flow* and $\frac{\Delta C_{i,t}}{M_{i,t}}$), which we hypothesize to be negative, since under-performing parents have more incentives to transfer cash from the publicly listed firms they control. This is a test of Hypothesis 3b. Following Jiang, Lee, and Yue (2010), we control for the listed firm's size, ROA, largest shareholding, SOE firms, and the marketization index developed by Fan, Wang, and Zhu (2009).

Table 5, Panel B, Column 1 reports a baseline specification without parent performance. In row 7, the coefficient associated with the level of cash holdings is significantly positive, which suggests that publicly listed firms with larger cash balances in year *t* increase intra-group loans to their controlling shareholders in year *t*+1, thus transferring part of the cash to their controlling shareholder. We observe the same effect in row 10. Publicly listed firms that have

extended more intra-group loans to their controlling shareholders subsequently increase their intra-group loans by more. Finally, in row 9, publicly listed firms with better operating performance extend more intra-group loans to their parents. This finding is in line with Cheung, Rau, and Stouraitis (2006) and Peng, Wei, and Yang (2011), who show that publicly listed firms with better performance, are more likely subject to tunneling. Overall, the results of the baseline specification appear in line with expectations.[25]

When we include parent performance in columns 2-3, these coefficients retain their magnitude and statistical significance. As conjectured however, the coefficient associated with the interactions between the change in cash holdings and parent performance in row 2 is negative and statistically significant. This suggests that firms increase the volume of intra-group loans to their parents more when these parents are underperforming. Based on coefficients in column 2, a firm with average cash balances in year *t* (14.2% of market capitalization from Table 1), which generates an additional $1 of cash, and whose parent ROA is on the cut-off for the bottom 25% quartile, *increases* intra-group loans to its controlling shareholder the following year by almost 4 cents [= (0.051×0.142) + 0.010 + (−0.001)×(−0.162) + (−0.132)×(−0.162)]. In contrast, a publicly listed firm whose parent performance is at the cut-off for the top 25% quartile increases intra-group loans to its controlling shareholder by less than 1 cent [= (0.051×0.142) + 0.010 + (−0.001)× 0.063 + (−0.132)× 0.063)]. Therefore, firms extend more than 4 times as many loans to their parents when these parents are under-performing compared to when the parents perform well. The results are qualitatively similar in column 3, where the explanatory variable is parent cash flow.[26]

[25] Jiang Lee and Yue (2010) find an inverse relationship between ROA and the *level* of intra-group loans. Our specifications, however, regress *changes* in intra-group loans and not levels. SOE ownership, firm size, and the marketization index are not significant in our specifications. In line with Jiang, Lee and Yue (2010), we find fewer intra-group loans in firms with larger ownership by the controlling shareholder.

[26] In unreported robustness tests, we include interaction terms between the level of cash balances (rather than changes in cash balances) and parent ROA. As in Table 2, the coefficient associated with this interaction term is negative, suggesting that publicly listed firms with large cash balances extend more intra-group loans to their parents when these parents are underperforming. We also examine the impact of Chairman tenure, as in Table 4. We do not find statistically significant differences when we include fixed effects in the regressions. However,

The traditional view of business groups is that they are collections of publicly listed firms under common ownership (Khanna and Palepu, 2000; Baek, Kang, and Lee, 2006). The minority shareholders of one firm can protect themselves from expropriation by purchasing shares in *all* other firms in the group. In our sample, however, minority shareholders cannot share in the gains made by the controlling shareholder, because the firms at the top of the pyramids are not publicly listed. The minority shareholders have no way to protect themselves from potential expropriation except by discounting the value of the asset ex ante. Consequently, any transfer from the listed subsidiary to the non-listed parent without a corresponding quid pro quo constitutes expropriation, irrespective of how the parent intends to use the funds. In that sense, the phenomenon that we study is more akin to firms that do not belong to business groups, where funds may be transferred from the firm to the pockets of individual controlling shareholders, rather than to the traditional view of business groups.

6. Is parent performance a good proxy for ex ante expropriation risk? Ruling out alternative explanations

Our identification of periods with higher ex ante expropriation risk as periods when the controlling shareholder is under-performing is based on findings from previous studies. In this section, we conduct two specific robustness tests to rule out alternative explanations.

Recent studies find benefits to group affiliation and challenge the idea that business groups are vehicles for the expropriation of minority shareholders.[27] The co-insurance argument suggests that funds are transferred to group-affiliated firms that are in risk of

without fixed effects, we find that for parent firms whose Chairmen have longer tenure, parent ROA and cash flow are statistically significant in explaining the volume of intra-group loans from the subsidiary to the parent. In contrast, for parent firms whose Chairmen have shorter tenure, parent ROA and cash-flow are not statistically significant in explaining the volume of intra-group loans.

[27] Khanna and Yafeh (2007); Almeida, Park, Subrahmanyam, and Wolfenzon (2011); or Siegel and Choudhury (2012).

bankruptcy.[28] Our results are in line with the co-insurance argument. Table 5, Panel B, row 9, shows a positive relationship between the listed firm's ROA and the transfer of intra-group loans to the parent. When the firm's ROA is negative, the outstanding intra-group loan receivables decline, suggesting that intra-group loans are paid back by the parent, amounting to cash assistance. However, our tests are not designed to test whether group affiliation is good or bad for firms overall, so we make no such claims. What we try to identify is what happens to the valuation of operating assets at times when the ex ante expropriation risk increases.

We first examine whether corporate governance reforms have affected the value of incremental cash and intra-group loan receivables. Such a finding would suggest that our results are driven by potential expropriation and not alternative explanations (Section 6.1). Then we examine whether our results are driven by the perceived ability of the parent to assist the subsidiary rather than transfers (Sections 6.2-6.3).

6.1. Market value of cash holdings and intra-group loans following corporate governance reforms

Chinese regulatory authorities took measures to reduce intra-group loans during 2001-2006 (Jiang, Lee and Yue, 2010), and also reformed non-tradable shares (2005-2006). If our results reflect expropriation (tunneling), we expect that the hypotheses in this study will be stronger in the period before the reforms, compared to the period after.

We also expect market estimates of the ex ante risk of expropriation to be significant when this is a choice variable for the controlling shareholder. Some studies argue that expropriation is more likely when macroeconomic conditions are poor.[29] While they offer differing reasons behind this conjecture, they analyze data for the 1997 Asian financial crisis,

[28] Khanna and Yafeh (2005); Gopalan, Nanda, and Seru (2007); Fisman and Wang (2010); or Jia, Shi, and Wang (2013).
[29] Johnson, Boone, Breach, and Friedman (2000); Mitton (2002); Friedman, Johnson, and Mitton (2003); Lemmon and Lins (2003); Baek, Kang, and Park (2004); or Bae, Baek, Kang, and Liu (2012).

when both publicly listed firms and their parents may be under-performing. Hence, it is unclear whether the expropriation during financial crises is solely due to the underperformance of the controlling shareholder. The period prior to 2007 was a period of continuous high growth for the Chinese economy. In periods of economic crises such as the 2008-2010 financial crisis, all controlling shareholders might be forced to expropriate.

In Table 6, we analyze separately the period prior to reform 1999-2007 (Panel A) and the period following the completion of the reform process 2008-2013 (Panel B). Our results show striking differences between the two periods. During 1999-2007, parent ROA and cash flow have explanatory power for the value of both cash holdings and intra-group loan receivables. During 2008-2013, following the corporate governance reform, they don't. In addition, with the exception of the interactions with parent performance (in rows 2 and 5), the coefficients of both cash variables $\Delta C_t/M_{t-1}$ and C_{t-1}/M_{t-1} (in rows 7 and 11) increase both in magnitude and in statistical significance following corporate governance reform.

In Table 6, Panel C, we analyze the impact of split share reform on the unconditional value of cash holdings. The reform converted non-tradable shares (held mainly by state-owned parties) to fully tradable. Once these shares became tradable, the incentives of the controlling shareholders holding them became better aligned with those of the minority shareholders. To avoid other confounding reform programs, we focus on the period immediately 3 years before (2004-2006) and 3 years after the reform (2007-2009). The coefficient of the interaction between the dummy variable "*Post*" and the value of an incremental dollar of cash holdings or intra-group loan receivables is positive and statistically significant. This suggests that following improvements in corporate governance, cash holdings and intra-group loan receivables were worth more. Therefore, our main results on cash and intra-group loan receivables are likely driven by tunneling considerations and not by alternative hypotheses.

6.2. Market value of cash holdings and the size of the publicly listed firm

We next examine whether our results are driven by the perceived ability of the parent to assist the subsidiary, rather than actual transfers. When parents perform well, they have adequate funds to assist subsidiaries, so cash on the subsidiary's balance sheet is valued at "fair" value. When parents perform poorly, they cannot assist their subsidiaries, and cash on the subsidiary's balance sheet is valued at a discount. We note that this alternative hypothesis cannot explain all our results. In Section 5, we documented both a positive relationship between the *level of cash balances* on the subsidiary's balance sheet and parent performance, and *direct fund transfers* from publicly listed subsidiaries to under-performing parents. [30]

If our results are driven by the perceived ability of the parent to assist the subsidiary, then the sensitivity of the value of the subsidiary's cash balances to the performance of its parent should be higher when the parent's perceived ability to help is higher. Smaller publicly listed subsidiaries are more likely to be financially constrained and face more difficulty in raising external financing. Firm size is a good proxy for financing constraints (Hadlock and Pierce, 2010), and cash holdings are more valuable for firms facing them (Faulkender and Wang, 2006; Pinkowitz and Williamson, 2007), because they allow them to invest in positive net present value projects (Denis and Sibilkov, 2010). When subsidiaries are small, it is easier for the parent to assist the subsidiary in case of need, and for this assistance to make a significant difference on the subsidiary's performance. Smaller subsidiaries may rely more on parent assistance and are simply easier to prop up.[31]

[30] For example, if cash is valued more highly because of the perceived ability of the parent to help the subsidiary, then we would expect publicly listed companies to keep more cash on their balance sheets when parents perform poorly (and hence, the parent cannot provide assistance), and less cash when parents perform well (and can provide assistance). However, our results in Section 4 document the opposite, which is in line with an extraction argument (see Stulz (2005) and Caprio, Faccio, and McConnell (2013) discussed earlier).

[31] Although smaller subsidiaries are easier to prop up, larger subsidiaries may be more valuable to the parent. This argument may have validity when business groups are large and parents may have a choice to prop up some subsidiaries and not others. In our sample, however, the vast majority of parents control only one publicly listed subsidiary. Therefore, each subsidiary should be equally important to the parent. In such cases, relative size may proxy for the perceived ability of the parent to help the subsidiary.

Table 7 reports our cash valuation model where we classify publicly listed firms into sub-samples based on median size (total assets). The median is estimated annually by industry. If our results are driven by the parent's perceived ability to assist (and not by tunneling considerations), we would expect that the cash and intra-group loan receivables should be more sensitive to parent performance in smaller publicly listed firms. [32]

Our results are the opposite of this prediction. For large firms that are more difficult to prop up and are less likely to face financing constraints in Panel A (columns 1, 2, and 4) the coefficients associated with interactions between parent performance and incremental cash ($\Delta C_t/M_{t-1}$) in row 2 or intra-group loan receivables ($\Delta OREC_t/M_{t-1}$) in rows 3 and 6 are significantly positive. In contrast, among small and financially constrained firms in Panel B, there is *no* significant relationship between the value of cash (or intra-group loan receivables) and parent performance.

6.3. Market value of cash holdings and the relative size of the publicly listed firm

Similarly, the perceived ability of the parent to assist the subsidiary is likely to be also larger for subsidiaries that are small relative to the size of their parents. It can be difficult or impossible for parents to assist large subsidiaries. In Table 8, we divide our sample based on the median ratio of total assets of the listed firm divided by the total assets of its parent across our entire sample (the median is estimated annually by industry). In Panel A, for subsidiaries which are large relative to their parents, the market value of cash and intra-group loan receivables are very sensitive to the parent's ROA (see columns 1, 2 and 4). In contrast, for small subsidiaries, in Panel B, the value of cash shows lower sensitivity to the parent's ROA

[32] Hadlock and Pierce (2010) find that firm age is also related to financial constraints. Most Chinese firms were carved out of pre-existing state-owned enterprises before they went public. Thus, the public listing year is not a good proxy for firm age. In unreported tests, we use firm age to classify firms into constrained and unconstrained. We do not obtain statistically significant differences between the two groups. Other studies use dividend payouts and credit ratings as proxies for financial constraints (Faulkender and Wang, 2006). Few Chinese firms pay dividends (paying dividends is likely more correlated with corporate governance rather than with financial constraints), so the dividend payout is not a good proxy. Finally, Chinese firms do not have publicly traded debt and they are not assigned ratings.

(the coefficient is smaller and less statistically significant only in column 1), while that of other receivables is not significant. Therefore, the perceived ability of the parent to assist the subsidiary does not appear to drive the market valuation of cash and other receivables in our sample.

Overall, although we cannot conclude that the perceived ability of the parent to assist the subsidiary is not present in other ways, our analysis suggests that it cannot be the *main* driving force behind our results. Our results are more consistent with an expropriation argument, whereby the expropriation by the controlling shareholder depends not only on its own performance but also on the capacity of the listed firm to raise additional cash in the future. Controlling shareholders appear to expropriate surplus cash from larger financially *un*constrained firms, which are more able to raise additional cash from external markets.

7. Conclusions

In our analysis we link the time-varying risk of expropriation of the publicly listed firm's assets to the performance of its controlling shareholder. When the controlling shareholder experiences poor operating performance and may be more likely to expropriate, cash and intra-group loans are valued lower by the market, whereas other operating assets are not affected. Furthermore, publicly listed firms carry less cash and directly make more loans to their controlling shareholders when the latter are underperforming. Extensive robustness tests suggest that our results capture tunneling rather than alternative explanations.

Our findings help us understand the incentives of controlling shareholders, namely *when* and *why* the controlling shareholders expropriate. The phenomenon that we study is more akin to firms that do not belong to business groups, where funds may be transferred from the firm to the pockets of the individual controlling shareholders, rather than to the traditional view of business groups.

Our results suggest that the corporate governance reforms undertaken by Chinese regulatory authorities during 2001-2006 have reduced expropriation risk among publicly listed firms. Hence, measures directly targeting the provision of intra-group loans from publicly listed subsidiaries to their parents and preventing cash holdings from being siphoned-off to the pockets of controlling shareholders may be an effective mechanism for reducing expropriation risk in emerging markets where publicly listed firms are controlled by large controlling shareholders.

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Table 1

Descriptive statistics

The table reports descriptive statistics for a sample of 705 pairs of firms listed in the Shanghai and Shenzhen stock exchanges during 1999-2013 and their non-listed controlling shareholders (parents), representing 3,746 paired firm-year observations for listed firms and their parents. We obtain financial information, governance, and return data for the listed firms from the China Stock Market and Accounting (CSMAR) database, and for the controlling shareholders (parents) from the National Bureau of Statistics (NBS) Annual Industrial Survey Database. Unless explicitly stated, variables refer to the publicly listed firm. All financial variables are winsorized at the 1% and 99% levels.

Variable	Definition	Obs (1)	Mean (2)	Median (3)
CAR_t (LSY)	12-month excess return using as benchmark Liu, Stambaugh, and Yuan's (2019) model and estimated using data for the universe of Chinese firms.	3,746	0.244	0.049
C_t/TA_t	Cash plus short-term investments (*C*) scaled by total assets (*TA*).	3,746	0.159	0.135
C_{t-1}/M_{t-1}	Cash plus short-term investments (*C*) scaled by market value of equity (*M*).	3,746	0.142	0.103
$\Delta C_t/M_{t-1}$	Changes in cash plus short-term investments from year *t-1* to *t*, scaled by lagged market value of equity.	3,746	0.013	0.003
$OREC_{t-1}/M_{t-1}$	"Other receivables" defined as inter-corporate loans from listed firms to their parents (*OREC*) following the definition of Jiang, Lee, and Yue (2010), scaled by market value of equity (*M*).	3,734	0.029	0.010
$\Delta OREC_t/M_{t-1}$	Change in other receivables from year *t-1* to *t*, scaled by lagged market value of equity.	3,731	0.000	0.000
$CAST_{t-1}/M_{t-1}$	Current assets scaled by market value of equity (*M*).	3,746	0.296	0.267
$\Delta CAST_t/M_{t-1}$	Changes in current assets from year *t-1* to *t*, scaled by lagged market value of equity.	3,746	0.055	0.023
Inv_{t-1}/M_{t-1}	Inventory scaled by market value of equity (*M*).	3,746	0.091	0.072
$\Delta Inv_t/M_{t-1}$	Changes in inventory from year *t-1* to *t*, scaled by lagged market value of equity.	3,746	0.022	0.009
REC_{t-1}/M_{t-1}	Accounts receivable scaled by market value of equity (*M*).	3,746	0.069	0.050
$\Delta REC_t/M_{t-1}$	Changes in accounts receivable from year *t-1* to *t*, scaled by lagged market value of equity.	3,746	0.008	0.003

$FAST_{t-1}/M_{t-1}$	Fixed assets scaled by market value of equity (*M*).	3,746	0.199	0.159
$\Delta FAST_t/M_{t-1}$	Changes in fixed assets from year *t-1* to *t*, scaled by lagged market value of equity.	3,746	0.044	0.010
$\Delta E_t/M_{t-1}$	Change in earnings before extraordinary items plus interest, deferred tax credits, and investment tax credits (*E*) from year *t-1* to *t* scaled by lagged market value of equity.	3,746	0.003	0.001
$\Delta NA_t/M_{t-1}$	Change in net assets from year *t-1* to *t*, where net assets are defined as total assets minus cash holdings (*NA*), scaled by lagged market value of equity. In the specifications including OREC as an explanatory variable, we also subtract OREC from total assets, although we do not change the notation in order to economize on space.	3,746	0.041	0.020
$\Delta D_t/M_{t-1}$	Change in common dividends from year *t-1* to *t* scaled by lagged market value of equity.	3,746	0.001	0.000
NF_t/M_{t-1}	Net financing, defined as net equity plus net debt issues (*NF*) scaled by lagged market value of equity.	3,746	0.024	0.000
NWC_t/NA_t	Net working capital excluding cash (*NWC*) scaled by net assets.	3,746	-0.179	-0.051
CF_t/NA_t	Operating income plus depreciation and amortization minus interest minus taxes minus dividends (*CF*) scaled by net assets.	3,746	0.015	0.009
$Capex_t/TA_t$	Capital expenditure is measured as the change in fixed assets from year *t-1* to *t* (*Capex*) scaled by total assets.	3,746	0.051	0.031
MB_t	Market value of equity divided by book value of equity.	3,746	3.232	2.428
TA_t	Total assets (in RMB billions)	3,746	2,452	2,142
$Log(TA_t)$	The natural logarithm of total assets.	3,746	21.620	21.485
L_t	The ratio of short- plus long-term debt to total assets.	3,746	0.474	0.478
ROA_t	The return on total assets (net income over total assets).	3,746	0.032	0.032
Parent ROA_t	The return on total assets of the listed firm's non-listed parent company.	3,746	0.022	0.011

Parent CF_t	The ratio of cash flow to net assets of the parent company, where cash flow is operating income plus depreciation and amortization minus interest minus taxes minus dividends.	3,516	0.094	0.072
SOE	Dummy variable, which equals to 1 if the firm's ultimate controller is the State-Owned Assets Supervision and Administration Commission (SASAC), and 0 otherwise.	3,725	0.736	1
Ownership by largest shareholder	The percentage of shares held by the largest shareholder.	3,743	43.861	43.701
Marketization index	Measures the development of the regional market in which the firm is registered and has been estimated by Fan, Wang and Zhu (2009).	3,746	6.863	6.820

Table 2

Parent firm performance and the value of operating assets

The table reports estimates of the impact of parent firm performance on the value of listed firm operating assets, following the model of Faulkender and Wang (2006). Panel A examines the valuation of cash holdings and intra-group loan receivables. Panel B examines the valuation of inventories, regular (trade) receivables, and fixed assets. Panel C examines the valuation of all operating assets. Sample characteristics, data sources, and variable definitions are reported in Table 1. Intercepts, firm fixed effects, and year fixed effects are estimated but not reported. Two-dimensional clustered ordinary least squares regressions follow Petersen (2009). Standard errors and *t* values in parentheses are computed following Froot (1989) and Williams (2000) by allowing for heteroskedasticity and any type of correlation for observations of the same firm but assuming independence for observations across firms. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

Panel A. Valuation of cash and other receivables (intra-group loans)

	Valuation of cash			Valuation of intra-group receivables	
	CAR_t (LSY)	CAR_t (LSY)	CAR_t (LSY)	CAR_t (LSY)	CAR_t (LSY)
	(1)	(2)	(3)	(4)	(5)
Parent characteristics					
(1) *Parent* ROA_t		1.157 (8.90)***		1.111 (8.59)***	
(2) *Parent* $ROA_t \times \Delta C_t/M_{t-1}$		2.568 (2.58)***			
(3) *Parent* $ROA_t \times \Delta OREC_t/M_{t-1}$				5.209 (1.81)*	
(4) *Parent* CF_t			0.061 (2.37)**		0.059 (2.35)**
(5) *Parent* $CF_t \times \Delta C_t/M_{t-1}$			0.034 (0.11)		
(6) *Parent* $CF_t \times \Delta OREC_t/M_{t-1}$					4.820 (1.66)*
Listed firm characteristics					
(7) $\Delta C_t/M_{t-1}$	1.298 (4.10)***	0.718 (2.20)**	1.199 (3.73)***	0.934 (2.96)***	1.211 (3.82)***
(8) $\Delta E_t/M_{t-1}$	0.609 (3.79)***	0.506 (3.17)***	0.606 (3.77)***	0.449 (2.83)***	0.566 (3.53)***
(9) $\Delta NA_t/M_{t-1}$	0.597 (5.61)***	0.506 (4.78)***	0.587 (5.52)***	0.515 (4.91)***	0.561 (5.29)***
(10) $\Delta D_t/M_{t-1}$	1.828 (2.93)***	1.632 (2.65)***	1.792 (2.88)***	1.610 (2.63)***	1.756 (2.83)***
(11) C_{t-1}/M_{t-1}	0.645 (7.18)***	0.606 (6.79)***	0.648 (7.20)***	0.646 (7.28)***	0.667 (7.44)***
(12) L_t	0.033 (0.41)	0.108 (1.33)	0.042 (0.51)	0.180 (2.20)**	0.106 (1.29)
(13) NF_t/M_{t-1}	-0.535 (-3.48)***	-0.474 (-3.11)***	-0.528 (-3.43)***	-0.444 (-2.93)***	-0.499 (-3.26)***
(14) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	-0.283 (-0.57)	0.110 (0.22)	-0.244 (-0.47)	-0.184 (-0.37)	-0.396 (-0.78)
(15) $L_t \times \Delta C_t/M_{t-1}$	-1.184 (-2.29)**	-0.967 (-1.86)*	-1.086 (-2.07)**	-1.083 (-2.09)**	-1.093 (-2.09)**
(16) $\Delta OREC_t/M_{t-1}$				1.014 (3.17)***	1.011 (3.13)***
(17) $OREC_{t-1}/M_{t-1}$				-1.034 (-5.26)***	-1.106 (-5.57)***
(18) $OREC_{t-1}/M_{t-1} \times \Delta OREC_t/M_{t-1}$				-0.558 (-0.33)	-0.283 (-0.16)
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	3,651	3,651	3,651	3,651	3,651
Adj. R^2	0.698	0.707	0.699	0.710	0.703

Panel B. Valuation of inventories, regular (trade) receivables, and fixed assets

	Valuation of inventory		Valuation of trade receivables		Valuation of fixed assets	
	CAR_t (LSY)	CAR_t (LSY)	CAR_t (LSY)	CAR_t (LSY)	CAR_t (LSY)	CAR_t (LSY)
	(1)	(2)	(3)	(4)	(5)	(6)
Parent characteristics						
(1) *Parent* ROA_t	1.030 (7.99)***		1.078 (8.36)***		1.040 (8.17)***	
(2) *Parent* $ROA_t \times \Delta Inv_t/M_{t-1}$	-0.485 (-0.54)					
(3) *Parent* $ROA_t \times \Delta REC_t/M_{t-1}$			0.862 (0.84)			
(4) *Parent* $ROA_t \times \Delta FAST_t/M_{t-1}$					-0.413 (-0.83)	
(5) *Parent* CF_t		0.065 (2.46)**		0.061 (2.42)**		0.074 (2.88)***
(6) *Parent* $CF_t \times \Delta Inv_t/M_{t-1}$		-0.452 (-1.31)				
(7) *Parent* $CF_t \times \Delta REC_t/M_{t-1}$				-0.392 (-1.42)		
(8) *Parent* $CF_t \times \Delta FAST_t/M_{t-1}$						-0.585 (-2.91)***
Listed firm characteristics						
(9) $\Delta C_t/M_{t-1}$	0.876 (2.80)***	1.105 (3.52)***	0.957 (3.03)***	1.163 (3.68)***	0.931 (2.98)***	1.185 (3.79)***
(10) $\Delta E_t/M_{t-1}$	0.407 (2.58)**	0.504 (3.17)***	0.458 (2.89)***	0.572 (3.59)***	0.426 (2.73)***	0.544 (3.47)***
(11) $\Delta NA_t/M_{t-1}$	0.483 (4.59)***	0.527 (4.97)***	0.464 (4.34)***	0.514 (4.77)***	0.407 (3.79)***	0.437 (4.04)***
(12) $\Delta D_t/M_{t-1}$	1.310 (2.15)**	1.426 (2.32)**	1.507 (2.47)**	1.658 (2.69)***	1.198 (1.98)**	1.328 (2.17)**
(13) C_{t-1}/M_{t-1}	0.645 (7.37)***	0.666 (7.54)***	0.645 (7.31)***	0.660 (7.40)***	0.636 (7.32)***	0.657 (7.49)***
(14) L_t	0.179 (2.20)**	0.109 (1.33)	0.111 (1.37)	0.038 (0.46)	0.168 (2.08)**	0.091 (1.13)
(15) NF_t/M_{t-1}	-0.450 (-3.00)***	-0.505 (-3.33)***	-0.383 (-2.53)**	-0.438 (-2.87)***	-0.464 (-3.10)***	-0.523 (-3.47)***
(16) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	-0.109 (-0.22)	-0.341 (-0.68)	-0.037 (-0.07)	-0.408 (-0.80)	-0.169 (-0.34)	-0.393 (-0.79)
(17) $L_t \times \Delta C_t/M_{t-1}$	-0.945 (-1.84)*	-0.880 (-1.69)*	-1.209 (-2.31)**	-1.013 (-1.92)*	-1.053 (-2.06)**	-1.027 (-2.00)**
(18) $\Delta Inv_t/M_{t-1}$	-0.027 (-0.16)	0.036 (0.23)				
(19) Inv_{t-1}/M_{t-1}	2.448 (2.95)***	2.486 (3.01)***				
(20) $Inv_{t-1}/M_{t-1} \times \Delta Inv_t/M_{t-1}$	-2.037 (-9.80)***	-2.155 (-10.39)***				
(21) $\Delta REC_t/M_{t-1}$			-0.314 (-1.61)	-0.163 (-0.81)		
(22) REC_{t-1}/M_{t-1}			3.012 (2.79)***	2.857 (2.62)***		
(23) $REC_{t-1}/M_{t-1} \times \Delta REC_t/M_{t-1}$			-1.62 (-7.95)***	-1.764 (-8.58)***		
(24) $\Delta FAST_t/M_{t-1}$					0.329 (3.42)***	0.431 (4.70)***
(25) $FAST_{t-1}/M_{t-1}$					-0.447 (-2.33)**	-0.492 (-2.58)***
(26) $FAST_{t-1}/M_{t-1} \times \Delta FAST_t/M_{t-1}$					-1.19 (-11.48)***	-1.262 (-12.08)***
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,651	3,651	3,651	3,651	3,651	3,651
Adj. R^2	0.716	0.710	0.713	0.707	0.720	0.715

Table 3

Type of controlling shareholder, parent firm performance, and the value of cash and intra-group loans

The table reports estimates of the impact of parent firm performance on the value of listed firm cash and other receivables, following the model of Faulkender and Wang (2006), after controlling for the type of controlling shareholder. Sample characteristics, data sources, and variable definitions are reported in Table 1. Intercepts, firm fixed effects, and year fixed effects are estimated but not reported. Two-dimensional clustered ordinary least squares regressions follow Petersen (2009). Standard errors and *t* values in parentheses are computed following Froot (1989) and Williams (2000) by allowing for heteroskedasticity and any type of correlation for observations of the same firm but assuming independence for observations across firms. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

	CARt (LSY)	CARt (LSY)	CARt (LSY)	CARt (LSY)
	(1)	(2)	(3)	(4)
Parent characteristics				
(1) *Parent* ROA_t	1.158 (8.89)***	1.113 (8.58)***	1.159 (8.88)***	1.113 (8.57)***
(2) *Parent* $ROA_t \times \Delta C_t/M_{t-1}$	2.563 (2.55)**		2.722 (2.68)***	
(3) *Parent* $ROA_t \times \Delta OREC_t/M_{t-1}$		5.020 (1.67)*		4.992 (1.65)*
(4) SOE	-0.022 (-0.40)	-0.010 (-0.18)		
(5) SOE $\times \Delta C_t/M_{t-1}$	-0.051 (-0.25)			
(6) SOE $\times \Delta OREC_t/M_{t-1}$		-0.107 (-0.21)		
(7) Local SOE			-0.026 (-0.48)	-0.013 (-0.24)
(8) Central SOE			-0.027 (-0.38)	-0.006 (-0.08)
(9) Local SOE $\times \Delta C_t/M_{t-1}$			-0.115 (-0.54)	
(10) Local SOE $\times \Delta OREC_t/M_{t-1}$				-0.113 (-0.22)
(11) Central SOE $\times \Delta C_t/M_{t-1}$			0.172 (0.60)	
(12) Central SOE $\times \Delta OREC_t/M_{t-1}$				-0.114 (-0.15)
Listed firm characteristics				
(13) $\Delta C_t/M_{t-1}$	0.754 (2.16)**	0.987 (2.95)***	0.711 (2.02)**	0.965 (2.87)***
(14) $\Delta E_t/M_{t-1}$	0.506 (3.16)***	0.449 (2.81)***	0.512 (3.19)***	0.452 (2.83)***
(15) $\Delta NA_t/M_{t-1}$	0.504 (4.75)***	0.515 (4.89)***	0.500 (4.70)***	0.514 (4.87)***
(16) $\Delta D_t/M_{t-1}$	1.607 (2.60)***	1.593 (2.59)***	1.569 (2.54)**	1.565 (2.54)**
(17) C_{t-1}/M_{t-1}	0.607 (6.76)***	0.647 (7.25)***	0.604 (6.73)***	0.646 (7.23)***
(18) L_t	0.108 (1.32)	0.179 (2.19)**	0.107 (1.31)	0.180 (2.20)**
(19) NF_t/M_{t-1}	-0.474 (-3.10)***	-0.45 (-2.93)***	-0.469 (-3.07)***	-0.442 (-2.90)***
(20) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	0.119 (0.24)	-0.172 (-0.34)	0.125 (0.25)	-0.172 (-0.34)
(21) $L_t \times \Delta C_t/M_{t-1}$	-0.969 (-1.85)*	-1.07 (-2.05)**	-0.907 (-1.72)*	-1.029 (-1.96)**
(22) $\Delta OREC_t/M_{t-1}$		1.085 (2.19)**		1.094 (2.21)**
(23) $OREC_{t-1}/M_{t-1}$		-1.03 (-5.22)***		-1.029 (-5.21)***
(24) $OREC_{t-1}/M_{t-1} \times \Delta OREC_t/M_{t-1}$		-0.543 (-0.32)		-0.529 (-0.31)
Firm and year fixed effects	Yes	Yes	Yes	Yes
Observations	3,638	3,638	3,638	3,638
Adj. R^2	0.706	0.709	0.706	0.708

Table 4

Parent firm performance, transfers, and managerial tenure, 1999-2007

The table reports estimates of the impact of parent firm performance on intra-group loans, the value of listed firm cash holdings and the value of intra-group loan receivables, following the model of Faulkender and Wang (2006). Panel A uses observations of parent firms whose Chairman's tenure is greater than 3 years, and Panel B uses observations of parent firms whose Chairman's tenure is less than or equal to 3 years. Sample characteristics, data sources, and variable definitions are reported in Table 1. Intercepts, firm fixed effects, and year fixed effects are estimated but not reported. Two-dimensional clustered ordinary least squares regressions follow Petersen (2009). Standard errors and *t* values in parentheses are computed following Froot (1989) and Williams (2000) by allowing for heteroskedasticity and any type of correlation for observations of the same firm but assuming independence for observations across firms. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

Panel A. Tenure of Parent Chairman > 3 years

	Valuation of cash		Valuation of intra-group receivables	
	CARt (LSY)	CARt (LSY)	CARt (LSY)	CARt (LSY)
	(1)	(2)	(3)	(4)
Parent characteristics				
(1) *Parent* ROA_t	2.346 (7.60)***		2.288 (7.48)***	
(2) *Parent* $ROA_t \times \Delta C_t/M_{t-1}$	2.111 (0.86)			
(3) *Parent* $ROA_t \times \Delta OREC_t/M_{t-1}$			10.787 (2.32)**	
(4) *Parent* CF_t		0.925 (5.54)***		0.813 (5.00)***
(5) *Parent* $CF_t \times \Delta C_t/M_{t-1}$		1.843 (1.25)		
(6) *Parent* $CF_t \times \Delta OREC_t/M_{t-1}$				8.421 (1.78)*
Listed firm characteristics				
(7) $\Delta C_t/M_{t-1}$	-0.278 (-0.46)	-0.143 (-0.23)	0.021 (0.04)	0.332 (0.56)
(8) $\Delta E_t/M_{t-1}$	0.070 (0.23)	0.126 (0.40)	0.017 (0.06)	0.074 (0.24)
(9) $\Delta NA_t/M_{t-1}$	0.442 (2.37)**	0.463 (2.44)**	0.433 (2.35)**	0.452 (2.41)**
(10) $\Delta D_t/M_{t-1}$	0.271 (0.29)	0.129 (0.13)	0.223 (0.24)	0.098 (0.10)
(11) C_{t-1}/M_{t-1}	0.640 (3.52)***	0.739 (4.01)***	0.655 (3.65)***	0.755 (4.14)***
(12) L_t	-0.156 (-0.91)	-0.215 (-1.23)	-0.054 (-0.31)	-0.102 (-0.59)
(13) NF_t/M_{t-1}	-0.506 (-1.70)*	-0.532 (-1.76)*	-0.473 (-1.61)	-0.486 (-1.62)
(14) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	1.544 (1.51)	1.592 (1.53)	1.664 (1.64)	1.608 (1.56)
(15) $L_t \times \Delta C_t/M_{t-1}$	-0.119 (-0.11)	-0.293 (-0.27)	-0.787 (-0.74)	-0.960 (-0.89)
(16) $\Delta OREC_t/M_{t-1}$			1.339 (2.98)***	1.396 (3.06)***
(17) $OREC_{t-1}/M_{t-1}$			-1.219 (-3.51)***	-1.282 (-3.63)***
(18) $OREC_{t-1}/M_{t-1} \times \Delta OREC_t/M_{t-1}$			-0.316 (-0.12)	-0.688 (-0.27)
Firm and year fixed effects	Yes	Yes	Yes	Yes
Observations	1,360	1,360	1,360	1,360
Adj. R^2	0.488	0.472	0.501	0.484

Panel B. Tenure of Parent Chairman ≤ 3 years

	Valuation of cash		Valuation of intra-group receivables	
	CARt (LSY)	CARt (LSY)	CARt (LSY)	CARt (LSY)
	(1)	(2)	(3)	(4)
Parent characteristics				
(1) *Parent* ROA_t	1.107 (4.75)***		1.078 (4.60)***	
(2) *Parent* $ROA_t \times \Delta C_t/M_{t-1}$	0.114 (0.05)			
(3) *Parent* $ROA_t \times \Delta OREC_t/M_{t-1}$			-0.276 (-0.06)	
(4) *Parent* CF_t		1.058 (6.38)***		1.041 (6.21)***
(5) *Parent* $CF_t \times \Delta C_t/M_{t-1}$		0.474 (0.33)		
(6) *Parent* $CF_t \times \Delta OREC_t/M_{t-1}$				3.966 (0.87)
Listed firm characteristics				
(7) $\Delta C_t/M_{t-1}$	0.123 (0.20)	-0.406 (-0.65)	0.224 (0.36)	-0.280 (-0.45)
(8) $\Delta E_t/M_{t-1}$	0.979 (3.16)***	0.853 (2.80)***	0.927 (3.01)***	0.822 (2.70)***
(9) $\Delta NA_t/M_{t-1}$	0.495 (2.21)**	0.495 (2.26)**	0.447 (1.99)**	0.464 (2.11)**
(10) $\Delta D_t/M_{t-1}$	0.458 (0.48)	0.028 (0.03)	0.490 (0.52)	0.055 (0.06)
(11) C_{t-1}/M_{t-1}	0.672 (3.29)***	0.672 (3.31)***	0.689 (3.45)***	0.698 (3.58)***
(12) L_t	0.160 (1.05)	0.265 (1.75)*	0.232 (1.51)	0.320 (2.10)**
(13) NF_t/M_{t-1}	-0.413 (-1.10)	-0.277 (-0.75)	-0.356 (-0.98)	-0.207 (-0.58)
(14) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	1.523 (1.19)	1.467 (1.17)	1.357 (1.06)	1.263 (1.01)
(15) $L_t \times \Delta C_t/M_{t-1}$	-0.991 (-0.99)	-0.661 (-0.67)	-1.164 (-1.14)	-0.805 (-0.80)
(16) $\Delta OREC_t/M_{t-1}$			0.717 (1.28)	0.539 (0.98)
(17) $OREC_{t-1}/M_{t-1}$			-0.773 (-3.07)***	-0.695 (-2.80)***
(18) $OREC_{t-1}/M_{t-1} \times \Delta OREC_t/M_{t-1}$			-2.380 (-0.95)	-0.823 (-0.33)
Firm and year fixed effects	Yes	Yes	Yes	Yes
Observations	903	903	903	903
Adj. R^2	0.446	0.466	0.454	0.472

Table 5

Parent firm performance, the level of cash holdings, and the transfer of intra-group loans

Panel A reports the effect of parent company performance on the listed firm's level of cash holdings. Panel B reports the impact of parent firm performance on the relation between listed firm cash holdings and other receivables. Sample characteristics, data sources, and variable definitions are reported in Table 1. Intercepts, firm fixed effects, and year fixed effects are estimated but not reported. Two-dimensional clustered ordinary least squares regressions follow Petersen (2009). Standard errors and *t* values in parentheses are computed following Froot (1989) and Williams (2000) by allowing for heteroskedasticity and any type of correlation for observations of the same firm but assuming independence for observations across firms. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

Panel A. Parent firm performance and the level of cash holdings

	$\log(1+C_t/NA_t)$	$\log(1+C_t/TA_t)$	$\log(1+C_t/M_t)$	$\log(1+C_t/NA_t)$	$\log(1+C_t/TA_t)$	$\log(1+C_t/M_t)$
	(1)	(2)	(3)	(4)	(5)	(6)
Parent characteristics						
(1) *Parent* ROA_t	0.227 (5.74)***	0.149 (6.81)***	0.033 (2.37)**			
(2) *Parent* CF_t				0.018 (2.25)**	0.011 (2.39)**	0.002 (0.55)
(3) SOE_t	0.016 (0.97)	0.009 (1.03)	0.013 (2.27)**	0.016 (0.95)	0.009 (1.00)	0.013 (2.26)**
Listed firm characteristics						
(4) $Log(TA_t)$	0.025 (3.63)***	0.015 (3.97)***	0.024 (9.47)***	0.028 (4.04)***	0.017 (4.46)***	0.024 (9.67)***
(5) ROA_t	0.400 (7.61)***	0.238 (8.15)***	0.049 (2.59)***	0.479 (9.47)***	0.291 (10.33)***	0.061 (3.39)***
(6) $Marketization\ Index_t$	0.004 (0.66)	0.001 (0.38)	0.002 (0.99)	0.004 (0.72)	0.001 (0.46)	0.002 (1.03)
(7) Ownership by largest shareholder	-0.032 (-0.70)	-0.013 (-0.50)	-0.044 (-2.71)***	-0.041 (-0.90)	-0.019 (-0.74)	-0.045 (-2.80)***
Firm and year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3429	3429	3429	3429	3429	3429
Adj. R^2	-0.109	-0.085	0.032	-0.120	-0.101	0.030

Panel B. Parent firm performance, cash holdings, and the transfer of intra-group loans

	$\Delta OREC_{t+1}/M_t$	$\Delta OREC_{t+1}/M_t$	$\Delta OREC_{t+1}/M_t$
	(1)	(2)	(3)
Parent characteristics			
(1) *Parent* ROA_t		-0.001 (-0.12)	
(2) *Parent* $ROA_t \times \Delta C_t/M_t$		-0.132 (-1.69)*	
(3) *Parent* CF_t			0.001 (0.61)
(4) *Parent* $CF_t \times \Delta C_t/M_t$			-0.071 (-1.92)*
(5) SOEt	0.000 (0.04)	0.000 (0.05)	0.000 (0.03)
Listed firm characteristics			
(6) Δ Ct/Mt	0.010 (1.26)	0.017 (1.78)*	0.018 (1.95)*
(7) C_t/M_t	0.051 (3.44)***	0.049 (3.29)***	0.051 (3.40)***
(8) $Log(TA_t)$	-0.002 (-1.12)	-0.002 (-1.06)	-0.002 (-1.06)
(9) ROA_t	0.130 (9.89)***	0.128 (9.38)***	0.128 (9.68)***
(10) $OREC_{t-1}/M_{t-1}$	0.348 (25.11)***	0.349 (25.14)***	0.349 (25.16)***
(11) Marketization index	0.001 (0.88)	0.001 (0.82)	0.001 (0.81)
(12) Ownership by largest shareholder	-0.034 (-2.93)***	-0.034 (-2.92)***	-0.033 (-2.85)***
Firm and year fixed effects	Yes	Yes	Yes
Observations	3,429	3,429	3,429
Adj. R^2	0.033	0.033	0.034

Table 6

Corporate governance reform and the value of cash holdings/intra-group receivables

The table reports estimates of the impact of corporate governance reform on the value of listed firm cash holdings and intra-group loan receivables following the model of Faulkender and Wang (2006). Sample characteristics, data sources, and variable definitions are reported in Table 1. Panel A reports results for 1999-2007 and Panel B for 2008-2013. Panel C reports estimates the impact from 3 years before to 3 years after split share reform. These specifications are estimated using data for 2004-2009, and the *post* dummy variable takes the value of 1 for years 2007-2009. Intercepts, firm fixed effects, and year fixed effects are estimated but not reported. Two-dimensional clustered ordinary least squares regressions follow Petersen (2009). Standard errors and *t* values in parentheses are computed following Froot (1989) and Williams (2000) by allowing for heteroskedasticity and any type of correlation for observations of the same firm but assuming independence for observations across firms. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

Panel A. 1999-2007

	CARt (LSY)	CARt (LSY)	CARt (LSY)	CARt (LSY)
	(1)	(2)	(3)	(4)
Parent performance				
(1) *Parent* ROA_t	1.652 (9.19)***	1.625 (9.08)***		
(2) *Parent* $ROA_t \times \Delta C_t/M_{t-1}$	2.681 (1.75)*			
(3) *Parent* $ROA_t \times \Delta OREC_t/M_{t-1}$		5.425 (1.91)*		
(4) *Parent* CF_t			0.961 (8.68)***	0.886 (8.14)***
(5) *Parent* $CF_t \times \Delta C_t/M_{t-1}$			1.698 (1.82)*	
(6) *Parent* $CF_t \times \Delta OREC_t/M_{t-1}$				5.349 (1.87)*
Listed firm characteristics				
(7) $\Delta C_t/M_{t-1}$	0.081 (0.20)	0.285 (0.72)	-0.090 (-0.22)	0.249 (0.62)
(8) $\Delta E_t/M_{t-1}$	0.638 (3.10)***	0.574 (2.80)***	0.582 (2.81)***	0.531 (2.58)**
(9) $\Delta NA_t/M_{t-1}$	0.412 (3.14)***	0.387 (2.96)***	0.421 (3.20)***	0.399 (3.05)***
(10) $\Delta D_t/M_{t-1}$	0.508 (0.82)	0.515 (0.84)	0.187 (0.30)	0.217 (0.35)
(11) C_{t-1}/M_{t-1}	0.574 (4.67)***	0.630 (5.18)***	0.659 (5.34)***	0.719 (5.90)***
(12) L_t	0.010 (0.09)	0.094 (0.88)	-0.011 (-0.10)	0.073 (0.69)
(13) NF_t/M_{t-1}	-0.418 (-1.94)*	-0.331 (-1.56)	-0.350 (-1.62)	-0.273 (-1.28)
(14) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	1.148 (1.56)	1.070 (1.46)	1.352 (1.83)*	1.190 (1.62)
(15) $L_t \times \Delta C_t/M_{t-1}$	-0.598 (-0.87)	-0.966 (-1.41)	-0.642 (-0.93)	-0.983 (-1.43)
(16) $\Delta OREC_t/M_{t-1}$		1.080 (3.47)***		0.985 (3.15)***
(17) $OREC_{t-1}/M_{t-1}$		-0.944 (-4.85)***		-0.951 (-4.86)***
(18) $OREC_{t-1}/M_{t-1} \times \Delta OREC_t/M_{t-1}$		-1.074 (-0.69)		-0.746 (-0.48)
Firm and year fixed effects	Yes	Yes	Yes	Yes
Observations	2,263	2,263	2,263	2,263
Adj. R^2	0.577	0.584	0.574	0.580

Panel B. 2008-2013

	CARt (LSY)	CARt (LSY)	CARt (LSY)	CARt (LSY)
	(1)	(2)	(3)	(4)
Parent performance				
(1) *Parent* ROA_t	0.836 (3.95)***	0.731 (3.52)***		
(2) *Parent* $ROA_t \times \Delta C_t/M_{t-1}$	1.199 (0.75)			
(3) *Parent* $ROA_t \times \Delta OREC_t/M_{t-1}$		-6.739 (-0.57)		
(4) *Parent* CF_t			0.015 (0.49)	0.014 (0.49)
(5) *Parent* $CF_t \times \Delta C_t/M_{t-1}$			0.097 (0.26)	
(6) *Parent* $CF_t \times \Delta OREC_t/M_{t-1}$				-4.430 (-0.37)
Listed firm characteristics				
(7) $\Delta C_t/M_{t-1}$	1.036 (1.63)	1.265 (2.18)**	1.267 (2.14)**	1.309 (2.24)**
(8) $\Delta E_t/M_{t-1}$	0.402 (1.54)	0.432 (1.67)*	0.524 (2.00)**	0.541 (2.09)**
(9) $\Delta NA_t/M_{t-1}$	0.338 (1.68)*	0.287 (1.46)	0.392 (1.96)**	0.317 (1.60)
(10) $\Delta D_t/M_{t-1}$	4.538 (2.70)***	4.221 (2.55)**	4.997 (2.96)***	4.606 (2.77)***
(11) C_{t-1}/M_{t-1}	1.338 (7.61)***	1.385 (7.97)***	1.342 (7.58)***	1.385 (7.93)***
(12) L_t	0.420 (2.08)**	0.559 (2.80)***	0.374 (1.85)*	0.511 (2.55)**
(13) NF_t/M_{t-1}	-0.223 (-0.91)	-0.217 (-0.90)	-0.263 (-1.07)	-0.239 (-0.99)
(14) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	-1.339 (-1.72)*	-1.642 (-2.14)**	-1.637 (-2.10)**	-1.868 (-2.43)**
(15) $L_t \times \Delta C_t/M_{t-1}$	-0.142 (-0.16)	-0.199 (-0.22)	-0.061 (-0.07)	0.028 (0.03)
(16) $\Delta OREC_t/M_{t-1}$		1.845 (1.23)		1.733 (1.15)
(17) $OREC_{t-1}/M_{t-1}$		-6.914 (-5.35)***		-7.244 (-5.59)***
(18) $OREC_{t-1}/M_{t-1} \times \Delta OREC_t/M_{t-1}$		36.195 (2.77)***		38.458 (2.93)***
Firm and year fixed effects	Yes	Yes	Yes	Yes
Observations	1,388	1,388	1,388	1,388
Adj. R^2	0.777	0.783	0.774	0.780

Panel C. Split share reform

	CARt (LSY) (1)	CARt (LSY) (2)
Split share reform timing		
(1) *Post*	0.293 (3.29)***	0.189 (2.27)**
(2) *Post* × $\Delta C_t/M_{t-1}$	1.430 (1.80)*	
(3) *Post* × $\Delta OREC_t/M_{t-1}$		13.058 (4.28)***
Listed firm characteristics		
(4) $\Delta C_t/M_{t-1}$	7.443 (5.90)***	7.104 (5.83)***
(5) $\Delta E_t/M_{t-1}$	2.053 (3.63)***	1.627 (2.98)***
(6) $\Delta NA_t/M_{t-1}$	0.998 (2.53)**	1.029 (2.72)***
(7) $\Delta D_t/M_{t-1}$	0.085 (0.04)	-0.780 (-0.36)
(8) C_{t-1}/M_{t-1}	4.589 (12.39)***	4.572 (13.08)***
(9) L_t	1.567 (3.50)***	1.507 (3.47)***
(10) NF_t/M_{t-1}	-0.336 (-0.53)	-0.430 (-0.70)
(11) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	-3.753 (-1.87)*	-5.000 (-2.60)***
(12) $L_t \times \Delta C_t/M_{t-1}$	-7.474 (-3.50)***	-6.275 (-3.11)***
(13) $\Delta OREC_t/M_{t-1}$		4.238 (3.77)***
(14) $OREC_{t-1}/M_{t-1}$		-6.075 (-7.89)***
(15) $OREC_{t-1}/M_{t-1} \times \Delta OREC_t/M_{t-1}$		-5.456 (-0.97)
Firm and year fixed effects	Yes	Yes
Observations	1,463	1,463
Adj. R^2	0.111	0.129

Table 7

Parent firm performance, the value of cash holdings, and financial constraints

The table reports estimates of the impact of parent firm performance on the value of listed firm cash holdings and intra-group loan receivables following the model of Faulkender and Wang (2006). Sample characteristics, data sources, and variable definitions are reported in Table 1. Constrained firms have total assets less than the sample median. The median is estimated annually by industry. Intercepts, firm fixed effects, and year fixed effects are estimated but not reported. Two-dimensional clustered ordinary least squares regressions follow Petersen (2009). Standard errors and *t* values in parentheses are computed following Froot (1989) and Williams (2000) by allowing for heteroskedasticity and any type of correlation for observations of the same firm but assuming independence for observations across firms. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

Panel A. Financially unconstrained / Large publicly listed subsidiaries

	CARt (LSY) (1)	CARt (LSY) (2)	CARt (LSY) (3)	CARt (LSY) (4)
Parent performance				
(1) *Parent* ROA_t	1.375 (3.56)***	1.317 (3.49)***		
(2) *Parent* $ROA_t \times \Delta C_t/M_{t-1}$	11.727 (2.61)***			
(3) *Parent* $ROA_t \times \Delta OREC_t/M_{t-1}$		45.854 (4.20)***		
(4) *Parent* CF_t			-0.048 (-0.53)	-0.030 (-0.34)
(5) *Parent* $CF_t \times \Delta C_t/M_{t-1}$			-0.073 (-0.07)	
(6) *Parent* $CF_t \times \Delta OREC_t/M_{t-1}$				46.307 (4.19)***
Listed firm characteristics				
(7) $\Delta C_t/M_{t-1}$	0.652 (0.51)	0.363 (0.29)	1.871 (1.47)	1.133 (0.91)
(8) $\Delta E_t/M_{t-1}$	-0.772 (-1.44)	-1.016 (-1.95)*	-0.950 (-1.75)*	-0.982 (-1.86)*
(9) $\Delta NA_t/M_{t-1}$	0.176 (0.45)	0.559 (1.52)	0.540 (1.40)	0.650 (1.75)*
(10) $\Delta D_t/M_{t-1}$	1.363 (0.54)	0.725 (0.29)	1.602 (0.62)	1.014 (0.40)
(11) C_{t-1}/M_{t-1}	1.716 (3.39)***	1.805 (3.71)***	2.029 (4.00)***	1.863 (3.77)***
(12) L_t	-0.158 (-0.64)	-0.046 (-0.19)	-0.207 (-0.82)	-0.107 (-0.43)
(13) NF_t/M_{t-1}	-0.682 (-1.13)	-1.167 (-2.01)**	-1.234 (-2.07)**	-1.441 (-2.48)**
(14) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	8.153 (2.51)**	5.402 (1.75)*	5.583 (1.74)*	4.910 (1.57)
(15) $L_t \times \Delta C_t/M_{t-1}$	-2.452 (-1.24)	0.740 (0.38)	-1.624 (-0.76)	0.206 (0.11)
(16) $\Delta OREC_t/M_{t-1}$		3.626 (3.67)***		3.406 (3.42)***
(17) $OREC_{t-1}/M_{t-1}$		-1.399 (-2.04)**		-1.501 (-2.17)**
(18) $OREC_{t-1}/M_{t-1} \times \Delta OREC_t/M_{t-1}$		-16.608 (-2.25)**		-14.752 (-1.98)**
Firm and year fixed effects	Yes	Yes	Yes	Yes
Observations	1,100	1,100	1,100	1,100
Adj. R^2	0.484	0.505	0.467	0.494

Panel B. Financially constrained / Small publicly listed subsidiaries

	CARt (LSY)	CARt (LSY)	CARt (LSY)	CARt (LSY)
	(1)	(2)	(3)	(4)
Parent performance				
(1) *Parent* ROA_t	1.347 (6.10)***	1.189 (5.43)***		
(2) *Parent* $ROA_t \times \Delta C_t/M_{t-1}$	4.230 (3.02)***			
(3) *Parent* $ROA_t \times \Delta OREC_t/M_{t-1}$		0.465 (0.09)		
(4) *Parent* CF_t			0.089 (2.33)**	0.085 (2.30)**
(5) *Parent* $CF_t \times \Delta C_t/M_{t-1}$			-0.034 (-0.08)	
(6) *Parent* $CF_t \times \Delta OREC_t/M_{t-1}$				-0.624 (-0.12)
Listed firm characteristics				
(7) $\Delta C_t/M_{t-1}$	-0.119 (-0.23)	0.289 (0.57)	0.304 (0.59)	0.284 (0.56)
(8) $\Delta E_t/M_{t-1}$	1.030 (4.16)***	0.963 (3.87)***	1.257 (5.08)***	1.208 (4.87)***
(9) $\Delta NA_t/M_{t-1}$	0.293 (1.91)*	0.353 (2.31)**	0.368 (2.38)**	0.365 (2.36)**
(10) $\Delta D_t/M_{t-1}$	1.217 (1.52)	1.197 (1.48)	1.244 (1.52)	1.239 (1.52)
(11) C_{t-1}/M_{t-1}	0.542 (4.49)***	0.578 (4.76)***	0.588 (4.80)***	0.613 (4.99)***
(12) L_t	0.255 (1.67)*	0.325 (2.13)**	0.136 (0.91)	0.159 (1.05)
(13) NF_t/M_{t-1}	-0.204 (-0.98)	-0.151 (-0.73)	-0.167 (-0.79)	-0.160 (-0.76)
(14) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	0.617 (0.97)	0.675 (1.06)	0.315 (0.49)	0.310 (0.48)
(15) $L_t \times \Delta C_t/M_{t-1}$	0.004 (0.01)	-0.501 (-0.60)	0.042 (0.05)	0.065 (0.08)
(16) $\Delta OREC_t/M_{t-1}$		0.531 (0.94)		0.603 (1.06)
(17) $OREC_{t-1}/M_{t-1}$		-0.636 (-2.14)**		-0.734 (-2.45)**
(18) $OREC_{t-1}/M_{t-1} \times \Delta OREC_t/M_{t-1}$		-1.516 (-0.57)		-1.709 (-0.63)
Firm and year fixed effects	Yes	Yes	Yes	Yes
Observations	1,103	1,103	1,103	1,103
Adj. R^2	0.760	0.758	0.751	0.752

Table 8

Parent firm performance, the value of cash holdings, and the relative size of subsidiaries

The table reports estimates of the impact of parent firm performance on the value of listed firm cash holdings and intra-group loan receivables, classified by the size of the publicly listed firm relative to its parent, following the model of Faulkender and Wang (2006). Sample characteristics, data sources, and variable definitions are reported in Table 1. *Subsidiary TA* is the publicly listed firms total assets. *Parent TA* is the parent firm's total assets. The median is estimated annually by industry. Intercepts, firm fixed effects, and year fixed effects are estimated but not reported. Two-dimensional clustered ordinary least squares regressions follow Petersen (2009). Standard errors and *t* values in parentheses are computed following Froot (1989) and Williams (2000) by allowing for heteroskedasticity and any type of correlation for observations of the same firm but assuming independence for observations across firms. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

Panel A. Large publicly listed subsidiaries (Subsidiary TA / Parent TA > median)

	Subsidiary TA / Parent TA > median			
	CARt (LSY)	CARt (LSY)	CARt (LSY)	CARt (LSY)
	(1)	(2)	(3)	(4)
Parent characteristics				
(1) Parent ROAt	1.866 (7.30)***	1.674 (6.69)***		
(2) Parent ROAt × ΔCt/Mt-1	4.940 (2.98)***			
(3) Parent ROAt × ΔORECt/Mt-1		10.540 (1.97)**		
(4) Parent CFt			0.027 (0.45)	0.028 (0.48)
(5) Parent CFt × ΔCt/Mt-1			1.458 (1.44)	
(6) Parent CFt × ΔORECt/Mt-1				9.297 (1.71)*
Listed firm characteristics				
(7) $\Delta C_t/M_{t-1}$	0.448 (0.82)	1.014 (1.99)**	1.060 (1.95)*	1.302 (2.52)**
(8) $\Delta E_t/M_{t-1}$	-0.197 (-0.73)	-0.249 (-0.93)	-0.061 (-0.22)	-0.084 (-0.31)
(9) $\Delta NA_t/M_{t-1}$	0.639 (3.63)***	0.689 (3.95)***	0.760 (4.26)***	0.760 (4.29)***
(10) $\Delta D_t/M_{t-1}$	0.959 (0.99)	0.869 (0.90)	1.078 (1.10)	0.993 (1.02)
(11) C_{t-1}/M_{t-1}	0.557 (3.44)***	0.591 (3.67)***	0.593 (3.60)***	0.603 (3.68)***
(12) L_t	0.208 (1.58)	0.292 (2.22)**	0.073 (0.55)	0.143 (1.08)
(13) NF_t/M_{t-1}	-0.635 (-2.34)**	-0.620 (-2.29)**	-0.740 (-2.68)***	-0.713 (-2.59)***
(14) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	1.296 (1.35)	0.836 (0.88)	0.651 (0.67)	0.377 (0.39)
(15) $L_t \times \Delta C_t/M_{t-1}$	-1.297 (-1.52)	-1.768 (-2.12)**	-1.293 (-1.52)	-1.343 (-1.59)
(16) ΔORECt/Mt-1		1.586 (3.02)***		1.670 (3.13)***
(17) ORECt-1/Mt-1		-1.036 (-3.00)***		-1.147 (-3.28)***
(18) ORECt-1 /Mt-1× ΔORECt/Mt-1		-1.120 (-0.39)		-0.915 (-0.31)
Firm and year fixed effects	Yes	Yes	Yes	Yes
Observations	1,808	1,808	1,808	1,808
Adj. R^2	0.658	0.660	0.645	0.649

Panel B. Small publicly listed subsidiaries (Subsidiary TA / Parent TA < median)

	Subsidiary TA / Parent TA < median			
	CARt (LSY) (1)	CARt (LSY) (2)	CARt (LSY) (3)	CARt (LSY) (4)
Parent characteristics				
(1) Parent ROAt	1.003 (6.47)***	0.974 (6.32)***		
(2) Parent ROAt × ΔCt/Mt-1	3.260 (2.34)**			
(3) Parent ROAt × ΔORECt/Mt-1		3.306 (0.99)		
(4) Parent CFt			0.056 (1.85)*	0.059 (2.01)**
(5) Parent CFt × ΔCt/Mt-1			0.318 (0.92)	
(6) Parent CFt × ΔORECt/Mt-1				3.161 (0.93)
Listed firm characteristics				
(7) $\Delta C_t/M_{t-1}$	0.341 (0.76)	0.619 (1.43)	0.777 (1.74)*	0.897 (2.05)**
(8) $\Delta E_t/M_{t-1}$	1.043 (5.12)***	0.971 (4.78)***	1.157 (5.61)***	1.076 (5.24)***
(9) $\Delta NA_t/M_{t-1}$	0.467 (3.36)***	0.465 (3.36)***	0.548 (3.90)***	0.520 (3.71)***
(10) $\Delta D_t/M_{t-1}$	2.064 (2.58)***	2.025 (2.55)**	2.228 (2.75)***	2.168 (2.69)***
(11) C_{t-1}/M_{t-1}	0.807 (7.10)***	0.889 (7.89)***	0.858 (7.47)***	0.915 (8.01)***
(12) L_t	0.063 (0.51)	0.152 (1.22)	0.011 (0.09)	0.105 (0.83)
(13) NF_t/M_{t-1}	-0.368 (-1.96)**	-0.315 (-1.69)*	-0.399 (-2.10)**	-0.367 (-1.94)*
(14) $C_{t-1}/M_{t-1} \times \Delta C_t/M_{t-1}$	-1.179 (-1.95)*	-1.337 (-2.22)**	-1.302 (-2.12)**	-1.423 (-2.33)**
(15) $L_t \times \Delta C_t/M_{t-1}$	0.535 (0.73)	0.279 (0.38)	0.305 (0.41)	0.109 (0.15)
(16) ΔORECt/Mt-1		0.506 (1.24)		0.426 (1.03)
(17) ORECt-1/Mt-1		-1.234 (-4.89)***		-1.330 (-5.21)***
(18) ORECt-1 /Mt-1× ΔORECt/Mt-1		0.785 (0.38)		1.352 (0.64)
Firm and year fixed effects	Yes	Yes	Yes	Yes
Observations	1,843	1,843	1,843	1,843
Adj. R^2	0.731	0.735	0.723	0.728

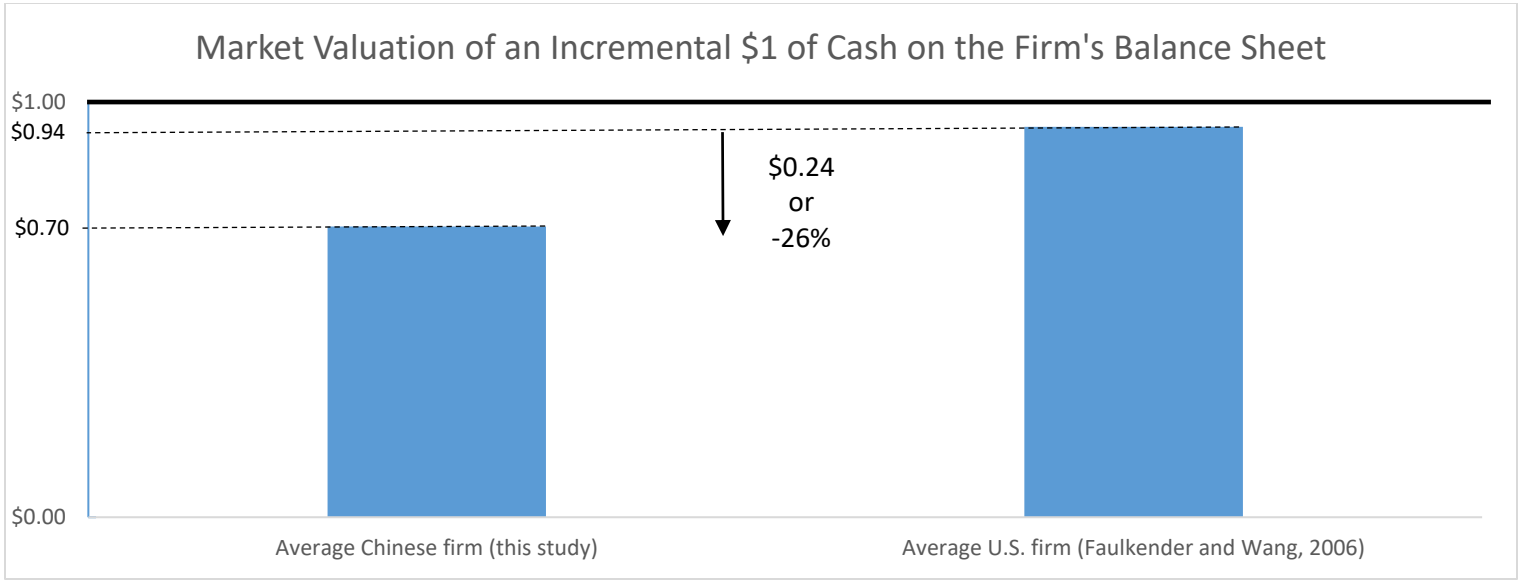

Figure 1

Comparison of the market valuation of an incremental $1 of cash on the balance sheet of the average U.S. and Chinese firm based on baseline model

The figure compares estimates of the valuation of an incremental dollar of Chinese listed firm cash holdings, following the model of Faulkender and Wang (2006), based on coefficients in Table 2, Panel A, Column 1, with those obtained for U.S. firms by Faulkender and Wang (2006). Sample characteristics, data sources, and variable definitions are reported in Table 1.

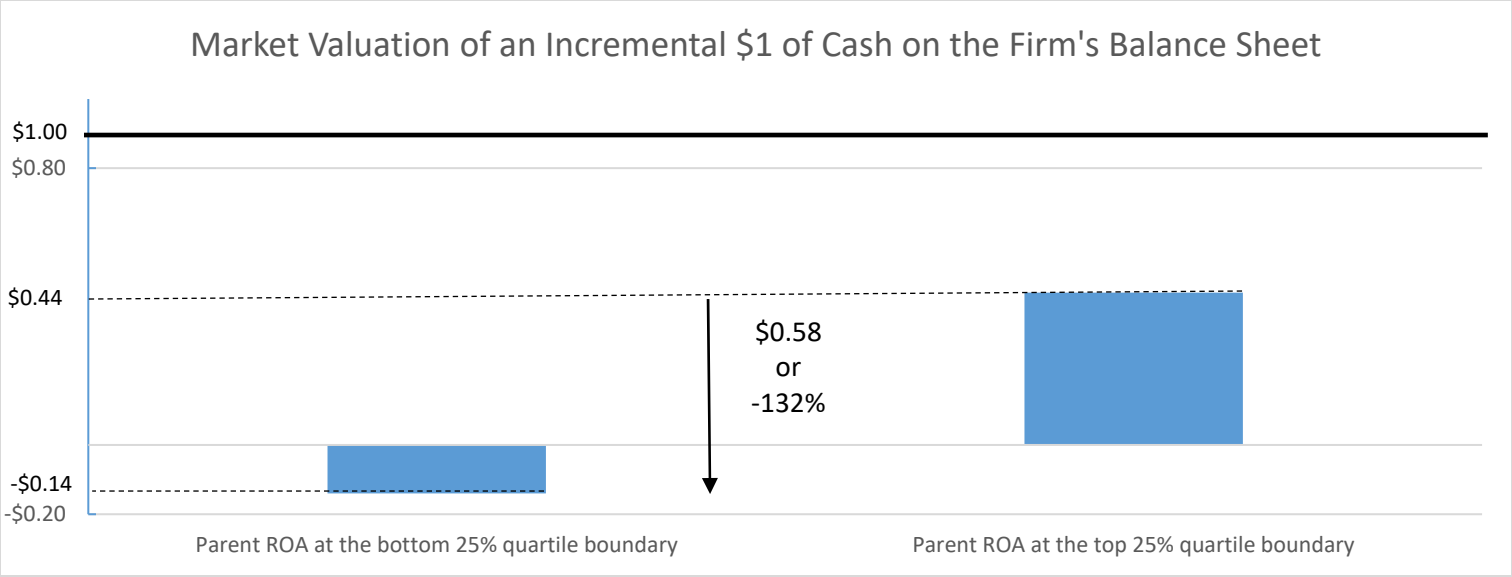

Figure 2

Comparison of the market valuation of an incremental $1 of cash on the balance sheet of a Chinese firm when its parent is out-/under-performing

The figure depicts estimates of the impact of parent firm performance on the value of an incremental dollar of listed firm cash holdings, following the model of Faulkender and Wang (2006), based on coefficients from Table 2, Panel A, Column 2. Sample characteristics, data sources, and variable definitions are reported in Table 1.

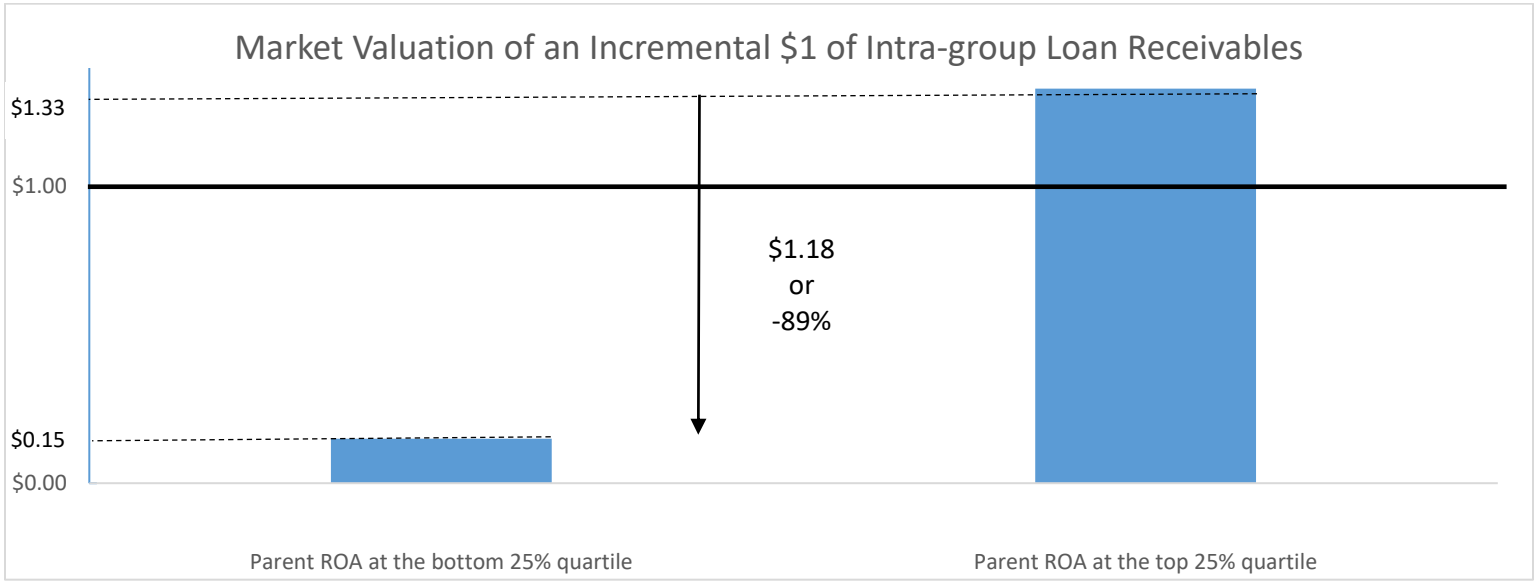

Figure 3

Comparison of the market valuation of an incremental $1 of intra-group loan receivables on the balance sheet of a Chinese firm when its parent is out-/under-performing

The figure depicts estimates of the impact of parent firm performance on the value of an incremental dollar of listed firm intra-group loan receivables, following the model of Faulkender and Wang (2006), based on coefficients from Table 2, Panel A, Column 4. Sample characteristics, data sources, and variable definitions are reported in Table 1.