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Evidence from a Micro Study

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The Asian Financial Crisis, Uphill Flow of Capital, and Global Imbalances: Evidence from A Micro Study

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Abstract

This study assesses the role of the Asian financial crisis of the late 1990s in the emergence and persistence of the large current account surpluses across non-China emerging Asia, which have been a significant counterpart to the U.S. current account deficit. Using panel data encompassing nearly 3,750 firms, we trace the current account surpluses to a marked and broad-based decline in corporate expenditures on fixed investment in the aftermath of the crisis that cuts across a wide spectrum of countries, industries, and firms. The lower corporate spending in turn depressed aggregate investment rates, widened the saving-investment gap, and allowed the region to turn into a net exporter of capital. We then consider the factors behind this reduction in postcrisis corporate investment. While weaker firm-level fundamentals in the postcrisis period seem to explain part of the drop in investment rates, ongoing re-structuring owing to large debts accumulated and excess investment undertaken in the run-up to the crisis has been the main source of restraint postcrisis corporate investment. The results suggest that even after a decade, the effect of the financial crisis is still affecting corporate investment decisions in emerging Asia, and that as the restructuring completes its course, investment rates will likely rise to contribute to a gradual reduction in the region's current account surpluses.

Keywords: Global Imbalance, Emerging Asia, Current Account, Investment
JEL classifications: F3, F21

1 Introduction

In the aftermath of the East Asian financial crisis of 1997 and 1998, the ratio of aggregate investment to Gross Domestic Product (GDP) in emerging Asia excluding China fell from an average of around 33 percent to about 25 percent, and has remained at about this level in subsequent years. At the same time, aggregate savings as percent of GDP in these countries have declined only slightly, leading to a swing in the current account balances from slight deficits in the period leading up to the crisis to substantial surpluses in the postcrisis era. These surpluses enabled the region to become an exporter capital in defiance of theory suggesting that capital should flow from capital-abundant to capital-scarce countries where returns on capital are higher. Indeed, data on the patterns of global current account imbalances indicate that the wider saving-investment gap for the region has been a significant counterpart to the large current account deficits in the United States since 1997, suggesting a possible role of the Asian financial crisis in the emergence of global imbalances.

Global imbalances, the growing current account deficit of the United States and the corresponding current account surpluses and accumulation of foreign exchange reserves in others countries–mainly in East Asia and, more recently, in oil-exporting economies–have been portrayed as perhaps the most important risk to the global economy. Chief among the risks is the possibility that the imbalances could unwind abruptly, with sharp contractions in assets prices (including the U.S. dollar), paving the way for a global financial and economic crisis. Concerns of this nature have been voiced by Obstfeld and Rogoff [2000], Blanchard et al. [2005], Mussa [2004], and others.[1] The quest to understand the causes of these imbalances and how they might unwind has generated a considerable amount of research that has tended to emphasize four broad explanations: differences in stages of demographic transitions (Feroli, 2003; Ferrero, 2002), differences in economic growth (Engel and Rogers, 2005), heterogeneity in stages of financial market development (Caballero et. al, 2006; Mendoza et al., 2007), and emerging market financial crises (Bernanke, 2005; Kamin and Gruber, 2007).[2] The contribution of this paper is in spirit of the fourth explanation.

Bernanke [2005] was among the early advocates of the view that financial crises in emerging markets contributed to the emergence of global imbalances. He argues that the global imbalances owe to the availability of excess saving (or a savings glut) from overseas that has financed the U.S. current account deficit. Bernanke notes that the global excess saving has mainly originated

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[1] Additional references include Mann [2004], and Roubini and Setser [2004].
[2] See also, Hubbard (2006), Prasad et al. (2006), Ju and Wei (2006), Obstfeld and Rogoff (2005) and others.

in emerging market economies, a development that he attributes to the series of financial crises, including the Asian financial crises in the 1990s. Gruber and Kamin [2007] more formally test this hypothesis for emerging Asia and confirm the predominant role of the Asian financial crisis as an explanation for the patterns of global imbalances. Using aggregate data and a panel regression model similar to the approach in Chinn and Prasad [2003], they find that none of the standard fundamental determinants of current accounts can explain either the large surpluses in emerging Asia or the large U.S. current account deficit unless the model is augmented to account for the Asian financial crisis of the late 1990s. They conclude that the Asian financial crisis played a key role in promoting current account surpluses for the economies in the region.

Our study extends this line of inquiry by attempting to uncover the mechanism that links the decade old financial crisis to the current account surpluses in non-China emerging Asia. While the link between the crisis and current account surpluses has been established by previous research, the mechanisms through which it might be occurring remain a open question. There are two main channels through which the financial crisis could have caused the region to run current account surpluses. The first (more direct) channel suggests that the postcrisis current account surpluses are the result of private optimizing behavior in the aftermath of the crisis. For example, the crisis could have disrupted financial intermediation within the economy resulting in a credit crunch or the crisis could have weakened the balances sheets of firms prompting prolonged cut backs in corporate investment spending. The second (indirect) channel suggests that the current account surpluses could be the result of shifts in government policies in the aftermath of the crisis such as keeping exchange rates undervalued to promote export-led growth, and to help accumulate foreign exchange reserves as a buffer against future crises (see for example Mann [2004]).

Disentangling the source of the postcrisis investment drag has important implications for the future adjustment of these imbalances. If the surpluses are the consequence of optimal private behavior, one might expect the imbalances between saving and investment to narrow as the effect of the financial crisis fades. If, as advocated by some studies, the surpluses are the result of deliberate government policies to promote economic development through export-led growth, they could persist for the foreseeable future. To better understand the link between the financial crisis and current account surpluses, we use a large cross-country panel data set of 3,750 publicly traded firms in eight emerging Asian countries (Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand). Using firm level data affords the unique opportunity to con-

duct a granular assessment of the determinants of investment, and to study the mechanism through which the financial crisis could be affecting investment dynamics in the region. To our knowledge, this is the first comprehensive micro study on the determinants of emerging Asia's current account surpluses and on the unique role of the financial crisis.

The results from the study confirm the predominant role of the financial crisis in generating the current account surpluses in the region since 1998. We find that the shortfall in the region's aggregate investment that generated the current account surpluses owes to a marked and broad-based decline in corporate spending on fixed investment in the aftermath of the crisis that cuts across a wide spectrum of countries, industries, and firms. We then consider the factors behind the postcrisis lower investment. The analysis indicates that weaker postcrisis fundamentals (valuation, profitability etc.) account for part of the lower corporate investment spending, but more importantly, ongoing re-structuring owing to large debts accumulated and the excess investment undertaken in the period leading up to the crisis appear to be the main factors weighing down the postcrisis investment. These findings support the hypothesis that the region's current account surpluses are a direct result of the financial crisis, and suggest that as restructuring completes its course and excess capacity wanes, investment rates could rise to reduce the current account surpluses.

The remainder of the study is structured as follows: in the next section, we review the pattern of global imbalances. In section 3, we describe the firm-level data used for the analysis. Section 4 shows the effect of the financial crisis on balance sheets of firms and corporate investment. Section 5 estimates an econometric model of firm investment and presents the results. In Section 6 we further analyze the unique role of excess debt on corporate investment, discuss the implications for the path of current account surpluses in Section 7, and conclude in Section 8.

2   Pattern of Global Imbalances

Table 1 presents the patterns of the global current account balances and highlights the importance of emerging Asia. The growing deficit in the United States (U.S.), particularly since the Asian financial crisis, mirrors the growing surplus in emerging Asia. Adjusting the current accounts to exclude oil imports and exports paints a clear picture of U.S. deficits almost totally offset by

emerging Asia's surpluses as indicated in Table 2.[3] At the eve of the crisis in 1996, emerging Asia excluding China registered a $6 billion current account deficit. The deficit reversed to a $110 billion surplus in 1998 that widened further to over $200 billion in 2005. During the same period, China's current account surplus rose from $11 billion in 1996 to $214 billion in 2005. Emerging Asia as a whole remains the single largest counterpart to the U.S. current account balance, tallying a $416 billion surplus to the U.S. $556 billion deficit, excluding oil, in 2005. This surplus is split nearly down the middle between China and the combined surplus in the *Asia-8* region: Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand. These patterns of global current account balances popularized the conundrum that developing economies have turned into net exporters of capital, which contradicts theory suggesting that capital should flow from capital-abundant advanced countries to capital-scarce developing countries where returns on capital are higher.

As indicated in Figure 1, the current account of the emerging Asia-8 economies switched from slight deficits prior to the crisis to sustained surpluses averaging over 5 percent of GDP since 1998– around the time when the U.S. current account began to deteriorate. Figure 2 shows the current account surpluses for the Asia-8 economies in terms of the excess of national saving over investment. Saving rates on average have declined only slightly on balance, but investment rates dropped sharply from an average of about 33 percent between 1990 and 1997 to 25 percent in 1998, and have stayed at around this level ever since.[4]

Figure 3 breaks down investment into private and public sector components. Nearly all of the decline in the aggregate investment rate can be attributed to private investment behavior, as the public sector's investment rate held steady at about 5 percent of GDP since 1991. The private investment rate on the other hand dropped significantly during the crisis period, from over 27 percent of GDP in 1996 to below 20 percent in 1999. The drop in the private sector investment rate (even as the saving rates remained high) accounts for the swing in the current account from deficits to surpluses among the Asia-8 economies since 1998, and appears to have played a large

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[3]We exclude oil trade because the portion of the global imbalances that owes to oil trade is well understood. It surfaced in tandem with the runup in oil prices, and all else equal, it will most likely fade if oil prices recede and/or the demand for oil falls. The portion of the imbalances from the non-oil trade on the other hand, has been around much longer, and it is much less understood.

[4]The analysis does not include China in part because it was not affected by the financial crisis, which occurred at a time when China maintained restrictions on capital flows, and in part because China's investment and saving appears to be driven by different dynamics.

role in the emergence of current account surpluses.

3 Description of Firm Level Data

For our analysis, we use an unbalanced panel of annual firm-level data from 1991 to 2005. The firm-level data were constructed using information from the Worldscope Database and include data from 3,750 publicly listed companies in eight countries that were more affected by the financial crisis. Although data are available for some firms prior to 1991, the coverage is generally quite thin prior to 1991 so we limit our sample to the period from 1991 to 2005. The number of firms available in the Worldscope dataset grows substantially over the course of the sample period, which suggests that changes in sample composition may be an important issue. For this reason, we focus exclusively on regression estimates in the within dimension and control for identifiable firm characteristics in order to limit the effect on our estimates of changing sample composition.

We construct the following variables: The investment rate (I_{it}/K_{it}), Tobin's Q (Q_{it}), the rate of cash flow (CF_{it}/K_{it}), the flow of external financing (XF_{it}/K_{it}), the debt-to-equity ratio ($Debt_{it}/Equity_{it}$), debt-to-capital ratio ($Debt_{it}/K_{it}$), and the ratio of short-term cash assets to capital ($Cash_{it}/K_{it}$). In addition, in order to control for the effect of firm size on behavior, we constructed a binary variable for each firm in each year using quartiles of their capital replacement values: Firms with capital holdings in the lowest quartile in any given year were defined as small ($D_{it}^{sm} = 1$), while firms with holdings in the largest quartile are defined as large ($D_{it}^{\text{lg}} = 1$). To remove the effect of outliers, we drop observations for any variable that are in the extreme tails (below the $1/4$ percentile and above the $99 - 3/4$ percentile) of the their cross-sectional distribution in any given year. Appendix B provides a detailed description of the Worldscope variables used and the data construction process.

4 Corporate Investment Before and After the Crisis

The guiding principle of our analysis is that aggregate variations in investment can only be explained by changes in fundamentals that cut across all firms. For this reason, we begin by looking at the systematic components of investment and fundamentals before diving into a more detailed analysis. Yearly variations in investment and each relevant fundamental can be decomposed into fixed effects, aggregate effects, group effects for small and large firms, and idiosyncratic components:

$$
\begin{bmatrix} \frac{I_{it}}{K_{it}} \\ \mathbf{x}_{it} \end{bmatrix} = \begin{bmatrix} f_i^{I/K} \\ \mathbf{f}_i^x \end{bmatrix} + \begin{bmatrix} b_S^{I/K} & b_L^{I/K} \\ \mathbf{b}_S^x & \mathbf{b}_L^x \end{bmatrix} \begin{bmatrix} D_{it}^{sm} \\ D_{it}^{\lg} \end{bmatrix} + \begin{bmatrix} a_t^{I/K} \\ \mathbf{a}_t^x \end{bmatrix} + \begin{bmatrix} e_{it}^{I/K} \\ \mathbf{e}_{it}^x \end{bmatrix}, \tag{1}
$$

where $\mathbf{x}_{it}$ is a vector of relevant investment fundamentals for i. This equation decomposes the investment rate for a given firm i into three broad components: $f_i^{I/K}$ the fixed effect, $a_t^{I/K}$ the aggregate component at $t = 1991, \ldots, 2005$, and $e_{it}^{I/K}$ the idiosyncratic component; $\mathbf{f}_i^x$, $\mathbf{a}_t^x$ and $\mathbf{e}_{it}^x$ are the corresponding components of the vector $\mathbf{x}_{it}$.[5] Dummies for small and large firms are included to control for group effects related to the relative size of the firm, which many studies have shown to affect investment behavior.[6]

We use panel regressions to estimate decompositions in (1). For each variable we normalize the year effect to be zero in our base year of 1996– the year that immediately preceded the crisis.[7] The estimated year effects in all other years capture the total effect of latent aggregate factors *relative* to their effect in this base year. Figure 4 shows the time path of our estimated year effects for the investment rate, along with aggregate effects for three commonly cited fundamentals: Tobin's Q, internal cash flow, and the rate of return on assets (ROA). The estimated time path for the firm-level investment rate–depicted in the top left panel of Figure 4–shows a distinct pattern that closely resembles the trajectory of aggregate investment shown in Figure 2. At the time of the crisis, the investment rate fell noticeably and then remained persistently low through the remainder of our sample period. The postcrisis investment rate is about 12 percentage points below the precrisis average, though the drag appears to attenuate late in the sample. The aggregate component of Q follows a pattern over our sample that broadly resembles that of investment, including a large decline during the crisis years and little sign of postcrisis recovery. This hints that less-favorable investment prospects may have played some role in the postcrisis investment slump. Return on assets (ROA) and cash flow deteriorated consistently in the years prior to crisis through 1998. Since then, both ROA and cash flow have improved steadily, peaking in 2004 at levels only somewhat below their precrisis norms.

In Figure 5, we plot the time path of estimated year effects for external funding flows and for

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[5]The firm-level fixed effect also controls for a number of effects that cannot be separately identified, including fixed firm characteistics, country effects, industry effects, and an aggregate effect for our baseline year of 1996.

[6]These controls are warranted, even though we include fixed effects, because the dataset is sufficiently long that the relative size of the incumbent firms in our sample tends to increase over the course of the sample period.

[7]By including controls for firm size, we remove from the aggregate component the portion attributable to shifts in firms between size categories from year to year. This is warranted because our time series is long enough that the size of a given firm could change substantially within the sample.

some other selected financial indicators that may influence firms' access to external funding: the debt-to-equity ratio, and ratios of debt obligations and cash holdings to capital. These indicators suggest that, on balance, firms relied extensively on external financing in the leadup to the crisis, which resulted in a substantial buildup of debt relative to capital and equity on the eve of the turmoil even as profitability declined and cash holdings deteriorated. After the crisis, external financing dropped significantly and debt levels moved down steadily.

This preliminary analysis suggests that the marked downturn in investment at the time of the crisis coincided with a broad deterioration in firms' investment fundamentals and financial health. But since the crisis, debt levels have gradually fallen and most fundamentals have shown signs of recovery that have not yet fed through to investment spending. One notable exception to this pattern is Tobin's Q, which has shown little signs of improvement. Theory suggests that Tobin's Q should, under ideal conditions, summarize all information that is pertinent for the current rate of investment. Taken at face value, the lack of meaningful improvement in Tobin's Q provides some rationale for the drop in investment over the postcrisis period. We explore more formally whether investment fundamentals are behind the drop in the postcrisis investment in the next section.

The intensity of the postcrisis investment drag appears to be similar across industries, countries, and firm sizes. Figure 6 considers the country dimension, showing estimated year effects from our panel of firms for each of the Asia-8 countries. We obtain these estimates using a regression of the form shown in Equation (1) but with the year dummies interacted with separate dummy variables for the eight countries in our panel. The bottom panel of the figure shows a somewhat simpler cut of the data. We replace the full set of year dummies in our panel regression with each country dummy interacted with a "postcrisis" dummy D_t^{97+} that is set to one from 1997 onward. Results using this specification indicate that all the countries in our sample experienced a postcrisis investment drag, though the effect appears to be less pronounced for Hong Kong and Taiwan. Figure 7 repeats the same exercise, but with separate postcrisis dummies for nine broad industry categories, where industries are categorized according to the first digit of the firm's SIC (Standard Industrial Classification) code. There do not appear to be significant differences in the postcrisis investment drag across industries. Though estimated postcrisis effect for two of the industries—industry 0 (Agriculture, Forestry and Fishing) and industry 6 (Finance, Insurance and Real Estate)—are not distinguishable from zero at standard significance levels, formal tests (not shown) cannot distinguish the magnitude of the postcrisis effect across these nine industries.

Figure 8 shows the results from a similar exercise using dummies for firm size. Firms in all three size categories have experienced postcrisis investment declines, and the effect appears to have been stronger for smaller firms. In sum, the shortfall in region's aggregate investment cuts across a wide spectrum of countries, industries, and firms.

5   Determinants of Drag on Postcrisis Corporate Investment

Our econometric specification is motivated by a standard value maximization problem for a competitive firm that faces adjustment costs for capital (see Appendix A for details). The specification relates the firm's rate of investment $\left(\frac{I_{it}}{K_{it}}\right)$ to its current value of Q, which is a valid summary of relevant investment fundamentals for a firm that faces no financial constraints or costs that limit its ability to raise funding for investment and is small enough that it treats all prices as given.[8] We augment this specification by including the same set of controls used in equation (1), along with additional firm-specific variables intended to capture the effect of restricted access to outside funding and other factors. Though these additional variables shouldn't matter under the idealized conditions set out above, empirical studies using firm-level data provide ample reason to believe that internal cash flows, non-price credit rationing, capital structure, and other factors influence investment even after controlling for Q.[9] For now, rather than estimating a full set of year effects to capture unexplained aggregate variation, we restrict the time pattern of these effects somewhat by simply including a single dummy variable for the crisis and postcrisis period (D_t^{97+}). We also interact this postcrisis effect with some of the firm characteristics identified above in order to allow the postcrisis effect to vary for firms with different selected characteristics:

$$
\begin{aligned}
\frac{I_{it}}{K_{it}} =\ & f_i + b_S D_{it}^{sm} + b_L D_{it}^{\lg} + a_p D_t^{97+} + \mathbf{c}' \mathbf{x}_{it} + a_p^S \left(D_{it}^{sm} D_t^{97+} \right) + a_p^L \left(D_{it}^{\lg} D_t^{97+} \right) \qquad (2) \\
& + a_p^{HST} \left(D_i^{HST} D_t^{97+} \right) + \sum_{\substack{n=1, \\ n \neq \overline{n}}}^{N} a_p^n \left(D_i^n D_t^{97+} \right) + e_{it},
\end{aligned}
$$

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[8]It also assumes that the homogeneity conditions described by Hayashi [1982] hold, so the measure Tobin's Q is a good proxy variable for the shadow value of capital.

[9]Prominent among numerous examples are Summers [1981], Gilchrist and Himmelberg [1995], and Erickson and Whited [2000].

where D_i^{HST} is a dummy that indicates whether firm i is located in Hong Kong, Singapore or Taiwan, and D_i^n is a dummy variable that controls for all industries $n = 1, \ldots, N$, with the exception of our baseline industry $\overline{n}$.[10] For practical reasons, we chose our baseline industry to be manufacturing, mainly because this category accounts for about three-fifths of the firms in our sample.[11] Given this specification, the coefficient a_p on the postcrisis dummy D_t^{97+} can be interpreted as the unexplained aggregate component of investment over the postcrisis period for our baseline firm: A medium-sized manufacturing entity located in Indonesia, Malaysia, South Korea, Thailand, or the Philippines. The coefficients on the various interaction terms show the *incremental* effect on investment from latent aggregate factors for firms with that specific attribute. For instance, the coefficient a_p^S on $\left(D_{it}^{sm} D_t^{97+}\right)$ represents the additional postcrisis effect on investment for small firms, over and above the baseline effect for medium-sized firms.

Results using variations of this specification are shown in Table 3. As a basis of comparison for subsequent estimates, the first column of the table shows results with no controls other than the postcrisis dummy and size effects, while the estimates shown in the second column include all of the controls in equation (2) *except* the fundamentals $\mathbf{x}_{it}$. According to these estimates, the investment rate for our baseline firm declined by about 12 percentage points in the postcrisis period, with a very narrow confidence interval. This postcrisis drag did not differ in a statistically meaningful way for small and large firms, but was about $7\frac{1}{2}$ percentage points less intense (but significant nonetheless) for the countries in our sample that appear to have been less affected by the crisis (Taiwan, Hong Kong, and Singapore).[12]

In the next steps of the analysis, we include other variables that could be relevant for investment in order to assess how much of the 12 percentage point postcrisis decline in the investment rate can be explained by fundamentals. As mentioned earlier, a voluminous empirical literature suggests that Q does not always summarize all the factors that are relevant for determining investment in practice. For this reason, we view Q as an imperfect proxy of a firm's perceived investment prospects, and estimate alternative specifications that include additional controls for other funda-

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[10]We include controls for the postcrisis effect in Hong Kong, Singapore and Taiwan because we felt the Asian financial crisis had less of an effect on these countries, given a priori considerations. The results shown in Figure 6 suggest that South Korea might also be included in this group. Our results are not sensitive to this change in specification.

[11]More specifically, we include in our baseline all firms whose SIC code has a first digit of either 2 or 3. These industry controls have almost no effect on our results.

[12]When one adds the postcrisis effect to the incremental effect for HTS countries, the combined effect is $4\frac{1}{2}$ percent, with a standard error of about 0.1.

mentals such as internal cash flows, external funding, and the debt-to-equity ratio.[13] Results using these specifications are presented in columns (2) through (5). When we simply include Tobin's Q in the regression as a proxy for time-series variation in investment opportunities, this reduces the contribution in the postcrisis period of latent aggregate factors to about $9\frac{1}{4}$ percentage points; the other variables explain even less.[14]

To allow for the possibility that independent variations in these fundamentals may collectively explain the postcrisis investment drag, columns (6) through (8) include combinations of these variables. Column (6) shows results from a specification that includes both Tobin's Q and internal cash flow as measures of fundamentals. Both of these variables enter significantly into the regression with high significance. Even so, the postcrisis drag is trimmed to about $8\frac{1}{2}$ percent—down just $3\frac{1}{2}$ percentage points from the baseline specification—and it remains highly significant. Column (7) includes the same variables in the third column, along with the debt-to-equity ratio, while column (8) adds both the debt-to-equity ratio and external funds. The estimates show that the debt-to-equity ratio adds almost no additional explanatory power for the aggregate effect (or investment in general) over and above Q and cash flow. And, though we have strong reservations about whether the external funding flow can be plausibly regarded as exogenous, including this information only seems to explain another percentage point of the aggregate effect, leaving a still-substantial $7\frac{1}{2}$ percentage points unexplained.

The last column of the table considers whether the sensitivity of investment to any of these fundamentals has changed over the postcrisis period, which might give insights about the nature of the latent aggregate factors that appear to have held back capital spending. These estimates suggest no statistically significant interaction between the postcrisis aggregate effect and Tobin's Q or the debt-to-equity ratio. For external financing, the interaction is negative and statistically significant, suggesting (subject to our caveat about endogeneity) that the effect of the aggregate shock has been more intense for firms that were more reliant on external financing prior to the crisis. In any case, although these interactions are intriguing, they explain little or none of the postcrisis effect. Even the most favorable specification shown in column (9) leaves unexplained

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[13] We include the debt to equity ratio because the firm's required rate of return on capital–an important investment determinant–is generally a function of its debt-to-equity ratio, except under the special conditions described by Modigliani and Miller [1958].

[14] Though not a focus in this context, the estimated coefficient on Q (0.023) is similar in magnitude compared to results from previous empirical work. The coefficient on internal cash flow is also in line with estimates in other studies.

about one-half of the postcrisis drag on aggregate investment.

Table 4 examines whether the unexplained portion of the aggregate drag on investment over the postcrisis period has been accentuated by cross-sectional differences in firms' balance sheets on the eve of the crisis. For this purpose, we interact our postcrisis dummy with readings for selected firm-specific variables in 1996—the year that immediately preceded the crisis. We consider precrisis values of Tobin's Q, external financing, cash flow, debt-to-equity, and debt-to-capital. Columns (1) through (4) indicate that variations across firms' Tobin's Q, external financing, cash flow, and the debt-to-equity ratio on the eve of the crisis do not help explain the postcrisis drag. However, when we condition the postcrisis effect on the include the control for the debt-to-capital ratio at the eve of the crisis, we find—quite stunningly—that this interaction term essentially explains the remainder of the drop in the postcrisis investment rate. For this case, the postcrisis investment drag is reduced to about 2 percent, but it is not statistically significant from zero. This suggests that the precrisis debt level affected the magnitude of the postcrisis investment drag above and beyond what can be justified by firms' investment fundamentals.

Figure 9 shows estimates of how each of these four factors (list the four factors here) contributed to the total drop in capital spending over time. These results are obtained by estimating year effects after controlling for various factors. The bottom solid line shows the entire set of aggregate effects (relative to their 1996 value) without conditioning for any fundamentals. The area between each chart and the bottom solid line captures the portion of the postcrisis investment drag that is explained away by each of the variables shown. For example, controlling for Tobin's Q, reduces the postcrisis investment drag by about 3 percentage points on average. Cash flow and external financing, taken together, explain an even smaller fraction of the postcrisis investment drag- around 1 percentage point. However, when we allow the year effects to interact with the eve-of-the-crisis debt-to-capital ratio, the postcrisis investment drag is almost entirely accounted for. Taken at face value, these estimates suggest that while poorer fundamentals contributed to the drop in capital spending after the crisis–cross-sectional, variations in the debt-to-capital ratio on the eve of the crisis appear to be the single most important factor behind the postcrisis investment drag. According to the estimates in this figure, this debt hangover effect has been attenuating in recent years. In the following section, we further explore this finding in more detail.

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6   Precrisis Excessive Debt and Investment, and postcrisis Investment Drag

To further understand the apparent debt hangover effect identified in the previous section, we plot in Figures 10 and 11 some characteristics of firms grouped by their debt-to-capital distribution in 1996 (top quartile, mid quartiles, and bottom quartile). Firms in the top quartile of the 1996 debt-to-capital distribution accumulated sizeable debt obligations in the years leading up to the crisis. This is consistent with the substantial amount of capital that flowed into the region over this period, which—it is widely believed–reflected the abundant credit availability for many firms in this region.[15] In particular, the bulk of this debt build up appears to have been concentrated in firms in the top quartile, whose debt levels exceeded both their total capital holding and the value of their equity. Indeed, for the rest of the firms in our sample, debt levels remained relatively steady throughout the sample period. This debt accumulation by these high-debt firms appears to have gone hand in hand with very high levels of capital spending: investment rates for these firms rose to roughly 20 percent in 1996. This suggests that the debt-to-equity effect identified in the previous section might also be described as a capital overhang. To assess this conjecture, for excess precrisis investment by constructing a binary dummy variable that takes a value of one for firms whose average investment rate in 1995 and 1996 was at least two standard deviations above the yearly cross-sectional mean. Interestingly, when we reestimate our regression with the debt-overhang variable replaced with an interaction between this crude proxy for overinvestment and the postcrisis dummy, the postcrisis investment drag also becomes insignificant (Column(6)). This suggests that these two variables largely capture the same effect, which supporting the argument that firms borrowed heavily to invest excessively.[16] On balance, this high investment occurred amid a backdrop of weakening fundamentals. For example, firms in the high-debt group had lower values of Tobin's Q prior to the crisis than other firms, and these values were dropping rapidly in 1995 and 1996. At the eve of the crisis, returns-on-assets and cash flow had also declined sharply for the median firm in this high-debt group.

As indicated earlier, investment declined the most during the crisis and the postcrisis drag was

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[15] See for example Ito [1999] or Calvo and Reinhart [1999] for extended discussions.

[16] The result is preserved when we control for the interaction betweeen the postcrisis dummy and $\frac{Debt_{i96}}{K_{i96}}$, and the coefficients for both $OverInvestment$ and $\frac{Debt_{i96}}{K_{i96}}$ are both statistically significant. The result is also preserved when we control for the interaction between the postcrisis dummy and Q_{96} $\frac{XF_{96}}{K_{i96}}$, and $\frac{CF_{i96}}{K_{i96}}$ interacted with the postcrisis dummy.

more pronounced for the firms in the top quartile of the 1996 debt-to-capital ratio distribution. Tobin's Q has improved somewhat since the crisis, notably for firms in the lower-debt group, but less so for firms in the high-debt category. Nonetheless, Tobin's Q remains below the standard benchmark of "1", above which, theory suggests that firms should resume investment spending. Profitability and cash flow have improved significantly for all firms including those in the high-debt group. External financing has also declined substantially for this group, turning negative since 1998, suggesting that they have been using generated cash flows to repay debt accumulated during the runup to the crisis. Consistent with this observation, debt-to-capital and debt-to-equity ratios have fallen significantly to levels comparable to those of other firms. For firms with lower debt, part of the cash flow has been allocated to dividend payments, and investment has improved a bit for these firms in the recent years.

All told, the evidence suggests the postcrisis investment drag is indeed a direct effect of the financial crisis, rather than a consequence of deliberate government policies to boost the current account. Since the crisis, however, investment rates have remained low despite significant improvements in fundamentals such as profitability and cash flow, consistent with a scenario where excess capacity inherited from the precrisis period reduced the need for additional investment spending in the postcrisis period as indicated by lower values of Tobin's Q. The financial crisis effect is most pronounced for high-debt firms that, taken together, accounted for about 25 percent of total investment in 1996. These firms apparently used high levels of debt financing to maintain excessive levels of capital spending during the runup to the crisis.

In theory, under ideal conditions, Tobin's Q should summarize all information that is relevant for a firm's investment, including the effect of large debts or excess capacity of capital. Under this ideal scenario, the level of debt prior to the crisis should not offer additional information that is relevant for the postcrisis investment behavior. Many empirical studies have documented that Tobin's Q falls well short of this standard in practice. We interpret our result as reflecting violations of the assumptions that support the Q-theory of investment. Indeed, the debt can affect investment by raising, for example, the agency cost of external financing. Whited [1992] finds that including the effect of a debt constraint in a standard firm investment model greatly improves the model's performance, suggesting an important role for debt levels in investment behavior.[17]

The drop in postcrisis investment that we document in this study could be rationalized along

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[17]See also Myers [1977] or Myers and Majluf (1984) for additional discussion.

two dimensions. In the first scenario, the excessive debt accumulated by many firms prior to the crisis raised the perceived riskiness associated with providing capital to these firms, boosting their postcrisis cost of capital and thereby pushing down their investment. In the second scenario, current investment levels, though lower, are consistent with desired levels of investment by these firms given their perceived cost of capital. In this view, firms have been efficiently allocating their financial resources over the postcrisis period to pay down debts, pay out dividends, or to accumulate liquid assets that can be used to fund investment when solid prospects arise.

Due to data limitations, we are unable to analyze whether the drop in capital spending since the crisis has been associated with higher costs of external funding. Instead, we test whether the level of debt in 1996 affected firms' postcrisis investment response to changes in the cash flow. The rationale behind this test is that firms that have more access to internal funds should be less affected by funding limitations imposed from external sources. As such, the postcrisis investment drag for these firms should be less intense for firms with higher cash flows and/or more ample liquid asset holdings.[18] Similarly, investment should be more sensitive to cash flow for firms that have accumulated more debt. We test both of these conjectures and report the results in columns (7) and (8).

For both of these cases, the results show no evidence that investment in the aftermath of the crisis was more sensitive to cash flow, even when we restrict our regression sample to firms in the top quartile of the 1996 debt distribution-column (8). In column (9), we test the second conjecture by interacting three variables: the postcrisis dummy, cash flow, and the 1996 debt-to-capital variable. This interaction term captures differences in the sensitivity of the postcrisis investment to cash flow for firms with greater debt holdings on the eve of the crisis. If high debt inherited from the crisis is restraining investment by raising the cost of external funds, we would expect the postcrisis investment by firms with higher precrisis debt holdings to be more sensitive to cash flow than firms with lower precrisis debt. The coefficient on this interaction term is negative and statistically significant. At best, the result suggests that the postcrisis investment was less (not more) sensitive to cash flow for firms with high precrisis debt levels.

In sum, the evidence suggests that higher costs of external funding were not behind the drop in capital expenditures since crisis. Instead, it appears that investment prospects were not strong enough to encourage higher investment spending beyond the capacity inherited from the precrisis

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[18]For examples, see Fazzari, Hubbard and Petersen [1988b], Gilchrist and Himmelberg [1995], and others.

period. As a result, firms allocated internal funds to accumulate liquid assets, make dividend payments and, in the case of high-debt firms, repay debt. In the next section, we review possible implications for the future adjustment of the current accounts balances.

7   Discussion and Implications for Adjustment of Current Accounts

Though it seems hard to believe that the adverse effects of the Asian financial crisis can still affect investment decisions after a decade, the results from this study indicate that the effect of the 1997 financial crisis continues to be a drag on firm investment. This drag in investment has played a big role in generating the current account surpluses in emerging Asia, and has enabled the region to export capital as the anemic domestic investment is unable to absorb the region's savings. The most important factor weighing on investment is the effect of excessive debt and excess investment that occurred in the years leading up to the crisis. As restructuring completes its course and excess capacity wanes, it is conceivable that corporate investment will continue to improve. We believe, however, that investment rates would likely not rise back up to the highs seen in the period leading up to the crisis. Since roughly one-third of the postcrisis investment drag can be attributed to fundamentals, it seems reasonable to expect investment rates to recoup only one-third of their declines after the effect of the crisis dissipates. For aggregate investment rates, this would imply increases in the vicinity of 3 percentage points, contributing to an equivalent reduction in current account surpluses all else equal.

The results from this study have implications that present challenges for some alternative explanations for emerging Asia's current account surpluses. Recent papers by Dooley, Folkerts–Landau and Garber argue that the current account surpluses in emerging market economies are the result of deliberate government policies to promote export led-growth. According to this explanation, investment from domestic sources is inefficient for fostering growth and emerging market economies require foreign direct investment to reach their development objectives. This argument suggests that current account surpluses are necessary to accumulate assets that are in turn invested in developed economies as potential collateral to induce inward foreign direct investment (FDI) from those developed countries (see Dooley, Folkerts-Landau and Garber, 2003, 2004). A similar line of argument by Mann [2004] suggests that the current account surpluses in Asia are the result of a

shift in policy to promote export-led growth after domestic-led growth in the early 1990s resulted in the Asian financial crisis. Yet another popular explanation attributes emerging Asia's surpluses to underdeveloped financial systems that are unable to intermediate domestic saving (Prasad, Rajan, and Subramanian [2006]) or to fulfill local residents' needs for high quality foreign financial assets (Mendoza, Quadrini, and Rios-Rull [2007]).

An implication for these various explanations is that Asia's current account surpluses would persist for the foreseeable future. While the results from this study do not directly refute these explanations, they rationalize the current account surpluses in a way that suggests that the surpluses need not persist. The study documents the predominant effect of the role of the financial crisis on current account surpluses through its adverse effect on firms' balance sheets. As firms complete the restructuring of their balance sheets and prospects strengthen, investment could rise to reduce the current account surpluses. However, it remains unlikely that investment rates would rise to the highs seen in the years leading up to the crisis as these rates seem to have been fueled by investment beyond levels supported by fundamentals. Eliminating the region's current account surpluses would require reductions in the region's savings rates which are among the highest in the world.

8   Conclusion

This study reviewed the role of emerging Asia's current account surpluses in global imbalances and assessed the unique role of the financial crisis using a cross-country data set of 3,750 firms. The results indicated that the current account surpluses in the region are a direct result of the effect of the financial crisis. In the aftermath of the crisis, corporate expenditures on fixed investment declined significantly, contributing to lower aggregate investment rates. The shortfall in corporate spending generated investment that fell short of saving, turning the region into a net exporter of capital. We then considered the factors behind the postcrisis lower investment rates.

Our analysis indicated that weaker postcrisis fundamentals account for a portion of the lower investment rates, but ongoing re-structuring owing to large debts accumulated and the excess investment undertaken in the period leading up to the crisis are the main factors weighing on the postcrisis corporate investment. These results support the hypothesis that the region's current account surpluses are a direct result of private restructuring behavior in response to the financial crisis. As this restructuring completes it course, investment rates will likely rise to reduce the

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region's current account surpluses, contrary to alternative explanations for Asia's current account surpluses that imply that they will persist for the foreseeable future. We do not, however, expect investment rates to rise back up to the unsustainable levels that prevailed at the eve of the crisis. A full adjustment of the surpluses would require reductions in the region's saving rates. Future research on the determinants and prospect of the region's saving rates is well indicated.

Appendix

A A Neoclassical Model of Corporate Investment

Our theoretical framework for firm investment is motivated by a fairly standard neoclassical *q-theory* of investment where firms face adjustment costs for adjusting their capital stock. Briefly summarizing this framework, we assume that markets are perfectly competitive, that all market participants share the same costless information, and that firms face no internal adjustment costs other than those for capital. The neoclassical firm chooses an investment rate that maximizes the market value of its future cash flows from capital, which is represented by the value function (see also Hubbard [1998]):

$$V\left(K_{i,t}, \nu_{i,t}, \varepsilon_{it}\right) = \max_{I_{it}} \left\{\Pi\left(K_{i,t}, \nu_{i,t}\right) - p_t \left[I_{i,t} + \Phi\left(I_{i,t}, K_{i,t}, \varepsilon_{it}\right)\right] + \rho_i E_t \left[V\left(K_{i,t+1}, \nu_{i,t+1}, \varepsilon_{it+1}\right)\right]\right\} \tag{3}$$

where $K_{i,t+1}$ is given by the following capital accumulation condition:

$$K_{i,t+1} = (1 - \delta_i) K_{i,t} + I_{i,t}. \tag{4}$$

In this formulation, i and t denote the firm and time period respectively, and ρ is the relevant discount factor for future cash flows. $\Pi\left(\cdot\right)$ is the firm's (gross) profit function, which, after optimizing out variable production factors, is a function of its current capital stock $K_{i,t}$ and a random variable $\nu_{i,t}$ that captures changes in productivity and/or the market price of variable inputs. The firm treats $\nu_{i,t}$ as given. $\Phi\left(\cdot\right)$ is a function that captures internal capital adjustment costs, $I_{i,t}$ investment, p_t is the relative price of capital goods net of the capitalized value of future tax shields. The random variable ε_{it} is an adjustment cost shock that is observed by the firm but not by econometricians, and δ_i is the rate of depreciation of capital for firm i. $E_t\left[\cdot\right]$ is an expectation conditional on information available at time t.

The first-order condition for value maximization provides the following familiar investment equation:

$$1 + \frac{\partial \Phi\left(I_{i,t}, K_{i,t}, \varepsilon_{it}\right)}{\partial I_{i,t}} = q_{i,t}, \tag{5}$$

where $q_{i,t}$ is marginal q: The shadow value to the firm of an incremental unit of capital in the

following period, reckoned in terms of capital. In turn, this shadow value is the present value of anticipated cash flows that the firm expects from a marginal increase in next period's capital stock, in units of capital:

$$q_{i,t} \equiv \frac{\rho_i}{p_{it}} E_t \left[\frac{\partial V\left(K_{i,t+1}, \nu_{i,t+1}\right)}{\partial K_{i,t+1}} \right] = \frac{\rho_i}{p_{it}} \sum_{s=1}^{\infty} \rho_i^s \left(1 - \delta_i\right)^s E_t \left[\frac{\partial \Pi\left(K_{i,.t+s}, \nu_{i,t+s}\right)}{\partial K_{i.t+s}} - \frac{\partial \Phi\left(I_{i,t+s}, K_{i,t+s}\right)}{\partial K_{i.t+s}} \right].$$

Equation (5) shows that — given the form of the adjustment cost function, its capital stock, and the adjustment cost shock ε_{it} — marginal q is sufficient to determine the firm's current investment flow.

To obtain an econometric model, we assume that the adjustment cost function takes the following quadratic form:

$$\Phi\left(I_{i,t}, K_{i,t}, \varepsilon_{it}\right) = \frac{\varphi}{2} \left[\frac{I_{it}}{K_{it}} - \varepsilon_{it} \right]^2 K_{it} \tag{6}$$

which is linearly homogeneous in capital and investment. Substituting equation (6) into equation (5) provides the following structural equation:

$$\frac{I_{it}}{K_{it}} = -\varphi^{-1} + \varphi^{-1} q_{i,t} + \varepsilon_{i,t}. \tag{7}$$

Assuming that, as in Hayashi [1982], the firm is a price taker in all markets, its profit function is linear in capital (which requires that the production function be linearly homogenous in all inputs), and financing and investment decisions are independent, the shadow value of capital in equation (7) can be replaced with the average value of capital Q_{it}, where the value of the firm is measured excluding the current dividend. This yields the following reduced-form specification:

$$\frac{I_{it}}{K_{it}} = f_i + a_t + bQ_{i,t} + \varepsilon_{it} \tag{8}$$

where we have assumed that each firm's adjustment cost shock $\varepsilon_{i,t}$ is composed of three separate components: A firm-level fixed effect f_i, a latent effect a_t that is common to all firms, and an idiosyncratic effect ε_{it} that varies randomly over time.

B Detailed Data Description

For each firm in our panel, annual values of each variable are determined as follows:

- The *replacement value of capital* ($p_{it}K_{it}$) for each firm in a given year is determined by taking the firm's total asset value less the value of its current assets, where variables are as recorded by Worldscope at the end of the preceding year. For a few firms there were gaps in the book value data from Worldscope. In these cases, we filled in these missing data for the nominal capital stock in these years by assuming that the real stock grew at a constant rate sufficient to reconcile the available capital stocks at the beginning and endpoints of the gap. In the process of making this calculation, we converted nominal capital stocks to real (and vice versa) using yearly values of the aggregate investment deflator for the country where the firm was located.

- The *market value of capital* $(p_{it}V_{it})$ in a given year is the sum of the market value of the firms' equity (share price times the number of common shares outstanding) plus the book value of its debt minus the book value of its current assets, as recorded in Worldscope balance sheet information for the end of the preceding year.

- *Investment rates* $\left(\frac{I_{it}}{K_{it}}\right)$ for each firm in each year are determined by taking from the firm's Worldscope cash flow statement its uses of cash to acquire fixed assets, netting out sources of cash from sales of property, plant and equipment, and then dividing this net total by the replacement value of the firm's capital.

- *Cash flow* $\left(\frac{CashFlow_{it}}{K_{it}}\right)$ is the firm's cash flow from operations (as recorded in the Worldscope cash flow statement) divided by the replacement value of its capital.

- *Tobin's Q* (Q_{it}) is the total market value of the firm's capital divided by the replacement value of the firm's capital.

- *Debt-to-equity ratio* $\left(\frac{Debt_{it}}{Equity_{it}}\right)$ of a firm is the current value of its equity divided by the book value of its debt, where the calculation of both variables are as described above.

- *External financing* $\left(\frac{ExtFin_{it}}{K_{it}}\right)$ is calculated by dividing the firm's flow of funding from external sources (as recorded in the Worldscope cash flow statement) by the replacement value of the

firm's capital.

- *Debt-to-capital ratio* $\left(\frac{Debt_{it}}{K_{it}}\right)$ of a firm is the book value of the firm's debt in the current year divided by the replacement value of its capital.

- *Cash-to-capital ratio* $\left(\frac{Cash_{it}}{K_{it}}\right)$ is the value of the firm's cash investments in the current year (as recorded in Worldscope balance sheet information) divided by the replacement value of its capital.

- *Return on assets* is the Worldscope estimate for the current year, calculated as current net income before preferred dividends plus current after tax interest expenses, all divided by the total book value of assets in the previous year.

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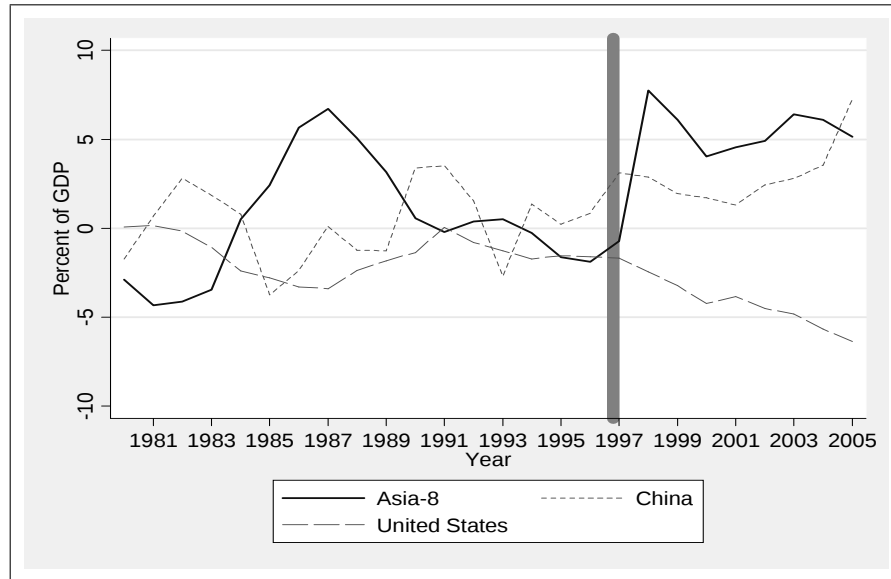
Figure 1: Annual current account balances as percent of Gross Domestic Product for the United States, China, and the Asia-8 region, 1980 to 2005.
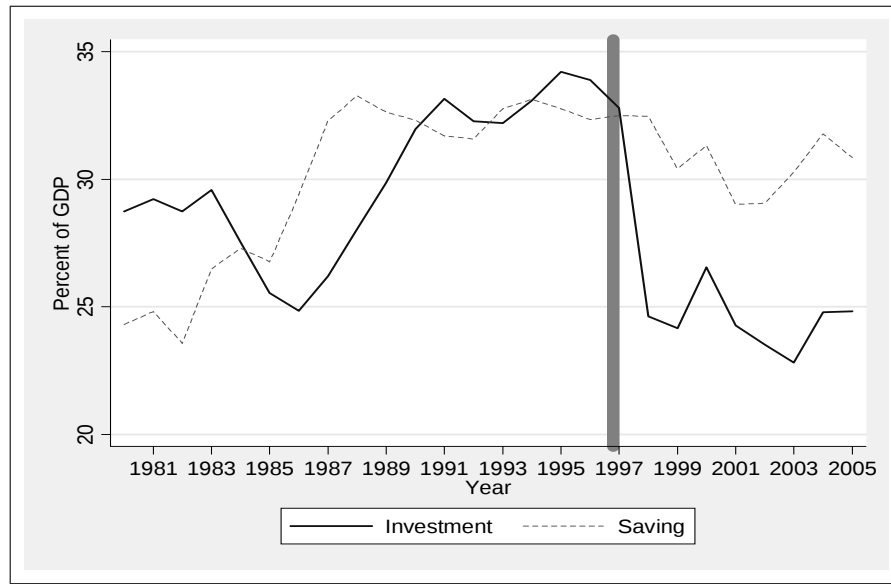
Figure 2: Aggregate national saving and private investment as percent of Gross Domestic Product for the Asia-8 region, 1980 to 2005.
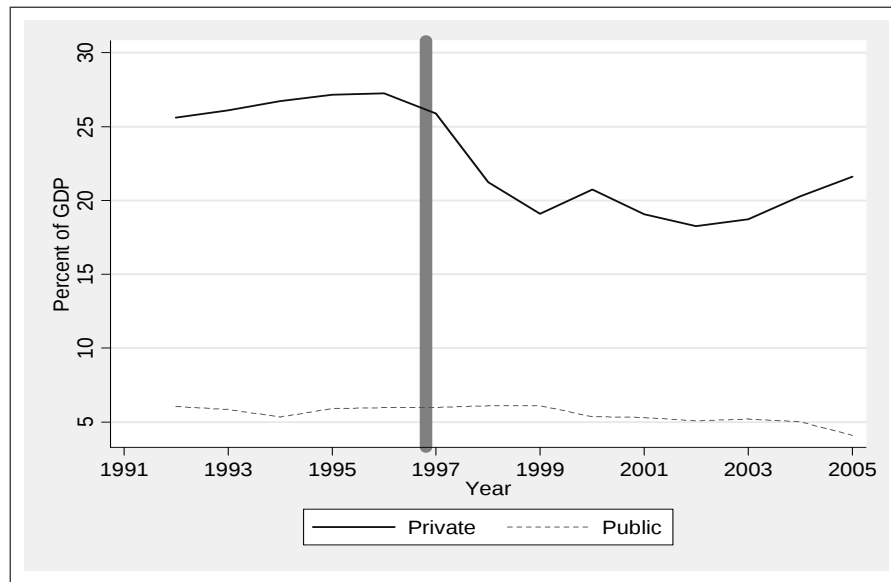
Figure 3: Aggregate private and public investment as percent of Gross Domestic Product for the Asia-8 region,1991 to 2005.
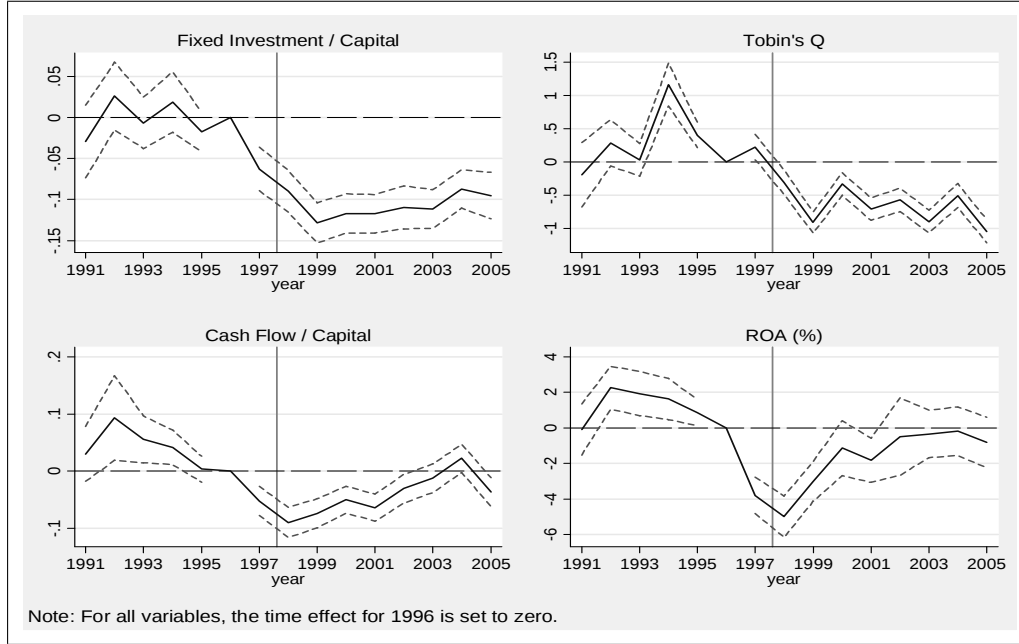
Figure 4: Estimated year effects for selected firm-level variables from a regression using data from our full sample of Asian firms, 1991 to 2005, with 95 percent confidence interval. Regressions control for fixed effects and firm size.
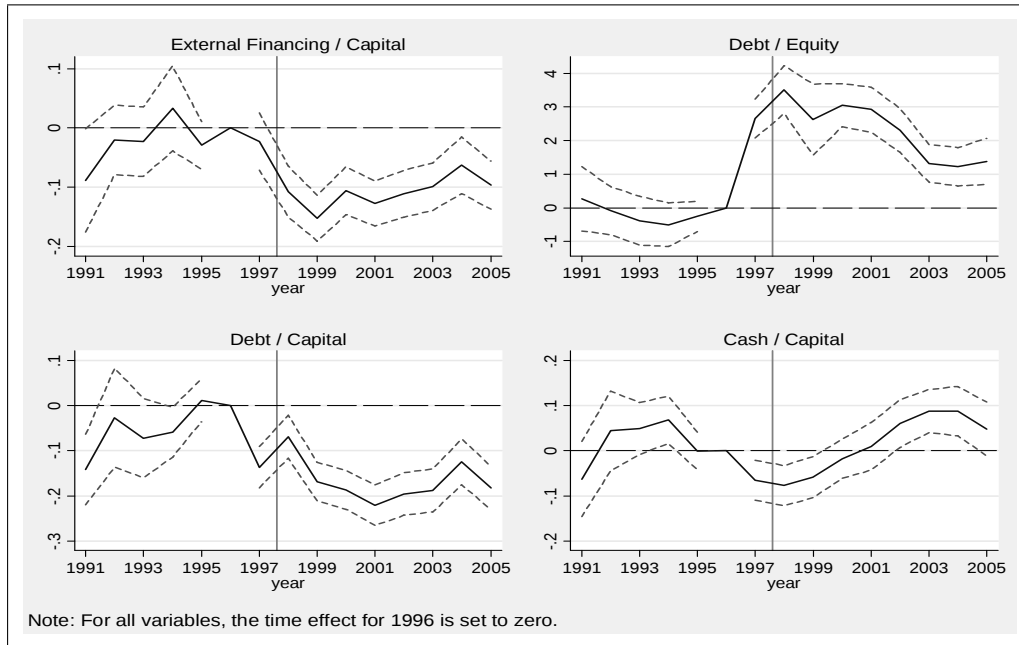
Figure 5: Estimated year effects for selected firm-level variables from a regression using data from our full sample of Asian firms, 1991 to 2005, with 95 percent confidence interval. Regressions control for fixed effects and firm size.
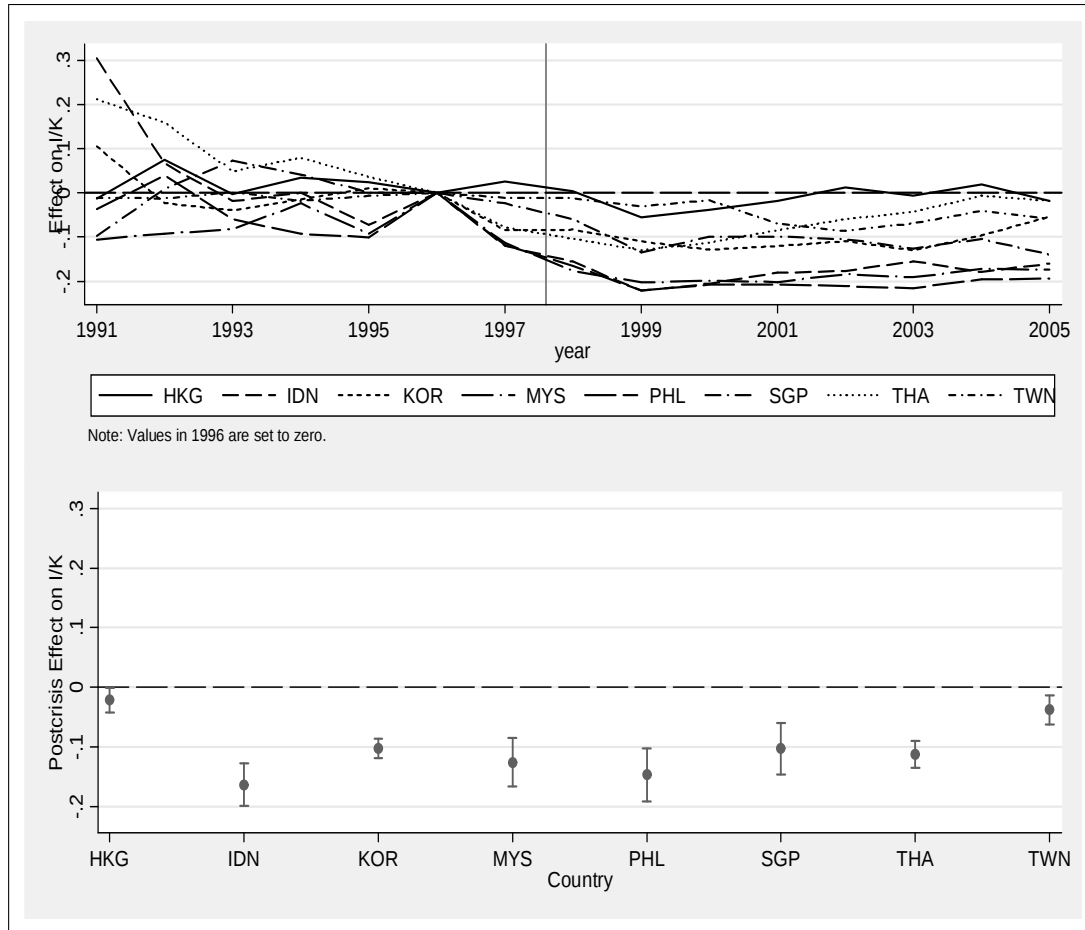
Figure 6: Top Panel: Estimated aggregate time effects on investment rate for each country from a regression using our panel of firms in Asia-8 countries, 1991 to 2005. Bottom Panel: Estimated mean postcrisis drag on investment rate for each country, with 95 percent confidence interval. Both regressions also control for fixed effects.
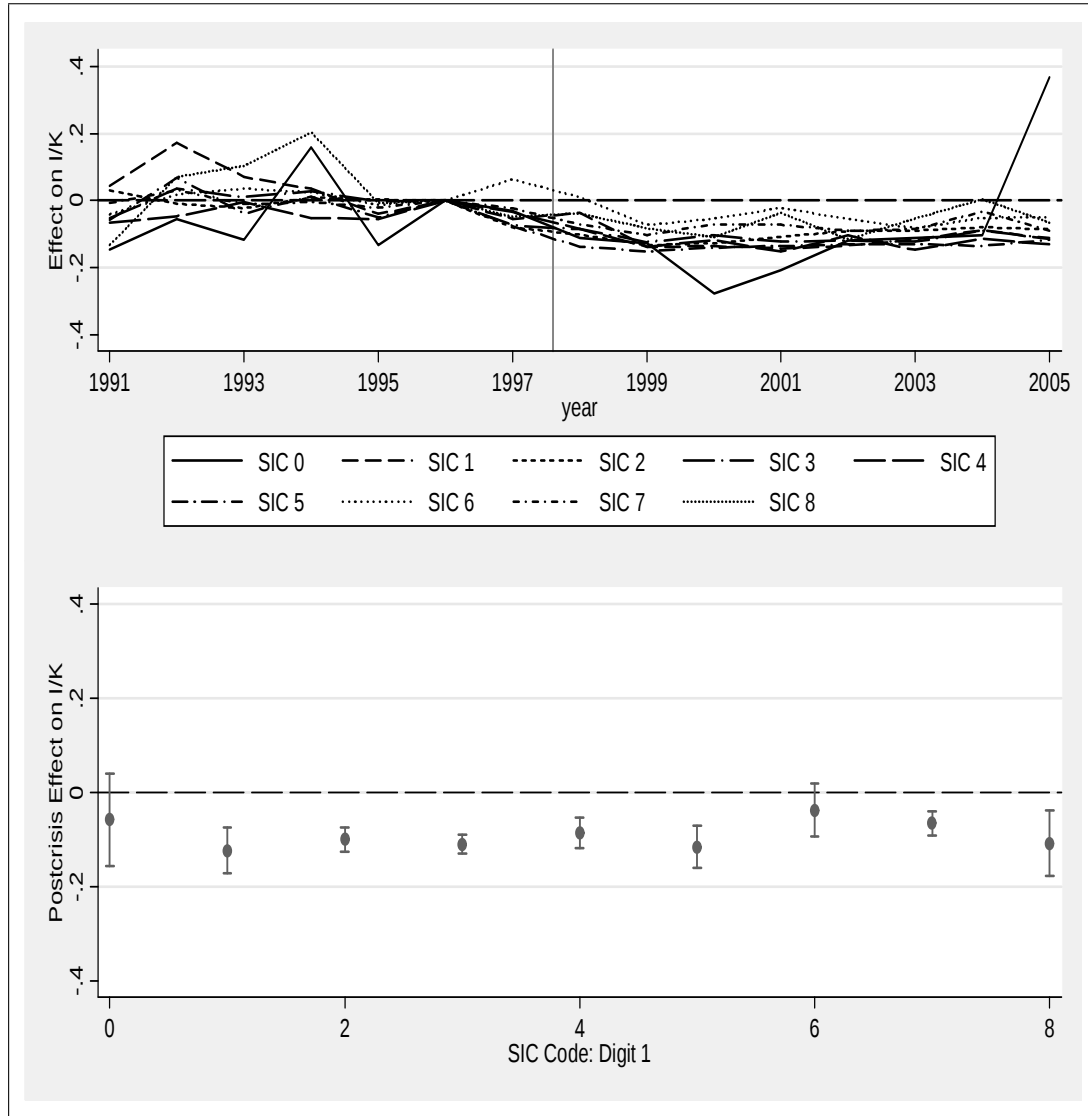
Figure 7: Top Panel: Estimated aggregate time effects on investment rate for each one-digit industry level from a regression using our panel of firms in Asia-8 countries, 1991 to 2005. Bottom Panel: Estimated mean postcrisis drag on investment rate for each one-digit industry level , with 95 percent confidence interval. Both regressions also control for fixed effects.
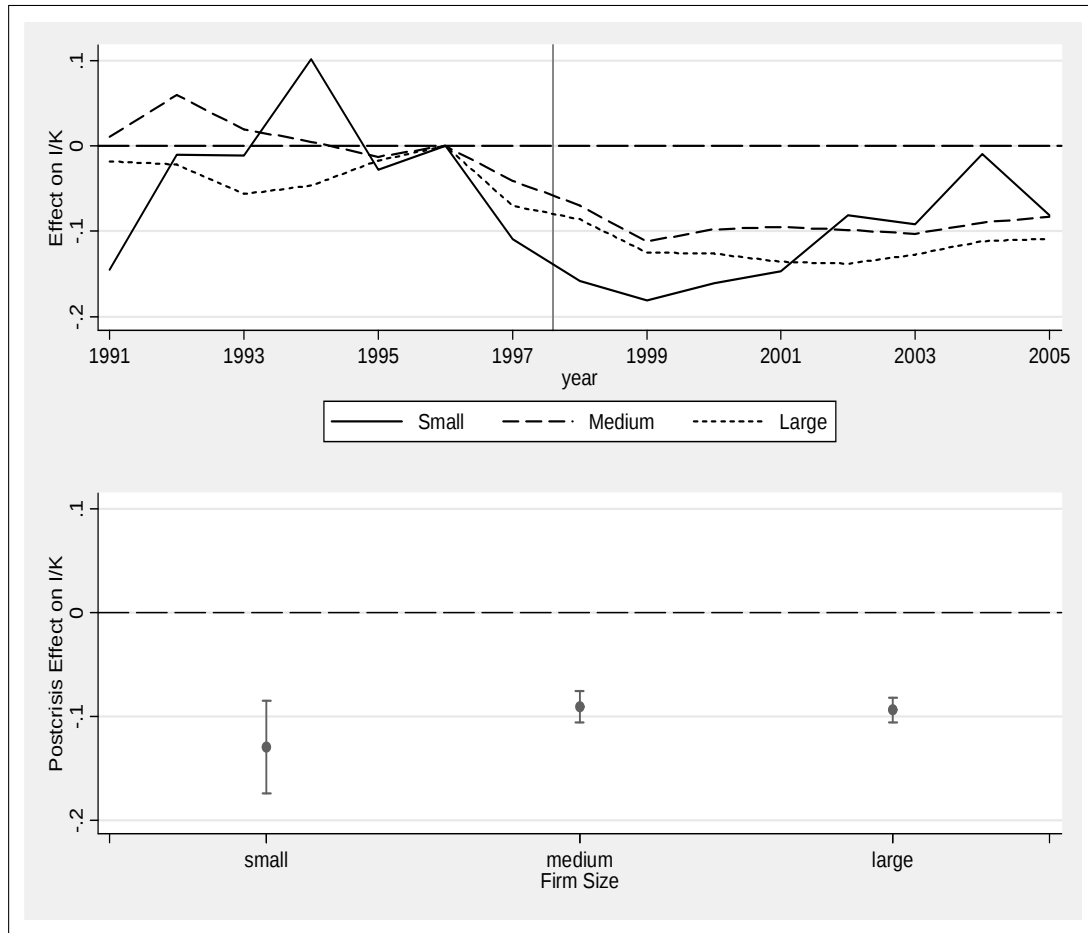
Figure 8: Top Panel: Estimated aggregate time effects on the rate of investment of small, medium and large firms from a regression using our panel of firms in Asia-8 countries, 1991 to 2005. Bottom Panel: Estimated mean postcrisis drag on investment rate for small, medium and large Asia-8 firms, with 95 percent confidence interval. Both regressions also control for fixed effects.
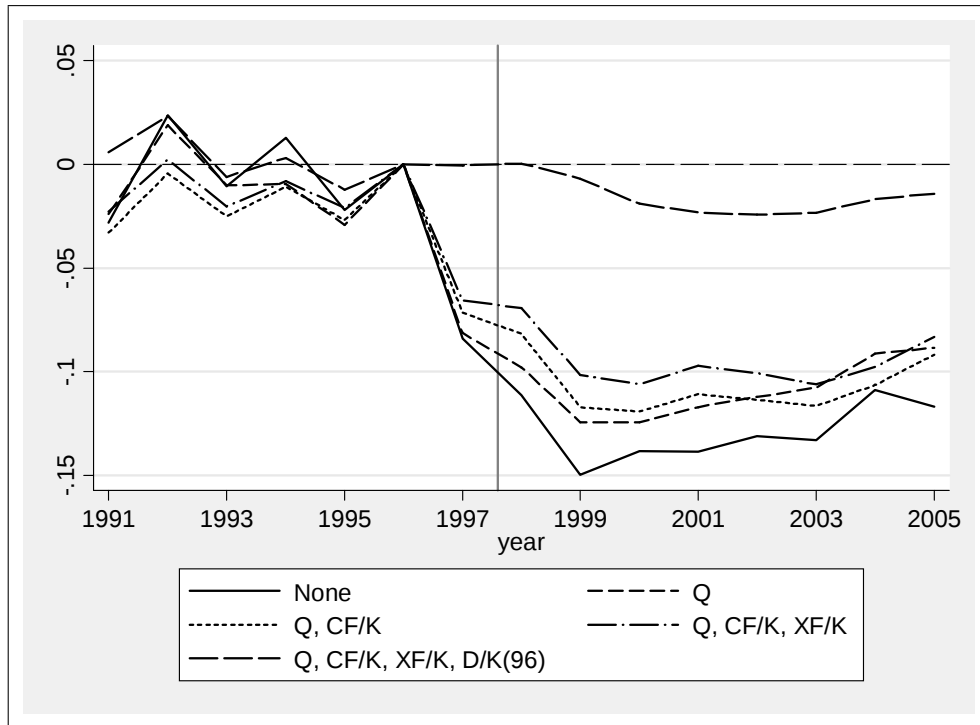
Figure 9: Investment year effects after controlling for fundamentals and precrisis conditions shown. Effects are estimated using our full sample of Asian firms from 1991 to 2005, and control for fixed effects and firm size.
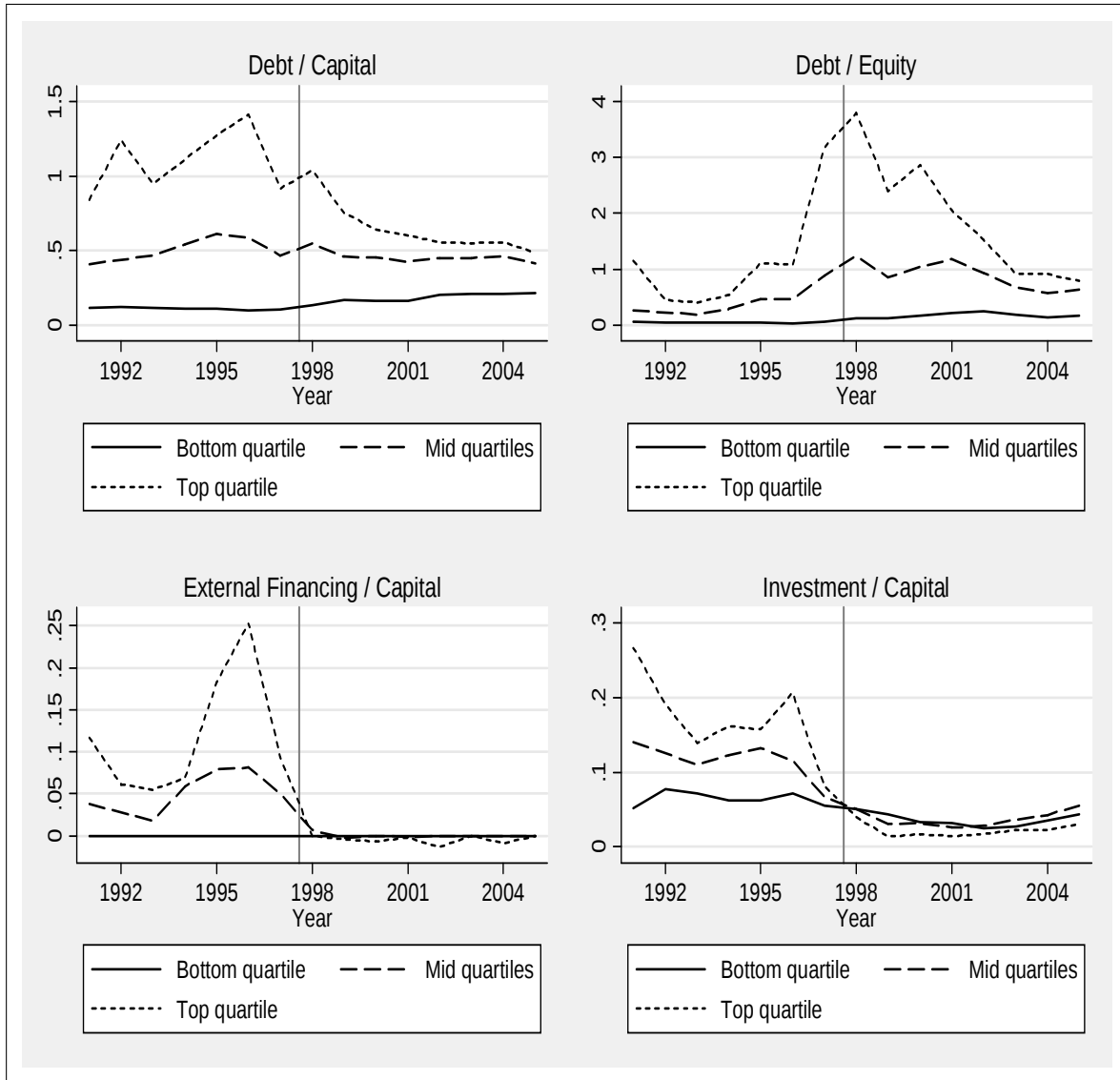
Figure 10: Median firm characteristics by debt-to-capital distribution in 1996.
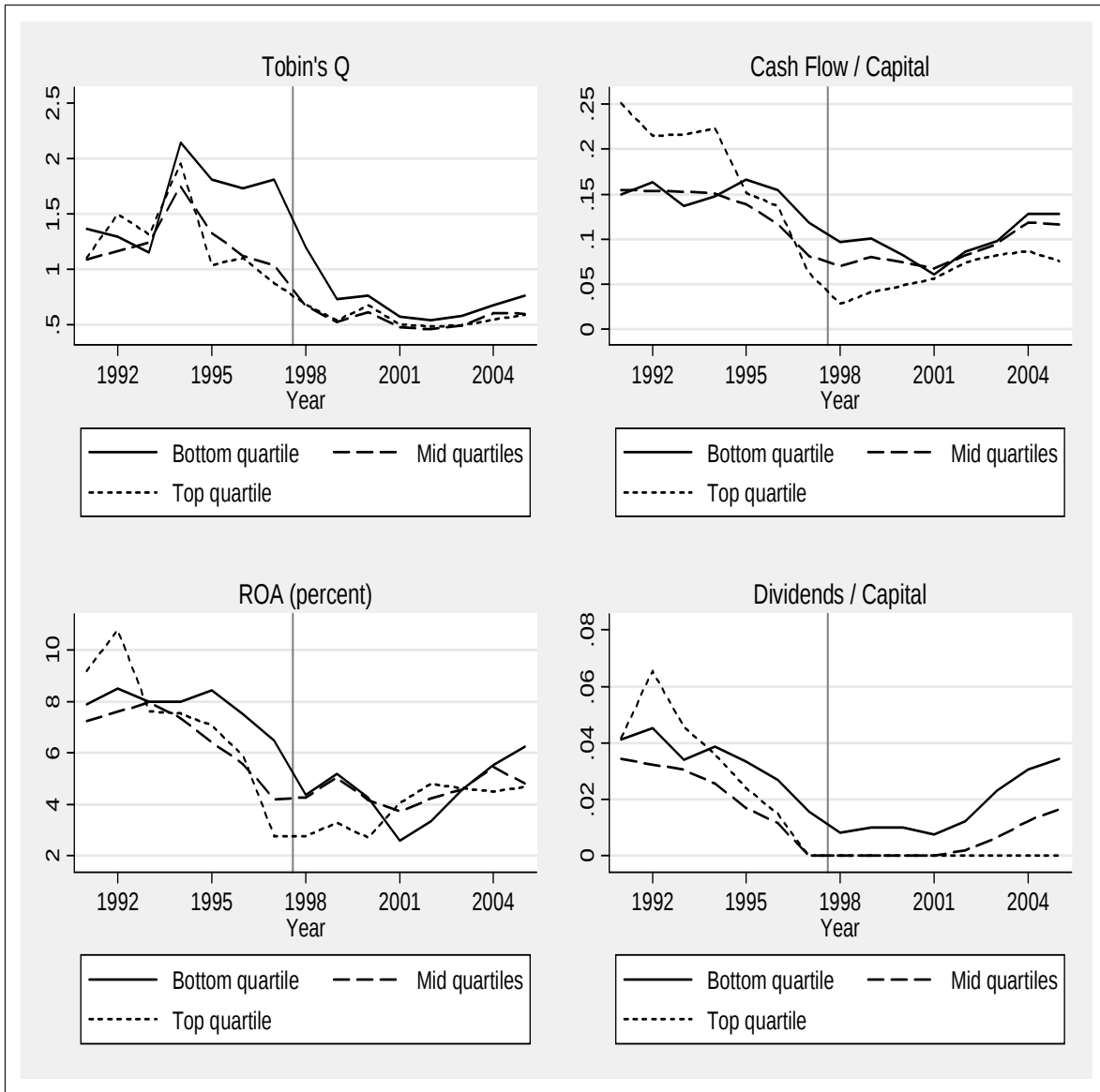
Figure 11: Median firm characteristics by debt-to-capital distribution in 1996.

Table 1: Geographic Distribution of Global Current Account Imbalances

	1996	2000	2005	1996	2000	2005
	billions U.S. dollars			percent of GDP		
Industrial	**30**	**-306**	**-573**	**0.1**	**-1.3**	**-1.8**
United States	-125	-415	-792	-1.6	-4.2	-6.4
Japan	66	120	166	1.4	2.6	3.6
Euro Area*	74	-41	-3	1.0	-0.7	0.0
Other	15	30	56	0.4	0.9	1.0
Developing	**-83**	**119**	**511**	**-1.2**	**1.6**	**4.3**
Asia	-40	77	252	-1.3	2.3	4.7
China	7	21	161	0.8	1.7	7.2
Asia-8	-32	63	106	-1.9	4.0	5.0
Other Asia	-15	-6	-15	-3.8	1.6	0.3
Middle East	15	67	183	2.9	10.7	18.5
Africa	-6	7	18	-1.2	1.6	2.3
Latin America	-39	-49	34	-2.1	-2.5	1.4
Eastern Europe and Former USSR	-14	16	24	-1.3	1.6	1.1
Statistical Discrepancy	**-53**	**-188**	**-62**	**n.a.**	**n.a.**	**n.a.**

To maintain consistency, the current account for the Euro area in 1996 was calculated using data from the same set of countries as in 2000. "n.a." denotes not applicable. Source: International Monetary Fund World Economic Outlook September 2006.

Table 2: Evolution of Current Account Balances for the United States, China, and Asia-8 Countries

| | Current Account including Oil Trade | | | | | | Current Account excluding Oil Trade | | | | | |
| | billions US dollars | | | percent of GDP | | | billions US dollars | | | percent of GDP | | |
	1996	2000	2005	1996	2000	2005	1996	2000	2005	1996	2000	2005
United States	**-125**	**-416**	**-805**	**-1.6**	**-4.2**	**-6.4**	**-53**	**-297**	**-556**	**-0.7**	**-3.0**	**-4.5**
China	**7**	**21**	**161**	**0.8**	**1.7**	**7.2**	**11**	**34**	**214**	**1.3**	**2.8**	**9.6**
Asia-8	**-32**	**62**	**109**	**-1.9**	**4.0**	**5.1**	**-6**	**104**	**202**	**-0.4**	**6.7**	**9.5**
Hong Kong	-2.6	7.0	19.7	-1.6	4.1	11.1	-1.2	9.4	25.8	-0.7	5.6	14.5
Indonesia	-7.7	8.0	4.5	-3.4	4.8	1.6	-12.7	5.2	7.9	-5.6	3.1	2.8
South Korea	-23.1	12.3	16.6	-4.1	2.4	2.1	-8.0	33.6	55.5	-1.4	6.6	7.1
Malaysia	-4.5	8.5	19.9	-4.4	9.4	15.2	-7.0	5.4	14.5	-6.9	6.0	11.1
Philippines	-4.5	-2.2	2.4	-5.4	-2.9	2.4	-1.8	1.3	8.2	-2.2	1.7	8.4
Singapore	13.9	10.7	33.2	15.0	11.6	28.5	18.0	17.5	47.3	19.4	18.9	40.6
Taiwan	10.9	8.9	16.4	3.8	2.8	4.7	16.2	17.2	34.3	5.6	5.3	9.9
Thailand	-14.4	9.3	-3.7	-7.9	7.6	-2.1	-9.7	14.7	7.8	-5.3	12.0	4.4

Current account balances excluding oil are calculated by extracting net trade in oil from the overall balance. Source: International Monetary Fund Economic Outlook September 2006.

Table 3: Panel Regression of Firm-level Investment Rate: Firm-Level Fundamentals

$\frac{I_{it}}{K_{it}}$	(0)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
97+	−.128	−.119	−.096	−.099	−.100	−.116	−.087	−.086	−.078	−.068
	(.007)	(.010)	(.010)	(.010)	(.010)	(.010)	(.010)	(.010)	(.010)	(.027)
Q_{it}			.020				.012	.012	.018	.005
			(.004)				(.003)	(.002)	(.002)	(.003)
$\frac{CF_{it}}{K_{it}}$				.301			.271	.271	.244	.244
				(.050)			(.047)	(.047)	(.044)	(.138)
$\frac{XF_{it}}{K_{it}}$					.153				.122	.206
					(.023)				(.018)	(.046)
$\frac{D_{it}}{E_{it}}$						−.0006		−.0002	−.0002	.005
						(.0002)		(.0002)	(.0002)	(.005)
D_{it}^{sm}		.167	.139	.094	.134	.168	.084	.084	.071	.064
		(.026)	(.024)	(.021)	(.023)	(.026)	(.022)	(.022)	(.020)	(.020)
D_{it}^{lg}		−.056	−.038	−.036	−.041	−.057	−.027	−.027	−.021	−.022
		(.011)	(.011)	(.011)	(.010)	(.011)	(.011)	(.011)	(.011)	(.011)
97+ dummy interacted with:										
D_{it}^{HTS}		.074	.057	.068	.060	.072	.058	.058	.051	.046
		(.012)	(.012)	(.012)	(.011)	(.012)	(.012)	(.012)	(.011)	(.011)
D_{it}^{sm}		−.031	−.034	−.004	−.047	−.032	−.008	−.008	−.023	−.016
		(.024)	(.023)	(.022)	(.022)	(.024)	(.022)	(.022)	(.020)	(.019)
D_{it}^{lg}		−.009	−.013	−.019	−.008	−.009	−.020	−.020	−.018	−.014
		(.010)	(.010)	(.010)	(.009)	(.010)	(.010)	(.010)	(.009)	(.011)
Q_{it}										.004
										(.004)
$\frac{CF_{it}}{K_{it}}$										−.003
										(.140)
$\frac{XF_{it}}{K_{it}}$										−.096
										(.050)
$\frac{D_{it}}{E_{it}}$										−.005
										(.005)
R^2	.019	.036	.069	.124	.113	.037	.135	.136	.182	.185
N	21900	21900	21900	21900	21900	21900	21900	21900	21900	21900

All regressions include fixed effects, and all but specification "0" control for firm size and interactions between the postcrisis dummy and industry dummy (not shown). Standard errors are robust to heteroskedasticity and serial correlation.

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Table 4: Regression of Firm-level Investment Flow: Sensitivity to Precrisis Conditions

$\frac{I_{it}}{K_{it}}$	precrisis Firm Characteristics								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
97+	−.095	−.071	−.089	−.085	−.021	−.016	−.013	.050	−.021
	(.019)	(.012)	(.014)	(.030)	(.030)	(.010)	(.039)	(.124)	(.029)
Q_{it}	.006	.007	.007	.007	.007	.007	.007	.011	.007
	(.003)	(.003)	(.003)	(.002)	(.003)	(.003)	(.003)	(.004)	(.003)
$\frac{CF_{it}}{K_{it}}$	.297	.278	.282	.272	.255	.265	.279	.296	.284
	(.081)	(.082)	(.076)	(.070)	(.068)	(.077)	(.104)	(.183)	(.078)
$97+$ dummy interacted with:									
Q_{96}	.001								
	(.026)								
$\frac{XF_{96}}{K_{i96}}$		−.154							
		(.057)							
$\frac{CF_{i96}}{K_{i96}}$			−.019						
			(.033)						
$\frac{Debt_{i96}}{Equity_{i96}}$				−.007					
				(.002)					
$\frac{Debt_{i96}}{K_{i96}}$					−.099		−.098	−.126	
					(.036)		(.035)	(.081)	
$\frac{CF_{it}}{K_{it}}$							−.056	−.176	
							(.095)	(.180)	
$OverInvestment$						−.152			
						(.012)			
$\frac{Debt_{i96}}{K_{i96}} * \frac{Cash_{it}}{K_{it}}$									−.042
									(.019)
R^2	.233	.243	.223	.207	.238	.245	.239	.363	.244
N	10346	10951	10992	10863	10985	10974	10985	2408	10985

All regressions include fixed effects, firm size, and interactions between the postcrisis dummy and industry dummy (not shown). Standard errors are robust to heteroskedasticity and serial correlation.

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