Financial Flexibility, Corporate Investment and Performance: Evidence from East Asian Firms[1]

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Abstract

This study examines the impact of financial flexibility on the investment and performance of 1,068 East Asian firms over the period 1994-2006. We show that firms can attain financial flexibility, primarily through conservative leverage policies and less commonly by holding large cash balances. Financial flexibility appears to be an important determinant of investment and performance, mainly during the 1997-1998 crisis. In particular, firms that are financially flexible prior to the crisis *(i)* have a greater ability to take investment opportunities, *(ii)* rely much less on the availability of internal funds to invest, and *(iii)* perform better than less flexible firms during the crisis. Our analysis covering the post crisis period does reveal any important investment differentials between flexible and inflexible firms. Finally, we provide evidence that financial flexibility is more likely to play a decisive role in determining corporate investment and performance than traditional measures of financial constraints (e.g. firm size, dividend payout, firm age and business group affiliation) during abnormal periods of the economic cycle.

JEL classification: G31; G32

Keywords: Financial Flexibility, Liquidity Management, Investment, East Asian Financial Crisis, Business Groups.

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Abstract

This study examines the impact of financial flexibility on the investment and performance of 1,068 East Asian firms over the period 1994-2006. We show that firms can attain financial flexibility, primarily through conservative leverage policies and less commonly by holding large cash balances. Financial flexibility appears to be an important determinant of investment and performance, mainly during the 1997-1998 crisis. In particular, firms that are financially flexible prior to the crisis *(i)* have a greater ability to take investment opportunities, *(ii)* rely much less on the availability of internal funds to invest, and *(iii)* perform better than less flexible firms during the crisis. Our analysis covering the post crisis period does reveal any important investment differentials between flexible and inflexible firms. Finally, we provide evidence that financial flexibility is more likely to play a decisive role in determining corporate investment and performance than traditional measures of financial constraints (e.g. firm size, dividend payout, firm age and business group affiliation) during abnormal periods of the economic cycle.

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1. Introduction

The majority of senior corporate managers around the world consider financial flexibility as one of the most important determinants of their capital structure decisions (Graham and Harvey, 2001; Bancel and Mittoo, 2004; and Brounen, De Jong and Koedijk, 2006). The academic literature argues the motives to attain financial flexibility are related to the future ability and need of firms to raise external funds and restructure their financing at low cost (see, e.g., DeAngelo and DeAngelo, 2007; Gamba and Triantis, 2008; and Byoun, 2008). Firms with financial flexibility enjoy easier access to external capital markets to meet funding needs arising from unanticipated earnings shortfalls - and/or new growth opportunities - and hence, avoid situations that lead to suboptimal investment and poor performance.[2]

In this study we empirically investigate the effects of financial flexibility on corporate investment and performance over the period 1994-2006 by paying particular attention to the East Asian crisis of 1997-1998. Focusing on a crisis period provides us with clear advantages. Economic and financial crises clearly represent exogenous shocks to firms' viability, profitability and cash flows, and generally reduce the expected return on investment opportunities. Moreover, due to lower asset prices, crises create opportunities for firms with the ability to invest (Mitton, 2002; and Byoun and Xu, 2011). To the extent that flexible firms are better equipped to cope with the adverse consequences of exogenous shocks, a crisis period would allow us to provide stronger tests on the impact of financial flexibility on corporate performance and investment policy during the crisis. The main hypothesis we investigate in this paper is that, *ceteris paribus*, the greater a firm's financial flexibility at the onset of the crisis, the less severe the decline in its investment expenditures

[2] Similar views have also been put forward by earlier studies. For example, the pecking order theory of capital structure, proposed by Myers (1984) and Myers and Majluf (1984), is based on the assumption that firms preserve financial slack to avoid the need for external funds in financing future investment opportunities. Also, Froot, Scharfstein and Stein (1993) suggest that firms maintain financial flexibility to avoid the costs of underinvestment.

and performance during the crisis. Some further analysis, covering the period 1999-2006, seeks to address the question of whether such effects persist in the post crisis period.

Our analysis begins with the construction of simple indicators of financial flexibility. Existing studies mainly focus on leverage and cash holdings decisions as ways of preserving flexibility, though these policies are generally considered separately.[3] Only recently have studies adopted the view that firms can attain financial flexibility through both their debt financing and cash holdings policies.[4] By drawing insights from these studies and noting that firms can attain financial flexibility through alternative routes (e.g. by accumulating cash, adopting a conservative leverage policy or adjusting simultaneously their cash and leverage levels), we classify firms into several groups of financial flexibility on the basis of their leverage and cash holding positions during the pre crisis period. We then examine whether firms that attain financial flexibility in the pre crisis period benefit from it by having a greater ability to take investment opportunities during the crisis period. A similar analysis is conducted for the post crisis period using lagged values for leverage and cash to measure financial flexibility.

To address the relationship between financial flexibility and investment we estimate cash flow sensitivities using the investment equation framework commonly used in the literature (see e.g. Fazzari, Hubbard and Petersen, 1988; Hubbard, Kashyap and Whited, 1995; Cleary, 2006; and Carpenter and Guariglia, 2008 among others). However, our

[3] A number of studies emphasize the importance of obtaining financial flexibility through low leverage policies (Goldstein, Ju and Leland, 2001; Billet, King and Mauer, 2007; Byoun, 2008; Lins, Servaes and Tufano, 2010; and Campello, Graham and Harvey, 2010) or moderate/high cash balances (Opler *et al.*, 1999; Billet and Garfinkel, 2004; Almeida, Campello and Weisbach, 2004; Acharya, Almeida and Campello, 2007; Faulkender and Wang, 2006; Dittmar and Mahrt-Smith, 2007; Kalcheva and Lins, 2007; Berrospide, Purnanandam and Rajan, 2008; Harford, Mansi and Maxwell, 2008; and Riddick and Whited, 2008). The main argument of both lines of research is that firms with readily available large cash balances or low leverage can better cope with earnings shortfalls and hence avoid underinvestment.

[4] For example, DeAngelo and DeAngelo (2007) explicitly consider leverage and cash holdings to define financial flexibility and argue that low leverage combined with moderate cash holdings and high dividend payouts constitute an optimal policy regarding flexibility. In line with this view, Gamba and Triantis (2008) show that financial flexibility can be a result of the firm's strategic decisions regarding its capital structure, liquidity and investment. Moreover, in the light of increased risk in the economic environment, Bates, Kahle and Stulz (2008) argue that high cash holdings are related to low levels of debt and hence the simultaneous practice of these policies enable firms to forestall distress and default. Finally, Byoun (2008) reports that small developing firms are more likely to seek financial flexibility and do so through lower leverage and larger cash holdings policies.

emphasis is similar to that in recent studies that attempt to provide insights into the effects of supply-side shocks on corporate investment (see Duchin, Ozbas and Sensoy, 2010). We also examine whether the performance of firms with greater flexibility differs from that of less flexible firms. By doing so, our study adds to the literature that investigates the effects of financial crises on corporate performance and contributes to the recent research on the value of financial flexibility (see e.g., Gamba and Triantis, 2008; Byoun, 2008; Byoun, 2011). For example, prior studies of the East Asian crisis present strong evidence for the importance of several firm characteristics, such as ownership structure and corporate governance, in determining corporate performance (see, e.g., Johnson et. al, 2000; Mitton, 2002; Fisman, 2002; and Lemmon and Lins, 2003). Our analysis builds on these studies by putting a specific focus on the potential role that financial flexibility might play for corporate valuation during the crisis.

Finally, drawing on recent findings showing strong inter-relations across several indicators of financial constraints and financial health (see, e.g., Cleary, 2006; Carpenter and Guariglia, 2008), our study also examines how traditional measures of financial constraints, such as dividend, firm size, firm age and business group affiliation, interact with the flexibility indicators utilized in this study. To this end, we evaluate the relative importance of traditional measures of financing constraints and leverage-based and cash-based flexibility indicators in explaining corporate investment and performance. By doing so, our study also contributes to the rich literature that examines whether large investment to cash flow sensitivities can be treated as evidence of financing frictions (see, e.g., Fazzari, Hubbard and Petersen, 1988; Kaplan and Zingales, 1997; Cleary, 1999; Guariglia, 2008; Pindado, Requejo and de la Torre, 2011).

Our empirical analyses provide several important findings. First, flexible firms seem to have greater capacity to pursue growth opportunities in the face of unanticipated earnings shortfalls during the crisis. Second, between the two components of flexibility, namely cash and leverage, leverage seems to be the main driver of investment behaviour during the crisis

period. Our results suggest that it is more likely that cash is mainly held as a form of insurance against financial distress and bankruptcy. Third, companies cannot solely rely on a business group affiliation to hedge against uncertain future contingencies. Fourth, financial flexibility not only leads to higher investment expenditures and lower investment cash flow sensitivity but also to better performance during the crisis. Interestingly, we do not observe any significant differences in terms of investment level and cash flow sensitivity to investment between flexible and inflexible firms in the post crisis period. This suggests that the value of financial flexibility is higher during abnormal periods of the economic cycle. Finally, our results, which go through a battery of robustness checks, demonstrate that cash and leverage policies of flexible firms in the pre crisis period are neither random nor driven by constraints arising from capital market imperfections.

The rest of the paper is organized as follows: Section 2 describes the data and provides summary statistics. Section 3 provides a detailed analysis regarding the role of financial flexibility in determining corporate investment. Section 4 investigates the relationship between financial flexibility and corporate performance, and Section 5 provides a series of robustness tests. Finally, Section 6 concludes.

2. Data and Descriptive Statistics

Our analysis to examine the value of financial flexibility is based on a sample of 1,068 listed firms from the following countries: Hong Kong, Indonesia, Malaysia, South Korea, and Thailand. This list of countries includes the four most affected Asian economies plus Hong Kong, a key market in the region that was generally less affected by the crisis than others but was still subject to some large shocks due to the openness of its economy and its close relationship with the other East Asian economies. Given our objective to emphasize on the East Asian crisis of 1997-1998, we exclude from the analysis Philippines, Singapore and

Taiwan as they account for three of the mildly affected countries from crisis, in contrast to the severely affected other East Asian countries (see Winters, 1999).[5]

Our dataset is constructed using data from several sources. Specifically, we obtain data on accounting and market variables from Thomson Datastream. The dataset covers pre crisis (i.e. 1994 to 1996), crisis (i.e. 1997 to 1998) and post crisis (1999-2006) periods.[6] To select the sample of firms, we drop financial firms and delete firm year observations with missing data and extreme values for our regression variables (on the basis of the top and bottom 1%). Finally, we keep in the sample only those firms that are traceable during the sample period. These criteria led to a final sample of 1,068 firms. We match firms in this sample with those from the study of Claessens, Djankov and Lang (2000) to obtain information on business group affiliation, the magnitude of separation between cash flow and control rights, the identity of the largest shareholder, and the role of CEOs and other senior managers as controlling shareholders of the company. These data are of either December 1996 or the end of the fiscal year 1996, which is just before the start of the crisis in East Asia.[7] Finally, given the cross country nature of our study, we also consider a country based rule of law measure that ranges from 0 to 10, with lower scores corresponding to less tradition for law and order. This measure is based on an assessment of the law and order tradition in a country as produced by the country risk taking agency International Country Risk (ICR).[8]

[*Insert TABLE 1 about here*]

[5] Characteristically, between July-November 1997, both Taiwan and Singapore had a current account surplus of more than 10 percent and Philippines had almost no deficit although the other countries in the region had a current account deficit of more than 10 percent on average. Also, between May 1997 and May 1998 Taiwan was the only East Asian country for which the average daily change in its stock market was not negative (see also Radelet and Sachs, 1998 and Nixson and Walters, 1999).

[6] To identify the pre crisis, crisis and post crisis periods we follow earlier studies on the subject (see e.g., Lee and Song, 2011; Claessens, Fan and Lang, 2006; and Lemmon and Lins, 2003). For robustness purposes we also adjust the pre crisis, crisis and post crisis periods to 1995-1997, 1998-1999 and 2000-2007 respectively, for Hong Kong. This helps control for the fact that the crisis occurred in Hong Kong with some delay (see e.g. Radelet and Sachs, 1998; Nixson and Walters, 1999; and Lam, Li and So, 2010). The results are not affected significantly.

[7] Ownership data cannot be obtained for a small number of firms in our sample. This should not bias, however, our results in a particular manner as there are no statistically significant differences, with respect to their key characteristics, between East Asian firms with and without ownership data at a particular point of time (see Lins, 2003 and Lemmon and Lins, 2003).

[8] See also La Porta *et al.* (1998).

Table 1 summarizes the basic descriptive statistics for the key variables of the study using the whole sample, reported separately for the pre crisis, crisis and post crisis periods (Panels A, B and C respectively). We start with analyzing the changes in the statistics of the key variables from the pre crisis to the crisis period. In general, the statistics differ significantly across the two sub-periods. For example, the mean value of investment expenditures of firms drops from 8.1 percent in the pre crisis period to about 4.15 percent during the crisis, which represents 48 percent decrease. Not surprisingly, the average cash flow ratio also drops by about 31 percent, from 9.99 to 6.91 percent. Furthermore, both growth opportunities, measured by the market to book ratio, and firm size get smaller during the crisis period, with the average values of the market to book ratio and the logarithm of total assets (expressed in US dollars) dropping from 1.57 to 1.19, and 12.44 to 12.33, respectively. Additionally, the crisis leads firms to significantly reduce their dividend payout ratios by about 37 percent (from 2.01 to 1.27 percent). Turning to the changes in the cash holding and leverage ratios of firms, we find that the cash holdings ratio of the average firm in our sample remains almost unchanged during the crisis period at about 11 percent. However, the change in the average value of leverage is significant, increasing from 29.25 percent in the pre crisis period to 34.67 percent in the crisis period, corresponding to an 18.5 percent increase. In Table 1 we also report the changes in the net debt ratio, defined as total debt minus cash holdings, divided by total assets. In line with the findings regarding leverage and cash holdings, there is an increase in net debt during the crisis, which is mainly driven by the increase in leverage.

The findings regarding leverage and net debt ratios are at odds with the view that the average debt level usually drops during a crisis period as a response to the increase in uncertainty and asymmetric information between borrowers and lenders. As we discuss later in Section 3, however, on closer inspection it appears that there are two groups of firms in our sample that behave differently with respect to their capital structure decision. On the one hand, a large proportion of firms, mainly those that adopt aggressive leverage policies in the

pre crisis period, experience difficulties to increase their leverage during the crisis period. On the other hand, consistent with our expectations, firms that adopt conservative policies in normal times (e.g. by retaining leverage at relatively low levels) indicate a higher ability to raise external financing in abnormal times.

Moving to the transition from the crisis to the post crisis period, we do not observe any significant changes to the levels of capital expenditures, cash flow, firm size and asset tangibility. However, there is a notable increase in the levels of cash holding where the average (median) value increases from 11.14 (7.2) percent in the crisis period to 12.71 (8.81) percent in the post crisis period. A year-by-year analysis suggests a consistent increase to the median level of cash holdings from about 7.60 percent in 1999 to 10.03 percent in 2006. This confirms the recent findings of Lee and Song (2011) for eight East Asian countries and is also in line with the strong precautionary motive for cash after crisis periods (see Lee and Song, 2011; and Almeida et al., 2004). The increase in cash holdings, accompanied by the large percentage drop in leverage, leads to a substantially lower net-debt ratio of 12.79 percent for East Asian firms in the post crisis period. Finally, the post crisis average dividend ratio seems to revert to its pre-crisis level of about 2 percent.

3. Financial Flexibility and Corporate Investment

This section provides more detailed descriptive statistics by dividing firms into subsamples on the basis of their cash and leverage positions in the pre crisis period. Initially, by using the median values of cash holdings and leverage ratios of firms during the pre crisis period, we generate four subsamples of firms, (1) low leverage (LL); (2) high leverage (HL); (3) low cash (LC); and (4) high cash (HC) firms.[9] Additionally, we identify two further groups of firms, (5) low leverage and high cash (LL-HC); and (6) high leverage and low cash (HL-LC) firms, by considering both policies simultaneously. Later, we provide the mean values of the

[9] In a series of robustness checks that are analytically discussed in Section 5, we use industry-adjusted median values for cash and leverage as well as different cut-off points (e.g. the 25th and the 75th percentiles) for classifying firms into different categories. Our results, which are discussed analytically in Section 5, remain robust across the different classifications.

main variables of interest in each subsample and compare them across the pre crisis and the crisis periods.

3.1 Financial flexibility by low leverage

Panel A.1 of Table 2 presents the average values of the key firm characteristics of the leverage subgroups of firms in the pre crisis period. There are several important observations that are of particular interest. First, in line with earlier findings in the literature, HL firms have lower cash holdings than LL firms. Second, the average HL firm invests more than the average LL firm in the pre crisis period, which may look surprising given that growth opportunities, proxied by the market to book ratio, and the cash flow ratio of HL firms are lower than the corresponding values for LL firms. Third, we find that HL firms are on average larger than LL firms. Overall, the firm characteristics during the pre crisis period suggest that HL firms are on average larger, have lower growth opportunities, cash holdings and cash flows. However, their investment expenditures are higher than those of the LL firms.

[*Insert TABLE 2 about here*]

In Panel B.1 we present the summary statistics of the same variables during the crisis period. In line with the argument that financially flexible firms have greater capacity to invest, LL firms seem to be more flexible than HL firms, suggested by their higher investment to assets ratio in the crisis period. The investment ratio for the average LL firm is about 4.56 percent whereas it is 3.73 percent for the average HL firm. As explained above, the pre crisis results suggest an opposite pattern. The corresponding percentage decreases in the investment ratio from the pre crisis to the crisis period, presented in Table 3, are about 56 and 40 percent for HL and LL firms respectively.

Comparing the mean values of other variables also leads to interesting inferences. HL firms are on average larger, have much more debt with lower growth opportunities and cash flows, and hold lower cash balances than LL firms during the crisis. However, a closer

inspection of the changes in the average values in the crisis period reveals a more striking picture. We observe that the changes in the cash holdings ratio of both HL and LL firms are negligible. However, the changes in the leverage ratio in the crisis period are significant where LL firms increase their leverage ratio during the crisis by about 44 percent whereas the increase in leverage by HL firms is limited to only about 9 percent. These findings imply that the net debt ratio of LL (HL) firms increases by 351 (10.5) percent from about 2.3 (33.97) percent to 10.2 (37.54) percent. There is strong evidence that LL firms of the pre crisis period are able to increase their leverage significantly in the crisis period and this probably enables them to maintain a higher level of investment expenditures than those of HL firms. We also check the debt maturity structure of HL and LL firms. The results indicate that the ratio of short term debt to total debt increases (decreases) for HL (LL) firms, suggesting that the increase in the leverage ratio of HL firms during the crisis is mainly maintained through short term debt. On the contrary, LL firms, despite the increase in their leverage ratio by almost 44 percent, are able to slightly reduce the share of short term debt in total debt by 1.26 percent (from 63.55 to 62.75).

In panel C.1 of Table 2 we report the summary statistics of HL and LL groups in the post crisis period. We find that LL firms invest slightly less than HL firms (4.01 percent vs. 4.27 percent), which represents a 14.48 percent increase for HL firms and 12.06 percent decrease for LL firms compared to their investment level prevailing during the crisis (see Table 3, Panel B). This evidence does not support the view that financial flexibility provides firms with the ability to invest more. Rather, LL firms seem to reduce their investment expenditures in the post crisis period, which may be explained by the moderate level of MTB (a proxy of growth opportunities). Also, HL firms have a leverage ratio of 41.98 percent, which is close to its pre-crisis level. This represents a 9.33 percent decrease compared to the leverage ratio in the crisis period. On the contrary, LL firms seem to adopt a different strategy in the post crisis period by reducing their leverage ratio to 9.16 percent from 23.07 percent, representing about a 60 percent drop). Such leverage level is considerably lower

than the 23.07 percent prevailing during the crisis period. Likewise, LL firms increase their cash holding in the post crisis period by 25.85 percent (from 13.50 to 16.99 percent) while HL firms reduce it by about 2.28 percent (from 8.76 to 8.56 percent).

Overall, the descriptive statistics discussed in this section provide preliminary evidence consistent with the view that maintaining debt at low levels enables firms to preserve debt capacity to fund investment opportunities in the face of unanticipated adverse shocks. However, such effect is prevalent only during the crisis period.

3.2 Financial flexibility by high cash balances

In this section we examine firm characteristics of the two subgroups of firms, grouped on the basis of their cash balances in the pre crisis period. We start by comparing high cash (HC) and low cash (LC) firms in the pre crisis period, presented in Panel A.2 of Table 2. The results suggest that the average net debt ratio of HC firms is only about 7.14 percent compared with 29.01 percent net debt ratio for LC firms. HC and the LC firms also differ significantly in several other characteristics in this period. For example, HC firms have greater cash flow to assets and market to book ratios. The differences are also statistically significant. Nevertheless, the investment ratio does not differ significantly across the two groups, and HC and LC firms are similar in size. Furthermore, the difference between the maturity structures of debt holdings of each group of firms is not statistically significant and about 60 percent of total debt for the average firm in both groups matures within one year.

In Panel B.2 of Table 2 we present the summary statistics of the two groups in the crisis period. The findings are very similar to those reported above for the pre crisis period. That is, compared to LC firms, HC firms have higher cash flow and market to book ratios, hold less debt in their capital structures, and pay more dividends. Moreover, the investment expenditures, size and the debt maturity structure of debt are similar for both groups. It is, however, important to note that although the difference is not statistically significant and

both groups drop their investment expenditures substantially, the average investment ratio of HC firms is now greater than that of LC firms in the crisis period.

[*Insert TABLE 3 about here*]

Moving to Table 3 (panel A), we find that both HC and LC firms increase their leverage ratio during the crisis, by 21.59 and 16.45 percent respectively. However, HC firms reduce the cash to assets ratio by 18.13 percent whereas LC firms increase it by 84.33 percent. These changes result in a significant increase in the net debt ratio of HC firms by nearly 125 percent and a small change of 7.4 percent for LC firms. Finally, both groups of firms reduce their investment expenditures substantially in the crisis period. The percentage drop in the investment to assets ratios for HC and LC firms are 46.08 and 51.47 percent respectively. Overall, the results reported in this subsection provide little evidence supporting the view that large cash balances provide firms with greater financial flexibility.

In Panel C.2 of Table 2 we present the summary statistics of HC and LC groups in the post crisis period. The results suggest that flexibility attained by cash reserves does not matter much for investment in the post crisis period. In particular, HC and LC firms retain their crisis investment levels, at about 4.3 and 3.9 percent respectively), over the period 1999-2006. We also find that while HC firms increase their cash holding and reduce their leverage substantially (at 21.56 and 19.34 percent respectively), LC firms reduce their cash further (at 3.86 percent) and reduce their leverage to a much lower extent (at 31.86%). This supports Lee and Song's (2011) view that the crisis has substantially changed firm's cash holding policies (see changes in cash for HC and LC firms in Table 3 (Panel A vs. Panel B)).

3.3 Financial flexibility by low leverage and high cash balances

Despite its useful insights, the analysis in the previous two subsections can be misleading given that it is based on a univariate setting and considers the cash and leverage positions of firms separately in grouping firms into different groups. Corporate cash and leverage decisions, however, are strongly interrelated in the sense that an adjustment in one policy

variable implies that other policy variables must also adjust (see Gatchev, Pulvino and Tarhan, 2010). As a result, firms may choose to attain financial flexibility by simultaneously maintaining low leverage and high cash policies. We take this view into consideration by regrouping firms in Tables 2 and 3 on the basis of both policies, and we compare the characteristics of low leverage-high cash (LL-HC) vs. high leverage-low cash (HL-LC) firms. We expect LL-HC firms to be more financially flexible than HL-LC firms in funding investment expenditures during the crisis period.

We start by assessing the differences in firm characteristics in the pre crisis period, shown in Panel A.3. By construction, HL-LC firms have higher leverage and lower cash holdings than LL-HC firms. However, their cash flow to assets and market to book ratios are lower than those of LL-HC firms. Additionally, compared to LL-HC firms, they are smaller, hold less short term debt in their capital structures, and pay out lower dividends relative to their total assets. More importantly, the average HL-LC firm invests more than the average LL-HC firm in the pre crisis period, though the difference is statistically significant only at the 10 percent level.

We now turn to the statistics in the crisis period and the percentage changes in the mean values across the two periods, reported in Panel B.3 of Table 2 and in Table 3 respectively. The comparative characteristics of firms in the two groups are very similar to those reported above for the pre crisis period. The only striking exception relates to the investment to assets ratio. In the crisis period, LL-HC firms have a greater investment ratio than that of HL-LC firms, given by 4.67 and 3.65 percent respectively. The corresponding figures for the pre crisis period are 7.52 and 8.42 percent. That is, the findings reveal that, as reported in Table 3, the investment ratio of LL-HC firms dropped by 37.9 percent whereas the decrease for HL-LC firms is 56.65 percent. Interestingly, the 56.65 percent drop in investment is the highest across all the subgroups in our sample.

Furthermore, HL-LC firms display the lowest rise in the net debt ratio, which increases in the crisis period only by 1.64 percent. Table 3 also reveals that HL-LC firms

drop their dividend payout ratio by 55.75 percent and increase their leverage ratio by only 7.32 percent. By contrast, LL-HC firms during the same period reduce their dividend payouts and cash holdings by 26.55 and 16.69 percent respectively, and increase their leverage ratio by 41.76 percent. The net debt ratio hence increases significantly, by more than 150 percent. The resulting drop of 37.9 percent in the investment ratio of LL-HC firms is the lowest among the subgroups included in Table 3.

In Panel C.3 of Table 2 we present the summary statistics of LL-HC and HL-LC firms in the post crisis period. The results reveal that both LL-HC and HL-LC firms have similar investment ratios at 4.19 and 4.11 percent respectively, which are not statistically different. Comparison of these findings with those for the crisis period further reinforces the argument that financial flexibility may not be an important determinant of investment during normal times. Interestingly, while flexible firms reduce their investment expenditures in relation to their total assets, less flexible firms are able to increase investment during the years following the crisis period (as shown in Panel B of Table 3). It seems that flexible firms of the pre crisis period (i.e. LL-HC firms) revert to being cautious by building up more flexibility in the post crisis period. They reduce their investment by 10.28 percent during the post crisis period. This view is also supported by the fact that LL-HC firms substantially reduce their net debt ratio to the level of -16.5 percent, which represents a huge decline of about 600 percent. On the contrary, HL-LC firms maintain a net debt ratio of 39.54 percent, which is similar to the one prevailing in the pre crisis and crisis periods (39.85 and 40.23 percent respectively). Overall, our findings provide suggestive evidence that firms combining low leverage with high cash balances in the pre crisis period are better positioned to maintain their investment expenditures during the crisis period. However, financial flexibility is less of an important determinant of investment during the post crisis period.

3.4 Financial flexibility and the cash flow sensitivity of investment

The evidence provided so far suggests that the investment expenditures of firms with low levels of debt and large cash balances are less sensitive to unanticipated negative shocks to earnings. In this section, we examine this issue further in a multivariate framework. Our empirical strategy is to estimate an investment model for different subgroups of firms, where the subgroups are determined on the basis of firms' past leverage and cash positions. Our main objective in this section is to examine the extent to which the cash flow sensitivity of investment varies across the subgroups in the pre crisis, crisis and post crisis periods. Based on the evidence reported in the previous section we argue that LL firms are more financially flexible in funding investment than HL firms. Similarly, LL-HC firms are believed to be more flexible than HL-LC firms in the sample. Thus, we use the terms LL, LL-HC and flexible, and the terms HL, HL-LC and less flexible interchangeably throughout our empirical analysis.

In line with prior research, the cash flow ratio is used as a proxy for the availability of internal sources for investment.[10] We expect that less flexible firms are more dependent on the level of cash flows for funding investment because of their limited ability to raise external finance. We estimate the cash flow sensitivity of investment using the following model:

$$I_{it} = a + \delta_1 CFLOW_{it-1} + \delta_2 MTB^{f}_{it-1} + \delta_3 MTB^{r}_{it-1} + u_{it}, \qquad (1)$$

In equation (1), *I* is the ratio of capital expenditures to lagged total assets, *CFLOW* is the sum of earnings before interest, tax and depreciation over total assets and *MTB* represents the firm's growth opportunities, measured by the market to book ratio. In an attempt to use a proxy that properly controls for growth opportunities, we decompose the market to book ratio into two parts - a fundamental component (MTB^{f}) and a residual component (MTB^{r}) - and then examine how investment responds to changes in these two components. We

[10] See Fazzari *et al.,*(1988); Hubbard *et al.,* (1995); and Gilchrist and Himmelberg, (1998) for a discussion on the use of the investment cash flow sensitivity as a proxy for financial constraints.

consider that such decomposition is necessary because stock valuations tend to deviate significantly from fundamentals in periods characterized by asset price shocks.[11] In estimating equation (1), we initially use a random effects GLS regression approach in which independent variables are lagged one year to control for potential endogeneity problems (see Duchin *et al.*, 2010).

For the estimation of the random effects model, one can assume both cross-sectional and time heterogeneity. We put forward several alternative one-way specifications and use the standard Breusch-Pagan Lagrange multiplier (LM) test for random effects with the null hypothesis that variances of groups (e.g. across time periods or across firms) are zero. The null hypothesis is rejected when cross-sectional heterogeneity is allowed for, while it cannot be rejected when time effects are allowed for. This is probably due to the structure of our data (i.e. we estimate our investment models separately for three sub-periods, which minimizes the importance of time effects). As a result, we estimate a one-way random effects model allowing for firm rather than time heterogeneity.

For completeness, we also obtain results by estimating a fixed effects model. The rationale behind the implementation of the latter method is that better companies may anticipate a downturn in their conditions and hence prepare for it. To this end, firm-specific fixed effects may be important in our investment framework.[12] Equation (1) is estimated for flexible and less flexible firms in the pre crisis, crisis and post crisis periods.[13]

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[11] To decompose the market to book ratio we follow a similar approach to that of Goyal and Yamada's (2004). Specifically, we regress the *MTB* ratio against contemporary and lagged sales growth, squared sales growth and industry dummies. The fitted values of this regression are used as a proxy for the fundamental component of stock valuations (MTB^f), while the residual component is used as a proxy for the residual values (MTB^r). The inclusion of both components of *MTB* in the regressions helps capture not only outsiders' but also insiders' evaluation of growth opportunities. Alternative ways to avoid the mismeasurement of the proxy of growth opportunities include: *i)* the use of contracted capital expenditures alongside *MTB* in the model (see Carpenter and Guariglia, 2008) and *ii)* the use of an error-correction specification (see Guariglia, 2008). Notwithstanding their merit, these methods cannot be utilized in our study due to the nature of our data (e.g. a short-panel) and the lack of availability of information on contracted expenditures. We therefore stick to Goyal and Yamada's (2004) method to tackle the measurement issue of growth opportunities. Other more straightforward variables that have been suggested as proxies for growth opportunities (e.g. ratio of R&D expenses to total sales) cannot be implemented in our analysis given the limited data availability (e.g. for the case of Korea, only 10% of the companies included in our sample disclosed to their R&D expenditures for the year 1998).

[12] We control for fixed effects in order to capture unobserved factors that are not taken into account by the model described by Equation (1). The results of the fixed effects model are very similar to the ones obtained

3.4.1 Baseline Investment Results

We start by estimating equation (1) using the whole sample without distinguishing between flexible and less flexible firms (Model 1 in Table 4). The estimated coefficient of cash flow is positive and statistically significant across all periods. The cash flow sensitivity of investment, however, is much lower during the crisis period than the pre crisis period (0.289 vs. 0.087). This finding is possibly attributable to the fact that while cash flow drops substantially during the crisis for almost all firms, a specific group of firms seem to manage to retain their investment at satisfactory levels by raising external financing (e.g. drawing-down pre-arranged lines of credit).[14] The cash flow sensitivity of investment increases to the level of 0.129 in the post crisis period.

[*Insert TABLE 4 about here*]

The results also show that during the pre crisis period that the estimated coefficients of both components (fundamental MTB^f and residual MTB^r) of the market to book ratio are economically and statistically insignificant, though they become significant during the crisis and post crisis periods. Although we do not investigate this further, a possible explanation relates to the overinvestment tendency of firms during economic booms (Hadlock, 1998; and

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using the random effects estimator. We therefore decide to report only those results that are based on the random-effects estimator (all unreported results are available upon request by the authors).

[13] Recent studies on the inter-temporal nature of financial decisions (see Gatchev *et al.,* 2010) suggest that the lagged value of investment should be included in equation (1). However, it is difficult to estimate a well-specified dynamic model using short panels such as ours. Specifically, the requirement to use lagged values of the dependent and independent variables as instruments makes it difficult to estimate such model separately for all three periods under investigation (pre-crisis, crisis and post crisis) and hence produce directly comparable results. Still, in the spirit of Pindado et al. (2011), we perform a GMM estimation using all firms over the entire sample period (1994-2006). The results show that the adjustment coefficient (given by 1 minus the coefficient of the lagged dependent variable) is 0.665, which is quite high. One possible explanation for the high value of the adjustment coefficient might be that the costs of deviating from the target are significant, supporting the argument that corporate investment expenditures are persistent over time and firms attempt to sustain their existing policies. We therefore conclude that the substantial differences in terms of investment level and cash flow sensitivity to investment between flexible and inflexible firms in the crisis period, as identified using a specific empirical framework, are less likely to be random and more likely to reflect unexpected changes in the availability of financing.Based on this evidence, we conclude that although our investment framework is not flawless, it seems appropriate for studying the impact of financial flexibility on investment for the specific sample/time-period.

[14] Another potential explanation for the declining cash flow sensitivity of investment across time relates to the life cycle hypothesis (see Hovakimian, 2009). According to the lifecycle hypothesis, young firms usually have low cash flows but relatively high investment expenditures due to the existence of abundant investment opportunities. However, as they become more mature they experience increasing cash flow with simultaneously decreasing investment rates, leading to a lower cash flow sensitivity of investment.

Wei and Zhang, 2008), which possibly weakens the link between growth opportunities and investment. This is also consistent with our earlier descriptive analysis reporting that the investment expenditures and cash flows of firms are at record high levels in the pre crisis period despite a modest average market to book ratio of 1.57.[15] The descriptive statistics for the post crisis period shows that the levels of investment and market to book ratio do not revert to their pre-crisis levels during the post-crisis period.

We next estimate the investment model through grouping firms into flexible and less flexible subsamples on the basis of their leverage behaviour in the pre crisis period. The results are reported in Models 2 and 3. The most striking finding from these estimations relates to the investment cash flow sensitivity coefficient. For high leverage (HL) and hence less flexible firms, the estimated coefficient on CFLOW is positive and statistically significant in both periods. However, in Model 3, which refers to low leverage firms (i.e. LL), the coefficient on CFLOW becomes insignificant in the crisis period, though it remains highly statistically significant in the pre crisis period. In terms of economic significance, while the coefficient for HL firms drops from 0.273 in the pre crisis period to 0.114 during the crisis period, the drop in the economic significance for LL firms is much bigger, from 0.369 in the pre crisis to 0.038 during the crisis period. Our results also indicate that despite the irrelevance of the market to book ratio in determining the investment expenditures of LL firms in the pre crisis period, the coefficients on the market to book variables in the crisis period switch signs and become positive and significant at the 1 percent level. In summary, these findings are consistent with the view that financial flexibility can be attained through a low leverage policy. Importantly, it seems that flexible firms rely less on internal resources (i.e. cash flow) for investing. Moreover, such firms are better equipped to meet financing needs though external financing and hence have a greater ability to undertake valuable growth opportunities that arise during the crisis. Interestingly, leverage does not seem to

[15] The weak relation can also be due to the poor empirical performance of q models especially when estimated adjustment costs are excessively large (see, Chirinko, 1993 for further discussion on the performance of q-models which explicitly underline that due to noise in stock markets Tobin's Q is not necessarily equivalent to growth opportunities for firms). Our specification (see Eq. 1) may help alleviate such problem.

significantly affect the cash flow sensitivity of investment in the post crisis period. The cash flow coefficient of the variable cash flow is positive and statistically significant for both HL and LL firms. The two cash flow sensitivities are also very similar in their magnitude (0.137 vs. 0.126 respectively).

We next carry out the same analysis using firms' cash holdings to distinguish the financially flexible firms from the less flexible ones. Specifically, as shown in Models 4 and 5, the cash flow sensitivity of investment for both flexible (HC) and less flexible (LC) firms is positive and significant during both pre crisis and crisis periods. The values of the estimated coefficients on CFLOW, however, drop significantly during the crisis, whereas the economic significance of the market to book variables improves significantly especially for the flexible firms. More importantly, in contrast to leverage, cash does not seem to significantly affect the cash flow sensitivity of investment during the crisis period. As for the post crisis period, cash holdings do not seem to significantly affect the cash flow sensitivity of investment with both sensitivities being positive and statistically significant.

In models (6) and (7) we estimate the investment equation after combining both cash and leverage through assigning firms into flexible (LL-HC) and less flexible (HL-LC) categories. The results are similar to those reported in Models 2 and 3 where low leverage is used to construct our flexibility proxy. The investment of flexible firms during the crisis does not depend on the level of cash flow and, as expected, is determined by the availability of valuable investment opportunities. However, this is not the case for less flexible firms as indicated by the positive and significant coefficient on CFLOW. It is important to note that adding cash holdings as an additional criterion in identifying financially flexible firms does not change the results significantly in either periods, where the results seem to be driven mostly by the leverage positions of firms prior to the crisis. Once again, the post crisis results are considerably different compared to the crisis ones, showing a similar cash flow sensitivity of investment for LL-HC and HL-LC firms (0.111 and 0.145 respectively). Also, both coefficients are statistically significant at the 1 percent level.

In Models (8) and (9), we re-estimate Models (6) and (7) after excluding negative cash flow observations from the sample. As Allayannis and Mozumdar (2004) and Bhagat, Moyen and Suh (2005) suggest, negative cash flow observations may bias the results of an investment model. This is because investment expenditures are unlikely to respond to cash flow changes when companies are in sufficiently bad shape. To address this issue, we identify and delete all negative firm year observations as a result of this check. However, our results, reported in Models 8 and 9, remain very similar, suggesting that they are not biased by the presence of negative cash flow firm year observations in our sample.[16]

Overall, the results presented in Table 4 are consistent with the hypothesis that financial flexibility is desirable to fund future growth opportunities when firms find external finance more costly and/or experience cash flow shortfalls.[17] Prior to the crisis and in the post crisis period it is difficult to distinguish between the investment behaviour of flexible and inflexible firms but their behaviour becomes distinct during the crisis. More specifically, firms attaining financial flexibility through low leverage in the pre crisis period do not rely on the availability of internal funds to finance their capital expenditures during the crisis. The main determinant of investment of flexible firms during the crisis period is their growth opportunities. On the contrary, high leverage firms seem to make relatively greater use of cash flows as a source of finance during the crisis. Furthermore, our findings suggest that in contrast to leverage, cash holdings do not seem to be important for funding future investment opportunities (i.e. the cash flow sensitivity of investment does not differ substantially across HC and LC groups). This finding is consistent with recent qualitative evidence by Lins *et al.* (2010) suggesting that excess cash is usually held as a form of insurance against financial distress while lines of credit are held to fund future growth.

Interestingly, these findings are not confirmed in our analysis covering the post crisis period. We therefore conclude that financial flexibility is an important determinant of

[16] Though we do not report the results in Table 4, we also repeat the same exercise for each of the HL, LL, HC, and LC subgroups by dropping the negative cash flow observations. Our findings prevail for all specifications.
[17] Ding, Domac and Ferri (1998), for example, provide evidence on the existence of a credit crunch during the East Asian crisis.

corporate investment but this result holds mainly during abnormal periods of the economic cycle.

3.4.2 Financial Flexibility and Business Group Affiliation during the Crisis

Business groups are diversifying organizations with a significant amount of ownership and control. Such groups can provide benefits to their affiliate firms through capital and product markets, contract enforcement, and government influence (see Khanna & Palepu, 2000; Rousseau and Kim, 2008). Recent evidence for East Asian (Korean) corporations, for example, supports a significant association between the existence of a business group and corporate debt policies (see Kang and Kim, 2006; Gul and Kealey, 1999). The questions that we try to address in this section are the following: *i)* Does the investment expenditure of firms that belong to a business group (BG) exhibit a lower sensitivity to the availability of internal funds than that of firms without a business group affiliation (non-BG), *ii)* Does business group affiliation work as substitute to financial flexibility, as attained through cash and leverage, during the crisis?

[*Insert TABLE 5 about here*]

To address the first question, we estimate equation (1) after splitting the sample into two subsamples based on their business group affiliation. The results from this estimation are reported in Panel A of Table 5. To address the second question, we estimate the investment model again by focusing on the subgroups based on a combination of the group affiliation and financial flexibility features of firms. For example, in Panel B of Table 6, Model 3 reports the estimation results using a subsample of firms that are defined as financially flexible and are also affiliated with a business group. On the other hand, Model 5 in Panel C considers firms that are financially inflexible (HL-LC firms) and affiliated with a business group.

The results presented in Panel A show that the cash flow sensitivity of investment is positive and statistically significant for both groups of firms, though the economic

significance of the coefficient on cash flow is greater for firms without a business group affiliation (0.142 vs. 0.073). This finding is consistent with the view that the investment of firms that belong to a business group is less dependent on the availability of cash flow. Another interesting finding, which is in line with our expectations, relates to the coefficient of the market to book ratio, which also plays a significant role for the BG firms in determining investment during the crisis period.[18]

The results in Panel B, where we estimate the investment model for the BG and non BG firms with financial flexibility, reveal that the cash flow sensitivity of investment becomes insignificant when we consider only those BG firms with financial flexibility (Model 3). However, there is some evidence that the availability of internal funds may still be important in determining the ability of firms to invest even though they have financial flexibility through low leverage and high cash balances (Model 4). The economic significance of the estimated coefficient on cash flow is similar to that of Model 2 but the coefficient is only marginally significant. Although the findings in Panel B may suggest that establishing financial flexibility may not be sufficient on its own to eliminate the adverse effects of the crisis on investment, it is more important to analyze the impact of business group affiliation among the less flexible firms in order to draw more definite conclusions. We conduct this analysis in Models 5 and 6 in Panel C and find that the cash flow sensitivity of investment is positive and significant for the less flexible firms regardless of whether they are affiliated with a business group. Thus, in line with our earlier findings, financial flexibility appears to be the main determinant of whether the investment expenditures of firms are cash flow dependent during the crisis period. The economic significance of the estimated coefficients in both subsamples is also very similar.

[18] These findings, however, may be mainly driven by the economic conditions that characterized East Asian countries during the crisis period. To this end, an interesting avenue for future research would be the examination of the role of business groups in East Asia within a dynamic setting (i.e. before, during and after the crisis). Indeed, recent studies that focus on Korean firms view the crisis of 1997/1998 as a structural break with respect to the investment behaviour and a shift towards stronger market orientation (see e.g. Rousseau and Kim, 2008).

Overall, the results of Table 5 suggest that companies cannot count solely on a business group affiliation to hedge against uncertain future contingencies, such as low profitability, low cash flow and/or high cost of external financing. Also, it seems that a sufficient level of financial flexibility can be attained through conservative leverage policies, even for firms that do not have a business group affiliation.[19]

4. Financial Flexibility and Corporate Performance: Evidence from the Crisis

Our analysis so far provides evidence that financial flexibility plays a crucial role in easing firms' cash flow shortfalls and their adverse effects on investment during crisis periods. In this section we directly examine the performance consequences of establishing financial flexibility. The question that we aim to address is whether establishing financial flexibility in the pre crisis period enhances the relative performance of firms during the crisis period.

In addressing this question we use three performance measures, namely Tobin's Q, interest coverage ratio, and operating margin, as our dependent variables. These variables, which have been extensively used in studies that analyze the performance of East Asian firms prior and during the 1998 crisis (see Claessens *et al.*, 2002; Allayannis, Brown and Klapper, 2003; Lemmon and Lins, 2003; Lins, 2003), are regressed on a number of independent variables including our main variable of interest, a dummy variable defining the flexibility status of firms in the pre crisis period. To control for the impact of corporate governance on performance, we follow Claessens *et al.* (2000) and include a set of dummy variables as explanatory variables in our performance equation. More specifically, these variables indicate whether: (i) ownership control rights of the largest owner exceed ownership cash flow rights (*Control vs. C.F. Rights*); (ii) a company is controlled through a pyramid structure (*Pyramid*); (iii) the largest shareholder is a widely held financial institution (*Financial Owner*); and (iv) the CEO, the board chairman or vice chairman are

[19] These results hold in models that use different proxies for flexibility (e.g. LL) and/or samples that exclude companies with negative cash flow observations (the results are available upon request).

part of the controlling owner (*Managerial Ownership*). To control for the important role that a business group affiliation can play on the performance of a company, we also include a dummy variable that takes the value of unity if a firm belongs to a business group and zero otherwise (*Business Group*). Finally, we also include the natural logarithm of total assets (*Size*), the ratio of capital expenditures to total assets (*Investment),* and the country's rule of law score (*Rule of Law*) as control variables in the regression.

Following Claessens *et al.* (2002), the estimation is conducted using a random effects GLS regression approach.[20] To control for endogeneity problems, the dependent variable is measured at time *t* while for the independent variables lagged values are used. Specifically, business group affiliation, ownership dummies, rule of law measures and financial flexibility are measured at their pre crisis levels. For the remaining independent variables, namely size and investment, one year lagged values are used. The results of the performance model estimations are reported in Table 6. In Models 1, 3 and 5 financial flexibility is defined by using the low leverage criterion (LL), whereas in Models 2, 4 and 6 the flexibility definition is based on the low leverage and high cash criterion (LL-HC).

[*Insert TABLE 6 about here*]

Starting with Models 1 and 2, where firm performance is measured by Tobin's Q, the results show a positive and statistically significant relationship between financial flexibility and performance under both definitions of flexibility. In economic terms, flexible firms indicate a much higher Tobin's Q. than that of less flexible firms. We also find that firms that are affiliated with a business group are more likely to have a greater Tobin's Q ratio than those without an affiliation. The results also reveal that the rule of law variable is positive and statistically significant in Models 1 and 2, suggesting that firms in countries with strong legal protection perform better than those firms in countries with weak legal protection of minority shareholders. This finding is consistent with La Porta *et al.* (2002) and

[20] The utilization of a fixed estimator is not possible given the static nature of some of the variables included in our performance model. For completeness, however, we have also carried out the estimation using a maximum likelihood estimator and obtained similar findings to the ones by the random effects estimator.

Hossain, Lim and Tan (2010), who also report a strong association between legal protection and firm performance in their sample of 539 firms from 27 countries. The rest of the independent variables do not appear to have a statistically significant impact on the performance of firms during the crisis period.

The results presented in Models 3 to 4 (for interest coverage ratio) and Models 5 to 6 (for operating margin) are generally similar to the ones reported so far. Specifically, financial flexibility, business group and rule of law dummies affect performance positively.[21] However, there are also important differences. For example, the coefficient on the variable *Pyramid* is negative and statistically significant, possibly suggesting that firms controlled through a pyramid structure do not perform as well as the others during the crisis. Also, the results regarding the firm size are mixed. When we use the interest coverage ratio as the dependent variable the relationship between size and performance is negative and significant, whereas the relation becomes positive when performance is measured using the firm's operating margin. Using the latter definition, we also observe that managerial ownership exerts a negative effect on firm performance, which is consistent with the view that firms with senior managers being part of the controlling owners exhibit inferior performance compared to firms that are run by independent senior managers. This implies that the entrenchment effects of large shareholdings by the CEO or Chairman may dominate the alignment incentive effect (see Claessens *et al.* 2002). Finally, in contrast to the results reported in Models 1 and 2, the findings indicate that firms with greater investment expenditures are also likely to perform better.

[21] We note that some caution should be taken when interpreting the coefficients on flexibility proxies in Models 3 and 4. We are aware that the positive relationship between the interest coverage ratio and the (leverage) financial flexibility dummy is generated by construction. However, there are reasons why the endogeneity problem should not be as serious as one would suspect initially. First, notice that the flexibility measure is based on firms' leverage positions in the pre crisis period and performance is observed during the crisis. Second, as reported earlier, low leverage, and hence flexible firms of the pre crisis period increase their leverage substantially, by about 44 percent, in the crisis period. Finally, the positive finding is also in line with the summary statistics regarding the cash flow ratio given that the LL and LL-HC firms have the lowest drops in their cash flows among all the subgroups of firms (see Table 3).

Among the remaining findings, it seems that the ownership variables, except for managerial ownership, do not appear to play a significant role in affecting firm performance of firms in the crisis period. Specifically, the estimated coefficients on *Pyramid, Financial Owner* and *Control vs. C.F rights* in models 5 and 6 are statistically insignificant, leading to the conclusion that agency problems between large and minority shareholders may not be among the key drivers of performance in the crisis period. This finding is in line with the results of Leung and Horwitz (2010) study, which focuses on the East Asian crisis and presents supportive evidence for the alignment theory of large managerial shareholdings. This evidence, however, is at odds with the findings of Claessens *et al.* (2002) who study the relationship between equity ownership and firm value in eight East Asian markets and find that the divergence between cash-flow ownership and control rights leads to a decrease in performance. The difference in findings may be partly attributed to the different samples and time-periods utilized across the two studies. For example, while Claessens *et al.* (2002) study the performance of firms in the pre crisis period, whereas our analysis focuses on the performance of firms during the crisis period. This explanation seems reasonable given the recent evidence by Wei and Zhang (2008) that the crisis altered the nature of agency problems in which Asian corporations are exposed to. It is then likely that the effectiveness of certain governance mechanisms/devices differs across different phases of the economic cycle (see Wei and Zhang, 2008; Leung and Horwitz, 2010).

Overall, the findings reported in Table 6 suggest that a firm's choice to establish financial flexibility and participate in a business group in the pre crisis period affects its performance positively during the crisis. However, flexibility through relatively high cash and low leverage policies, and group affiliation does not necessarily work as substitutes in helping firms to hedge against unexpected future contingencies. When we interact the financial flexibility proxies with the business group dummy and include the underlying interaction terms in the performance equation, the results indicate that the estimated coefficient on the interaction termsis statistically insignificant in most of the regressions (the

results are available upon request). Our findings reiterate earlier findings regarding the crucial role that financial flexibility can play during economic downturns. Also, the results emphasize the benefits of participating in a business group, which seem to materialize for all firms during a crisis period. In this respect, our study builds on the study of Claessens *et al.* (2006), which indicates that a group membership in the pre crisis period is beneficial only for mature firms with sluggish growth.

We finally consider the possibility that the improved performance during the crisis period may arise from lower agency costs rather than the ability to exploit valuable investment opportunities that financial flexibility offers (although such explanations are not necessarily mutually exclusive). The fact that our performance models also include a set of corporate governance characteristics that may capture agency costs effects confirms that any performance differentials between flexibly and inflexible firms is more likely to be attributed to the different ability of each group to undertake profitable investment projects rather than agency costs. Such ability may of course be strongly linked with the fact that flexible firms have lower interest payment obligations. To further investigate the validity of this argument, we conduct the following check. We calculate the asset-turnover ratio (the ratio of total sales to total assets) of each firm and following Florackis and Ozkan (2009), we interpret it as an inverse proxy of expected agency costs. We then examine whether the agency cost differential between flexible and inflexible firms varies over time. Appropriate *t*-tests for differences in means suggest that the agency cost differential in the pre-crisis period is not statistically different from the agency cost differential in the crisis period [t=1.174; P(T≤t)=0.240] . We therefore conclude that the observed outperformance of financially flexible firms during the crisis period do not seem to be arising from lower agency costs in that period.[22] Still, we acknowledge that an analysis considering optimal rather than observed levels of cash and leverage (see e.g. Frésard and Salva, 2010; Lee and Lee, 2009;

[22] We thank an anonymous reviewer for suggesting to explore and analyze this alternative interpretation of our findings.

Ozkan and Ozkan, 2004; Opler et al., 1999 on optimal cash and Morellec, 2004; Johnson, 1998 on optimal leverage) would provide further insights into the link between financial flexibility, agency costs and firm value.

5. Further Checks

In the results reported so far we take financial flexibility as given without investigating explicitly whether low leverage and high cash policies in the pre crisis period are optimal or due to constraints arising from capital market imperfections. For example, we are aware of the possibility that firms hold large cash balances and/or low levels of debt in their capital structure because the cost of external finance is prohibitively high. Put differently, by using low leverage and high cash holdings ratios as our classification criteria, we may be picking up financially constrained firms and wrongly classifying them as financially flexible. For example, recent studies by Lins *et al.* (2008) and Hadlock and Pierce (2010), suggest that a high level of cash holdings may relate to financial constraints in the sense that firms hold elevated levels of cash for precautionary reasons. Another possibility is that hoarding cash is not the only way through which companies can establish financial flexibility. Lee *et al.* (2011) show that high growth firms can build up "precautionary reserves" for flexibility considerations through dividend policy (e.g. by reducing the payout ratio and retaining more earnings). Finally, it is also likely that the policies towards flexibility observed prior to the crisis are simply random despite the performance enhancing effects of such policies we observe during the crisis. To explore these possibilities we run several detailed checks.

First, though we do not report the results in the paper, we estimate our baseline investment equation in the pre crisis period for constrained and unconstrained groups using firm characteristics such as size, age and dividend payout ratio. We find that, across all measures, the cash flow ratio of firms has a positive and significant impact on investment for both constrained and unconstrained firms, while the relationship between investment and the market to book ratio is weak. The extent to which the cash flow sensitivity of investment can

be used to determine financially constrained firms, we cannot find any firm characteristics which would enable us to distinguish between financially constrained and unconstrained firms in the pre crisis period. Our analyses suggest that neither the flexible nor the less flexible firms in our sample are likely to be constrained in the pre crisis period. The summary statistics we report in Sections 2 and 3 mostly support this view. Specifically, as noted earlier, the characteristics of the flexible firms in the crisis period are such that they have greater growth opportunities, are smaller, and have higher dividend payout, cash flow and investment ratios than the less flexible ones. The significant and persistent differences between the characteristics of flexible and inflexible firms in both periods also rule out the possibility that our classification of flexibility is driven by random behaviour of firms.

As a second robustness check, we put forward an additional measure of flexibility in our analysis. Specifically, instead of simply looking at their cash and leverage policies at the onset of the crisis, we also look at the changes in cash holdings and leverage in order to classify firms into flexible and inflexible groups. Firms are classified as flexible ones if they have low leverage and high cash holdings at the onset of the crisis and, additionally, if their cash holdings ratio does not drop during the crisis. An appealing feature of such classification criterion is that it helps us distinguish between financially flexible from financial constrained firms; this is because financially constrained firms usually burn through their cash reserves to meet their liquidity needs during a crisis (see Campello *et al.*, 2010). Clearly, our groups of flexible firms (as defined above) are not likely to include any constrained firms as none of these groups includes firms that burn through their cash reserves. The results of our empirical analysis remain qualitatively similar when the new flexibility proxy is used.

Another potential issue with our proxies for financial flexibility relates to the use of median values for classifying firms into flexible and less flexible categories. For robustness purposes, we estimate our investment and performance models again after using the 25% cut off point for the classification. Specifically, a firm is classified as flexible (less flexible)

under the leverage criterion if its leverage ratio lies in the first (fourth) quartile of the leverage distribution in the pre crisis period. Similarly, under the criterion that combines both leverage and cash holdings, a firm is characterized as flexible (less flexible) if its leverage ratio lies in the first (fourth) quartile of the leverage distribution and, also, its cash ratio lies in the fourth (first) quartile of the cash distribution in the pre crisis period. Once more the results are qualitatively similar to the ones reported so far. Specifically, flexible firms seem to be less dependent on internal resources during the crisis and, also, exhibit better performance than the others (see Panel A in Table 7 and Models 1, 4 and 7 in Table 8).

[*Insert TABLE 7 about here*]

A further issue that needs investigation is the substitutability between cash and leverage when they are considered as attributes of financial flexibility. Our analysis so far provides some insights into the substitutability between the two variables by providing separate results for the cases when only cash, only leverage and both cash and leverage are used as classification criteria. Given the recent evidence by Acharya *et al.* (2007), which suggests that cash should not be viewed as negative debt in the presence of financing frictions, there is some scope for tackling the substitutability between cash and leverage in a more formal way. To do so, we use the KZ-Index to classify firms into flexible and less flexible groups. The main advantage of the KZ-Index is that it assigns different weights to the cash and leverage variables.[23] Additionally, the index is composed of variables such as cash flow and dividends and, therefore, it explicitly controls for the possibility that flexibility can be established through dividend policy (e.g. by reducing the payout ratio and retaining more earnings) (see Lee *et al.*, 2011).[24] Firms are classified as flexible (less flexible) if they exhibit a small (large) KZ-Score based on median values. Such classification scheme seems

[23] Following Almeida *et al.* (2004) the KZ index is calculated using the following equation:
$KZ - Index = -1.002 * CashFlow + 0.283 * Q + 3.139 * Leverage - 39.368 * Dividends - 1.315 * CashHoldings$

[24] Bhaduri (2008) further supports this argument by showing that low dividend payout firms are more likely to be confronted with financial constraints, when compared to their respective counterparts.

reasonable given that firms assigned to the flexible group (low KZ firms) exhibit a lower leverage ratio, a higher cash holdings ratio and, also, pay higher dividends and generate more earnings (cash flow). These are among the main characteristics of flexible firms as classified by our earlier criteria (see descriptive analysis in Table 2). Based on such classifications, we repeat the estimation of the investment and performance equations. As shown in Panel B of Table 7, the cash flow sensitivity of investment is positive and statistically significant only in the case of less flexible firms. Also, consistent with our previous findings, the proxy for financial flexibility retains a positive and statistically significant coefficient in Models 2, 5 and 8 of Table 8.

[*Insert TABLE 8 about here*]

A final issue that we tackle in our analysis is that of persistence. The financial flexibility proxies used so far are based on average firm level information for cash and leverage over the period 1994-1996 (pre crisis period). However, it is possible that cash and leverage distributions evolve over time in a way that firms may be erroneously assigned to a specific group. For example, a particularly high leverage ratio for a firm in 1994 may contribute to a retentively high average leverage ratio for the 1994-1996 period, independently of whether the firm may have significantly dropped its leverage ratio close to the industry average in years 1995 and 1996 (just before the crisis). Although we partially control for this problem by using different cut off points (i.e. median values vs. 25% cut off points), an additional task is put forward to take into account the issue of persistence. Specifically, we classify firms into flexible (less flexible) if they display both low (high) leverage and high (low) cash for three consecutive years over the period 1994-1996. We then estimate the investment and performance equations again. Similar to the previous cases, the investment results do not differ materially from those reported so far. The performance results, however, are clearly weaker with the flexibility proxy being statistically significant only in Model 6 of Table 8. This finding is partly explained by the fact that the classification

criterion that is based on persistence is a rather strict criterion for classifying firms into different groups, leading most of them to be assigned to the less flexible group.

6. Conclusions

Using a large sample of firms from five East Asian countries, we investigate the impact of financial flexibility on corporate investment and performance over the period 1994-2006. We identify financially flexible firms on the basis of their past cash and leverage policies using several criteria. Our findings strongly suggest that financial flexibility appears to be an important determinant of investment, mainly during the 1997-1998 crisis.

Analytically, we provide evidence that leverage is the most important component of financial flexibility. While a low leverage policy at the onset of the crisis appears to be particularly useful in financing investment expenditures during the crisis, it seems that most of our firms in our sample do not spend cash reserves to fund future growth but, rather, use it as a form of insurance against financial distress. We find that financially flexible firms invest more than less flexible firms during the crisis. Moreover, the sensitivity of the investment expenditures of flexible firms to the availability of internal funds is lower than that of the less flexible firms. Interestingly, our analysis for the post crisis period does not reveal any significant differentials in investment behaviour of flexible and inflexible firms. Finally, the current analysis also suggests that, during abnormal periods of the economic cycle, traditional measures of financial constraints (e.g. business group affiliation, size, age and dividend payouts) are less useful predictors of corporate investment behavior than the simple flexibility proxies utilized in this study.

Overall, our results complement and extend those of previous studies on corporate investment and performance. In particular, we present strong evidence that less flexible firms are more vulnerable to sudden drops in their cash flows. More importantly, we find that while the leverage policy and to a lesser extent the cash holding policy of firms are decisive

determinants of financial flexibility, business group affiliation of firms play a modest role in maintaining corporate investment at a satisfactory level during the crisis period. These findings reduce the ambiguity in the use of the term *financial flexibility* in the literature, as mentioned in a recent survey by Byoun (2011). In particular, if financial flexibility is defined as the ability of a firm to access and restructure its financing to cope with uncertain future contingencies, the group of firms with the highest ability to do so is that of relatively low leverage and high cash. Additionally, our findings complement the ones of Duchin *et al.,* (2010), who focus on the subprime mortgage credit crisis and observe substantial declines in the investment of firms with low cash reserves and high short-term debt. Finally, our analysis builds on existing studies that analyze the factors that affect corporate performance during the East Asian crisis (see, e.g., Johnson *et. al*, 2000; Mitton, 2002; Fisman, 2002; Lemmon and Lins, 2003; Lins, 2003). In particular, our paper presents overwhelming evidence that in addition to several corporate governance characteristics, financial flexibility constitutes an important driver of firm performance during economic downturns.

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List of Tables

Table 1
Descriptive statistics for the whole sample

This table presents descriptive statistics for the whole sample of 1,068 firms. Pre crisis period (Panel A) includes the years 1994, 1995 and 1996, crisis period (Panel B) includes the years 1997 and 1998 and post crisis period (Panel C) includes the years from 1999 to 2006. *Investment* is measured as the ratio of capital expenditures to total assets. *CFLOW* is the sum of earnings before interest, tax and depreciation over total assets. *MTB* is the ratio of the book value of total assets minus the book value of equity plus the market value of equity to the book value of assets. *Size* is USD currency adjusted total assets. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and equivalents to total assets. *Net Debt* is the difference between *Leverage* and *Cash* ratios. *Dividend* is the ratio of total dividends to total assets. *Tangibility* is measured as the ratio of tangible assets to total assets. Finally, *Short Debt* is the ratio of short term debt to total debt.

	Panel A: Pre Crisis Period				*Panel B: Crisis Period*				*Panel C: Post Crisis Period*			
	Mean	Median	Min.	Max.	Mean	Median	Min.	Max.	Mean	Median	Min.	Max.
Investment	0.0810	0.0635	0.000	0.5903	0.0415	0.0258	0	0.3463	0.0411	0.0247	0	0.4601
CFLOW	0.0999	0.0913	-0.1277	0.7615	0.0691	0.0642	-0.6298	0.5199	0.0702	0.0656	-0.4969	0.6217
MTB	1.5676	1.2244	0.2109	15.289	1.1864	0.9505	0.1726	11.984	1.1389	0.9389	0.0606	14.682
Size	12.439	12.298	7.9083	17.492	12.329	12.253	7.1736	17.706	12.472	12.343	7.276	18.423
Leverage	0.2925	0.2831	0	0.8544	0.3467	0.3237	0	1	0.2557	0.2349	0	1
Cash	0.1115	0.0731	0.0002	0.7479	0.1114	0.0720	0.0004	0.8328	0.1271	0.0881	0	1
Net Debt	0.1810	0.2110	-0.0002	0.1065	0.2353	0.2517	-0.0004	0.1672	0.1279	0.1346	-0.0001	0.9839
Dividend	0.0201	0.0126	0	0.2727	0.0127	0.0021	0	0.6064	0.0179	0.0051	0	0.8781
Tangibility	0.4087	0.3942	0	0.9653	0.4391	0.4294	0	1.1672	0.4112	0.4006	0	0.9969
Short Debt	0.5909	0.5935	0	1	0.6041	0.6071	0	1	0.5630	0.5553	0	1

Table 2
Descriptive statistics for different subgroups of firms

This table presents descriptive statistics for the following subgroups of firms (all classifications are based on median values): high leverage (HL) firms; low leverage (LL) firms; high cash (HC) firms; low cash (LC) firms; low leverage and high cash (LL-HC) firms; high leverage and low cash (HL-LC) firms. Pre crisis period (Panel A) includes the years 1994, 1995 and 1996, crisis period (Panel B) includes the years 1997 and 1998 and post crisis period (Panel C) includes the years from 1999 to 2006. *Investment* is measured as the ratio of capital expenditures to total assets. *CFLOW* is sum of earnings before interest, tax and depreciation over total assets. *MTB* is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. *Size* is USD currency adjusted total assets. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and equivalents to total assets. *Net Debt* is the difference between *Leverage* and *Cash* ratios. *Dividend* is the ratio of total dividends to total assets. *Tangibility* is measured as the ratio of tangible assets to total assets. Finally, *Short Debt* is ratio of short term debt to total debt.

Panel A: Pre Crisis Period

	(A.1)			(A.2)			(A.3)		
	HL firms	LL firms	*t-test*	HC firms	LC firms	*t-test*	LL-HC firms	HL-LC firms	*t-test*
Investment	0.0856	0.0764	-2.17**	0.0803	0.0818	-0.31	0.0752	0.0842	-1.71*
CFLOW	0.0834	0.1160	7.45***	0.1081	0.0916	3.70***	0.1230	0.0808	6.92***
MTB	1.4358	1.6998	3.73***	1.6885	1.4488	3.37***	1.8486	1.4182	4.39***
Size	12.656	12.227	-4.88***	12.432	12.442	-0.11	12.190	12.572	-3.29***
Leverage	0.4249	0.1605	-33.76***	0.2562	0.3283	-6.52***	0.1451	0.4332	-27.57***
Cash	0.0852	0.1379	8.18***	0.1848	0.0383	29.96***	0.2079	0.0374	24.73***
Net Debt	0.3397	0.0226	-28.02***	0.0714	0.2901	-16.40***	-0.0628	0.3958	-32.45***
Dividend	0.0127	0.0272	10.17***	0.0230	0.0170	4.09***	0.0290	0.0113	9.09***
Tangibility	0.4137	0.4040	-0.72	0.3574	0.4609	-8.00***	0.3501	0.4474	-5.98***
Short Debt	0.5483	0.6355	5.18***	0.5859	0.5961	-0.60	0.6328	0.5652	3.11***

Panel B: Crisis Period

	(B.1)			(B.2)			(B.3)		
	HL firms	LL firms	*t-test*	HC firms	LC firms	*t-test*	LL-HC firms	HL-LC Firms	*t-test*
Investment	0.0373	0.0456	2.89**	0.0433	0.0397	1.26	0.0467	0.0365	2.70***
CFLOW	0.0553	0.0831	4.54***	0.0765	0.0617	2.40**	0.0871	0.0513	4.57***
MTB	1.1621	1.2033	0.66	1.2495	1.1228	2.02**	1.3091	1.1580	1.65
Size	12.530	12.139	-4.05***	12.370	12.287	0.85	12.167	12.441	-2.17**
Leverage	0.4630	0.2307	-17.65***	0.3115	0.3823	-4.77***	0.2057	0.4649	-15.44**
Cash	0.0876	0.1350	7.05***	0.1513	0.0706	12.64***	0.1732	0.0626	13.14***
Net Debt	0.3754	0.1020	-16.90***	0.1602	0.3117	-8.29***	0.0325	0.4023	-17.47***
Dividend	0.0059	0.0194	7.34***	0.0155	0.0098	3.03***	0.0213	0.0050	7.95***
Tangibility	0.4456	0.4323	-0.98	0.4032	0.4764	-5.44	0.3925	0.4666	-4.25***
Short Debt	0.5803	0.6275	2.58**	0.6110	0.5975	0.73	0.6298	0.5756	2.23**

Table 2 (continued)
Descriptive statistics for different subgroups of firms

Panel C: Post Crisis Period

	(C.1)			(C.2)			(C.3)		
	HL firms	LL firms	*t-test*	HC firms	LC firms	*t-test*	LL-HC firms	HL-LC Firms	*t-test*
Investment	0.0427	0.0401	2.43**	0.0431	0.0390	3.77***	0.0419	0.0411	0.61
CFLOW	0.0606	0.0826	-10.77***	0.0833	0.0572	12.70***	0.0945	0.0566	14.77***
MTB	1.0864	1.1468	-3.34***	1.2406	1.0376	10.68***	1.2603	1.0461	8.92***
Size	12.745	12.247	13.84***	12.464	12.478	-0.38	12.215	12.628	-9.54***
Leverage	0.4198	0.0916	120.1***	0.1934	0.3186	-29.39***	0.0774	0.4328	-106.6***
Cash	0.0856	0.1699	-31.58***	0.2156	0.0386	87.20***	0.2422	0.0374	72.76***
Net Debt	0.3342	-0.0784	100.2***	-0.0224	0.2798	-58.74***	-0.1647	0.3954	-119.5***
Dividend	0.0086	0.0278	-21.31***	0.0250	0.0107	15.90***	0.0336	0.0074	20.82***
Tangibility	0.4496	0.370	16.23***	0.3416	0.4808	-29.61***	0.3201	0.4908	-30.10***
Short Debt	0.5034	0.6339	-17.75***	0.5759	0.5511	3.32***	0.6496	0.5217	13.84***

Table 3
Percentage changes of key variables from pre crisis to crisis period for different subgroups of firms

This table presents percentage changes of key variables from pre crisis to crisis period for the following subgroups of firms (all classifications are based on median values): high leverage (HL) firms; low leverage (LL) firms; high cash (HC) firms; low cash (LC) firms; low leverage and high cash (LL-HC) firms; high leverage and low cash (HL-LC) firms. Pre crisis period (Panel A) includes the years 1994, 1995 and 1996, crisis period (Panel B) includes the years 1997 and 1998 and post crisis period (Panel C) includes the years from 1999 to 2006. *Investment* is measured as the ratio of capital expenditures to total assets. *CFLOW* is the sum of earnings before interest, tax and depreciation over total assets. *MTB* is the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. *Size* is USD currency adjusted total assets. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and equivalents to total assets. *Net Debt* is the difference between *Leverage* and *Cash* ratios. *Dividend* is the ratio of dividends to total assets. *Tangibility* is measured as the ratio of tangible assets to total assets. *Short Debt* is ratio of short term debt to total debt. Finally, Δ symbolises the change, while ↑ and ↓ denote increase and decrease respectively.

Panel A: Changes from Pre Crisis to Crisis Period

	HL firms	LL firms	HC firms	LC firms	LL-HC firms	HL-LC firms
Δ in Investment	56.43 ↓	40.31 ↓	46.08 ↓	51.47 ↓	37.90 ↓	56.65 ↓
Δ in CFLOW	33.69 ↓	28.36 ↓	29.23 ↓	32.64 ↓	29.19 ↓	36.51 ↓
Δ in MTB	19.06 ↓	29.21 ↓	26.00 ↓	13.76 ↓	29.18 ↓	18.35 ↓
Δ in Size	1.00 ↓	0.72 ↓	0.50 ↓	1.25 ↓	0.19 ↓	1.04 ↓
Δ in Leverage	8.97 ↑	43.74 ↑	21.59 ↑	16.45 ↑	41.76 ↑	7.32 ↑
Δ in Cash	2.82 ↑	2.10 ↓	18.13 ↓	84.33 ↑	16.69 ↓	67.38↑
Δ in Net Debt	10.51 ↑	351.3 ↑	124.4 ↑	7.41 ↑	152.8 ↑	1.64 ↑
Δ in Dividend	53.54 ↓	28.68 ↓	32.61 ↓	42.35 ↓	26.55 ↓	55.75 ↓
Δ in Tangibility	7.71 ↑	7.00 ↑	12.81 ↑	3.36 ↑	12.11 ↑	4.29 ↑
Δ in Short Debt	5.84 ↑	1.26 ↓	4.28 ↑	0.23 ↑	0.47 ↓	1.84 ↑

Panel B: Changes from Crisis to Post Crisis Period

Δ in Investment	14.48 ↑	12.06 ↓	0.46 ↓	1.76 ↓	10.28 ↓	12.60 ↑
Δ in CFLOW	9.58 ↑	0.60 ↓	8.89 ↑	7.29 ↓	8.50 ↑	10.33 ↑
Δ in MTB	6.5 1	4.70 ↓	0.71 ↓	7.59 ↓	3.73 ↓	9.66 ↓
Δ in Size	1.72 ↑	0.89 ↑	0.76 ↑	1.55 ↑	0.39 ↑	1.50 ↑
Δ in Leverage	9.33 ↓	60.29 ↓	37.9 ↓	16.66 ↓	62.37 ↓	6.90 ↓
Δ in Cash	2.28 ↓	25.85 ↑	42.50 ↑	45.33 ↓	39.84 ↑	40.26 ↓
Δ in Net Debt	10.97 ↓	176.86 ↓	113.98↓	10.23 ↓	606.77 ↓	1.72 ↓
Δ in Dividend	45.76 ↑	43.30 ↑	61.29 ↑	9.18 ↑	57.75 ↑	48.00 ↑
Δ in Tangibility	0.90 ↑	14.41 ↓	15.28 ↓	0.92 ↑	18.45 ↓	5.19 ↑
Δ in Short Debt	13.25 ↓	1.02 ↑	5.74 ↓	7.77 ↓	3.14 ↑	9.36 ↓

Table 4
The cash flow sensitivity of investment across different subgroups of firms

This table shows the cash flow sensitivity of investment for the following subgroups of firms: ALL firms, high leverage (HL) firms; low leverage (LL) firms; high cash (HC) firms; low cash (LC) firms; low leverage and high cash (LL-HC FIRMS I) firms; high leverage and low cash (HL-LC FIRMS I) firms; low leverage and high cash firms with positive cash flows (LL-HC FIRMS II); high leverage and low cash firms with positive cash flows (HL-LC FIRMS II). *I (investment)* is measured as the ratio of capital expenditures to lagged total assets. *CFLOW* is sum of earnings before interest, tax and depreciation over total assets. *MTB* is decomposed into two parts - a fundamental component, MTB^f, and a residual component, MTB^r (see Section 4 for details). *t*-statistic values are reported in parentheses. ***, ** and * indicate coefficient is significant at the 1%, 5% and 10% level respectively.

	PANEL A: PRE CRISIS PERIOD						PANEL B: CRISIS PERIOD					
Dependent Variable	*Independent Variables*						*Independent Variables*					
I (investment)	CFLOW	MTB^f	MTB^r	Constant	R^2	N	CFLOW	MTB^f	MTB^r	Constant	R^2	N
1) ALL FIRMS	0.289	0.002	0.002	0.095	0.07	1504	0.087	0.031	0.030	0.009	0.07	2035
	(6.49)***	(0.80)	(0.87)	(8.51)***			(4.32)***	(8.00)***	(9.19)***	(1.29)		
2) HL FIRMS	0.273	0.149	0.013	-0.168	0.08	724	0.114	0.001	0.017	0.027	0.05	1007
	(3.33)***	(2.83)***	(2.32)**	(-1.71)*			(4.47)***	(0.06)	(2.82)***	(0.058)		
3) LL FIRMS	0.369	-0.001	-0.001	0.093	0.16	778	0.038	0.038	0.037	0.005	0.09	1024
	(7.61)***	(-0.44)	(-0.28)	(8.06)***			(1.17)	(8.14)***	(8.98)***	(0.45)		
4) HC FIRMS	0.275	0.0001	0.0001	0.081	0.04	687	0.090	0.039	0.037	-0.018	0.10	1009
	(3.90)***	(0.03)	(0.03)	(4.36)***			(2.92)**	(8.29)***	(9.04)***	(-1.92)*		
5) LC FIRMS	0.281	0.016	0.007	0.055	0.11	815	0.081	0.001	0.017	0.029	0.04	1022
	(4.99)***	(1.50)	(2.15)**	(3.12)***			(3.04)***	(0.05)	(3.01)***	(1.20)		
6) LL-HC FIRMS I	0.348	-0.003	-0.003	0.078	0.13	380	0.035	0.048	0.046	0.005	0.13	590
	(5.25)***	(-0.76)	(-0.67)	(4.00)***			(0.76)	(8.29)***	(8.97)***	(0.32)		
7) HL-LC FIRMS I	0.250	0.155	0.009	-0.133	0.10	417	0.101	0.003	0.030	0.059	0.05	586
	(2.89)***	(2.36)**	(1.68)*	(-1.40)			(2.92)***	(0.14).	(3.24)***	(0.60)		
8) LL-HC FIRMS II	0.377	-0.005	-0.005	0.086	0.11	362	0.022	0.184	0.042	-0.196	0.14	541
	(4.80)***	(-1.32)	(-1.23)	(5.18)***			(0.41)	(3.80)***	(7.64)***	(-2.99)***		
9) HL-LC FIRMS II	0.267	0.161	0.007	-0.205	0.10	405	0.126	0.178	0.029	-0.233	0.05	508
	(2.88)**	(2.36)**	(1.20)	(-1.60)			(2.73)***	(3.27)***	(2.58)***	(-3.06)***		

Table 4 (continued)
The cash flow sensitivity of investment across different subgroups of firms

	PANEL C: POST CRISIS PERIOD					
Dependent Variable	*Independent Variables*					
I (investment)	CFLOW	MTB^f	MTB^r	Constant	R^2	N
1) ALL FIRMS	0.129	0.063	0.008	-2.079	0.17	6905
	(17.21)***	(6.58)***	(6.25)***	(-3.81)***		
2) HL FIRMS	0.137	0.080	0.009	-4.193	0.18	3434
	(12.60)***	(5.87)***	(4.46)***	(-5.35)***		
3) LL FIRMS	0.126	0.061	0.008	0.154	0.18	3367
	(11.27)***	(4.26)***	(4.71)***	(0.19)		
4) HC FIRMS	0.117	0.059	0.007	-0.911	0.14	3417
	(11.07)***	(4.19)***	(4.04)***	(-1.10)		
5) LC FIRMS	0.149	0.067	0.008	-3.728	0.21	3488
	(14.29)***	(5.14)***	(4.49)***	(-4.41)***		
6) LL-HC FIRMS I	0.111	0.064	0.007	0.988	0.14	2146
	(7.93)***	(3.52)***	(3.45)***	(0.94)		
7) HL-LC FIRMS I	0.1445	0.084	0.009	-4.191	0.19	2192
	(10.41)***	(5.05)***	(3.44)***	(-4.31)***		
8) LL-HC FIRMS II	0.150	0.104	0.006	0.369	0.14	1908
	(8.22)***	(4.60)***	(2.35)**	(0.31)		
9) HL-LC FIRMS II	0.247	0.103	0.004	-5.539	0.18	1800
	(11.20)***	(4.86)***	(1.36)	(-4.77)***		

Table 5
The cash flow sensitivity of investment across different subgroups of firms: Evidence from the 1997-1998 crisis

This table shows the cash flow sensitivity of investment for different subgroups of firms. *I (investment)* is measured as the ratio of capital expenditures to lagged total assets. *CFLOW* is sum of earnings before interest, tax and depreciation over total assets. *MTB* is decomposed into two parts - a fundamental component, MTB^f, and a residual component, MTB^r (see Section 4 for details). BG_Firms are the firms with a business group affiliation just before the start of the crisis. Non BG_Firms are the firms without a business group affiliation just before the start of the crisis. *LL-HC FIRMS* are the firms that combine low leverage and high cash. *HL-LC FIRMS* are the firms that combine high leverage and low cash. *t*-statistic values are reported in parentheses. ***, ** and * indicate coefficient is significant at the 1%, 5% and 10% level respectively.

	CRISIS PERIOD (1997-1998)					
Dependent Variable	*Independent Variables*					
I (investment)	CFLOW	MTB^f	MTB^r	Constant	R^2	N
Panel A						
1) BG_Firms	0.073	0.062	0.040	-0.027	0.14	934
	(2.37)**	(2.70)***	(9.49)***	(-0.66)		
2) Non BG_Firms	0.142	0.044	0.010	-0.020	0.11	539
	(4.29)***	(1.26)	(1.61)	(-4.51)***		
Panel B						
3) BG_Firms & LL-HC firms	-0.007	0.178	0.055	-0.205	0.26	252
	(-0.10)	(3.27)***	(7.82)***	(2.76)***		
4) Non BG_Firms & LL-HC firms	0.124	0.045	0.008	-0.009	0.10	167
	(1.97)*	(0.66)	(0.69)	(-0.10)		
Panel C						
5) BG_Firms & HL-LC firms	0.153	-0.005	0.037	0.040	0.12	278
	(3.33)***	(-0.17)	(3.42)***	(1.01)		
6) Non BG_Firms & HL-LC firms	0.166	0.126	0.045	-0.123	0.17	131
	(2.98)***	(1.67)*	(2.93)***	(-1.27)		

Table 6
Performance of firms during the crisis period

This table presents the results from our performance models. *Tobin's Q* is measured as the ratio of book value of total assets minus the book value of equity plus the market value of equity to book value of assets. *Interest Coverage Ratio* is measured as earnings before interest and tax dividend by interest expense. *Operating Margin* is obtained by dividing operating income to sales. In models 1, 3 and 5 (2, 4 and 6) *Flexibility* is a dummy variable that takes the value of 1 if the firms belongs to the LL (or LL-HC) group and zero otherwise at the onset of the crisis. *Investment* is measured as the ratio of investment in fixed assets to total assets. *Business Group* is a dummy variable that takes the value of unity if the firm belongs to a business group and zero otherwise. *Pyramid* is a dummy variable indicating whether the firm is controlled through a pyramid structure. *Financial Owner* is a dummy variable indicating whether the largest shareholder is a widely held financial institution or not. *Control vs. C.F. Rights* is a dummy variable that takes the value of unity if control rights of the largest owner exceed cash flow rights and zero otherwise. *Managerial Ownership* is a dummy variable if the CEO, the board chairman or vice chairman are part of the controlling owner. *Rule of Law* is a score that ranges from 0 to 11, lower scores corresponding to less tradition to law and order. Finally, *Size* is the USD currency adjusted total assets. *t*-statistic values are reported in parentheses. ***, ** and * indicate coefficient is significant at the 1%, 5% and 10% level respectively.

	Dependent Variable= Tobin'Q		*Dependent Variable= Interest Coverage Ratio*		*Dependent Variable= Operating Margin*	
Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Flexibility (LL)	0.140 (2.13)**	-	2.123 (8.02)***	-	0.023 (2.43)**	-
Flexibility (LL-HC)	-	0.253 (3.47)***	-	2.369 (8.00)***	-	0.018 (1.68)*
Investment	0.566 (1.13)	0.549 (1.10)	5.195 (2.89)***	5.266 (2.93)***	0.134 (2.28)**	0.136 (2.31)**
Business Group	0.159 (2.05)**	0.167 (2.17)**	0.718 (2.30)**	0.822 (2.63)***	0.022 (1.95)*	0.024 (2.04)**
Pyramid	-0.012 (-0.10)	-0.010 (-0.08)	-1.181 (-2.24)**	-1.208 (-2.29)**	-0.033 (-1.69)*	-0.033 (-1.72)*
Financial Owner	0.025 (0.15)	0.022 (0.13)	0.216 (0.32)	0.161 (0.24)	-0.013 (-0.55)	-0.014 (-0.58)
Control vs. C.F. Rights	-0.093 (-0.74)	-0.104 (-0.84)	0.511 (1.01)	0.456 (0.90)	0.018 (0.98)	0.018 (0.98)
Managerial Ownership	-0.524 (-0.74)	0.009 (0.11)	-0.481 (-1.45)	-0.524 (-1.59)	-0.026 (-2.17)**	-0.007 (-2.17)**
Rule of Law	0.104 (2.77)***	0.106 (2.93)***	0.785 (5.22)***	0.944 (6.48)***	-0.010 (-1.46)	-0.008 (-1.45)
Size	0.003 (0.16)	0.003 (0.14)	-0.327 (-3.65)***	-0.327 (-3.65)***	0.015 (4.52)***	0.014 (4.27)***
Number of Observations	1,010	1,010	1,010	1,010	1,010	1,010
Adjusted R^2	0.037	0.048	0.1935	0.1935	0.103	0.098

Table 7
The cash flow sensitivity of investment across different flexibility subgroups

This table shows the cash flow sensitivity of investment for different flexibility subgroups of firms. In *Panel A*, a firm is characterized as LL-HC (HL-LC) if its leverage ratio lies in the first (fourth) quartile of the leverage distribution, and, also its cash ratio lies in the fourth (first) quartile of the cash distribution. In *Panel B*, the classification of the firms is based on the median values of the KZ-Index which is calculated as $-1.002 * CashFlow + 0.283 * Q + 3.139 * Leverage - 39.368 * Dividends - 1.315 * CashHolding$. *Flexible Firms (Inflexible Firms)* are the ones that exhibit a small (large) KZ-score (based on median values). Panel C focuses on the persistency of firms in adopting and retaining a specific policy. Specifically, a firm is called as LL-HC (HL-LC) if it displays both low (high) leverage and high (low) cash for the three consecutive years of 1994, 1995 and 1996. *I (investment)* is measured as the ratio of capital expenditures to lagged total assets. *CFLOW* is sum of earnings before interest, tax and depreciation over total assets. *MTB* is decomposed into two parts - a fundamental component, MTB^f, and a residual component, MTB^r (see Section 4 for details). *t*-statistic values are reported in parentheses. ***, ** and * indicate coefficient is significant at the 1%, 5% and 10% level respectively.

Dependent Variable	*Independent Variables*					
I (investment)	CFLOW	MTB^f	MTB^r	Constant	R^2	N
Panel A: 25th & 75th Percentiles						
1) LL-HC FIRMS	-0.072	0.178	0.058	-0.119	0.25	218
	(-0.88)	(2.89)***	(7.45)***	(-1.79)*		
2) HL-LC FIRMS	0.157	0.154	0.009	-0.129	0.08	177
	(2.37)**	(1.66)*	(0.47)	(-1.35)		
Panel B: KZ-Index						
1) FLEXIBLE FIRMS	0.050	0.040	0.038	0.014	0.09	988
	(1.40)	(7.86)***	(8.58)***	(1.02)		
2) LESS FLEXIBLE FIRMS	0.095	0.003	0.020	0.047	0.05	967
	(3.80)***	(0.16)	(3.24)***	(2.77)***		
Panel C: Persistency						
1) LL-HC FIRMS	0.079	0.031	0.031	0.029	0.25	139
	(1.33)	(4.05)***	(4.05)***	(2.08)**		
2) HL-LC FIRMS	0.081	0.055	0.004	0.002	0.06	876
	(3.00)***	(2.00)**	(0.75)	(0.07)		

Table 8
Performance of firms during the crisis period across different flexibility subgroups

This table presents the results from the performance models as estimated across the different flexibility subgroups of firms. In models 1, 4, 7*;* LL-HC (*25th & 75th Percentiles*) is a dummy variable that takes the value of 1 for firms that have their leverage ratio lying in the first quartile of the leverage distribution, and, also their cash ratio lying in the fourth quartile of the cash distribution, and zero otherwise. In models 2, 5, 8; LL- HC (*Persistence*) is a dummy variable that takes the value of 1 for firms that fit into the category of low leverage and high cash for the three consecutive years of 1994, 1995 and 1996, and zero otherwise. In models 3, 6, 9; Flexibility (KZ-Index*)* is a dummy variable that takes the value of 1 for firms that exhibit a below median KZ-score, which is measured as -1.002^{*} *CFLOW* $+0.283^{*}Q + 3.139$ **Leverage* $- 39.368^{*}$*Dividends* $- 1.315^{*}$*CashHolding,* and zero otherwise. Analytical definitions for the variables *Tobin's Q*, *Interest Coverage Ratio, Operating Margin, Investment, Business Group, Financial Owner, Control vs. C.F. Rights*, *Managerial Ownership*, *Rule of Law* and *Size* are provided in Table 6. *t*-statistic values are reported in parentheses. ***, ** and * indicate coefficient is significant at the 1%, 5% and 10% level respectively.

	Dependent Variable: Tobin's Q			*Dependent Variable: Interest Coverage Ratio*			*Dependent Variable: Operating Margin*		
Independent Variables	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)	Model (7)	Model (8)	Model (9)
LL- HC (*25th & 75th Percentiles*)	0.432	-	-	3.417	-	-	0.042	-	-
	(4.01)***			(7.76)***			(2.62)***		
LL- HC (*Persistence*)	-	-	0.187	-	-	2.142	-	-	-0.006
			(1.48)			(4.03)***			(-0.31)
Flexibility (KZ-Index)	-	0.121	-	-	2.882	-	-	0.045	-
		(1.75)*			(10.40)***			(4.25)***	
Investment	0.564	0.600	0.605	5.408	5.130	5.375	0.136	0.133	0.140
	(1.13)	(1.21)	(1.20)	(3.00)***	(2.89)***	(2.94)***	(2.31)**	(2.22)**	(2.38)**
Business Group	0.151	0.147	0.160	0.698	0.864	0.746	0.022	0.024	0.023
	(1.97)**	(1.98)**	(2.05)**	(2.23)**	(2.88)***	(2.28)**	(1.92)*	(2.11)**	(2.03)**
Pyramid	-0.018	0.014	-0.030	-1.289	-1.264	-1.417	-0.034	-0.034	-0.034
	(-0.14)	(0.11)	(-0.23)	(-2.44)**	(-2.53)**	(-2.57)**	(-1.75)*	(-1.77)*	(-1.75)*
Financial Owner	0.047	0.043	0.008	0.358	0.439	0.002	-0.012	-0.011	-0.014
	(0.29)	(0.27)	(0.05)	(0.53)	(0.69)	(0.00)	(-0.48)	(-0.45)	(-0.56)
Control vs. C.F. Rights	-0.062	-0.075	-0.081	0.826	0.636	0.691	0.022	0.018	0.020
	(-0.50)	(-0.63)	(-0.64)	(1.62)	(1.32)	(1.30)	(1.18)	(0.99)	(1.06)
Managerial Ownership	0.001	-0.045	-0.012	-0.632	-0.542	-0.705	-0.028	-0.028	-0.030
	(0.01)	(-0.58)	(-0.15)	(-1.91)*	(-1.72)*	(-2.05)**	(-2.30)**	(-2.35)**	(-2.47)**
Rule of Law	0.102	0.123	0.128	0.947	1.008	1.149	-0.009	-0.008	-0.006
	(2.83)***	(3.56)***	(3.54)***	(6.48)***	(7.32)***	(7.69)***	(-1.64)	(-1.48)	(-1.15)
Size	0.008	0.001	-0.006	-0.365	-0.335	-0.476	0.014	0.015	0.013
	(0.35)	(0.04)	(-0.27)	(-4.10)***	(-3.94)***	(-5.20)***	(4.48)***	(4.65)***	(4.08)***
Number of Observations	1,010	986	1,010	1,010	986	1,010	1,010	986	1,010
Adjusted R^2	0.053	0.037	0.034	0.190	0.250	0.130	0.104	0.127	0.094