Internal Capital Market in Emerging Markets: Expropriation and Mitigating Financing Constraints

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We gratefully acknowledge valuable comments from … and seminar participants at Chinese University of Hong Kong, Harvard Business School, Binghamton University, Singapore Management University and Queensland University of Technology. Zheng also want to appreciate the financial supports from National Natural Science Foundation of China (project number: 70532003).

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Abstract

This paper studies internal capital market in emerging market business groups using Chinese data. We focus on two aspects of the internal capital market that are less prominent in the developed markets: a cross-financing to get over severe financing constraints that are often prevalent in emerging market economies, and the rampant expropriation of minority shareholders under the weak corporate governance environment. We document the existence and interaction of both and discuss the implication of the efficiency of internal capital markets in emerging market. We found that, from the perspective of the collection of firms affected by the internal capital market, the market is the least inefficient when weak corporate governance induce more tunneling activities and there is no big need for mitigating financing constraints. On the other hand, when the corporate governance is relatively stronger and firms have a pressing need to use the internal capital market to mitigate financing constraints, the efficiency of the internal capital market is the highest.

Keywords: internal capital market, emerging market, corporate governance, expropriation, financial constraint

JEL Classification: G31 G32 G34 G15

1. Introduction and Literature

A large theoretical and empirical literature has been developed studying the prevalence and role of internal capital markets (ICM) in developed economies (see Shin and Stulz 1998 for evidence in the US and Hoshi, Kashyap, and Scharfstein 1991 for evidence in Japan). This literature predominantly focuses on internal versus external resource allocation efficiency. The implicit assumption is that both external financing and internal financing are feasible, although in some circumstances one is preferable to the other due to agency problems and/or informational asymmetry. When agency problems of divisional managers are more severe and headquarter has weak information about the divisions, different divisions might end up subsidizing each other (Rajan, Servaes, and Zingales 2000, Scharfstein and Stein 2000). On the other hand, when corporate headquarters have informational advantages relative to

external investors and exploit all sources of value by allocating resources to their best use, internal capital market can be more efficient (Williamson, 1985, Stein 1997).

In emerging markets, one particular form of (broadly defined) internal capital markets is the business group, which comprise of a set of legally independent firms that are tightly connected to each other financially and operationally. Prior research has demonstrated that business groups perform many functions associated with internal capital markets, such as sharing risk (Khanna and Yafeh, 2005), protecting the downside of member firms (Gopalan et al., forthcoming), and helping member firms overcome constraints on raising external capital (Hoshi, Kashyap and Scharfstein, 1991). In any of these circumstances, capital allocation is (at least partially) achieved internally through the members of the business groups. While the internal capital market in this context continues to exhibit the efficiencies and inefficiencies discussed in the context of the developed market, there are some additional important features of ICM in emerging markets. First, the underdeveloped financial market often makes it hard for firms to raise external financing when in need (La Porta et al., 1998), causing many firms to face severe or even prohibitive financing constraints. Second, the insufficient protection of outside minority investors and the widespread use of pyramid structure can lead to tunneling (Johnson, La Porta, Lopez-De-Silanes, Shliefer, 2000), resulting in value-loss in the firms whose assets are tunneled out and value-gains in the firms whose assets are tunneled in.[1] [2] In addition to transferring resources across firms, tunneling incurs an additional deadweight loss because additional resources are diverted to cover up the tunneling. While both the expropriation of minority shareholders and financing constraints might exist even in

[1] La Porta, Lopez-d-Silanes, Shleifer, and Vishny (1999) document the widespread use of pyramids. Claessens, Djankov, and Lang (2000) found that for many East Asian firms there is a large divergence between cash flow rights and control rights. Claessens et al. (2002), La Porta et al. (2002), Mitton (2002), Lemmon and Lins (2003), and Baek, Kang, and Park (2004) found that such separation of cash flow and control rights of controlling shareholders negatively impact the firm value.

[2] A number of papers, such as Claessens, Djankov, Fan, and Lang (2002), and Claessens, Djankov, and Lang (2000), have studied whether group firms where the controlling shareholder has higher cash flow rights have higher q-ratios and greater profitability. They in general documented such correlations.

developed markets, the severity of such in emerging markets is arguably an order of magnitude higher (Shleifer and Vishny 1997; Stein 2002). Understanding how internal capital market in emerging market might reflect both the need for businesses to mitigate severe financing constraints and the desire of controlling shareholders to expropriate minority investors will help shed light on the functioning and roles of internal capital markets in general[3].

Using a unique Chinese data set of 1324 pairs of publicly listed firms and their non-listed parent companies, we study the existence and magnitude of internal capital market in emerging market, paying special attention to two features: the role of expropriation, and the role of mitigating severe financing constraints.

In Chinese stock markets, due to a size quota at the time of the IPO, it is a common practice for firms to spin off a subsidiary, and then list that subsidiary on the public stock market. The non-listed parent company will typically retain a controlling stake in the public subsidiary company, with the rest taken by diverse outside equity investors. While the two firms are legally independent after the listing, the non-listed parent companies maintain a close relationship with the public subsidiary company financially and operationally.

Our data contains detailed financial information of both the publicly traded subsidiary and their non-listed controlling parent company. This allows us to go beyond the oft-observed characteristic of cross-subsidization among divisions of a conglomerate company, but instead focus on the one-directional flow of funds from the listed subsidiary to the non-listed parent. Specifically, in an emerging market economy such as China, non-listed parent company (by its non-listed nature) faces more severe

[3] Almeida and Wolfenzon (2006) analyze another kind of equilibrium cost of the internal capital markets in emerging markets. When internal capital market is the dominant form of capital allocation, firms that are not affiliated with business groups might find it harder to get capital, even if they have higher productivity. Such negative externality could decrease the overall capital allocation efficiency of the economy even when internal capital market is efficient..

financing constraints, and might rely more on internal capital market to fund its investments; due to weak corporate governance, parent company might also have an incentive to expropriate outside investors in the listed subsidiary, that is, increase its own value at the expense of the listed subsidiary. Because of these unique characteristics in emerging markets, internal capital market is more likely to take the form of funds flowing from the listed subsidiary to the non-listed parents, even though theoretically it is possible to observe fund flows in both directions. We document this asymmetry, and measure the intensity and the efficiency of such internal capital market activities. We then use these measures to test a few hypothesis related to internal capital market in emerging markets.

In particular, we hypothesize that

1) Internal capital markets can arise due to the expropriation of the minority outside shareholders (tunneling). Such tunneling can be particularly prevalent if the parent company has relatively small cash flow stakes in the listed firm (i.e., a separation of cash flow rights and control rights). Following the large existing literature, we measure the sensitivity of parent company investment to the cash flow of the listed subsidiary firm, controlling for a variety of other factors. A positive and significant sensitivity of parent company investment to listed subsidiary cash flow indicates the existence of internal capital market. We predict that smaller parent company ownership stake in the listed subsidiary leads to more internal capital market activities, reflected by a higher sensitivity of parent firm investment to the available cash flows of the listed subsidiary. Furthermore, since the main aim of tunneling is to transfer value from the listed subsidiary to the non-listed parent firm, the efficiency of such tunneling is often not a first order consideration for the parent firm. Parent firm might be willing to engage in tunneling that would be overall value-destroying to the combined values of the listed subsidiary and parent company, as long as the tunneling increases the value of the parent firm more than the parent's stake in the value of the listed subsidiary. This leads to prediction of a low efficiency of the use of the cash

flow tunneled out of the listed firm. Specifically, we predict that when listed subsidiaries have weak corporate governance, the sensitivity of parent's investment to the subsidiary's cash flow is less likely to increase with parent's industry average Tobin's Q (a proxy for future investment opportunities of the parent company).

2) Internal capital market can also arise when the external financial market does a poor job in allocating funds. Firms with a lot of difficulty obtaining external financing will resort more to internal financial markets. While some degree of financing constraints likely exists even in developed markets, the costs of external financing in emerging markets could be substantially higher, sometimes prohibitively high. As a result, firms are much more likely chronically liquidity-constrained, and the propensity of investing out of firm's own cash flow would be high. In addition, given the paired structure of our sample, we document an asymmetry in the degree of financing constraint faced by the public subsidiary and the non-listed parent firm. Listed firms, often by the fact that they have relatively easier access to the capital markets, tend to be much less financially constrained. Parent company, due to the non-listed nature, might face much more severe financing constraints. If ameliorating severe financing constraints is the main motivation of internal capital market, then internal capital market might provide a positive role of helping financial resources to flow to their most productive uses within the group of firms. We therefore predict that parent firms with more severe external financing constraints will more likely resort to internal capital markets to fund their investments. For non-listed parent firms, this means that their investment will be more responsive to both their own cash flows and to their subsidiary's cash flows. Furthermore, the investment of funds from this channel is not necessarily inefficient. Specifically, we predict that for parent companies operating under more severe financing constraints, the magnitude of internal capital market activities is higher. Furthermore, if the aim is to mitigate severe financing constraints and enable the pursuit of better investment opportunity, then the amount of parent company investment out of listed firm cash flow would be

more positively (or less negatively) related to our proxy for future investment opportunities of the parent company.

Our empirical results consider both sides of the story. In a structural model we estimate the impacts of both corporate governance and financing constraints. We found both impacts to be highly relevant. In particular, we found that firms with a higher dispersion between control rights and cash flow rights of the subsidiary tend to exhibit more internal capital market activities, and the investment outcome from the ICM activities is inefficient. That is, parent company investment out of listed subsidiary cash flow is actually higher when parent company's industry average Tobin's Q is lower. At the same time, controlling for the impact of expropriation, parent firms facing more severe financing constraint tend to use more internal capital market, and for these parent firms, the propensity of investing out of listed subsidiary cash flow is higher when investment opportunity is better, indicating higher investment efficiency.

Our results not only document the existence and significance of internal capital market in emerging markets, but also highlight the different motivations for firms to use internal capital market in emerging markets. When internal capital market is used for expropriating minority shareholders, it tends to be value-destroying for the pair of firms, as it results in inefficient use of the funds tunneled out; when internal capital market is used for mitigating severe financing constraints, it can be value-enhancing for the pair of firms, as capital tend to flow to places with more productive use.

Our paper is related to the recent literature trying to document the existence and magnitude of tunneling, such as Bertrand, Mehta, and Mullainathan (2002) and the reference cited therein. Existing literature documents that business group firms where the controlling shareholder has higher cash flow rights have higher q-ratios and greater profitability. As argued by Bertrand, Mehta, and Mullainathan (2002), the evidence cannot be easily taken as a test of tunneling since "it could also result from

differences in preexisting efficiency or any number of other unobservable factors." There is very little evidence on how tunneling affects the investment efficiency. Also, there is generally no interaction between tunneling and the positive role of mitigating financing constraints. Our paper is also related to the largely separate literature on business groups, such as Khanna and Palepu (2000) and Hoshi, Kashyap, and Scharfstein (1991), and recently Gopalan et al (2006). Most of the existing papers focus on publicly listed firm, with the exception of Gopalan et al (2006)[4]. While most papers in this literature focus on the positive roles played by the internal capital markets, few simultaneously study the role of expropriation in the establishment of ICM in emerging markets.

Our main contribution to literature is to study simultaneously the role of mitigating financing constraints and tunneling played by internal capital markets in emerging markets. We document the co-existence of both, and separately estimate their magnitude and impacts. Compared to many existing studies of conglomerates or business groups, this paper also highlights the *asymmetry* of the operation of the internal capital markets. Lastly, the paper exploits data on non-listed firms to gain more insights on the operation of internal capital markets and its interaction with corporate governance and financing constraints. This can be important because these non-listed firms likely face more severe financing constraints.

Our general conclusion is, internal capital market in emerging markets can play both a positive and negative role. It can help firms navigate through underdeveloped financial institutions and mitigate severe financing constraints, but it also might subject firms to the expropriation of controlling shareholders. Which role dominates will depend on the exact setting of corporate governance and financing constraints facing the firm.

[4] Gopalan et al (2006) use a database including both private and public Indian firms, but they mention that "While the coverage for public firms is comprehensive (due to reporting requirements), the coverage for private firms is limited".

The remainder of the paper is organized as followed: Section 2 explains in detail the data and our measures. Section 3 presents the main empirical results. Section 4 concludes.

2. Data and Measures

2.1 Institutional Background of China's Listed Firms and Their Non-listed Parent Firms

Our data are paired companies, where each pair consists of one publicly listed firm and its non-publicly traded parent firm. The paired structure is a result of the unique path of evolution of the public equity market in China. Since the establishment of the Shanghai and Shenzhen Stock Exchanges in 1990 and 1991 respectively, the Chinese government has aimed at using the public equity market as an alternative financing source to bank finance. To refrain from flooding the fragile public equity market with too much public equity offering while ensuring that as many companies as possible can gain *some* access to the public equity market, the regulators initiated a quota system on the total amount of capital to be raised from the public equity market by a listed company. Oftentimes, as big companies sought to be listed, they had to first spin off a subsidiary, and then list the subsidiary on the public equity market. Also, to limit the supply of assets on the market so as to not destroy the appetite of investors, typically only a small fraction of a listed firm is floated on the exchanges as tradable shares. The bulk of the shares are still held by the parent company. By 2004, roughly two thirds of the equity of the publicly listed Chinese companies was held in the form of 'non-tradable" shares, to be held by the parent firm and, in some cases, the State directly. The size of the listed company and the proportion of it that is allowed to be floated on the exchanges are determined by careful political deliberation trying to balance regions and industries and set by the central government. Firms themselves

have little saying in that decision. This results in the paired structure we observe, where a non-listed parent company holds a substantial stake in a listed subsidiary company. The controlling parent companies (hereafter HQs) typically retain controlling stake in the listed subsidiaries (hereafter LFs), but there are also dispersed outside equity investors taking rest of shares of the LFs[5]. This most closely resembles what we see in business groups elsewhere in the world, particularly in emerging markets, whereby we have legally independent entities with close relationship financially and operationally. However, one characteristics of the paired structure is that control is one-directional: HQs controls LFs. In that sense, it is a special form of the pyramid structure.

This engenders interesting cash flow rights and control issues. Oftentimes the non-listed parent company (hereafter HQ) has control rights in the listed firm (hereafter LF) but not the full cash flow rights. On top of that, Chinese companies are typically subject to weak corporate governance. Many managers and directors of publicly traded companies are often bureaucrats or are appointed by parent companies. It is questionable whether their incentives are for the listed company shareholders or for the parent companies (Fan, Wong, and Zhang 2007). This can give rise to incentive problems resulting in expropriation of the LF (tunneling). In addition to a transfer of resources benefiting the expropriator at the cost of the firm being expropriated, such tunneling has the additional deadweight loss due to the additional effort incurred to tunnel.

On the other hand, as an emerging market economy, China does not have a well-functioning and smooth external financial market. The tradable public equity market by early 2004 (roughly the middle of our sample period) was equivalent to

[5] In our sample, the average parent firm holds 51.5% (54.2%) of the listed subsidiary at the mean (median) level.

only 17% of China's total GDP, according to a study by McKinsey[6]. The public corporate debt market in China was virtually non-existent, and the major state-owned banking system was very rigid in their lending practice and often have strong bias against small and medium sized companies or private sector firms, resulting in many firms with good investment projects starved for cash (Allen et al. 2005; Cull and Xu , 2000, 2003; Maskin and Xu, 2001). Unlike the practice of many developed markets, the operations of private equity and venture capital investors were in a legal grey area, and not well-protected. Their scales are also typically very small, rendering them less relevant for the funding of large scale investment projects[7]. As a result of all of these, firms in China often operate in a rigid financial environment, and external financing is often not readily available. This external financing constraint is particularly striking for the non-listed parent firm, compared to the listed subsidiary.

The weak financial and legal environment thus gives HQ at least two potential reasons to rely on internal capital markets with the LF: 1) to expropriate minority shareholders in the LF; and 2) to mitigate the constraint faced on securing external financing. This provides an interesting characteristic of the firm pairs that is distinct from many other business group settings in the existing literature. The Chinese firm pairs might have an internal capital market that is asymmetric: HQ has control over LF and not vice versa, and financing constraint is more severe for HQ than for LF. Thus for both expropriation reasons and for reasons of mitigating financing constraints, we might observe more cash flowing from LF to HQ.

2.2 Tunneling and the Measure of Cash Flow in the Investment Model

[6] McKinsey: Putting China's Capital to Work: The Value of Financial System Reform, May 2006.

[7] Not surprisingly, when such PEVC funds are available, the required cost of capital is on par, if not much higher, than those observed in more developed markets, and are much higher than the cost of capital observed on the public equity market.

Tunneling takes many forms. For example, Bae, Kang, and Kim (2002) reports evidence consistent with the view that Korean business groups (chaebols) use their publicly traded companies to engage in mergers and acquisitions that benefit the groups at the expense of minority shareholders of the listed companies. Baek, Kang, and Lee (2006) found that equity-linked private securities offerings can be used as a mechanism for tunneling among firms that belong to a Korean chaebol. Theoretically, tunneling can also take the form of transfer pricing through related party transactions (hereafter RPTs) of raw materials, intermediate or final products, which is popular in China's business groups. For example, the HQ can sell raw materials or products at a high price to LF, while charge a low price when buying from LF. But given most LF are subsidiaries artificially spun off from HQ out of the IPO institutional requirements, LF and HQ might be *naturally* highly operationally interdependent even after the spin-offs. The organizational structure dictates high levels of RPTs in finished product, intermediate goods or raw materials. For example, if the HQ spins off its manufacturing assets to LF but still maintains the functions of finished product sales and raw material procurements, then neither HQ nor LF is independent from each other. Therefore RPTs between HQ and LF would naturally be high. In addition, transfer pricing through RPTs is the easiest to detect and monitor by auditors and market regulators because it will be reflected in many accounting and information disclosures for RPTs. Any irregular activities in RPT could result in strong share price reaction (Cheung et al., 2006), or even sometimes disciplinary actions from the regulators. In fact, in China, the first accounting standard for all industrial firms published in 1997 is about accounting treatment and information disclosure of RPTs. In addition to the accounting standards, the Chinese regulators also provide detailed regulations on the information disclosure of the governance of RPTs. For these reasons, we decided to filter out the RPT activities, and to see whether there are remaining inter-company cash flow activities even after that. These other channels of inter-company cash flows are more obscure, often in the legal grey area or are outright illegal. For example, there could be equity co-investments, purchases or sales of assets

at distorted prices, low interest loans, debt guarantees, unreported cryptic transactions, and so on.

To filter out the impact of RPT, in the analysis below we focus on investment sensitivity to firm cash flows, where those cash flows are measured by adjusting the impact of RPT activities. To be specific, we make the following modification: In the literature studying sensitivity of investment to cash flow, the cash flow is typically measured by earnings before interest and tax (EBIT) plus depreciation and amortization (Kaplan and Zingales, 1997)[8], which is then used in testing the ICM among the divisions of a conglomerate company. However, in our data, a large fraction of the EBIT could take the form of trade credits between the pairs of HQ and LF, i.e., accounts receivables and payables. Since trade credits are reflected in the EBIT number but not yet received by the firm under discussion as cash flows, the true amount of firm cash flow that are available for firms' own use, and thus also subject to ICM activities, would be equal to firm cash flows further adjusted by the amount of the increase of trade credits it extends since last period[9].

To summarize, on the one hand, trade credits between HQ and LF can be very large through regular RPTs in finished product, intermediate goods or raw materials, most of which could be normal due to the institutional arrangements between HQ and LF in the IPO process; on the other hand, the existence of these trade credits significantly affect the "true" cash flow that are available for firms to use. We do not want to

[8] Kaplan and Zingales (1997) also defined cash flow as earnings before extraordinary items plus depreciation; Other literature use similar definitions, for example, Shin and Stulz (1998), Shin and Park(1999) both defined cash flow as operating profit plus depreciation, Hoshi, Kashyap and Scharfstein (1991) use income after tax plus depreciation then minus dividend payments to measure cash flow.

[9] As a numerical example, suppose that firm A has a $ 100 sales in a year and there is no depreciation and amortization. If firm A did not give trade credit to its customers, then, by definition, its cash flow is $100, but if $30 of the sales are in the form of accounts receivable, then the current period actual cash flow would be only $70. Here, the existence of trade credits affects the amount of actual cash flow available for investment activities.

attribute trade credits arising naturally from business interdependences to ICMs as we do not want to overestimate the ICM activities. Therefore, in this paper, we define LF (HQ) cash flow as EBIT plus depreciation minus net increase in trade credits with HQ (LF)[10], here trade credits is equal to accounting receivables minus accounting payables.

We document strong evidence of ICM even after this adjustment on the cash flow. Note that we are being very conservative: if there were any ICM activities hidden in the RPT activities, then we are clearly under-estimating the true magnitude of the ICM. Nonetheless, even with this conservative measure, we still document significant ICM activities.

2.3 Data and Source

The unique features of our sample data is that the sample is constructed by 1324 pairs of listed firms and their non-listed parent firms with detailed financial information of both types of firms from 2000-2005[11]. Specially, we have basic income statement and balance sheet data of both listed firm and their non-listed controlling parents, which allow us to directly test the directions of ICM by running regressions on both the non-listed parent firms and the listed subsidiaries. We also hand collected data of trade credit between HQ and LF from the annual LF reports, and adjust the cash flow and construct the basic investment-cash flow model. To further test our two hypothesis of ICM, we also collected data on cash flow right of HQ on LF and bank relationship data.

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[10] Since we do have the data of amortization, we do not add it to calculate cash flow, we also use similar definitions mentioned above to replace EBIT, and the results are very similar.

[11] According to accounting standards, when the non-listed parent firms control their listed subsidiaries more than 50% of shares, the financial statements of their listed subsidiaries should be consolidated into their parent firms, which will prevent us from documenting the true relation between listed and non-listed firms, therefore, in this paper, we use the individual instead of consolidated financial data of the non-listed parent firms.

Besides hand collected data from public channels, our data comes from two main sources[12]: (1) Data of listed firms is from annual reports of listed firms that are publicly available from the websites of the Chinese Securities Regulatory Commission; (2) Data of non-listed parent firms are from Annual Industrial Survey Database by National Statistics Bureau (NBS), which surveys financial and operating information on industrial firms and publishes such information in the official *China Statistics Yearbooks*. As mentioned by Fan et al. (2007), previous studies have used this source and confirm that the data are accurate and well representative of the national economy (Chow 1993, Chuang and Hsu 2004, and Li et al. 2006). Theoretically, this database includes all the state-owned industry enterprises and some of the private industry enterprises with total annual sales more than RMB 5 million (about US $600 thousand using the exchange rate on Dec 31st, 2005).

Insert Table 1 here

As is reported in table 1, theoretically, we have 6972 firm-year observations (here, one observation means one listed firm and its largest shareholder/or non-listed parent firm) from 2000-2005. However, to make sure we are not including parent firms that are "shell" or holding companies and have no real operations, we include only observations where the parent firms are industrial firms that are surveyed by NBS. This leads to 2590 observations lost. There are cases where even though a parent firm is an industrial firm, it is not listed by the same names as it is reported in the annual reports of listed firms. This is not simply a mistake but mainly because some of the non-listed parent firms experienced organizational changes (for example, from a huge plant to a corporation or a group) and legally changed their names and legal ID that

[12] From the begging of 1993,all the industrial firms in China must report their financial statements according to the same "Accounting Standards for Enterprises" regardless of their ownership type and size, Therefore, the financial and operating information of data from listed firm and private firms are consistent because almost all of our sample firms are industrial firms.

reflected in the annual reports of listed firms but not reflected in time in the NBS database[13]. Another reason why some firms cannot be matched could be data entering errors by NBS during the survey and data collection process. Altogether, we lost 2882 observations. Then, we manually found out 1500 firm-year observations of non-listed parent firms from the NBS database. By doing this, together with data of listed firms, we form our original pair of firm sample including both listed and non-listed parent firms. After that, we dropped 45 parent firms that have no real operating activities during the sample period and 88 observations with missing data. Finally, we exclude from our sample those observations where the parent companies do not have more than 20% of stake in the listed subsidiaries, in order to make sure that the parent firms have at least relative controlling position in the listed firms.[14] In the end, we got a sample of 1324 firm-year observations.

Insert Table 2 here

Table 2 reports the sample distribution by year and industry. We can see that, about 19.29% (in firm numbers) and 18.59% (in firm market value) of the listed firms can be matched to their non-listed parent firms, the ratio ranges from 17.55% to 19.36% (in firm numbers) and 17.75% to 20.63% (in firm market value) in the sample period.

From the distribution table of industry, we see that most of listed firms and their non-listed parent firms are in manufacturing industries, the ratios of manufacturing listed firms range from 0.08% to 24.7%, with a total ratio of 86.49%, while that of

[13] Sometimes, the NBS database purposively does that because it wants the firms in the database to be consistent with time going.

[14] Our descriptive statistic (not reported) shows that, although nor all the parent firms have at least 50% of stake in the listed firms, in general, the cash flow rights of parent firm is about 6 times by mean or 10 times by median larger than the sums of cash flow right of top 2-3 shareholders. Even when parent firm has cash flow right less than 50%, the cash flow right difference between different shareholders is still very obvious. Therefore, in our sample, non-listed firms can easily get the controlling position because the other large shareholders are so small that they don't have real impacts on the largest shareholders.

non-listed parent firms range from 0.23% to 26.06%, with a total ratio of 88.22%. In all the industries, both the listed firms and their non-listed parent firms come most from machinery, equipment and instrument manufacturing industry. Overall, the industry distribution of our sample is symmetric between listed firm and non-listed parent firms.

2.4 Summary Statistics

Table 3 reports the summary statistics of the main variables. The average (median) capital expenditure adjusted by total $assets_{t-1}$ is 10.9% (7.01%) in LF and 7.21% (3.83%) in HQ, showing a 2.88% (3.18%) difference of fixed asset investment level between LF and HQ. Net trade credit between HQ and LF adjusted by total $assets_{t-1}$ is -3.71% (-1.47%) in LF and 2.86% (1.37%) in HQ, which means that on average, LF tends to be the net trade credits provider. For LF, before and after adjusting for net trade credit, average (median) cash flow is 9.87% (9.49%) and 6.20% (8.10%) respectively. At the same time for HQ, before and after adjusting for net trade credit, average (median) cash flow is 7.02% (5.85%) and 10.21% (8.03%) respectively, which means a significant adjustment both for LF and HQ cash flow but in different directions: after adjustment, HQ cash flow increases while LF decreases[15].

Panel A and Panel B also report industry average Tobin's Q , industry average sale growth and industry external finance dependence respectively. And Panel C shows some common variables that used to divide the sample by measures for governance and financing constraint. We can see that, HQ on average controls 52.4698% shares of LF and 22.66% of the pairs of firms have relationship with local banks.

Insert Table 3 here

[15] This is important evidence that further supports our adjustment of cash flow measure because in our sample, the fraction of net trade credit to total assets is pretty large, which accounts for large difference between "seeming" and "true" cash flow both for HQs and LFs.

Table 4 reports the correlations of variables used in the basic model. We can see that, in each HQ or LF regression, none of pair of independent variables has a coefficient higher than 0.5, there should not have severe mufti-co linearity problem. It also shows that, for HQ sample, capital expenditure is significantly positive to own cash flow and LF cash flow, but significantly negative to HQ industry average Tobin's Q; for LF sample, capital expenditure is also significantly positive to own cash flow, but slightly negative to HQ cash flow and significantly negative to LF industry average Tobin's Q.

Insert Table 4 here

3. Empirical Tests

Our first regression is based on the following model:

$$CapitalExpenditure = \alpha_0 + \beta_1 OwnCashFlow + \beta_2 OtherCashFlow + \beta_3 IndustryAverageTobin'Q + \beta_4 OtherCashFlow * IndustryAverageTobin'Q + \gamma YearDummies + \varepsilon$$

We ran the above model using LF and HQ sample respectively. Capital Expenditure is measured by fixed assets investment. For regressions of LF, Own Cash Flow is the cash flow of LF, Other Cash Flow is cash flow of HQ; for regressions of HQ, Own Cash Flow is the cash flow of HQ, Other Cash Flow is cash flow of LF. All these variables are adjusted by the total assets of LF (HQ) at the beginning of the fiscal year. For LF, Industry Average Tobin's Q is the mean of firm level lagged Tobin's Q in the same 2-digit industry calculated from total listed firms in China's capital market. Since there are no direct markets value measures for the non-listed HQ, in order to be consistent in both the LF and HQ regressions, we assume that HQ's investment opportunity can be measured by the average Tobin's Q for firms in the

same 2-digit industry as the HQ. Finally, year dummy variables are included in the regression and we also include firm level fixed effect in the regression.

According the above analysis, if ICM exists, controlling for own cash flow, capital expenditure of a firm should be sensitive to other cash flow, that means β_2 is significantly positive. The higher β_2 is, the more sensitive one company's capital expenditure is to the other firms' cash flow, i.e., the bigger the magnitude of the ICM. β_4 measures investment efficiency out of the ICM activities: If β_4 is significantly negative, that means that a firm tends to invest more out of the other firm's cash flow exactly when the investment opportunity (measured by the Tobin's Q) is worse, thus showing the inefficient use of ICM. If β_4 is significantly positive, that means that a firm tends to use ICM more exactly when investment opportunity is better, thus showing the efficient use of ICM by HQ.

3.1 On the Existence of ICM

Table 5 reports the results of total sample regression, where we can see that in both LF and HQ regressions, capital expenditure is very significantly related to own cash flow, but the coefficients of own cash flow in HQ regressions are about five times larger than in LF regressions. More important results are that the coefficients of other cash flow are significantly positive in the HQ regressions but not significant in LF regressions, showing the very existence of ICM between HQ and LF and at the same time, we know that this existence is asymmetric, in that only HQ investments rely on the cash flow of LF but not the opposite. These findings are consistent with the argument that HQ (by its non-listed nature) faces more financing constraints or has more incentives to expropriate. Furthermore, we see that the coefficients of the interaction between other cash flow and industry average Tobin's Q in all regressions is negative but only significant in HQ regressions, which means that in general, the use of ICM by HQ is inefficient. Since our main focus is on whether the cash flow out of the LF into HQ represents efficient use of the ICM, for analysis below, we will

only show empirical results for the HQ regressions. We do explain the results for the LF regressions.

Table 5 also tells us that, given the incentive of HQ to transfer resource from LF, besides trade credit resulted from regular RPTs, there are many other less observable channels for HQ to do. Since we have documented the existence of ICM after controlling for trade credit, it is convincing to say that the actual existence and incentive of ICM should be more pervasive and stronger.

Insert Table 5 here

3.2 On the Role of Corporate Governance

Much of the literatures argued that ownership is fundamental in corporate governance and cash flow right is theoretically one of the most important issues that related to corporate governance (Jensen and Meckling, 1976; Shleifer and Vishny, 1997) and empirically highly related to the incentives of large shareholders to tunnel listed firms they control (Bertrand, Mehta and Mullainathan, 2002; Claessens, Djankov, Fan and Lang, 2002), especially when legal protection for outside investors are weak (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 1997,1998, 1999). Therefore, we use cash flow right of HQ as our primary measure for corporate governance.

Table 6 reports the results by dividing the sample according to the cash flow right of HQ on LF. As we can see from the table, HQs' investments are more dependent on other cash flow when HQs have less cash flow right on LFs. The coefficients are about four times larger when cash flow right is less and the F tests for the difference of coefficients between high and low cash flow rights samples are significant at the 1% level. The investment efficiency is lower (the coefficients of the interaction term are very significantly negative and about five times larger in absolute value) when

HQ has less cash flow right. Again, the F test for the difference of coefficients between high and low cash flow rights samples is significant at 5% level. The asymmetry of the existence and efficiency of ICM between firms with different cash flow rights strongly support the expropriation hypotheses of ICM in emerging markets. Unreported results show that, for LFs' investment out of HQ cash flows, there seems to be no significant difference in the investment-cash flow sensitivity between high cash flow right and low cash flow right subsamples.

Insert Table 6 here

3.3 On the Role of Mitigating Severe External Financing Constraints

According to the literature, bank relationship is important for firms when raising external finance. For example, Hoshi, Kashyap and Scharfstein (1991) examined two sets of Japanese firms, the first set of firms has close financial ties to large Japanese banks that serve as their primary source of external finance and the second sets firms did not have such ties, they found that investment is more sensitive to liquidity for the second set of firms, showing that bank relationship is an important mechanism to mitigate financing constraints. In China, many firms have ties to local banks through the ownership of the stakes in these banks. We further hypothesize that the pair of HQ and LF has good relationship with a bank when at least one of them own shares of local banks. As is reported in panel C of Table 2, about 22.66% of the sample firms have such kind of bank relationship.

The literatures also highlight the role of industrial level or regional level dependence on external finance in shaping firm level investment behavior. For example, Rajan and Zingales (1998) argued that firms are less financial constrained when they are in industries that are less dependent on external finance and found that these firms developed disproportionately faster in countries with relatively developed financial markets. Following Rajan and Zingales (1998), we defined "industry external

finance dependence" as the fraction of capital expenditure that needs to be financed externally. An industry is more dependent on external fund if the fraction is bigger[16]. We hypotheses that firm's capital expenditure is more dependent on other cash flow when its industry is heavily dependent on external finance.

We report the regression results on the role of mitigating severe external financing constraints in Tables 7 and 8, with bank relationship and external finance dependence as the proxies for financing constraint, respectively. We can see from these two tables that, when HQs have no bank relationship or they are in industries more dependent on external financing, their investments are more dependent on the cash flow of LF (the coefficients of "other cash flow" are more than four times larger respectively). At the same time, the investment efficiency is better for this subsample: the interaction term is insignificantly negative (Table 7) or even positive (Table 8), while they are significantly negative when HQs have bank relationship or are in industries less dependent on external finance. In contrast, in unreported tests, we found no clear evidence in the LF regressions if we similarly break down the sample. Overall, the empirical results are consistent with the hypothesis that for HQs facing strong financing constraints, the inter-company cash flow from LF to HQ is stronger, and that overall, the efficiency for these cash flows are better than in the situation where HQs do not face severe financing constraints. .

Insert Table 7 and Table 8 here

3.4 The Interaction of Corporate Governance and Financing Constraints

Tables 6-8 report separately the effects of expropriation and mitigating financing constraints on the existence and efficiency of ICM. Table 9-10 further report the

[16] The calculation formula is: ratio= (capital expenditure-own cash flow)/capital expenditure, where the definition of capital expenditure and own cash flow is the same with our basic model. If the ratio is positive, it means the capital expenditure can't be satisfied by the own cash flow generated by firm itself, which means a gap of fund that needs to be financed by outside markets. We first calculate the ration at firm level in the NBS database, and then we get industry level ratio of external financial dependence by calculating the mean ratio of firms in the same 2 digit industry.

results of the joint effects of corporate governance and financing constraints on internal capital markets, with bank relationship (Table 9) and (Table 10) as the measures financing constraint respectively. We use a structural model to control governance (financing constraints) effects when considering the effects of financing constraints (governance), by doing that, we form four sub-samples characterized by "good governance and financially constrained", "good governance and not financially constrained", "bad governance and financially constrained" and "bad governance and not financially constrained", respectively.

We can see from Tables 9 and 10 that, in most the HQ regressions, after controlling for corporate governance (financing constraint), the effects of financing constraint (corporate governance) on internal capital markets are still obvious. Furthermore, it is very interesting to see that, in most of the regressions, the coefficients of the interaction terms are most negative when cash flow right of HQ is lower and HQ is less financial constrained. For example, in column 3, table 9, the coefficient of "other cash flow* industry average Tobin's Q" is -0.9095, the most negative and significant coefficient in table 9 and similar results are reported in column 4, table 10.

Overall, our basic results on the existence and efficiency of ICM are robust when we control for the effects of expropriation and mitigating financing constraints in a structural model. Furthermore, we find that the effects of financing constraints on ICM are more pronounced when governance is bad. Similarly, the effects of governance on ICM are more pronounced when firms face less financing constraints. In other words, we document that expropriation decreases the efficiency of ICM and the result is most prominent when the firms do not face severe financing constraint, i.e., there is less of a legitimate reason to resort for transfer of funds between companies as opposed to through external markets.

Insert Tables 9 and 10 here

3.5 Robust Tests

Table 11 -12 reports similar results using industry average sale growth to proxy for investment opportunity, with bank relationship and external financial dependence to proxy for financing constraints respectively. Industry average sale growth is the mean of firm level lagged sale growth in the same industry calculated from Annual Industrial Survey Database by National Statistics Bureau (NBS). This measure is supposed to be exogenous since it is calculated by the last year sale growth data from a very large non-listed firm sample and applied to our relatively small sub sample. From these tables, we can see very robust and similar results to previous tables. For example, we still see that, the coefficient of "other cash flow*industry average sale growth" is most negative and significant when cash flow right of HQ is lower and HQ facing more financing constraints.

4. Conclusion

We study internal capital market in emerging market business groups using Chinese data. We focus on two aspects of the internal capital market that are less commonly seen in the developed markets: a cross-financing to get over severe financing constraints that are often prevalent in emerging market economies, and the rampant expropriation of minority shareholders due to weak corporate governance. We document the existence of both. Our results suggest that internal capital market in emerging market economies might serve two distinct roles: it helps mitigate severe financial constraints, while at the same time can be used to expropriate outside investors, particularly when the corporate governance mechanism is bad.

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Table 1 Sample selection

Sample selection steps:	Number of firms
Theoretical sample from 2000-2005	6972
Drop:	
Parents firms who are not industrial firms	2590
Parents firms not found in NBS database for some reasons (e.g. changing firm ID code).	2882
Get original sample:	1500
Parent firms that don't have real operating activities	45
Parent firms with missing data	88
Parent firms that don't have at least 20% of stake in the listed firms	43
Final sample for research	1324

Table 2 Sample Distribution by Industry and Year

CSRC Industry Classifications	2000	2001	2002	2003	2004	2005	All years	Percentage
Panel A: By Industry of LF								
Farming, Forestry, Animal Husbandry, and Fishery	1	1	2	2	2	2	10	0.76%
Mining	6	7	7	7	7	8	42	3.17%
Food and Beverage	13	14	15	15	16	17	90	6.80%
Lumber and furniture	9	10	10	11	11	12	63	4.76%
Textile, Apparel, Furand Leather	0	1	0	0	0	0	1	0.08%
Paper and Allied Products; Printing	6	6	6	6	7	7	38	2.87%
Petroleum, Chemical, Plastics and Rubber Products Manufacturing	37	40	40	41	43	46	247	18.66%
Electronics	8	8	8	9	9	9	51	3.85%
Metal , Non-metal	40	42	43	44	46	46	261	19.71%
Machinery, Equipment and Instrument Manufacturing	48	52	54	55	58	60	327	24.70%
Medicine and Biological Products	10	11	11	11	12	12	67	5.06%
Utilities	6	6	6	7	7	7	39	2.95%
Construction	0	0	0	0	1	1	2	0.15%
Transportation and Warehousing	0	0	0	0	0	1	1	0.08%
Information Technology	8	9	9	9	9	10	54	4.08%
Wholesale and Retail Trades	1	1	1	1	2	3	9	0.68%
Real Estate	1	1	1	1	1	2	7	0.53%
Public Facilities and other Services	0	1	0	0	0	0	1	0.08%
Conglomerates	2	2	3	3	3	3	16	1.21%
All industries	196	212	216	222	234	244	1324	100.00%
Percentage of sample firms to total listed firms (by number)	19.29%	19.36%	18.52%	18.00%	17.55%	18.10%	18.41%	19.29%
Percentage of sample firms to total listed firms (by market value)	17.75%	20.02%	20.63%	18.66%	16.38%	18.09%	18.59%	17.75%
Panel B: By Industry of HQ								
Mining	9	10	10	10	11	11	61	4.61%
Food and Beverage	17	18	18	18	19	20	110	8.31%
Lumber and furniture	11	12	12	12	13	13	73	5.51%
Textile, Apparel, Furand Leather	0	0	0	0	1	2	3	0.23%
Paper and Allied Products; Printing	5	5	5	6	6	6	33	2.49%
Petroleum, Chemical, Plastics and Rubber Products Manufacturing	36	39	40	41	43	45	244	18.43%
Electronics	4	4	4	4	4	5	25	1.89%
Metal , Non-metal	40	43	44	45	48	50	270	20.39%
Machinery, Equipment and Instrument Manufacturing	51	55	56	58	61	64	345	26.06%

Medicine and Biological Products	10	11	11	11	12	12	65	4.91%
Utilities	6	7	7	7	7	8	42	3.17%
Information Technology	8	8	8	8	9	10	51	3.85%
All industries	196	212	216	222	234	244	1324	100.00

Table 3 Summary Statistics

Variable	Obs.	Mean	Median	Max	Min	Sd
Panel A: Listed Firm (LF) Variables						
Fixed assets investment /total assets $_{t-1}$	1324	0.1090	0.0701	0.6911	-0.1042	0.1210
Net trade credits with HQ/total assets $_{t-1}$	1324	-0.0371	-0.0147	0.2319	-0.5242	0.0955
Unadjusted Cash flow/total assets $_{t-1}$	1324	0.0987	0.0949	0.3266	-0.1458	0.0698
Adjusted cash flow/total assets$_{t-1}$	1324	0.0620	0.0810	0.4196	-0.5824	0.1357
Industry average Tobin's Q	1324	3.1894	3.0908	8.7550	1.2058	1.2873
Industry average sale growth	1324	0.1133	0.0911	0.3795	-0.0023	0.0917
Industry external finance dependence	1324	-0.8310	-0.8607	0.1680	-1.3504	0.2454
Size (thousand Yuan)	1324	2531340	1510720	39356810	159080	3455560
Panel B: Group Headquarter (HQ) Variables						
Fixed assets investment /total assets $_{t-1}$	1324	0.0721	0.0383	1.3730	-0.4356	0.1699
Net trade credits with LF/total assets $_{t-1}$	1324	0.0286	0.0137	0.5123	-0.1310	0.0708
Unadjusted Cash flow/total assets $_{t-1}$	1324	0.0702	0.0585	0.4130	-0.0846	0.0638
Adjusted Cash flow/total assets$_{t-1}$	1324	0.1021	0.0803	0.9735	-0.0973	0.1002
Industry average Tobin's Q	1324	3.1184	3.0908	8.7550	1.2058	1.1655
Industry average sale growth	1324	0.1185	0.0948	0.7530	-0.0591	0.0976
Industry external finance dependence	1324	-0.8198	-0.8566	0.1680	-1.3433	0.2464
Size (thousand Yuan)	1324	5663280	2590135	150000000	18980	10100000
Panel C: Common Variables						
Cash flow right of HQ	1324	52.4698	54.5500	84.9700	20.0000	14.6824
Bank relationship dummy	1324	0.2266	0.0000	1.0000	0.0000	0.4119

Table 4 Correlation of Investment, Cash Flow and Industry Average Tobin's Q

This table reports the correlation of main variables in the model. Both HQ and LF **Capital Expenditure** are the Change of net value of fixed asset from year t-1 to t, plus depreciation, divided by the total assets at the end of year t-1; **Cash Flow**＝EBIT+ depreciation + decrease in accounting receivable + increase in accounting payables**,** divided by the total assets at the end of year t-1; In regressions of LF (HQ), **Own Cash Flow** is the cash flow of LF (HQ) while **Other Cash Flow** is the Cash Flow of HQ (LF); For LF, **Industry Average Tobin's Q** is the mean of firm level lagged Tobin's Q in the same industry calculated from total listed firms in China's capital market. For HQ, **Industry Average Tobin's Q** is matched from LF by the same industry. All the variables are winsorized at the 1% and 99% points.

Variable	HQ Capital Expenditure	LF Capital Expenditure	HQ Cash Flow	LF Cash Flow	HQ Industry Average Tobin's Q	LF Industry Average Tobin's Q
LF Capital Expenditure	0.1679	1.0000				
	0.0000					
HQ Cash Flow	0.3913	-0.0199	1.0000			
	0.0000	0.4359				
LF Cash Flow	0.1389	0.3919	-0.2291	1.0000		
	0.0000	0.0000	0.0000			
HQ Industry Average Tobin's Q	-0.1148	-0.0319	-0.0462	-0.0923	1.0000	
	0.0000	0.2336	0.0862	0.0006		
LF Industry Average Tobin's Q	-0.1245	-0.0471	-0.0290	-0.0995	0.9258	1.0000
	0.0862	0.0784	0.2811	0.0002	0.0000	

Table 5 The Magnitude and Efficiency of Internal Capital Markets

This table reports total sample regression on our basic model. The dependent variable is **Capital Expenditure**, the Change of net value of fixed asset from year t-1 to t, plus depreciation, divided by the total assets at the end of year t-1; **Cash Flow**＝EBIT+ depreciation + decrease in accounting receivable + increase in accounting payables**,** divided by the total assets at the end of year t-1; In regressions of LF (HQ), **Own Cash Flow** is the cash flow of LF (HQ) while **Other Cash Flow** is the Cash Flow of HQ (LF); For LF, **Industry Average Tobin's Q** is the mean of firm level lagged Tobin's Q in the same industry calculated from total listed firms in China's capital market. For HQ, **Industry Average Tobin's Q** is matched from LF by the same industry. All the regressions includes year dummies but not reported and all the variables are winsorized at the 1% and 99% points. The regressions employ firm level fixed effects method, standard errors are in the parentheses.***,**and* denote significance at 1%,5%and 10% level, respectively.

	LF Regression		**HQ Regression**	
Own Cash Flow	0.2809	0.2789	1.3250	1.3251
	(0.0380)***	(0.0381)***	(0.0771)***	(0.0770)***
Other Cash Flow	**0.0226**	**0.0880**	**0.4780**	**1.3012**
	(0.0444)	**(0.0962)**	**(0.0659)*** **	**(0.4398)*** **
Industry Average Tobin's Q	0.0093	0.0114	0.0923	0.1056
	(0.0069)	(0.0075)	(0.0668)	(0.0671)
Other Cash Flow * Industry Average Tobin's Q		**-0.0229**		**-0.2162**
		(0.0299)		**(0.1142)***
Obs.	1324	1324	1324	1324
Adj_R2	0.08	0.08	0.29	0.29

Table 6 The Effect of Cash Flow Right on Internal Capital Markets

This table reports sub-sample regressions based on cash flow right. **Cash Flow Right of HQ** is the percentages of LF shares owned by HQ. We define **"High Cash Flow Right"** when cash flow right of HQ is above median in the total sample and **"Low Cash Flow Right"** below the median. The dependent variable is **Capital Expenditure**, the Change of net value of fixed asset from year t-1 to t, plus depreciation, divided by the total assets at the end of year t-1; **Cash Flow**＝EBIT+ depreciation + decrease in accounting receivable + increase in accounting payables**,** divided by the total assets at the end of year t-1; **Own Cash Flow** is the cash flow of HQ while **Other Cash Flow** is the Cash Flow of LF; For LF, **Industry Average Tobin's Q** is the mean of firm level lagged Tobin's Q in the same industry calculated from total listed firms in China's capital market. Here, HQ **Industry Average Tobin's Q** is matched from LF by the same industry. All the regressions includes year dummies but not reported and all the variables are winsorized at the 1% and 99% points. The regressions employ firm level fixed effects method, standard errors are in the parentheses.***,**and* denote significance at 1%,5%and 10% level, respectively.

Variable	**Cash flow right of HQ**			
	High		**Low**	
	1	2	3	4
Own Cash Flow	0.9490	0.9499	1.6230	1.6243
	(0.1317)***	(0.1318)***	(0.0954)***	(0.0947)***
Other Cash Flow	**0.2749**	0.5754	**0.6146**	2.1693
	(0.1040)* **	(0.6681)	**(0.0946)*** **	(0.6050)***
Industry Average Tobin's Q	0.0054	0.0128	0.0835	0.1011
	(0.1007)	(0.1021)	(0.0979)	(0.0975)
Other Cash Flow * Industry Average Tobin's Q		**-0.0802**		**-0.4026**
		(0.1761)		**(0.1548)*** **
Obs.	662	662	662	662
Adj_R2	0.18	0.18	0.44	0.45
F test for "**other cash flow**" between column 1 and 3: 12.90***				
F test for "**other cash flow*industry average Tobin's Q**" between column 2 and 4 : 4.34**				

Table 7 The Effect of Bank Relationship on Internal Capital Markets

This table reports sub-sample regressions based on bank relationship. **Bank Relationship of HQ(LF)** equals to one if HQ(LF) owns shares of local banks. The dependent variable is **Capital Expenditure**, the Change of net value of fixed asset from year t-1 to t, plus depreciation, divided by the total assets at the end of year t-1; **Cash Flow**＝EBIT+ depreciation + decrease in accounting receivable + increase in accounting payables**,** divided by the total assets at the end of year t-1; **Own Cash Flow** is the cash flow of HQ while **Other Cash Flow** is the Cash Flow of LF; For LF, **Industry Average Tobin's Q** is the mean of firm level lagged Tobin's Q in the same industry calculated from total listed firms in China's capital market. For HQ, **Industry Average Tobin's Q** is matched from LF by the same industry. All the regressions includes year dummies but not reported and all the variables are winsorized at the 1% and 99% points. The regressions employ firm level fixed effects method, standard errors are in the parentheses.***,**and* denote significance at 1%,5%and 10% level, respectively.

Variable	**Banks relationship of HQ**			
	Yes		**No**	
	1	2	3	4
Own Cash Flow	1.2889	1.3037	1.3394	1.3387
	(0.1876)***	(0.1867)***	(0.0850)***	(0.0850)***
Other Cash Flow	**0.2468**	0.4437	**0.5189**	1.7168
	(0.1241)**	(0.2134)**	**(0.0718)*****	(0.6003)***
Industry Average Tobin's Q	0.1040	0.1327	0.0818	0.0922
	(0.1216)	(0.1219)	(0.0810)	(0.0815)
Other Cash Flow * Industry Average Tobin's Q		**-0.5075**		**-0.1488**
		(0.2246)**		**(0.1262)**
Obs.	300	300	1024	1024
Adj_R2	0.29	0.31	0.30	0.32
F test for "**other cash flow**" between column 1 and 3 : 10.45***				
F test for "**other cash flow*industry average Tobin's Q**" between column 2 and 4 : 8.07***				

Table 8 The Effect of External Finance Dependence on Internal Capital Markets

This table reports sub-sample regressions based on industry level external finance dependence of HQ(LF), **Industry External Finance Dependence** is the median of firm level external finance dependence in the same industry from Annual Industrial Survey Database by National Statistics Bureau (NBS), where firm level external finance dependence ratio=(capital expenditure-cash flow)/ capital expenditure. We define "**More Dependence on external Finance**" when industry external finance dependence is above the median of all industries and "**Less Dependence on external Finance**" when below median. The dependent variable is **Capital Expenditure**, the Change of net value of fixed asset from year t-1 to t, plus depreciation, divided by the total assets at the end of year t-1; **Cash Flow**＝EBIT+ depreciation + decrease in accounting receivable + increase in accounting payables**,** divided by the total assets at the end of year t-1; **Own Cash Flow** is the cash flow of HQ while **Other Cash Flow** is the Cash Flow of LF; For LF, **Industry Average Tobin's Q** is the mean of firm level lagged Tobin's Q in the same industry calculated from total listed firms in China's capital market. For HQ, **Industry Average Tobin's Q** is matched from LF by the same industry. All the regressions includes year dummies but not reported and all the variables are winsorized at the 1% and 99% points. The regressions employ firm level fixed effects method, standard errors are in the parentheses.***,**and* denote significance at 1%,5%and 10% level, respectively.

Variable	**External finance dependence of HQ industry**			
	More		**Less**	
	1	2	3	4
Own Cash Flow	1.1115	1.1133	1.3828	1.3923
	(0.1604)***	(0.1615)***	(0.0839)***	(0.0836)***
Other Cash Flow	**0.6179**	2.2110	**0.3052**	0.5751
	(0.1945)* **	(0.6981)***	**(0.0734)*** **	(0.2241)**
Industry Average Tobin's Q	0.3091	0.3056	0.0409	0.0585
	(0.1976)	(0.2004)	(0.0675)	(0.0676)
Other Cash Flow * Industry Average Tobin's Q		**0.0349**		**-0.2938**
		(0.3177)		**(0.1242)** **
Obs.	507	507	817	817
Adj_R2	0.21	0.21	0.35	0.36
F test for "**other cash flow**" between column 1 and 3: 4.27**				
F test for "**other cash flow*industry average Tobin's Q**" between column 2 and 4 : 7.01***				

Table 9 The Interaction Effect of Cash Flow Right and Bank Relationship on Internal Capital Markets

This table reports sub-sample regressions based on the interaction of cash flow right and bank relationship. **Cash Flow Right of HQ** is the percentages of LF shares owned by HQ. We define **"High Cash Flow Right"** when cash flow right of HQ is above median in the total sample and **"Low Cash Flow Right"** below the median. **Bank Relationship** of HQ (LF) equals to one if HQ(LF) owns shares of local banks. The dependent variable is **Capital Expenditure**, the Change of net value of fixed asset from year t-1 to t, plus depreciation, divided by the total assets at the end of year t-1; **Cash Flow**＝EBIT+ depreciation + decrease in accounting receivable + increase in accounting payables**,** divided by the total assets at the end of year t-1; **Own Cash Flow** is the cash flow of HQ while **Other Cash Flow** is the Cash Flow of LF; For LF, **Industry Average Tobin's Q** is the mean of firm level lagged Tobin's Q in the same industry calculated from total listed firms in China's capital market. For HQ, **Industry Average Tobin's Q** is matched from LF by the same industry. All the regressions includes year dummies but not reported and all the variables are winsorized at the 1% and 99% points. The regressions employ firm level fixed effects method, standard errors are in the parentheses.***,**and* denote significance at 1%,5%and 10% level, respectively.

Cash Flow Right of HQ	**High**		**Low**	
Banks relationship of HQ	**Yes**	**No**	**Yes**	**No**
	1	2	3	4
Own Cash Flow	1.5876	0.8342	1.0884	1.7435
	(0.3187)***	(0.1453)***	(0.2420)***	(0.1024)***
Other Cash Flow	**0.3726**	**0.6931**	**0.7455**	**2.7854**
	(0.2079)	**(0.7093)**	**(0.4432)***	**(0.9764)*****
Industry Average Tobin's Q	0.2240	-0.0592	-0.0202	0.1130
	(0.1710)	(0.1319)	(0.2057)	(0.1127)
Other Cash Flow * Industry Average Tobin's Q	**-0.5781**	**-0.0528**	**-0.9095**	**-0.2755**
	(0.5931)	**(0.1863)**	**(0.3045)*****	**(0.1649)***
Obs.	160	502	140	522
Adj_R2	0.30	0.16	0.35	0.50
F test for **"other cash flow**"	——		3.92**	
F test for "**other cash flow*industry average Tobin's Q**"	——		4.41**	

Table 10 The Interaction Effect of Cash Flow Right of HQ and External Finance Dependence on Internal Capital Markets.

This table reports sub-sample regressions based on the interaction of cash flow right and industry level external finance dependence. **Cash Flow Right of HQ** is the percentages of LF shares owned by HQ. We define **"High Cash Flow Right"** when cash flow right of HQ is above median in the total sample and **"Low Cash Flow Right"** below the median. **Industry External Finance Dependence** is the median of firm level external finance dependence in the same industry from Annual Industrial Survey Database by National Statistics Bureau (NBS), where firm level external finance dependence=(capital expenditure-cash flow)/ capital expenditure. We define "**More Dependence on external Finance**" when industry external finance dependence is above the median of all industries and "**Less Dependence on external Finance**" when below median. The dependent variable is **Capital Expenditure**, the Change of net value of fixed asset from year t-1 to t, plus depreciation, divided by the total assets at the end of year t-1; **Cash Flow**＝EBIT+ depreciation + decrease in accounting receivable + increase in accounting payables**,** divided by the total assets at the end of year t-1; **Own Cash Flow** is the cash flow of HQ while **Other Cash Flow** is the Cash Flow of LF; For LF, **Industry Average Tobin's Q** is the mean of firm level lagged Tobin's Q in the same industry calculated from total listed firms in China's capital market. For HQ, **Industry Average Tobin's Q** is matched from LF by the same industry. All the regressions includes year dummies but not reported and all the variables are winsorized at the 1% and 99% points. The regressions employ firm level fixed effects method, standard errors are in the parentheses.***,**and* denote significance at 1%,5%and 10% level, respectively.

Cash Flow Right of HQ	**High**		**Low**	
External finance dependence of HQ industry	**More**	**Less**	**More**	**Less**
	1	2	3	4
Own Cash Flow	0.2793	1.3261	2.2636	1.4613
	(0.2397)	(0.1494)***	(0.2206)***	(0.1040)***
Other Cash Flow	**1.0865**	**-0.6601**	**2.9363**	**0.7511**
	(0.6711)	**(1.9549)**	**(0.8350)*** **	**(0.3588)** **
Adjusted Industry Average Tobin's Q	0.0145	0.0790	-0.0072	-0.0175
	(0.4367)	(0.0962)	(0.2388)	(0.1077)
Other Cash Flow * Industry Average Tobin's Q	**0.2066**	**-0.1911**	**0.4774**	**-0.6151**
	(0.5417)	**(0.1711)**	**(0.3948)**	**(0.2027)*** **
Obs.	277	385	230	432
Adj_R2	0.11	0.28	0.55	0.44
F test for **"other cash flow**"	——		5.10**	
F test for "**other cash flow*industry average Tobin's Q**"	——		23.96***	

Table 11 The Interaction Effect of Cash Flow Right of HQ and Bank Relationship on ICM (Using Industry Average Sale Growth to Proxy for Investment Opportunity).

This table reports sub-sample regressions based on the interaction of cash flow right and bank relationship. **Cash Flow Right of HQ** is the percentages of LF shares owned by HQ. We define **"High Cash Flow Right"** when cash flow right of HQ is above median in the total sample and **"Low Cash Flow Right"** below the median. **Bank Relationship** of HQ (LF) equals to one if HQ(LF) owns shares of local banks. The dependent variable is **Capital Expenditure**, the Change of net value of fixed asset from year t-1 to t, plus depreciation, divided by the total assets at the end of year t-1; **Cash Flow**＝EBIT+ depreciation + decrease in accounting receivable + increase in accounting payables**,** divided by the total assets at the end of year t-1; **Own Cash Flow** is the cash flow of HQ while **Other Cash Flow** is the Cash Flow of LF; **Industry Average Sale Growth** is the mean of firm level lagged sale growth in the same industry calculated from Annual Industrial Survey Database by National Statistics Bureau (NBS). All the regressions includes year dummies but not reported and all the variables are winsorized at the 1% and 99% points. The regressions employ firm level fixed effects method, standard errors are in the parentheses.***,**and* denote significance at 1%,5%and 10% level, respectively.

	HQ Regression			
Cash Flow Right of HQ	**High**		**Low**	
Banks relationship of HQ	**Yes**	**No**	**Yes**	**No**
Own Cash Flow	1.4959	0.8382	1.0616	1.7709
	(0.3084)***	(0.1469)***	(0.2405)***	(0.1030)***
Other Cash Flow	**0.1394**	**0.2996**	**0.2187**	**0.6712**
	(0.2854)	**(0.1152)*** **	**(0.2382)**	**(0.1005)*** **
Industry Average Sale Growth	0.2836	-0.0608	0.5212	0.1473
	(0.4298)	(0.2236)	(0.5783)	(0.2288)
Other Cash Flow * Industry Average Sale Growth	**-0.0318**	**0.0915**	**-2.9912**	**-1.4927**
	(1.7540)	**(0.8222)**	**(1.2601)** **	**(0.6951)** **
Obs.	160	502	140	522
Adj_R2	0.29	0.16	0.35	0.50
F test for **"other cash flow**"	2.93*		10.28***	
F test for "**other cash flow* Industry Average Sale Growth**	——		5.45**	

Table 12 The Interaction Effect of Cash Flow Right of HQ and External Financial Dependence on ICM (Using Industry Average Sale Growth to Proxy for Investment Opportunity).

This table reports sub-sample regressions based on the interaction of cash flow right and industry level external finance dependence. **Cash Flow Right of HQ** is the percentages of LF shares owned by HQ. We define **"High Cash Flow Right"** when cash flow right of HQ is above median in the total sample and **"Low Cash Flow Right"** below the median. **Industry External Finance Dependence** is the median of firm level external finance dependence in the same industry from Annual Industrial Survey Database by National Statistics Bureau (NBS), where firm level external finance dependence=(capital expenditure-cash flow)/ capital expenditure. We define "**More Dependence on external Finance**" when industry external finance dependence is above the median of all industries and "**Less Dependence on external Finance**" when below median. The dependent variable is **Capital Expenditure**, the Change of net value of fixed asset from year t-1 to t, plus depreciation, divided by the total assets at the end of year t-1; **Cash Flow**＝EBIT+ depreciation + decrease in accounting receivable + increase in accounting payables**,** divided by the total assets at the end of year t-1; In regressions of LF (HQ), **Own Cash Flow** is the cash flow of LF (HQ) while **Other Cash Flow** is the Cash Flow of HQ (LF); **Industry Average Sale Growth** is the mean of firm level lagged sale growth in the same industry calculated from Annual Industrial Survey Database by National Statistics Bureau (NBS). All the regressions includes year dummies but not reported and all the variables are winsorized at the 1% and 99% points. The regressions employ firm level fixed effects method, standard errors are in the parentheses.***,**and* denote significance at 1%,5%and 10% level, respectively.

Cash Flow Right of HQ	**HQ Regression**			
	High		**Low**	
Industry external finance dependence	**More**	**Less**	**More**	**Less**
Own Cash Flow	0.8945	1.2912	2.3262	1.4489
	(0.2468)***	(0.1476)***	(0.2144)***	(0.1031)***
Other Cash Flow	**0.3586**	**0.0491**	**1.1731**	**0.3710**
	(0.1203)* **	**(0.2005)**	**(0.2050)*** **	**(0.1113)*** **
Industry Average Sale Growth	-0.0476	0.1629	0.0991	0.2732
	(0.3070)	(0.2828)	(0.3917)	(0.2627)
Other Cash Flow * Industry Average Sale Growth	**0.6146**	**0.6274**	**-1.0979**	**-2.9460**
	(1.1143)	**(1.1900)**	**(0.6377)***	**(1.2645)** **
Obs.	277	385	230	432
Adj_R2	0.15	0.14	0.54	0.44
F test for **"other cash flow**"	6.61**		15.31***	
F test for "**other cash flow* Industry Average Sale Growth**	——		9.78***	