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# Selective Asymmetric Capital Financing Behavior: Preference towards Equity Financing

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## ABSTRACT

This paper investigates the capital financing behavior of Chinese companies using data from 1,217 publicly traded companies listed in both the Shanghai and Shenzhen Stock Exchanges covering the period of 1994 to 2006. The panel regression analysis indicates that the capital financing behavior of Chinese firms deviates substantially from the well-known pecking order theory. Specifically, the results show that for Chinese firms, equity issues are always the preferred financing source over both retained earnings and debt issues in meeting their funding requirements. The results also indicate that this attitude of favoring equity financing is a universal phenomenon among Chinese firms regardless of the difference in their firm characteristics. Most importantly, further analysis in the paper gives rise to a pattern of stylized asymmetric capital financing behavior – equity issues are used much more frequently over debt issues under the condition of a fund flow surplus versus that of a fund flow deficit. This phenomenon could be the result of Chinese firms selecting the degree of inherent equity-issue preference that is feasible to pursue given its fund flow condition.

*Key Words:* Capital Financing Choices (or Preference), Equity Financing, Financing Hierarchy, and Pecking Order Theory

*JEL Classification:* G32

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# 1 Introduction

The well-known pecking order theory developed by Myers (1984) and Myers and Majluf (1984) suggests that a firm has a preference ranking regarding its financing sources. The theory argues that asymmetric information between managers and investors gives rise to adverse selection costs, associated with a situation whereby the firm passed up a valuable investment opportunity because it was faced with issuing undervalued securities in order to finance it. The theory predicts that a firm uses financing sources in reverse order of information asymmetry to avoid adverse selection costs – i.e., firms prefer internal to external financing and debt to equity if security issues are necessary.

Shyam-Sunder and Myers (1999) formulate a regression analysis to test the pecking order theory that views the issuance of equity as a residual financing source. They test the hypothesis that the financial deficit (which occurs when the firm's internal cash flow is inadequate for its real investment and dividend commitments) should have an approximately dollar-to-dollar impact on firm leverage if the firm follows the theory to always issue debt, but never equity, when the external financing is necessary for investment funding.<sup>1</sup> They further note that the test can accommodate a reverse version of pecking order theory: the firm would prefer to pay down debt but not repurchase equity when there is a financial surplus.<sup>2</sup> Shyam-Sunder and Myers (1999) use the data from relatively large U.S. firms for the period of 1971 to 1989 to test the hypothesis and conclude that the pecking order is an excellent first-order descriptor of corporate financing behavior. However, several subsequent studies have found conflicting results to challenge the pecking order theory.

Frank and Goyal (2003) point out that a problem with sample selection (i.e., a relatively small sample of large firms) might have led to a bias in Shyam-Sunder and Myers' results that support the pecking order theory. In contrast, Frank and Goyal (2003) used a broad sample (of 768 firms) over the period of 1971 to 1998 to show that only the financing behavior of the largest quartile firms in earlier years exhibited some aspects of pecking order behavior, but that such behavior disappeared over time. Chirinko and Singha (2000) caution that using the hypothesis test designed by Shyam-Sunder and Myers to evaluate plausible patterns of external financing can often generate misleading inferences. For example, they show that the regression results fail to reject the pecking order hypothesis even when the firm did not follow the financial hierarchy of the pecking order theory (i.e., the firm issued equity before debt or it issued equity and debt in fixed proportions, assuming an optimal debt-equity ratio exists).

There is also research seeking support for the theory by testing the implications from the pecking order theory against those from a competing capital structure theory, the static trade-off theory.<sup>3</sup> Fama and French (2002) find some support for the pecking order theory based on a negative association between firm profitability and leverage. However, they find a negative association between equity issue and the level of firm leverage, which also lends support for the trade-off theory. Graham and Harvery (2001) survey the Chief Financial Officers of U.S. corporations about their financial behavior. They conclude that, although there is some support for both theories, the evidence in favor of these theories does not hold up well under closer scrutiny.<sup>4</sup> In particular, the evidence is largely inconsistent in regard to the pecking order theory, with informational asymmetry causing the pecking-order-like financing behavior. The consensus in the field has been that there is no conclusive test that can be used to evaluate whether the pecking order theory or the trade-off theory offers a better explanation of a company's financing behavior. The major difficulty is that the two theories share many common variables when conducting an empirical analysis. Reflecting this consensus, Myers (2003) stated clearly that "there is no universal theory of capital structure and no reason to expect one".

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<sup>1</sup>They estimate a fund-flow-deficit regression whose slope coefficient gives information on the proportion financed by debt issued of a one dollar increase in financial deficits and the full support for the pecking order theory is the coefficient being one.

<sup>2</sup>Shyam-Sunder and Myers (1999, pp. 225) provide a general explanation as to why the pecking order theory should work in reverse, while the associated theoretical reasoning can be derived based on Myers and Majluf (1984, pp. 207-209).

<sup>3</sup>See Harris and Raviv (1991) as a comprehensive survey paper that reviews the implications from both the pecking order and the static trade-off theories.

<sup>4</sup>The supportive evidence for the pecking order (trade-off) theory includes but not limited to that firms value financial flexibility, and their equity issuance decision is affected by equity undervaluation (firms target a range of debt ratio, and the transactions costs affect their debt policy).

In most recent years, another set of studies have turned their focus on adding modifications to the testing framework of Shyam-Sunder and Myers (1999) because they argue the pecking order hypothesis based on Myers (1984) is oversimplified. Lemmon and Zender (2004) refine the empirical analyses by taking the debt capacity constraints into consideration. They argue that a firm has rated debt outstanding does not have debt capacity concerns constraining its financial choices. Consequently, the financial hierarchy of the pecking order theory is more likely to be followed. Similarly, Jong, et al. (2009) incorporate the debt capacity concerns in their regression analysis by separating the effects of normal deficits and large deficits. Leary and Roberts (2008) further show that the pecking order's predictive ability begin to increase when they expand the empirical model to incorporate more factors, including cash reservoirs and debt capacity, which are typically attributed to alternative theories.

It is worthy to note that the majority of empirical studies on capital structure theories use data from industrial countries, mainly the U.S., including all of the literature that has been discussed thus far. On the contrary, there are very few studies taking an interest in examining the capital structure behavior in developing countries.<sup>5</sup> Singh and Hamid (1992) and Singh (1995) study corporate financing patterns in developing countries and compare them with those in industrial countries. Both studies point out that corporations in developing countries rely more heavily on issuing equity to finance growth than their counterparts in industrial countries. Booth et al. (2001) provide evidence that capital structure choices in developing countries are affected by the same variables as in industrial countries, but there are important inter-country differences in how the debt ratios are affected by country-specific factors, such as the development of capital markets. Their findings suggest that the corporate financing patterns can be country specific.

The purpose of this study is to examine whether Chinese firms have a country-specific preference ranking regarding their financing sources, and what factors may contribute to the country-specific corporate financing patterns. We start our analysis with tests of financing hierarchy from the pecking order theory as it is an existing theory that gives prediction on a firm's preference for financing sources. We find that the pecking order theory is far from being a complete descriptor of Chinese corporate financing behavior as the test results show that: (1) debt issue is not an exclusive finance source when external financing is needed for real investment, and (2) a reverse version of pecking order theory does not work at all.

Next, in order to identify if there is any specific type of financing hierarchy (other than the one proposed by the pecking order theory) that exists among Chinese firms, it is natural to analyze how the three major financing sources – retained earnings, debt, and equity – are allocated to meet the funding requirement of a firm growth. The results from the analysis demonstrate a stylized pattern of asymmetric capital financing behavior. Chinese firms prefer equity to both debt and retained earnings for funding growth, and the preference is overwhelmingly stronger when facing a financial surplus versus a financial deficit. Importantly, we find that this stylized financial pattern is robust to the differences in firm characteristics. It appears that a firm's financial situation is an influential factor that drives a Chinese firm's decision regarding how much it would pursue its given preference on equity issues over debt issues to meet a funding requirement.

The rest of the paper is organized as follows. Section 2 describes sample data and provides descriptive statistics on capital structure variables in both the full sample and subsamples based on different firm characteristics. Section 3 discusses the empirical methodology and reports associated test results for two analyses: (1) the pecking order's financing hierarchy, and (2) an asset growth regression that gives information on the portion of a funding requirement that is met with each of major financing sources. A stylized pattern of asymmetric capital financing behavior with the preference towards equity financing emerges from these testing results. Section 4 offers a possible explanation as to why the firm's financial situation is an important factor that contributes to the asymmetry in financing behavior discovered in section 3. Section 5 summarizes the conclusions.

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<sup>5</sup>There are reasons to suspect that firms in developing countries may exhibit different financing behavior than their counterparts in industrial countries. For example, capital markets in developing countries are typically less developed and the accounting/auditing standards are somewhat more relaxed than those in industrial countries. Therefore, firms in developing countries can be expected to face different extent of constraints on their financing decisions from their counterparts in industrial countries.

## 2 Sample Data and Preliminary Statistics

We use CCER database. The raw data contains 1,388 publicly traded companies (excluding financial companies) listed in both Shanghai and Shenzhen Stock Exchanges covering the period of 1994 to 2006. There are 171 companies' data showing some inconsistencies which include: 1. the (book) value of their long-term investment is negative 2. the (book) value of their intangible assets is negative and 3. the (book) value of their long-term liability is negative. After filtering these potentially problematic companies out of the sample, we end up with a sample containing 1,217 companies. We use the maximum length of the data available for each company in the analysis. The longest (shortest) length of the data we have for a company is 12 years (1 year).

In the subsequent analysis, we categorize the full sample (consisting of 1,217 firms) into three equally-divided subsamples based on three criteria- the level of firm size, firm growth, and firm leverage. The size of a firm is measured by its mean value of total assets in all of the years included in the sample. The level of firm growth is measured by the mean value of growth rate in total assets in all sample years. Also, the level of leverage for a firm is calculated as its mean value of debt ratio, defined as total liabilities to the value of total assets, in all sample years. Note that book value, instead of market value, of total assets is used to compile all statistics in this paper.

Table 1 provides a summary of the descriptive statistics for the capital structures variables, including retained earning ratio, debt ratio, equity ratio, and debt-to-equity ratio, for the full sample and the subsamples.<sup>6</sup> In the full sample, the mean debt ratio, equity ratio, and debt-to-equity ratios are 50.89%, 22.01%, and 3.25, respectively. The results for the subsamples reveal several findings that are worthy of further analysis. First, both the equity and debt-to-equity ratios vary with respect to firm size. In particular, there is a negative association between firm size and the equity ratio. Specifically, the small-size firms have a highest equity ratio of 30.10%, followed by medium-sized firms at 19.90%, and large-sized firms at 16.03%. In addition, there is a positive association between firm size and the debt-to-equity ratio: the large-sized firms have the highest debt-to-equity ratio at 4.52, followed by medium-sized firm at 3.05, and small-sized firms at 2.17. These results indicate the relative importance of using debt versus equity as a financing source is higher in larger-sized firms. Second, similar to the finding for firm size, it is found that both the equity and debt-to-equity ratios vary with respect to firm growth. The relation is negative for the equity ratio and positive for the debt-to-equity ratio. The result suggests that the relative significance of debt versus equity to account for total assets is higher in firms with higher growth.<sup>7</sup>

To examine one of the paper's main concerns - whether a firm's fund flow condition influences its capital financing choices between debt and equity, we compile the data of fund flow deficit in the last column of Table 1.<sup>8</sup> A clear negative (positive) association between equity (debt-to-equity) ratio and fund flow deficit level emerges, when results in both subsamples grouped by firm size and firm growth are compared. Using the results in different firm size subsamples as an example, it can be seen that small-size firms have the smallest fund flow deficit level at -\$5.35 (i.e., these firms have fund flow surplus) and their equity (debt-to-equity) ratio is at the highest (lowest) level at 30.10% (2.17), while large-size firms have the largest fund flow deficit at \$35.58 and the equity (debt-to-equity) ratio is at the lowest (highest) level at 16.03% (4.52). Further, medium-size firms have fund flow deficit of \$23.35 which falls between small-size and large-size firms, and both their equity and debt-to-equity ratios sit in the middle of these two sets of firms as well. To further demonstrate the association between equity (debt-to-equity) ratio and fund flow deficit level, we divide full sample into two subsamples based on whether a firm faces fund flow deficit or surplus situation. The results reported in the last two rows of Table 1 support the earlier finding showing that the firm group with fund flow surplus at \$212.66 has a higher equity ratio and lower debt-to-equity ratio than the firm group with fund flow deficit at \$172.69.

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<sup>6</sup>The debt ratio is calculated as the % of total liability (which is the sum of both long-term and short-term liabilities) out of total assets, - i.e., the formula for the debt ratio is  $(\text{total liability}/\text{total assets})\times 100$ . Similarly, the formula for retained earning ratio and equity ratio are  $(\text{retained earnings}/\text{total assets})\times 100$  and  $(\text{equity}/\text{total assets})\times 100$ , respectively. We calculate the debt-to-equity ratio by the formula of  $(\text{total liability}/\text{equity})$ .

<sup>7</sup>It is, however, important to note that the debt ratio (unlike both the equity and debt-to-equity ratios) do not vary in a specific direction with respect to either firm size or firm growth.

<sup>8</sup>A negative number for fund flow deficit indicates the situation where sample firms end up with fund flow surplus.

### 3 Empirical Methodology and Results

So far, evidence presented in Table 1 suggests firms increase the relative usage of debt to equity (to finance their total assets) when the level of fund flow deficit increases. It is, however, unclear as to whether this increase in debt-to-equity ratio is the result of a firm changing its debt issue, equity issue, or both. The rest of the paper focuses on examining what specific change in financing choices contributes to the observed positive relationship between fund flow deficit and the debt-to-equity ratio.

#### 3.1 Tests on the Pecking Order's Financing Hierarchy

An existing capital structure theory relevant to our study is the pecking order theory (Myers, 1984). The theory argues that there is a cost of relying on external financing driven by the asymmetric information between managers and investors. This cost is referred to the situation where a firm passes up a valuable investment opportunity because it has to issue undervalued securities to finance it. Since the debt issue is generally involved with smaller undervalue problem than the equity issue, the theory suggests firm prefers internal to external financing, and debt to equity if it issues securities.

Shyam-Sunder and Myers (1999) note that the simplest form of the pecking order theory hypothesizes that when a firm's internal cash flows are inadequate for its real investment and dividend commitments (i.e., when a firm has fund flow deficit), the firm issues debt but *never* equity.<sup>9</sup> Consequently, the theory predicts that the financial deficit should have a dollar-to-dollar impact on firm leverage:

$$\Delta D_{it} = a_1 + b_{po} DEF_{it} + e_{it}, \quad (1)$$

where  $D_{it}$  is the long-term debt outstanding for firm  $i$  at period  $t$ ;  $\Delta D_{it}$  ( $= D_{it} - D_{it-1}$ ) is the amount of long-term debt issued by firm  $i$  at period  $t$ ; and  $DEF_{it}$  is the fund flow deficit for firm  $i$  at period  $t$ .<sup>10</sup>  $b_{po}$  is the pecking order coefficient and the supportive evidence for the theory is  $b_{po} = 1$ .

It is important to note that the standard pecking order regression (1) assumes that firm reaction of changing debt issues to fund flow deficit ( $DEF_{it} > 0$ ) and surplus ( $DEF_{it} < 0$ ) is "symmetric": firms would issue (retire) debts when they have fund flow deficit (surplus). Since the evidence in Table 1 seems to suggest capital financing choices are different between the firm group with fund flow deficit and that with surplus, in the subsequent analysis we will partition the standard pecking order regression (1) into cases with fund flow deficit situation and with fund flow surplus situation:

$$\Delta D_{it} = a_2 + b_{po}^D \times d_{1it} DEF_{it} + b_{po}^S \times d_{2it} DEF_{it} + \varepsilon_{it}, \quad \text{subject to} \quad (2)$$

$$\begin{aligned} d_{1it} &= 1, \text{ if } DEF_{it} > 0; \text{ otherwise } d_{1it} = 0 \\ d_{2it} &= 1, \text{ if } DEF_{it} \leq 0; \text{ otherwise } d_{2it} = 0 \end{aligned}$$

We refer regression (2) as the modified pecking order regression and the coefficients of  $b_{po}^D$  and  $b_{po}^S$  are the modified pecking order coefficient under fund flow deficit and surplus, respectively. Although it has been standard in the pecking order literature to use the data of long-term debt issued for the dependent variable of  $\Delta D_{it}$ , here we use three different sets of data for it: 1. change in total liability 2. change in long-term liability and 3. change in short-term liability. This approach is in response to some practitioners have noted that a considerable portion of Chinese companies' debt financing is short-term.

Table 2 reports panel regression results on both standard and modified pecking order regressions (1) and (2) for the full sample. Results on the standard pecking order regression (1) reveal that Chinese companies did substantially rely on short-term debts as much as long-term debts. This can be seen from the compatible size of estimated  $b_{PO}$  between using  $\Delta D_{it} = \Delta \text{long-term liability}$  and  $\Delta D_{it} = \Delta \text{short-term liability}$  as dependent variable for regression (1) (0.42 versus 0.38). Since the long-term and short-term liability are

<sup>9</sup>The equity issue may occur when a firm can only issue junk debt and its costs of financial distress have been uncomfortably high.

<sup>10</sup>The formula for fund flow deficit is as follows:  $DEF_t = \text{dividend payment for period } t + \text{capital expenditure for period } t + \text{net increase in working capital for period } t + \text{current portion of long-term debt at start of period } t - \text{operating cash flows (after interest and taxes) for period } t$ .

equally important to capture debt financing behavior of Chinese firms, in the following analysis we use total debt issued for  $\Delta D_{it}$ . When total debt issued is used for  $\Delta D_{it}$ , the standard pecking order coefficient of  $b_{po}$  is 0.79 ( $\neq 1$ ). This result indicates that there is not a full support for the pecking order theory in the full sample. In addition, results on the modified pecking order regression (2) give rise to the asymmetric reaction of debt issues to fund flow deficit and surplus situation. The regression result of  $b_{po}^D = 1.12$  (insignificantly different from 1) suggests that firms choose to entirely finance their deficits by issuing debts when there is fund flow deficit situation. On the contrast, when there is fund flow surplus situation, the regression result of  $b_{po}^S$  being insignificantly different from 0 indicating that firms do not choose to retire any of their debt. This “asymmetric” debt financing behavior in responding to fund flow deficit and surplus situation is not expected by the pecking order theory.

Does this asymmetric debt financing behavior hold for different subsamples? We run panel regression analysis on (1) and (2) for subsamples grouped by firm size, firm growth, and firm leverage. Panels A, B, and C in Table 3 report associated regression results.

First, focusing on the standard pecking order regression (1), there appears considerable difference in the magnitude of estimated  $b_{po}$  among different firm-size, firm-growth, and firm-leverage groups. This result indicates that firm size, firm growth, and firm leverage are influential factors for debt financing decisions. For subsamples grouped by firm size, firm growth, and firm leverages, we find the largest estimated  $b_{po}$  is in the group of large-sized firms at 0.81, the high-growth firms at 1.02, and the low-leveraged firm at 1.22. These results are fairly consistent with what have been reported in the pecking order literature (see Frank and Goyal (2003)). In more detail, similar to previous studies that often argue there is very little support for the pecking order theory in small-size firms, we find  $b_{po} = 0$  for the group of small-sized Chinese firms. In addition, capital structure studies (not limited to the pecking order studies) suggest that firms are expected to have "reverting" financing behavior towards moderate debt levels.<sup>11</sup> The results in panel C provide support for this noted reverting behavior showing that the low-leveraged firm group (who has previous low level of leverage ) has the highest estimated  $b_{po} = 1.22$ , while the high-leveraged firm group (who has previous high level of leverage) has the lowest estimated  $b_{po} = 0.72$ .

To assess whether there is an asymmetric debt financing pattern cross different subsamples, we compare the magnitude of estimated coefficients between  $b_{po}^D$  and  $b_{po}^S$  from the modified pecking order regression (2) in each subsample. For three subsamples - large-sized firms, high-growth firms, low-leveraged firms, where the largest estimated  $b_{po}$  is found in (1), their corresponding estimation results from regression (2) on  $b_{po}^D$  and  $b_{po}^S$  are 1.14 and 0, 1.13 and 0.46, and 1.35 and 0, respectively. These results indicate a clear pattern of  $b_{po}^D > b_{po}^S$ , suggesting firms issue more debts under fund flow deficit than retire debts under fund flow surplus. This asymmetric debt financing behavior is particularly striking in that for any subsample where significant positive  $b_{po}$  is found in (1), we see clearly that  $b_{po}^D > b_{po}^S$  in (2) (except for the subsample of low-growth firms).

### 3.2 Examination on A Hierarchy of Financing Sources

With the results indicating that  $b_{po} \neq 1$  and the existence of asymmetric debt financing behavior, the evidence presented so far does not offer much support for the simplest version of pecking order theory which suggests firms prefer to issue debt but *never* equity if fund flow deficit situation arises. This result follows that the pecking order regressions (1) and (2), where debt is considered the exclusive financing source, are insufficient to capture Chinese firm’s capital financing behavior. In order to fully investigate the issue as to whether Chinese firms adhere to a hierarchy of financing sources, we assess how Chinese firms allocate three major financing sources - retained earnings, debt, and equity, to fulfill their funding requirement measured by asset growth. To do so, we use the following regression:

$$\frac{\Delta TA_{i,t}}{TA_{i,t-1}} = a_3 + b_{RE} \left( \frac{\Delta RE_{i,t}}{TA_{i,t-1}} \right) + b_{DI} \left( \frac{\Delta D_{i,t}}{TA_{i,t-1}} \right) + b_{EI} \left( \frac{\Delta E_{i,t}}{TA_{i,t-1}} \right) + \nu_{it}, \quad (3)$$

<sup>11</sup>This reverting capital financing behavior is expected regardless of whether a firm follows the trade-off or pecking order theory for its capital financing decisions. For example, Shyam-Sunder and Myers (1999, p. 226) note that they do not believe that balance sheets are irrelevant and they expect firms to find ways to add equity when debt ratios are painfully high, and to reduce equity when they are near zero.

where  $\Delta TA_{it}$  ( $= TA_{it} - TA_{it-1}$ ) is the change in (the book value of) total assets for firm  $i$  at period  $t$  (measured as the difference in total assets from period  $t-1$  to period  $t$ );  $\Delta RE_{it}$  ( $= RE_{it} - RE_{it-1}$ ) is the amount retained earnings for firm  $i$  at period  $t$ ;  $\Delta D_{it}$  ( $= D_{it} - D_{it-1}$ ) is the amount debt issued by firm  $i$  at period  $t$ ; and  $\Delta E_{it}$  ( $= E_{it} - E_{it-1}$ ) is the amount equity issued by firm  $i$  at period  $t$ . To have total asset change ( $\Delta TA_{it}$ ) expressed as the growth rate format in (3), explanatory variables of  $\Delta RE_{it}$ ,  $\Delta D_{it}$ , and  $\Delta E_{it}$  are all measured in relation to the level of total asset at period  $t-1$  (i.e.,  $TA_{i,t-1}$ ). With this setting, the estimated coefficients of  $b_{RE}$ ,  $b_{DI}$ , and  $b_{EI}$  provide information on the portion of the funding requirement (in total asset growth) that is financed by retained earnings, debt issue, and equity issue, respectively. If  $b_{RE} = b_{DI} = b_{EI}$ , it indicates that the change in funding requirement is exactly matched proportionately by retained earnings, debt issue, and equity issue.

Regression (3) was used in Watson and Wilson (2002) to examine how companies in the United Kingdom finance their asset growth and we will refer it as the standard asset growth regression. Since our analysis in the previous section has indicated an asymmetric firm financing behavior in reaction to different fund flow situations, in the following analysis we will further run our data on a modified asset growth regression where we partition the standard asset growth regression (3) into cases with fund flow deficit and with fund flow surplus:

$$\begin{aligned} \frac{\Delta TA_{i,t}}{TA_{i,t-1}} &= a_4 + b_{RE}^D \times d_{1it} \left( \frac{\Delta RE_{i,t}}{TA_{i,t-1}} \right) + b_{DI}^D \times d_{1it} \left( \frac{\Delta D_{i,t}}{TA_{i,t-1}} \right) + b_{EI}^D \times d_{1it} \left( \frac{\Delta E_{i,t}}{TA_{i,t-1}} \right) \\ &+ b_{RE}^S \times d_{2it} \left( \frac{\Delta RE_{i,t}}{TA_{i,t-1}} \right) + b_{DI}^S \times d_{2it} \left( \frac{\Delta D_{i,t}}{TA_{i,t-1}} \right) + b_{EI}^S \times d_{2it} \left( \frac{\Delta E_{i,t}}{TA_{i,t-1}} \right) + v_{it}, \text{ subject to} \\ &d_{1it} = 1, \text{ if } DEF_{it-1} > 0; \text{ otherwise } d_{1it} = 0 \\ &d_{2it} = 1, \text{ if } DEF_{it-1} \leq 0; \text{ otherwise } d_{2it} = 0 \end{aligned} \quad (4)$$

We refer regression (4) as the modified asset growth regression. In regression (4), the ranking on the size of estimated coefficients among  $b_{RE}^D$ ,  $b_{DI}^D$ , and  $b_{EI}^D$  ( $b_{RE}^S$ ,  $b_{DI}^S$ , and  $b_{EI}^S$ ) provides direct reference on what a hierarchy of financing sources among retained earnings, debt issue, and equity issue is for Chinese firms when they face fund flow deficits (surplus). Comparison on the two rankings generated from regression (4) would give inference on whether fund flow condition affects financing preference of Chinese firms. Further, the ranking on the size of coefficients from both regressions (3) and (4) would reveal whether the pecking order theory holds in Chinese firms. The supportive evidence for the pecking order theory are  $b_{RE} > b_{DI} > b_{EI}$  from (3) and  $b_{RE}^D > b_{DI}^D > b_{EI}^D$  from (4).

### 3.2.1 Descriptive Statistics

Prior to the regression analysis, Table 4 provides descriptive statistics for % changes in total assets, and in financing sources (including retained earnings, debt issue, and equity issue) for the full sample and the subsamples. To facilitate the examination on a potential relation between the fund flow condition and the relative changes in three financing sources among different firm groups, the last column of Table 4 compiles the data of fund flow deficit.

The results for the full sample show that Chinese companies, as a whole, have a mean of annual total asset growth rate of 14.66% (See results in [.] ). To make fair comparison on the size of % change in retained earnings, debt issue, and equity issue in different subsamples, we scale % changes in these three financing sources by % change in total assets. With this scaling, the results for the full sample shows that corresponding to 1% growth in total assets, the debt issue has the highest increment at the average of 0.67%, followed by the equity issue of 0.15%, and the retained earnings of 0.02%.

The results for the subsample grouped by firm size indicates that both % changes in debt and equity vary negatively with respect to firm size: The small-sized firms have a highest % changes in debt and equity of 0.77% and 0.26%, respectively, followed by the medium-sized firms at 0.67% and 0.15%, respectively, and the large-sized firms at 0.63% and 0.10%, respectively. Similar to the finding for firm size, the results for the subsample grouped by firm growth show that both % changes in debt and equity vary negatively with



respect to firm growth. For the subsamples grouped by the level of firm leverage, the results show that the level of leverage is positive associated with % change in debt but negative associated with % change in equity. These results from subsamples suggest the level of firm size, firm growth, and firm leverage are important factors for the observed variation in change in financing sources.

For this paper’s particular interest, the most important observation from Table 4 is that there are consistent results suggesting a pattern that the firm group with smaller fund flow deficit level tends to end up with larger change in both debt and equity. The results in the last two rows of Table 4 support the pattern showing that when the full sample is divided into two subsamples based on the fund flow condition, the firm group with fund flow surplus at \$212.66 has a larger % change in both debt and equity of 0.90% and 0.22%, respectively, than the firm group with fund flow deficit at \$172.69 of 0.62% and 0.13%, respectively. This negative relation between the level of fund flow deficit and % change in both debt and equity can also be seen in subsamples grouped by both firm size and firm growth. For example, the large-sized firms have the largest fund flow deficit at \$35.58, followed by medium-sized firm at \$23.35, and small-sized firm at -\$5.35. Their associated % changes in debt and equity have the smallest level at 0.63% and 0.10%, respectively, for large-sized firms, followed by 0.67% and 0.15%, respectively, for medium-size firms, and by 0.77% and 0.26%, respectively, for small-sized firms.

Overall, results in Table 4 suggest that in addition to the level of firm size, firm growth, and firm leverage, firm’s fund flow condition appears to be a key determinant for its decision on the relative usage of financing sources for the funding of firm growth. In particular, the result of negative association between the level of fund flow deficit and the changes in both debt and equity suggests that firms with less fund flow deficit tend to utilize not only more of debt issues but also more of equity issues to fulfill their financing requirement. Since both debt and equity issues react to the level of fund flow deficit in the same direction, what remains unclear is whether firm prefers debt issues over equity issues (or equity issues over debt issues) for its funding requirement with respect to different fund flow situation. To identify the hierarchy on firm’s financing sources, we next turn our attention to the regression analysis of (3) and (4). Table 5 and Table 6 report associated regression results for the full sample and subsamples, respectively.

### 3.2.2 Asymmetric Behavior on the Preference towards Equity Financing

For the full sample, the coefficient estimation from the standard asset growth regression (3) are  $b_{RE} = 0.80$ ,  $b_{DI} = 0.87$ , and  $b_{EI} = 1.72$ . This result indicates that Chinese companies, as a whole, use equity issues most extensively to finance firm growth. The preference of equity issues over both retained earnings and debt issues are clearly indicated by the fact that the size of  $b_{EI}$  is approximately twice as large as both  $b_{RE}$ , and  $b_{DI}$ .

What condition may contribute to this observed firm behavior of preferring equity issues for firm growth? Our further analysis from the modified asset growth regression (4) shows that the condition of whether a firm experiences fund flow surplus matters to this particular financing behavior. Specifically, focusing on the result for the cases with fund flow surplus, we find that equity issues are *overwhelmingly* preferred over both retained earnings and debt issues ( $b_{RE}^S = 0.74$ ,  $b_{DI}^S = 0.67$ , and  $b_{EI}^S = 3.09$ ). In the contrast, for the cases with fund flow deficit, we see that firms do not necessarily prefer equity over debt financing. Firms appear to fund their growth proportionately by equity and debt issues and this finding is evidenced by the compatible size of estimated coefficients on  $b_{DI}^D$  and  $b_{EI}^D$  ( $b_{DI}^D = 1.15$ , and  $b_{EI}^D = 1.24$ ).

A clear indication from the results in Table 5 is that Chinese companies, as a whole, do not follow the pecking order theory to exhibit the financing behavior of  $b_{RE} > b_{DI} > b_{EI}$ . Instead, their financing behavior exhibits a clear tendency of  $b_{EI} > b_{DI}$ . Further, such tendency of preferring equity over debt financing intensifies with the condition of fund flow surplus but subsides with the condition of fund flow deficit.

Regression results for subsamples reported in Table 6 further confirms the pattern that Chinese firms prefer to issue equity over debts for firm growth. We see this pattern arises when making comparison on the size of estimated coefficients between  $b_{DI}$  and  $b_{EI}$  in regression (3) for all subsamples. We note that in all nine subsamples (with an only exception of low-growth firms subsample), the estimated coefficients showing a pattern of  $b_{EI} > b_{DI}$ . Also, we see the extent on the pattern of  $b_{EI} > b_{DI}$  varies among subsamples. In more details, the pattern of  $b_{EI} > b_{DI}$  is most pronounced in the group of small-size firms ( $b_{EI} = 1.21$ , and

$b_{DI} = 0.38$ ), high-growth firms ( $b_{EI} = 2.16$ , and  $b_{DI} = 0.90$ ), and high-leverage firms ( $b_{EI} = 2.67$ , and  $b_{DI} = 0.67$ ) among subsamples grouped by firm size, firm growth, and firm leverage, respectively. We regard this result as the evidence that firm characteristic affects the degree of firm's financing preference on equity over debt issues. The characteristic of a firm group is generally plausible for its financing hierarchy estimated by regression (3). For example, among all subsamples, the high-leverage firm group has the strongest pattern of  $b_{EI} > b_{DI}$  showing that funding requirement for firm growth is financed at a 4 : 1 ratio between equity issues and debt issues. This result is plausible based on the fact that high-leverage firms may have painfully high debt ratios, thus they prefer to add much of equity but little debt for their financial need.

Most importantly, in all eight (out of nine) subsamples where the pattern of  $b_{EI} > b_{DI}$  is identified in the standard asset growth regression (3), their corresponding results from the modified asset growth regression (4) reveal a stylized "asymmetric" capital financing behavior. The firm attitude of favoring equity over debt financing is asymmetric to its fund flow condition: The pattern of  $b_{EI} > b_{DI}$  is much stronger when there is fund flow surplus than there is fund flow deficit. We use the regression results for the group of small-size firms to demonstrate the noted asymmetric financing behavior. For small-size firms, estimates from regression (3) (which does not consider the firm's fund flow condition) identifies the financing hierarchy as equity issue first, then retained earnings, and the last debt issues (i.e.,  $b_{EI} > b_{RE} > b_{DI}$ ). With the fund flow condition being added to the consideration, estimates from regression (4) show that *cases with fund flow surplus* end up with the same financing hierarchy of  $b_{EI}^S > b_{RE}^S > b_{DI}^S$  as regression (3) has identified, but *cases with fund flow deficit* do not. Although estimates from both regression (3) and regression (4) with cases of fund flow surplus indicate the same financing hierarchy, firm's preference on equity over debt issues are much stronger in regression (4) with cases of fund flow surplus than in regression (3) ( $b_{EI}^S = 1.74$ ,  $b_{DI}^S = 0$  versus  $b_{EI} = 1.21$ ,  $b_{DI} = 0.38$ ). On the contrary, such preference toward equity issues diminishes considerably when fund flow deficit situation is present. The evidence for this result comes from the estimates from regression (4) with cases of fund flow deficit being  $b_{EI}^D = 0.92$  and  $b_{DI}^D = 0.98$ , which are not statistically being different. In this particular subsample of small-size firms, fund flow deficit situation reduces firm's overall finance preference on equity issues to a level where the firm growth is funded by approximately equal proportions of debt and equity issues.

All in all, results in Table 6 provide a clear picture on the capital financing choices among Chinese firms towards funding firm growth. The evidence suggests that the fund flow condition does have critical impact on firm's capital financing choices. With fund flow surplus, firms choose to issue a lot more equity than debt to finance their growth. The considerable extent on the pattern of  $b_{EI}^S > b_{DI}^S$  can be seen in each of the eight subsample where  $b_{EI} > b_{DI}$  is identified. With fund flow deficit, firm's preference on equity issue diminishes substantially. In six (out of eight) subsamples, this preference diminishes to a level where firm chooses to finance growth by similar amount of debt and equity issues (i.e.,  $b_{EI}^D = b_{DI}^D$ ). These six subsamples are small-size firms, medium-size firms, medium-growth firms, low-leverage firms, medium-leverage firms, and high-leverage firms. Firms in the other two subsamples, large-size firms and high-growth firms, remain to have equity issues as the dominating finance source for firm growth.

The asymmetric capital financing behavior in reaction to fund flow condition is apparent when the estimates from regression (4) under cases of fund flow surplus and cases of fund flow deficit are compared. For example, in the subsample of high-growth firms, the estimates of  $b_{EI}$  and  $b_{DI}$  differ at a much larger extent under fund flow surplus than under fund flow deficit ( $b_{EI}^S = 2.80$ ,  $b_{DI}^S = 0.83$  versus  $b_{EI}^D = 1.63$ ,  $b_{DI}^D = 1.26$ ). Consequently, we note that it is firm's strong preference on equity financing under fund flow surplus (but not deficit) situation contributes to the overall financing hierarchy of  $b_{EI} > b_{DI}$ . Another point to make is the capital financing behavior among Chinese firms shows a complete deviation from what the pecking order theory would have expected. In all subsamples (except low-growth firms), we see no result indicating that firm used either more of debt issue or retained earnings (i.e., internal funding) than equity issue to finance their growth regardless of the fund flow condition.

## 4 Discussion

We have identified two types of asymmetry in Chinese firm's capital financing behavior in reaction to fund flow condition. The first type of asymmetric behavior shows that firms issue more debts under fund flow

deficit than retire debts under fund flow surplus. More specifically, our analysis from the modified pecking order regression (2) indicates that firms choose to entirely finance their deficits by issuing debts when there is fund flow deficit but retire very little debt when there is fund flow surplus. The second type of asymmetric behavior is the firm attitude of favoring equity over debt financing (for firm growth) is much stronger under fund flow surplus than under fund flow deficit. More specifically, our analysis from the modified asset growth regression (4) reveals that firm choose to issue overwhelmingly more equity than debt under fund flow surplus but issue similar amount of equity and debt under fund flow deficit.

The two noted asymmetric financing behavior are found to exist in all of the subsamples (except low-growth firms) grouped by three different firm characteristics, including firm size, firm growth, and firm leverage. We therefore argue that the stylized asymmetric financing behavior is independent from the firm characteristics and Chinese firms' fairly homogenous reactions in financing choices to fund flow condition contribute to the asymmetric financing patterns observed in the full sample. In addition to the asymmetric capital financing behavior to fund flow condition, the evidence also indicates a "universal" attitude of favoring equity financing over both debt and internal financing, which is found to exist across different firm groups with different firm characteristics.

What role does the firm characteristic and the fund flow condition each play in the Chinese firm's capital financing choices? In the literature, firm characteristics are typically found to be useful in explaining the observed variations on the relative usage of major financing sources among different firm groups. Consistent with the literature, in this paper we find that the firm characteristics can help explain the variations in the degree of Chinese firm's "universal" capital financing preference towards equity issues. For example, the evidence indicates that both the high-leverage and the low-leverage firm groups choose to use equity as the priority financing source, but this attitude of favoring equity financing is much stronger in the high-leverage firm group than in the low-leverage firm group. This result is readily plausible in that the high-leverage firms are more likely to have uncomfortably high debt ratio and consequently they tend to use equity financing more extensively than the low-leverage firms. Following this rationale, firm characteristics are presumably the first set of factors for Chinese firms to decide on their capital financing choices. Depending on its status on the firm size, firm growth, and firm leverage, the firm decides on what degree of preference on equity financing (relative to debt and internal financing) is appropriate to pursue. Accordingly, the firm forms its baseline attitude on the capital financing choices based upon the firm characteristics. Yet, the firm would have to adjust its baseline financing choices from time to time according to the changing fund flow condition it faces. The reason for this adjustment is that the change in fund flow condition can critically influence the firm's ability in pursuing the preference on equity issues.

In general, the firm's decision on the extent of new equity issues depends on the potential price it can receive from investors. In pricing the firm's new stock issues, investors rely on any information that helps to form their expectation about the firm's future prospects. We argue that the firm's fund flow condition is informative about the firm's future prospects: The investors view the fund flow surplus as positive news to the firm's future prospects, while the fund flow deficit as negative news. As a result, the firm expects to receive better price for its new equity issues when facing the fund flow surplus than the fund flow deficit.

Given that Chinese firms have a universal preference towards equity issues, their financing choice for funding requirement would always be equity issues first. Debt issues would not be considered unless the equity financing is practically infeasible (or insufficient) to meet the funding requirement. In other words, the firm's decision on the extent of debt issues is contingent to how much it can pursue the preference of equity issues. When the firm faces fund flow deficit, its ability to pursue preference on equity financing subsides given that it is likely to receive unfavorable (or bad) price for the new stock issues. This situation leads to the observation that both equity and debt issues are used to a similar extent to fund firm growth as the firm downplays the attitude of favoring equity issues under fund flow deficit. To the contrary, when the firm faces fund flow surplus, expectation on the favorable price to be received on new stock shares issued allows the firm to fully pursue the preference on equity financing. This situation explains why we observe overwhelmingly larger extent in equity issues than debt issues for funding requirement under the fund flow surplus. It evidences that Chinese firms prefer equity financing and the situation of fund flow surplus further facilitates this preference.

In summary, the evidence indicates that Chinese firms have exhibited the universal preference to finance

firm growth by issuing equity over debt, regardless of whether there is difference in the firm characteristics. Further, the fund flow condition is a deciding factor for the firm to change this universal preference on equity financing either to a larger extent if under fund flow surplus or to a smaller extent if under fund flow deficit. Finally, we can use this stylized asymmetric capital financing behavior to explain what specific firm action contributes to the observation that the firm group with higher fund flow deficit ends up with higher debt-to-equity ratio (associated statistics are presented in Table 1). As discussed earlier, the increase in fund flow deficit limits the firm's ability to pursue the preference on equity financing. Consequently, the worsening fund flow condition forces the firm to issue fewer equity, which makes equity issue along is insufficient to fulfil the funding requirement. This situation in turn forces the firm to issue more debt. It is therefore clear that the increase in debt-to-equity ratio is the result of the firm changing both its debt and equity issues to react to the increase in fund flow deficit.

A relevant point to make is the Chinese firm's financing behavior on the amount of debt issues deviates completely from what is predicted by the pecking order theory. The pecking order theory predicts that there is a dollar-to-dollar direct impact from the financial deficit to the debt issue. Deviating from this prediction, the Chinese firm's financing behavior shows that the fund flow condition only has direct impact on the amount of equity issue. It is this direct impact on the amount of equity issue "indirectly" affects the amount of debt issue.

## 5 Concluding Remarks

In this paper, we have investigated the financing behavior of Chinese companies using data from 1,217 publicly traded companies listed in both the Shanghai and Shenzhen Stock Exchanges covering the period of 1994 to 2006. The evidence indicates that the capital financing behavior of Chinese firms deviates substantially from the well-known pecking order theory which predicts the firm prefers to issue debt but never equity if the fund flow deficit situation arises and the firm prefers internal to external financing, and debt to equity if it issues securities.

Starting with the analysis on the standard pecking order regression, we find that there is little support for a dollar-to-dollar impact from fund flow deficit to debt issue. This result gives indication that besides debt, other finance sources are used by the Chinese firms to meet their funding requirement when facing fund flow deficit and that the pecking order theory is insufficient to capture the Chinese firm's capital financing behavior. To investigate whether the Chinese firms adhere to a hierarchy of financing sources, including retained earnings, debt issue, and equity issue, to meet their funding requirement, we next run analysis on the asset growth regression that gives estimates on the portion of the asset growth that is financed by each of the three financing sources. The results show that equity issues are always the preferred financing source over both retained earnings, and debt issues, for funding requirement. It is important to note that the attitude of favoring equity issues emerges as the "universal" phenomena among Chinese firms, regardless of whether there is difference in their firm characteristics. Further evidence shows that although the firm characteristics and the fund flow condition are both important for the decision on the relative usage of financing sources, ultimately Chinese firms use the fund flow condition as the deciding factor for their capital financing choices. The condition of whether the firm experiences fund flow deficit or surplus affects firm's decision on how much it can pursue the noted universal preference on equity issues.

The important role of fund flow condition in capital financing choices resides upon its potential influence on the price that is expected to be received on the new stock shares issued. The occurrence of fund flow deficit gives investors negative view on the firm's future prospects, which in turn lowers the firm's expectation on the price for the new stocks issued. Accordingly, the fund flow deficit limits the firm's ability to pursue its given financing preference on equity issues. We thus observe that both debt and equity issues are used to a similar extent to finance firm growth when there exists fund flow deficit. On the other hand, the investors welcome the occurrence of fund flow surplus and regard it as good news for the firm's future prospects. Expecting good price to be received on the new stock shares, the firm fully peruses its given financing preference on equity issues. We thus observe that the equity are issued way more extensively than the debt to finance firm growth when there exists fund flow surplus.

In conclusion, evidence presented in this paper suggests that Chinese firms have acted on their preference

towards equity financing regardless of whether there is fund flow deficit or surplus situation. The observed asymmetric capital financing pattern – much more equity issues are used over debt issues under fund flow surplus than under fund flow deficit, is the result of Chinese firms selecting the degree of inherent equity-issue preference that is feasible to pursue based on its fund flow condition.

## References

- Booth, L, Aivazian, V., Demircuc-Kunt, A., and Maksimovic, V., 2001. “Capital Structures in Developing Countries,” *Journal of Finance* 56 (1): 87-130
- Chirinko, R. S., and Singha, A. R., 2000. “Testing Static Tradeoff against Pecking Order Models of Capital Structure: A Critical Comment,” *Journal of Financial Economics* 58 (3): 417-425
- Fama, E. F., and French, K. R., 2002. “Testing Trade-Off and Pecking Order Predictions about Dividends and Debt,” *The Review of Financial Studies* 15 (1): 1-33
- Frank, M. Z., and Goyal, V. K., 2003. "Testing the Pecking Order Theory of Capital Structure," *Journal of Financial Economics* 67 (2): 217-248
- Graham, J. R.,; and C. R., Harvey. 2001. “The Theory and Practice of Corporate Finance: Evidence from the Field,” *Journal of Financial Economics* 60(3): 187-243
- Harris, M., and Raviv, A., 1991. "The Theory of Capital Structure," *Journal of Finance* 46 (1): 297-355
- Jong, A. B., Verbeek, m., and Verwijmeren, P., 2009. "The Impact of Financing Surpluses and Large Financing Deficits on Tests of the Pecking Order Theory," *Financial Management* (forthcoming)
- Leary, M. T., and Roberts, M. R., 2008. “The Pecking Order, Debt Capacity, and Information Asymmetry,” Working Paper, Cornell University and University of Pennsylvania
- Lemmon, M. L., and Zender, J. F., 2004. “Debt Capacity and Tests of Capital Structure Theories”, Working Paper, University of Utah
- Myers, S. C. 1984. "The Capital Structure Puzzle," *Journal of Finance* 39 (3): 575-592
- Myers, S. C. 2003. "Capital Structure Puzzle," Working Paper, Massachusetts Institute of Technology
- Myers, S. C., and Majluf, N. S., 1984. "Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have," *Journal of Financial Economics* 13 (2): 187-221
- Shyam-Sunder, L., and Myers, S. C., 1999. “Testing Static Tradeoff against Pecking Order Models of Capital Structure,” *Journal of Financial Economics* 51 (2): 219-244
- Singh, A. 1995. “Corporate Financial Patterns in Industrializing Economies: A Comparative International Study,” *International Finance Corporation Technical Paper*, no. 2. Washington, D.C.: World Bank
- Singh, A., and J., Hamid., 1992. “Corporate Financial Structures in Developing Countries,” *International Finance Corporation Technical Paper No. 1*. Washington, D.C.: World Bank
- Watson, R., and Wilson, N., 2002. "Small and Medium Size Enterprise Financing: A Note on Some of the Empirical Implications of a Pecking Order," *Journal of Business Finance & Accounting*, 29 (3/4), 557-578

Table 1: Descriptive Statistics for Capital Structures in Full Sample and Subsamples

	<u>Mean of Grouping Criteria for Subsamples</u>				<u>Mean of Capital Structure Variables</u>			
	No. of Firms	Total Assets	Total Asset Growth (%)	Debt Ratio (%)	Retained Earning Ratio (%)	Equity Ratio (%)	Debt-to-Equity Ratio	Fund Flow Deficit
Full Sample	1,217	\$2,943.68	14.66	50.89	-4.62	22.01	3.25	\$17.85
Subsamples grouped by firm size:								
Small-size Firms	406	\$638.59	8.34	53.14	-17.62	30.10	2.17	-\$5.35
Medium-size Firms	405	\$1,380.29	14.72	48.53	-0.15	19.90	3.05	\$23.35
Large-size Firms	406	\$6,808.31	20.92	50.99	3.94	16.03	4.52	\$35.58
Subsamples grouped by firm growth:								
Low-growth Firms	406	\$1,851.03	1.01	55.24	-19.54	28.13	2.46	-\$124.28
Medium-growth Firms	405	\$3,370.51	12.94	47.05	1.57	20.59	2.92	-\$62.72
High-growth Firms	406	\$3,610.55	30.04	50.37	4.14	17.32	4.37	\$240.36
Subsamples grouped by firm leverage:								
Low-leverage Firms	406	\$2,170.37	12.71	29.68	6.37	24.61	1.56	\$49.62
Medium-leverage Firms	405	\$3,994.45	16.82	47.79	2.82	19.78	3.06	-\$70.86
High-leverage Firms	405	\$2,668.81	14.46	75.19	-23.03	21.65	5.13	\$74.58
Subsample grouped by fund flow condition:								
with Fund Flow Deficit	728	\$2,706.86	20.13	46.40	4.26	19.10	3.45	\$172.69
with Fund Flow Surplus	489	\$3,296.25	6.52	57.58	-17.83	26.35	2.96	-\$212.66

Notes: Total Assets and Fund Flow Deficit are expressed in terms of millions Chinese yuan. See footnote 6 for the exact definitions of retained ratio, equity ratio, and debt-to-equity ratio. Also see footnote 10 for the definition of fund flow deficit.

Table 2: Full Sample of Fixed Effect Panel Regression on Equations (1) and (2): Estimated Coefficients and Test Statistics

Coefficients of explanatory variables and test statistics	Dependent Variable					
	$\Delta D_{it} = \Delta$ Total liability		$\Delta D_{it} = \Delta$ Long-term liability		$\Delta D_{it} = \Delta$ Short-term liability	
	(1)	(2)	(1)	(2)	(1)	(2)
Standard pecking order coefficient: $b_{PO}$	0.79*** (5.65)		0.42*** (9.805)		0.38** (2.42)	
Modified pecking order coefficient:						
with fund flow deficit: $b_{PO}^D$		1.12*** (8.48)		0.38*** (7.68)		0.75*** (4.91)
with fund flow surplus: $b_{PO}^S$		0.13 (0.40)		0.50*** (7.41)		-0.37 (-1.25)
R <sup>2</sup>	0.41	0.49	0.58	0.59	0.15	0.32
No. of firms				1,217		
No. of observations				9,354		
No. of observations with fund flow deficit				5,011		
No. of observations with fund flow surplus				4,343		

Notes:  $T$ -statistics are in parentheses. \*\*\*, \*\*, and \* 1%, and 5% significance levels, respectively.

Table 3: Subsamples of Fixed Effect Panel Regression on Equations (1) and (2): Estimated Coefficients and Test Statistics

Panel A: Subsamples grouped by firm size:						
	Small-sized firms		Medium-sized firms		Large-sized firms	
	(1)	(2)	(1)	(2)	(1)	(2)
Standard pecking order coefficient: $b_{PO}$	0.06 (1.55)		0.24*** (4.72)		0.81*** (5.66)	
Modified pecking order coefficient: with fund flow deficit: $b_{PO}^D$		0.12 (1.34)		0.44*** (5.66)		1.14*** (8.49)
with fund flow surplus: $b_{PO}^S$		0.02 (0.37)		-0.01 (-0.11)		0.15 (0.43)
R <sup>2</sup>	0.01	0.01	0.06	0.09	0.43	0.51
No. of firms	406	406	405	405	406	406
No. of observations	3115	3115	3028	3028	3211	3211
No. of observations with fund flow deficit		1551		1669		1790
No. of observations with fund flow surplus		1564		1359		1421
Panel B: Subsamples grouped by firm growth:						
	Low-growth firms		Medium-growth firms		High-growth firms	
	(1)	(2)	(1)	(2)	(1)	(2)
Standard pecking order coefficient: $b_{PO}$	0.23*** (4.96)		0.21 (0.52)		1.02*** (9.64)	
Modified pecking order coefficient: with fund flow deficit: $b_{PO}^D$		0.07 (0.61)		0.76**** (2.72)		1.13*** (7.58)
with fund flow surplus: $b_{PO}^S$		0.27*** (5.32)		0.01 (0.02)		0.46* (1.85)
R <sup>2</sup>	0.12	0.13	0.02	0.06	0.68	0.69
No. of firms	406	406	405	405	406	406
No. of observations	3195	3195	3264	3264	2895	2895
No. of observations with fund flow deficit		1367		1773		1870
No. of observations with fund flow surplus		1828		1491		1025
Panel C: Subsamples grouped by firm leverage:						
	Low-leverage firms		Medium-leverage firms		High-leverage firms	
	(1)	(2)	(1)	(2)	(1)	(2)
Standard pecking order coefficient: $b_{PO}$	1.22*** (5.59)		0.62*** (2.84)		0.72*** (9.63)	
Modified pecking order coefficient: With fund flow deficit: $b_{PO}^D$		1.35*** (6.03)		1.07*** (5.85)		0.85*** (13.09)
With fund flow surplus: $b_{PO}^S$		0.02 (0.08)		0.11 (0.25)		0.39** (2.33)
R <sup>2</sup>	0.73	0.77	0.27	0.36	0.40	0.42
No. of firms	406	406	405	405	406	406
No. of observations	2940	2940	3163	3163	3251	3251
No. of observations with fund flow deficit		1571		1745		1694
No. of observations with fund flow surplus		1369		1418		1557

Notes: *T*-statistics are in parentheses. \*\*\*, \*\*, and \* denote 1%, 5% and 10% significance levels, respectively.



Table 4: Descriptive Statistics for Changes in Total Assets and in Three Major Financing Sources in Full Sample and Subsamples

	No. of Firms	<u>% Change in Total Assets</u>	<u>% Change in Financing Sources</u>			<u>Fund Flow Deficit</u>
		$\Delta TA_t/TA_{t-1}$	Retained Earnings: $\Delta RE_t/TA_{t-1}$	Debt Issue: $\Delta D_t/TA_{t-1}$	Equity Issue: $\Delta E_t/TA_{t-1}$	$DEF_t$
Full Sample	1217	1.00 [14.66]	0.02 [0.22]	0.67 [9.86]	0.15 [2.16]	17.85
Subsamples grouped by firm size:						
Small-size Firms	406	1.00 [8.34]	-0.16 [-1.31]	0.77 [6.46]	0.26 [2.20]	-5.35
Medium-size Firms	405	1.00 [14.72]	0.03 [0.44]	0.67 [9.89]	0.15 [2.20]	23.35
Large-size Firms	406	1.00 [20.92]	0.07 [1.55]	0.63 [13.24]	0.10 [2.09]	35.58
Subsamples grouped by firm growth:						
Low-growth Firms	406	1.00 [1.01]	-2.09 [-2.11]	2.08 [2.10]	1.29 [1.30]	-124.28
Medium-growth Firms	405	1.00 [12.94]	0.05 [0.63]	0.62 [7.96]	0.16 [2.05]	-63.89
High-growth Firms	406	1.00 [30.04]	0.07 [2.15]	0.65 [19.52]	0.10 [3.14]	240.36
Subsamples grouped by firm leverage:						
Low-leverage Firms	406	1.00 [12.71]	0.12 [1.57]	0.46 [5.83]	0.20 [2.57]	49.62
Medium-leverage Firms	405	1.00 [16.82]	0.05 [0.86]	0.66 [11.14]	0.13 [2.24]	-70.86
High-leverage Firms	406	1.00 [14.46]	-0.12 [-1.74]	0.87 [12.61]	0.12 [1.68]	74.58
Subsample grouped by fund flow condition:						
with Fund Flow Deficit	728	1.00 [20.13]	0.07 [1.39]	0.62 [12.55]	0.13 [2.65]	172.69
with Fund Flow Surplus	489	1.00 [6.52]	-0.23 [-1.51]	0.90 [5.86]	0.22 [1.44]	-212.66

Notes: Fund flow deficit are expressed in terms of millions Chinese yuan.

For ease in comparison, we scale statistics of % change in total assets, % change in retained earnings, % change in debt issue, and % change in equity issue by % change in total assets. The initial statistics of these variables without such scaling are reported in [.]

Table 5: Full Sample of Fixed Effect Panel Regression on Equations (3) and (4): Estimated Coefficients and Test Statistics

Coefficients of explanatory variables and test statistics	Dependent Variable: $\Delta TA_{i,t}/TA_{i,t-1}$	
	(3)	(4)
Standard TA growth regression coefficients:		
$b_{RE}$	0.80*** (4.76)	
$b_{DI}$	0.87*** (5.20)	
$b_{EI}$	1.72*** (6.54)	
Modified TA growth regression coefficients: with fund flow deficit:		
$b_{RE}^D$		0.77*** (7.91)
$b_{DI}^D$		1.15*** (17.20)
$b_{EI}^D$		1.24*** (8.98)
with fund flow surplus:		
$b_{RE}^S$		0.74*** (3.33)
$b_{DI}^S$		0.67*** (3.02)
$b_{EI}^S$		3.09*** (3.95)
R <sup>2</sup>	0.66	0.70
No. of firms	1204	1204
No. of observations	8137	8137
No. of observations with fund flow deficit		4502
No. of observations with fund flow surplus		3635

Notes: *T*-statistics are in parentheses. \*\*\* denotes 1% significance level.

Table 6: Subsamples of Fixed Effect Panel Regression on Equations (3) and (4): Estimated Coefficients and Test Statistics

Panel A: Subsamples grouped by firm size:						
	Small-sized firms		Medium-sized firms		Large-sized firms	
	(3)	(4)	(3)	(4)	(3)	(4)
Standard TA growth regression coefficients:						
$b_{RE}$	0.66*** (4.44)		0.82*** (5.21)		1.09*** (15.60)	
$b_{DI}$	0.38* (1.80)		1.19*** (21.42)		1.19*** (15.47)	
$b_{EI}$	1.21*** (6.58)		1.36*** (4.62)		1.66*** (9.93)	
Modified TA growth regression coefficients: with fund flow deficit:						
$b_{RE}^D$		0.61*** (7.59)		1.01*** (15.03)		1.13*** (8.95)
$b_{DI}^D$		0.98*** (20.35)		1.19*** (16.43)		1.27*** (10.46)
$b_{EI}^D$		0.92*** (6.29)		1.03*** (3.89)		1.54*** (8.14)
with fund flow surplus:						
$b_{RE}^S$		0.52*** (3.10)		0.59*** (2.65)		1.04*** (16.85)
$b_{DI}^S$		0.17 (0.91)		1.16*** (23.14)		1.09*** (28.60)
$b_{EI}^S$		1.74*** (3.41)		2.34*** (5.37)		1.97*** (6.98)
R <sup>2</sup>	0.34	0.47	0.89	0.90	0.87	0.88
No. of firms	398	398	403	403	403	403
No. of observations	2709	2709	2623	2623	2805	2805
No. of observations with fund flow deficit		1392		1507		1603
No. of observations with fund flow surplus		1317		1116		1202
Panel B: Subsamples grouped by firm growth:						
	Low-growth firms		Medium-growth firms		High-growth firms	
	(3)	(4)	(3)	(4)	(3)	(4)
Standard TA growth regression coefficients:						
$b_{RE}$	0.64*** (9.52)		0.36 (1.24)		1.98** (2.35)	
$b_{DI}$	0.83*** (14.88)		0.72*** (4.80)		0.90*** (4.96)	
$b_{EI}$	0.58*** (2.73)		1.49*** (7.22)		2.16*** (5.33)	
Modified TA growth regression coefficients: With fund flow deficit:						
$b_{RE}^D$		0.65*** (10.11)		0.96*** (5.51)		0.58* (1.93)
$b_{DI}^D$		0.87*** (17.13)		1.04*** (38.42)		1.26*** (14.50)
$b_{EI}^D$		0.51** (2.17)		1.02*** (9.67)		1.63*** (8.88)
with fund flow surplus:						
$b_{RE}^S$		0.63*** (6.22)		0.20 (0.66)		2.88*** (3.71)
$b_{DI}^S$		0.80*** (9.75)		0.51*** (2.75)		0.83*** (5.50)

$b_{EI}^S$		0.81*** (5.65)		2.51*** (4.83)		2.80*** (3.75)
R <sup>2</sup>	0.66	0.66	0.52	0.59	0.76	0.81
No. of firms	401	401	402	402	401	401
No. of observations	2789	2789	2859	2859	2489	2489
No. of observations with fund flow deficit		1244		1620		1638
No. of observations with fund flow surplus		1545		1239		851

Panel C: Subsamples grouped by firm leverage:

	Low-leverage firms		Medium-leverage firms		High-leverage firms	
	(3)	(4)	(3)	(4)	(3)	(4)
Standard TA growth regression coefficients:						
$b_{RE}$	0.93*** (6.69)		0.98*** (12.77)		0.70*** (4.51)	
$b_{DI}$	1.14*** (23.30)		1.24*** (14.45)		0.67*** (3.09)	
$b_{EI}$	1.27*** (10.83)		1.39*** (9.95)		2.67** (2.56)	
Modified TA growth regression coefficients:						
With fund flow deficit:						
$b_{RE}^D$		0.96*** (4.55)		1.13*** (8.45)		0.70*** (8.93)
$b_{DI}^D$		1.17*** (16.47)		1.32*** (10.51)		1.02*** (24.60)
$b_{EI}^D$		1.27*** (9.28)		1.30*** (9.03)		0.93*** (2.83)
with fund flow surplus:						
$b_{RE}^S$		0.91*** (5.68)		0.84*** (11.02)		0.63*** (3.13)
$b_{DI}^S$		1.10*** (19.97)		1.12*** (39.16)		0.45* (1.90)
$b_{EI}^S$		1.26*** (4.91)		1.60*** (5.54)		6.74*** (3.47)
R <sup>2</sup>	0.73	0.73	0.86	0.86	0.59	0.68
No. of firms	400	400	399	399	405	405
No. of observations	2534	2534	2758	2758	2845	2845
No. of observations with fund flow deficit		1395		1580		1527
No. of observations with fund flow surplus		1139		1178		1318

Notes: *T*-statistics are in parentheses. \*\*\*, \*\*, and \* denote 1%, 5% and 10% significance levels, respectively.