

# Does Foreign Portfolio Investment Help In Bad Times?

## Firm-Level Evidence from the Asian Financial Crisis

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#### Abstract

Capital raised through foreign portfolio flows is seen as volatile and undesirable for countries with poorly regulated financial systems. An implication is that firms that finance themselves in part with such investment have worse outcomes during systemic liquidity crises. I investigate if this is true for East Asian firms that raised portfolio capital through foreign public issuances prior to the Asian financial crisis. Unlike previous studies, I control for selection bias using propensity score-weighted difference-in-difference estimation. I find that firms that had previously raised capital abroad had better crisis and post-crisis period outcomes than otherwise comparable local firms. Specifically, foreign equity-raising firms and foreign debt-raising firms with robust capital structures outperform comparable local firms. I present evidence that foreign equity-raising firms were less financially constrained than similar local firms, while foreign debt-raising firms appear more financially constrained during and after the crisis. To highlight the liquidity constraints channel I show that crisis and post-crisis period borrowing ability, and consequently firm outcomes, were impaired by pre-crisis level and composition of firm debt. My analysis underscores that foreign issuances had positive value during the crisis and that firms whose growth plans were based on a mix of foreign equity and debt had better crisis-period outcomes than firms that relied primarily on debt.

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*“Unlike FDI, portfolio investment is fully mobile at low cost. Because of their volatility, portfolio investments can cause drastic disruptions in private capital flows during crises which may then spill into the real sector since such investments are a significant source of productive resources, especially for developing countries”*

United Nations Conference on Trade and Development.<sup>1</sup>

## 1 INTRODUCTION

A large body of research cautions against relying on foreign portfolio investment (FPI) because of its instability during financial crises. It is claimed that FPI is quick to flee in a crisis. A snapshot of the behavior of foreign portfolio capital during the East Asian financial crisis and the Tequila crisis of the 1990s, as shown in Figure 1, underscores how FPI was quickly withdrawn from the affected economies.<sup>2</sup>

Less well appreciated is that there is also often a fresh influx of FPI during or soon after the crisis into firms that raise new capital abroad. 288 firms from East Asia and Japan raised capital through 334 public issues and private placements in foreign capital markets during 1997-1999. 135 of these foreign raisings were by firms that had accessed foreign capital markets previously through public issues of capital. Similarly, since 2007 some 2000 foreign equity and debt issues have been made by firms in US and Western European countries affected by the ongoing global financial crisis. Evidently, some firms are able to attract foreign portfolio capital even in bad times.

It has been a challenge to systematically analyze the comparative performance of firms that finance themselves in part with foreign portfolio investment.<sup>3</sup> In this paper I investigate whether

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<sup>1</sup>World Investment Report 1998, UNCTAD, page 208. FDI: Foreign Direct Investment

<sup>2</sup>FPI comes in various forms of debt and equity: the biggest share is through foreign financial institutions and foreign investors who invest directly in the domestic capital markets where local firms are situated. Besides this, local firms can get FPI by listing in foreign capital markets, by issuing depository receipts as well as by raising new capital abroad through private placements or public issues. The key difference in Foreign Direct Investment (FDI) and FPI is investor control. International Monetary Fund (IMF, 1993, section 359) defines FDI as “investment that reflects the objective of obtaining a lasting interest by a resident entity in one economy in an enterprise resident in another economy....”.

<sup>3</sup>Due to its liquid nature, portfolio flows are highly mobile and therefore hard to be tracked periodically at the firm-level.

East Asian firms that had accessed foreign financial markets in the early 1990s performed better or worse than other firms during the Asian financial crises. The Asian crisis is a logical episode for my analysis since it gave rise to liquidity constraints and was characterized by flight of foreign capital. I focus on firms that had raised capital abroad through public issues of equity or debt prior to the crisis (hereafter referred to as 'publicly internationalized firms' or PIFs).<sup>4</sup>

Ex-ante it is not clear how PIFs would fare, relative to comparable local firms, when there is a systemic financial crisis. Foreign public issuances can be costly. But a few firms do raise capital abroad, often to send a signal that they are an attractive business or investment opportunity.<sup>5</sup> During bad times this signal could enable PIFs to differentiate themselves from non-PIFs. Information asymmetry is acute during liquidity crises. When foreign or domestic investors do not know which firms are close to bankruptcy, only firms that have previously provided more information about their viability or those that have complied with the strictest regulatory requirements might be able to raise sufficient finance; and PIFs have an advantage in this respect.<sup>6</sup>

Raising capital in foreign capital markets can also act as an insurance against bad shocks to domestic financial markets. As a result, crisis-period benefits from such foreign issuances could also come from having access to alternate options of finance. PIFs have an advantage over local firms since they have previously overcome regulatory and informational barriers associated with foreign capital markets. We could therefore argue that PIFs would not be as adversely affected, during a domestic financial crisis, as firms that rely primarily on domestic financial institutions.<sup>7</sup>

On the other hand, the risk of sudden reversal in foreign capital flows is high in financial crises. This risk is especially very high for short-term foreign debt. Even though firms do not lose capital that was raised abroad through equity issues, they can find their market valuations dropping when

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<sup>4</sup>For example, a South Korean firm that had a public issue of equity at the New York Stock Exchange in 1994 would be classified as a treatment case in my analysis.

<sup>5</sup>Firms could also have more immediate goals of raising larger amounts of capital or raising capital at cheaper costs.

<sup>6</sup>Cleary et al (2007) show that profitable firms that have less asymmetric information issues tend to be less financially constrained.

<sup>7</sup>Leuz et al (2006) find that Indonesian firms with strong financial patronage at home were less likely to raise capital abroad and were affected worse during the 1997-1998 financial crisis. Similarly Baek et al (2004) find that during the 1997-1998 crisis, Korean firms that were part of business groups (chaebols) and had significant state patronage suffered greater loss in firm value relative to firms that had foreign investors.

there is sustained selling pressure (heightened by foreign investor panic) on their listed securities.<sup>8</sup> Similarly, firms that had raised foreign debt could find the value of their foreign liabilities increasing substantially if the crisis also involves a devaluation of the home currency (balance sheet effects). Worse still, if the foreign debt is maturing during the crisis and cannot be replaced with new borrowing, the firm's liquidity position could be severely impacted. As a result, PIFs could be in a position where the market value of their collateral assets is insufficient or they face higher financing costs for raising additional liquidity. Lower valuation or balance sheet effects could thus imply greater financial constraints relative to non-PIFs, which would impair their crisis period outcomes.<sup>9</sup>

To determine whether PIFs performed better or worse than local firms during and following the Asian financial crisis, I first present a theoretical framework which shows that crisis period outcomes of PIFs and non-PIFs are affected by liquidity constraints of the firms. To empirically test my hypothesis, I use two datasets with information on global security issuances and global firm financial results. I consider firms from Indonesia, Philippines, Malaysia, Hong Kong, Taiwan, Japan, South Korea and Thailand - all countries that experienced a systemic financial crisis that led to severe liquidity constraints in the domestic economy.<sup>10</sup>

I measure firm outcomes by the growth and volatility of sales, asset growth, profitability and liquidity. A major issue with such comparisons is that only certain types of firms raise capital abroad; past studies show that firms raising capital abroad tend to be large and have strong balance sheets (Gozzi et al 2010). This problem of selection bias has been inadequately addressed in studies assessing the relative performance of firms with FDI or firms that list abroad.

I therefore use propensity score-weighted regression analysis to create an appropriate control

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<sup>8</sup>Evidence shows that, other things being equal, firms that are cross-listed on foreign capital markets receive more significantly more investment as those that are not cross-listed (Hale, 2010). Some of this investment comes through portfolio investment in the firm's domestic capital markets. The exposure to foreign portfolio investment could thus be much greater than the amounts raised abroad directly through public issues.

<sup>9</sup>Further, having already demonstrated their strong future growth potential through the foreign issuance, weakened PIFs could become a takeover target for 'firesale acquisition' (Aguair and Gopinath, 2005).

<sup>10</sup>I include Japan, despite it being a developed country, because it was also characterized by a poorly regulated banking system that had close ties with powerful business groups, similar to what was also at the root of the financial crisis in other East Asia nations. Previous research shows that during this period, foreign capital reversal extended to Japan as well. The country's entire financial system - capital markets, banks and other financial institutions - experienced a systemic crisis that required major reorganization of the banking system and several rounds of liquidity injection by the government. The predominance of the banking system in corporate financing meant that the impact on Japanese firms was significant. Hoshi et al (1991), Kanaya and Woo (2000), (Karloyi 2002).

group of firms that are similar to PIFs on all major characteristics except for raising capital abroad through public issuance. Specifically, I estimate propensity scores for being a PIF prior to the crisis, use these scores to calculate weights, and then combine them with difference-in-difference estimation. Firms similar to PIFs would thereby, have a large weight while firms that are unlikely to raise capital abroad would have a low weight in this model. By using propensity score-weighted difference-in-difference estimation I am able to control for selection bias arising from observable and time-invariant unobservable firm characteristics.<sup>11</sup>

I find that foreign equity-raising PIFs had better crisis-period outcomes than comparable local firms. They had 9% higher sales growth and 10% asset growth during the crisis than similar local firms. The post-crisis performance of foreign equity-raising firms was also similarly better than non-PIFs. In contrast, foreign-debt raising PIFs had worse liquidity outcomes during the crisis period, though their post-crisis outcomes were better than those of similar local firms. Further, unlike equity PIFs, which had 9-10% higher sales and asset growth in the post-crisis period, debt PIFs had only 2-4% higher sales and asset growth rates than similar local firms.

To analyze why equity PIFs had better growth and liquidity outcomes than debt PIFs during and after the crisis, I test if they were better able to raise new finance. I use three measures of potential new finance: growth in short-term debt, growth in long-term debt and growth in paid-in capital. I find that equity PIFs had higher growth in long-term borrowing both during the crisis and in the post-crisis years. In contrast, foreign debt-raising PIFs were even more constrained than their local peers; they had significantly lower growth in short-term debt during the crisis and post-crisis years.

This divergence in crisis-period growth, liquidity and financial constraints of foreign equity raising firms and foreign debt raising firms, relative to similar local firms, is puzzling since both foreign equity and foreign debt raising PIFs should have lower financial constraints from having easier access to alternate sources of financing. I investigate whether these patterns were due to weakened capital structures in the years leading up to the crisis (Claessens et al 2000). Specifically,

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<sup>11</sup>However my empirical strategy does not control for any bias that might arise from time-variant unobservable characteristics. With respect to observable characteristics, while my merged dataset lacks direct data on exports and ownership for local firms, I create proxy variables to address these issues (explained in later sections).

I test whether PIFs that relied excessively on debt prior to the crisis were adversely affected during the crisis. I find that foreign debt-raising PIFs that had greater than median short-term and long-term debt had worse outcomes during and after the crisis. In contrast, foreign debt-raising PIFs with below median levels of debt outperformed comparable local firms during these periods. Further these impacts are characteristic only of debt-raising PIFs and not of equity-raising PIFs.

The results suggest that while foreign portfolio debt has positive impact during crisis and post-crisis periods, firms that engaged in unsustainable levels of borrowing (foreign currency or otherwise) were hit harder by the financial shock. Previous studies have discussed how crisis-induced currency devaluations led to adverse balance sheet effects for firms with foreign-currency denominated liabilities.<sup>12</sup> My analysis underscores that even large and well-established firms were not immune to this effect.

This study makes four important contributions. First, I present new evidence that previous raising of capital through foreign public issues has positive value during the crisis and post-crisis years. While all types of firms are adversely affected by a crisis, and while all types of firms recover subsequently, PIFs are better able to cushion the negative shock and recover faster.<sup>13</sup>

Previous research has seemingly drawn a bright line between portfolio capital flows and direct foreign investment. But there is little consensus on which side, different forms of foreign portfolio capital belong. My study shows that certain forms of foreign portfolio investment are beneficial even during bad times and they have a positive role that cannot be swept away with criticisms about volatility of portfolio flows in aggregate.

Second, this paper underscores the importance of distinguishing foreign debt and equity investment.<sup>14</sup> Foreign equity issuance behaves like FDI in terms of stability during crises and enhances access to liquidity. My analysis shows that raising foreign debt through public issues can be beneficial during good times but can be costly during bad times when excessive debt can become unsustainable. These results suggest that East Asian firms whose pre-crisis growth plans relied on

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<sup>12</sup>Krugman (1998),

<sup>13</sup>These findings are similar to the evidence in Blalock et al (2008) and Desai et al (2008) of relatively strong post-crisis performance of multinational affiliates during crises that involve currency devaluations.

<sup>14</sup>There are very few studies with respect to foreign debt and its implications during crisis, despite the fact that it constitutes a significantly larger share (two-thirds) of foreign capital raised by firms worldwide.

a mix of foreign equity and debt fared better than firms that relied mainly or entirely on cheap foreign debt.<sup>15</sup>

Third, my analysis provides micro-evidence for the adverse crisis-period impact on liquidity of very large firms that used their preferential PIF status to raise unsustainable levels of borrowing before the crisis.<sup>16</sup> Far from being able to take advantage of their PIF status during the crisis, these weakened foreign debt-raising firms were instead constrained to meet their debtor obligations. Indeed, previous studies have argued that the depth and scope of the Asian financial crisis was not just the result of the inadequacies of the banking systems in these countries but also due to the weakened corporate structures that pushed several large firms and business groups into financial distress (Harvey and Roper 1999, Radelet and Sachs 2000).<sup>17</sup>

These findings on large firm behavior during crisis are especially relevant when taken in context of recent research which posits that large firm behavior has significant impacts on macro fluctuations.<sup>18</sup> The distinction between foreign debt and foreign equity and its implications during bad times for very large firms is thus important. From a policy perspective, this suggests that large corporations and business groups need to be incentivized to undertake financing decisions that are robust even under stress conditions.

Fourth, this paper advances the literature on implications of foreign capital during crises, through its usage of propensity score methods to address selection bias. Existing studies, including Desai et al (2008), Blalock et al (2008) and Lemmon and Lins (2003), use linear regression or difference-in-difference estimation strategies, which help to understand crisis-period empirical patterns but may not identify the causal effect of having foreign investors. The methodology used here is common in labor economics literature but is relatively recent in corporate finance and international economics.

The study also adds to the growing amount of literature on the impact of financial constraints on

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<sup>15</sup>This is consistent with the results of country-level research that also report the superiority of portfolio equity over portfolio debt, especially short-term debt, for example Aizenmann et al (2011)

<sup>16</sup>For example, South Korean firms had an average debt to equity ratio of 400% before the crisis (Lim 2010).

<sup>17</sup>They that the first signs of foreign investor panic emerged when large firms collapsed, in early 1997, under the strain of excessive leverage levels. For example, Hanbo Steel, a conglomerate in South Korea collapsed under the strain of excessive debt (almost \$6 billion) in early 1997. It was one of the first chaebols to collapse and together with other bankruptcies they weakened the Korean banks which had large exposure to such firms.

<sup>18</sup>For example, Gabaix (2009) shows that idiosyncratic firm-level fluctuations, especially those of the largest firms in an economy, can explain a large part of aggregate shocks.

firms. As financial systems evolve to accommodate foreign capital it is crucial to infer how different types of capital, domestic and foreign, affect firm outcomes during good times as well as during bad times. Finally, my study advances the literature on the different implications of capital controls on economic stability and growth.

The rest of the paper proceeds as follows. In the next section I provide motivation and discuss how my study is related to existing work. Section 3 presents a stylized framework to highlight the difference between PIFs and local firms during the liquidity crisis. The data and empirical strategy employed are described in Section 4 and 5 respectively. The results of the empirical analysis are reported in Section 6. In section 7, I present robustness checks and other possible explanations for my results; and Section 8 concludes.

## **2 RELATED RESEARCH**

Imperfections in capital markets have a significant impact on firms' investment and future profitability. Foreign capital can help alleviate some of the constraints imposed by inadequate domestic financial systems. But while economies and firms benefit from foreign capital, they are also at risk of sudden reversals in flows during periods of financial crises. It is in this context that countries impose restrictions on certain kinds of capital flows (for example, short-term flows) and provide preferential treatment to foreign capital that is thought to be more stable (i.e. FDI).

Despite the criticism that foreign portfolio investment attracted during the financial crises of the 1990s, it has some important advantages. In contrast to FDI, portfolio flows provide foreign financing with relatively lesser loss of control or ownership. To raise capital in financial markets of developed countries, firms from less developed financial systems must comply with the requirements of stricter regulatory regimes of developed countries; through this certain types of foreign portfolio investment can help promote better corporate governance in recipient firms and prudential supervision of financial systems at home.

Why do firms raise capital abroad and through foreign public issues in particular? Many of the

reasons are similar to why a firm goes public, as opposed to staying private i.e. greater access to capital, lower costs, market timing etc.<sup>19</sup> Raising capital abroad enables a firm to establish credentials for better corporate governance or to expand its product reputation and export markets.<sup>20</sup> By undertaking a public issue in a foreign capital market, firms can distinguish themselves from other local firms by signaling that they have good investment opportunities. Such issuances help firms to overcome regulatory and informational barriers, making it easier for them to access various foreign capital markets in future years.

But sending this signal or investing in this sort of 'financial insurance' comes at a cost. There are costs of acquiring regulatory and institutional knowledge of foreign capital markets, in addition to which PIFs are required to reveal more information about themselves than their local counterparts at the time of issue and on an ongoing basis.<sup>21</sup> More analyst coverage and international exposure leads to greater scrutiny and thus reduces information asymmetry with respect to performance, accounting practices, governance and ownership.<sup>22</sup> Since most foreign issuances are in stricter regulatory regimes that demand greater information sharing (relative to the domestic regimes), if there is a hierarchy of portfolio flows in terms of information revelation we would expect PIFs to be at the top close to firms with FDI.

Little is known about how firms with foreign capital fare in bad times; and even less is known

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<sup>19</sup>The most quoted reason for firms going public (which is also applicable to raising foreign capital) is that it provides an alternate source of finance. Venturing into foreign capital markets is attractive to firms that have large investment needs and good growth opportunities. Going public, at home or abroad, provides the firm with a larger pool of investors, possibly with a greater appetite for risk as such investment can be used to hedge against domestic exposure. Going abroad also provides firms with cheaper financing options. For example, a number of Japanese firms ventured into foreign debt markets in 1970s and 1980s because of the high cost of issuing corporate debt at home. Firms could also benefit from the reduction in information asymmetry or from the positive signal value of a foreign public issue. Studies show that firms that go public face lower bank credit costs due to either improved public information or stronger bargaining position (Pagano et al 1998). This could be especially beneficial in emerging markets where banks, being a principal source of finance for firms, tend to use their monopoly financing power to extract higher rents. Firms could also have issuances abroad to exploit the positive macroeconomic environment or to capitalize on their ongoing strong performance.

<sup>20</sup>Presence of foreign investors is often used in research as a proxy for lower risk of managerial misappropriation. Besides revelation of ownership information is often a prerequisite for raising capital abroad which makes it less likely that firms with complex ownership structures will undertake such a public issue.

<sup>21</sup>Firms have to incur costs of complying with international accounting/regulatory standards and for marketing the issue to a broad variety of investors who know even less than domestic investors about the firm. In addition foreign registration processes are usually lengthier and thus result in a longer time for cash to flow into the issuing firm. A number of foreign raising costs are ongoing due to the requirement of continuous disclosure in accordance with the requirements of the foreign regulatory regime. As a result few firms find it feasible to raise capital abroad.

<sup>22</sup>PIFs also open themselves to continuous exposure to broader civil and criminal liability and anti-fraud provisions in multiple (and stricter) capital markets.

about firms that raise capital abroad through public issues. Most previous research into performance of firms with foreign capital during financial crisis has looked at firms that are listed abroad, firms that are multinational affiliates or firms that are majority owned by foreign investors (Mitton 2002, Baek et al 2004, Blalock et al 2008, Desai et al 2008, Leuz et al 2006).

The corporate governance (foreign minority ownership) impacts of cross-listing can be significant during financial crises.<sup>23</sup> Mitton (2002) finds that firms with minority foreign ownership and cross-listings abroad had better stock performance than others during the East Asian financial crisis. He argues that foreign listing indicates higher disclosure quality, which limits the scope for expropriation of minority shareholders when legal protection is inadequate. Lemmon and Lins (2003) find that East Asian firms with foreign minority investment can be construed as having weaker managerial control rights/lower risk for expropriation and therefore had better stock returns during the East Asian crisis of 1997-1998. Baek et al (2004) finds that Korean firms with more unaffiliated (or minority) foreign investors experienced a smaller reduction in firm value relative to domestic firms.

These studies look at a sample of firms which is mostly composed of those that cross-list abroad and do not necessarily raise capital. Further, these studies do not include debt raisings which are a more popular form of foreign financing for developed and emerging economy firms. Over the past two decades, in fact, firms have raised twice as much through foreign debt as through foreign equity. Finally, in contrast to these studies that focus primarily on the corporate governance channel, I analyze the impact on crisis-period outcomes of comparable firms arising from different liquidity constraints.

A few studies related to my paper investigate the performance of multinational affiliates during crises. Desai et al (2008) show that multinational affiliates are able to circumvent financial con-

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<sup>23</sup>Merely listing of shares in a foreign capital market tends to raise the stock market performance of firms which indicates that firms that list abroad are perceived to be better firms (Foerster and Karloyi 1999). Listing, normally, does not permit capital raising; so firms that are just listed cannot issue new securities to raise equity or debt capital without additional regulatory requirements. In other words, listing sans the ability to issue new equity or debt would imply a change in the minority ownership structure of the firm but is not a source of additional capital inflows. Capital raising requires even greater revelation of accounting and governance information and compliance with foreign regulatory rules and so the level of transparency for PIFs is higher than for firms that only list abroad but do not raise new capital. Higher transparency could lower the likelihood of investors abandoning the firm during crises. Goldstein and Razin (2006) show that when transparency is high, the reduction in asymmetric information brings the trade-off between FDI and FPI closer and investors are less likely to withdraw FPI (similar to FDI) when there is a liquidity shock to the local firm.

straints and increase sales, assets and investment more than local firms during and subsequent to a currency crisis. Blalock et al (2008) also show that foreign-owned Indonesian firms were not liquidity constrained, unlike other local firms, in the immediate aftermath of the 1997-1998 financial crisis. They find that only exporters with foreign ownership were able to increase investment significantly. Access to global capital markets may also affect the relative performance of the subset of firms in an economy that can access those markets. Desai et al. (2006) demonstrate that multinational affiliates substitute internal capital markets borrowing (i.e. rely on parent firm) for costly external finance stemming from adverse capital market conditions.

Another paper related with my analysis is Leuz et al (2006) that looks at Indonesian firms and their closeness to the Suharto regime to determine the impact on firm valuation during the East Asian crisis. The authors find that firms closely aligned with the Suharto regime were less likely to raise capital abroad and suffered a greater loss in value in the crisis years; in contrast firms that had raised capital abroad through foreign public issues had smaller valuation losses during the same period.

A number of studies such as Gopinath and Aguir (2005), assume that unlike majority foreign ownership associated with FDI, foreign portfolio investment does not help mitigate liquidity constraints arising from capital market imperfections because it usually comes in small amounts from unaffiliated foreign investors who do not have a long-term interest in the firm. While it is true that foreign portfolio investors cannot be called on by the affected firm to provide additional financing during a crisis, we cannot rule out the signal value or insurance value of a foreign public issuance in alleviating the firm's liquidity constraints in a crisis. My study investigates if foreign public issues have any value during crises.

Data on capital flows shows that foreign portfolio investment is more volatile than FDI. It is not thus surprising that the share of FDI in equity flows to emerging economies is large for developing countries, relative to developed countries (Albuquerque 2003). But there is little consensus on the crisis-period impacts of the different forms of foreign portfolio investment. Understanding the behavior of various capital flows is critical for assessing their impact during financial shocks. My

study investigates, from a cross-country perspective, the value of foreign capital raising activity (through public issues) in firm performance during a period of financial crisis.

### 3 THEORETICAL FRAMEWORK

This section presents a simple stylized framework, based on Aguir and Gopinath (2005), to understand how PIFs are affected relative to local firms during a crisis.

There are two types of firms:  $j = d$  (domestic) and  $f$  (PIF), and two periods  $t = 1, 2$ . Each firm has capital stock  $K_{j,1}$  at the start of period 1 and profits of  $\pi_{j,1}$  during the period. I assume the two firms are identical except that the domestic firm faces a borrowing constraint  $D_{j,1}$  in period 1 and the PIF does not, since it can access global capital markets. Firms choose investment  $I_{j,2}$  at the beginning of period 2 subject to their borrowing constraint, if any, period 1 profits ( $\pi_1$ ) and anticipated productivity  $\theta_2$ . For simplicity I assume that firms are price-takers and the price of capital is normalized to 1. Any difference in prices is captured by productivity  $\theta_2$ . I also assume that the real interest rate and discount rate is zero.

I can define the value of the domestic (non-PIF) firm at the beginning of period 2, before crisis, as:

$$V_d(K_1, \theta_2, \pi_1) = \max_I \{ \pi_1 - I_2 + \theta_2 F(K_2) + (1 - \delta)K_2 \}$$

$$\text{s.t. } K_2 = (1 - \delta)K_1 + I_2$$

$$I_{d,2} \leq \bar{D} + \pi_1$$

where  $F' > 0$ ,  $F'' < 0$  and the rate of capital depreciation is  $\delta \in (0, 1)$ . Note that  $(\pi_1 - I_2)$  represent retained earnings at the end of period 1. The first constraint is the standard capital

accumulation equation. The second constraint is the borrowing constraint for the domestic firm. Assuming that liquidity of the firm is the level at which the borrowing constraint holds, I define liquidity  $l$ , as:

$$l_{d,2} = \bar{D} + \pi_{d,1}$$

The value of my identical PIF would be:

$$\begin{aligned} V_f(K_1, \theta_2, \pi_1) &= \max_I \{ \pi_1 - I_2 + \theta_2 F(K_2) + (1 - \delta)K_2 \} \\ \text{s.t. } K_2 &= (1 - \delta)K_1 + I_2 \end{aligned}$$

I can assume that there is no borrowing constraint for the PIF during normal times.

### 3.1 *Financial crisis*

I consider a financial crisis that results in a decline in the availability of liquidity to domestic firms. In other words, conditional on firm characteristics, firms as a group face a difficulty in borrowing from domestic financial institutions during the crisis. Let  $H_1(l)$  specify the normal period (i.e. period 1) cumulative distribution of liquidity, conditional on firm characteristics ( $\theta_2$  and other). Then  $H_2(l)$  would be the equivalent cumulative distribution of liquidity during the financial crisis. By definition, I have that  $H_1(l)$  *first order stochastically dominates*  $H_2(l)$ .

Due to the systemic nature of the liquidity crisis, I can no longer assume that PIFs face no borrowing constraint. The value of the PIF during crisis (i.e. period 2) can be expressed as:

$$\begin{aligned} V_f(K_1, \theta_2, \pi_1) &= \lambda \max_I \{ \pi_1 - I_2 + \theta_2 F(K_2) + (1 - \delta)K_2 \} \\ \text{s.t. } K_2 &= (1 - \delta)K_1 + I_2 \end{aligned}$$

$$I_{2,f} \leq D_{f,crisis}^- + \pi_{f,1}$$

where I assume that  $\lambda > 1$  captures the relative superior valuation of the PIF documented in previous studies. As explained in the previous section, these studies attribute the higher valuation of PIFs to better corporate governance during crisis (i.e. lower risk of misappropriation) as is signaled through the foreign listing (or foreign public issuance in my analysis). This means that the market value of PIF is higher than the value of an otherwise comparable local firm during a financial crisis.

I posit that the higher valuation also reflects better current and potential *real* outcomes for these firms. In other words, other components of firm value (output and liquidity) of PIFs are also superior to those of comparable local firms (non-PIFs).

Period 2 output for PIF can be thus expressed as:

$$\theta_2 F_f(K_2) = \theta_2 F[(1 - \delta)K_1 + I_2] = \theta_2 F[(1 - \delta)K_1 + D_{f,crisis}^- + \pi_1] = \theta_2 F[(1 - \delta)K_1 + l_{f,crisis}]$$

Similarly period 2 output for domestic firm (non-PIF) can be shown as:

$$\theta_2 F_d(K_2) = \theta_2 F[(1 - \delta)K_1 + I_2] = \theta_2 F[(1 - \delta)K_1 + \bar{D}_{d,crisis} + \pi_1] = \theta_2 F[(1 - \delta)K_1 + l_{d,crisis}]$$

During the liquidity crisis, output decline of the PIF is lower than output decline of the local firm *if and only if* the liquidity of the PIF is higher than the liquidity of the comparable local firm; i.e.

$$g_f > g_d \iff l_{f,crisis} > l_{d,crisis} \iff D_{f,crisis} > D_{d,crisis}$$

If PIFs are more financially constrained than comparable non-PIFs, the former will have lower output growth (and similarly lower levels of liquidity and asset growth) in crisis. This is the main

hypothesis I would be testing in the empirical section.

## 4 DATA USED IN EMPIRICAL ANALYSIS

I obtain firm-level financial and accounting data from Compustat North America and Compustat Global. I combine the Compustat data with data on equity and debt issuances from Security Development Corporation's (SDC) 'New Issues Database'. Details regarding the databases and the generation of my analysis sample are provided in Appendix 1.

In order to analyze firms that are PIFs in the Asian financial crisis, I identify firms that raised capital abroad during the 1991-1996 period. Since my treatment group assignment is determined prior to the crisis (see empirical strategy section) and remains constant thereafter for my analysis, I exclude all firms that raised foreign capital through public issues during the crisis and post-crisis years. Table 1 shows the number of firms, equity and debt, at different stages of the database merging process.

Data on the starting and ending years of banking crises is obtained from Laeven and Valencia (2010) and supplemented by Reinhart and Rogoff (2008). I use a binary measure for the annual banking crisis variable (1= banking crisis in a particular year in a country, 0 = no crisis). I consider countries that were both affected by the Asian financial crisis and also faced a severe liquidity crunch. For this reason, I include only countries that faced a systemic banking crisis coupled with a crisis in other financial sectors (i.e. stock-market crisis and/or currency crisis).<sup>24</sup>

Based on these criteria, the countries I include are: Indonesia, Malaysia, Thailand, Hong Kong, Taiwan, Japan, Philippines and South Korea. The systemic banking crisis started in 1997 as a result of the currency crisis that emerged first in Thailand. The crisis soon spread throughout the region; and as it spread, foreign capital was withdrawn in substantial amounts from East Asian

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<sup>24</sup>Laeven and Valencia (2010) define a systemic banking crisis as one where a country's corporate and financial sectors experience a large number of defaults and where financial institutions and firms face substantial obstacles honoring contracts in a timely fashion; as a result of which all or most aggregate banking system capital is exhausted. The episode may be accompanied by depressed asset prices, sharp increases in real interest rates, and a slowdown or reversal in capital flows. In some cases, "the crisis is triggered by depositor runs on banks, though in most cases it is a general realization that systemically important financial institutions are in distress".

countries leading to currency devaluations.<sup>25</sup> The deficiencies of the domestic financial sector, largely dominated by the banking system, were compounded by the sharp reversal of foreign capital flows. This led to a serious liquidity crunch and severe economic decline in the affected countries.<sup>26</sup>

The eight countries had differing experiences with the crisis. Hong Kong and Taiwan's financial systems were able to recover by the end of 1998, though it took another four years for the banking sector performance indicators to return to pre-crisis levels. The crisis was most severe in Indonesia, Thailand and Philippines, where the constrained liquidity conditions eased only after 2001.

Also included in my country list is Japan, which being a highly developed country is different from the other East Asian countries. Japan had a seemingly robust and liberalized financial sector. Nevertheless, like the other sample countries, its corporate sector was dominated by powerful business groups with close ties with financial and banking institutions (Hoshi et al 1991). The absence of an adequate regulatory framework exposed the financial system to economic losses from the collapse of asset prices in the early 1990s. Japanese banks, through their extensive investment in East Asia, had some of the largest foreign exposures in the region. With the 1997 Asian financial contagion, a number of high profile financial institutions in Japan experienced financial distress, culminating in a systemic banking crisis.<sup>27</sup> While Japan did not have a currency crisis ('twin crises') as in the other East Asian nations, it did experience a protracted stock market crisis (like the other East Asian nations).<sup>28</sup> The 1997-2001 period was characterized by a severe liquidity crunch and major banking sector reorganization.

Exchange rate data is obtained from International Monetary Fund's IFS database. The price indices data which is used to deflate all variables to constant 2005 prices are also obtained from IFS. Data for constructing a binary indicator for developed or developing country is obtained from the IMF.

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<sup>25</sup>Some reports indicate that almost \$100 billion was withdrawn from the region in 1997-1998. 'The Asian Financial Crisis, 10 Years Later: Time to Reaffirm Economic Freedom' 2007, Heritage Foundation.

<sup>26</sup>These countries were all characterized by close ties between political institutions, financial entities and business groups. Lack of transparency and inadequate regulatory oversight led to excessive borrowing, especially foreign currency borrowing, by financial intermediaries and firms.

<sup>27</sup>For example Yaimichi Securities, one of the four largest security houses in Japan, Sanyo Securities, Nippon Credit Bank ('Bank Failures in Mature Economies', WP 13, April 2004, Bank of International Settlements).

<sup>28</sup>Karloyi (2002).

## 4.1 *Performance Measures*

To measure firm performance I consider both growth and volatility of sales growth, asset growth, return on assets and liquidity measures.

Firm-level growth: I define growth as the average year-to-year change in various firm measures of activity - sales, assets, debt and paid-in capital.

Firm-level volatility: I define volatility as the year-to-year deviation (from average) in various measures of firm activity. Thus the volatility of  $x$  is the square of standard deviation of  $x$  from average  $x$  for the firm over pre-crisis period and crisis period.

$$Vol(x_{it}) = \left(x_{it} - \sum_{t=1}^T x_{it}\right)^2$$

I then take logs of the resulting volatility to ensure that my results are not driven by outliers. This series is better suited for data with a large time series dimension. Given the paucity of adequate time-series data for global firms, I also construct an alternate year-by-year volatility measure following previous work (Morgan et al 2004, Castro et al 2009, Thesmar and Thoenig, forthcoming). I regress firm level outcome on firm fixed effects, country and sector fixed effects and time fixed effects as follows:

$$\Delta \log(y_{ijct}) = \alpha_i + \gamma_{jt} + \rho_{ct} + \varepsilon_{ijct}$$

where  $\alpha_i$  is firm-specific fixed effects;  $\gamma_{jt}$  are sector-specific year dummies and  $\rho_{ct}$  measure the country specific year effects. I am interested in estimated residuals  $\hat{\varepsilon}_{ijct}$ , which show how much year  $t$ 's sales (or assets or investment) growth differs from average (across firms) growth in year  $t$  and across years growth of firm  $i$ . This can be expressed as:

$$SD_{ijct} = |\varepsilon_{ijct}|$$

The fluctuation in sales growth for a given firm-industry-country-year equals the deviation from average growth for the firm and for average growth for all sectors and countries in that year. I use

absolute or squared deviations for my measure of volatility. I use absolute deviations because they maintain the same units as growth and also because squared deviations may result in large outliers which might bias my results.

In addition, I investigate asset growth and return on assets (profitability) across different groups of firms. I also have two measures of liquidity.<sup>29</sup> The first measure of liquidity is the stock of cash and marketable securities that is scaled by assets. My second measure is cash flow to output, which is measured by the ratio of earnings before taxes, interest and depreciation to firm's sales. I also include investment to asset ratio as an alternate measure of liquidity in robustness checks.

## 5 EMPIRICAL STRATEGY

I am interested in identifying the effect of the financial crisis on firm outcomes as measured by sales growth, asset growth and liquidity. I test my main hypothesis by comparing the effect of the financial crisis on PIFs and local firms. I posit that differential firm outcomes could be because of liquidity constraints caused by foreign capital reversals and tighter domestic financial constraints.

A firm's decision to raise capital abroad is endogenous to its observable financial characteristics and to unobservable characteristics like corporate management quality. As a result, the decision to go abroad for foreign capital may not be random; the resulting correlations between foreign public issues and firm variables would therefore lead to biased estimates. The best approach to this problem would be to compare a PIF's performance in the two states – if it raises capital abroad and if it does not raise capital abroad. Since the firm is observed in only one state for a given time (i.e. I cannot observe the counterfactual outcome), I estimate the counterfactual outcome using non-experimental methods: difference-in-difference (DID) estimation and weighted regression combined with DID estimation.

A number of firm characteristics that drive identification are usually time-invariant over the short

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<sup>29</sup> Aguiar and Gopinath (2005) showed that liquidity was an important determinant of acquisition risk by foreign firms during the Asian crisis. PIFs, having signaled their future growth potential through the previous foreign issuance, are especially attractive takeover targets. If PIFs were liquidity constrained during the crisis they would have an even higher probability of being acquired at 'firesale' valuations.

and medium-term. Examples of such characteristics are relative size, ownership and management quality. A common strategy to control for time-invariant characteristics in panel data is to use DID models. DID methods estimate the difference in outcomes across individual firms and across time periods, which helps to control for time-invariant observed and unobserved firm features. In essence, the change in the outcome for the control group firms would be a counterfactual estimate for the change in outcome for the treatment firms, had the latter not received the treatment.

The baseline econometric specification for DID estimation is expressed as:

$$\begin{aligned}
Y_{ijct} = & \alpha_i + \beta_1 * PIF_i + \sum_{t=Pre(-2)}^{Post(3)} \beta_{2,t} * PIF_i * Year_t + \gamma_1 X_{1,iPre} * Crisis \\
& + \gamma_2 X_{1,iPre} * PostCrisis + \delta_t + \theta_c + \rho_{ct} + \mu_j + \varepsilon_{ijct}
\end{aligned} \tag{1}$$

where  $Y$  is outcome of firm  $i$ , in sector  $j$ , country  $c$  and in period  $t$ , with respect to average sales and asset growth, profitability and measures of liquidity.  $PIF$  is a dummy variable that assigns a value of one if the firm raised capital abroad through public issues in the five years preceding the crisis and zero otherwise.  $Crisis$  is the dummy for the years of crisis which extends from two to five years depending on the individual country. Similarly,  $PostCrisis$  is the dummy for the three years following the end of the financial crisis.  $Pre$  is my omitted dummy variable for the three years preceding the onset of the crisis. The sample period thus ranges from three years prior to the crisis to three years after the crisis.  $PIF * Year$  is the interaction variable of the  $PIF$  dummy and the crisis (or post-crisis) year dummy.

The  $\beta_{2,t}$  are the coefficients of interest. They measure the impulse response of being hit by a liquidity shock on PIFs relative to non-PIFs and the pre-crisis period.  $\beta_1$  measures the impact of being a PIF in any period.<sup>30</sup>  $X$  is a vector of controls which includes firm financial characteristics like size (assets) and profitability (operating income to assets ratio) that would affect firms' decision to raise capital abroad through public issues. The next four terms are fixed effects with respect to sector, country and time.

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<sup>30</sup>So while  $\beta_{2,t}$  measures the impact of being a PIF during crisis (post-crisis), relative to the pre-crisis period,  $\beta_1 + \beta_2$  measures the overall impact of being a PIF during the crisis period.

The last term is the idiosyncratic error term, which is time varying and assumed to be distributed independent of the fixed effects. A major critique of the conventional DID technique is that the errors may be correlated across time. For example, sectoral fixed effects could induce sector-level time series correlation. To account for this, I estimate my DID model using yearly as well as data averaged for each of the three time periods: pre-crisis, crisis and post-crisis periods. I also cluster errors at the firm level to reduce potential biases in the estimation of standard errors. I use the following average period data specification to present my baseline results:

$$\begin{aligned}
Y_{ijct} = & \alpha_i + \beta_1 * PIF_i + \beta_{2,i} * PIF_i * Crisis + \beta_{3,i} * PIF_i * PostCrisis + \gamma_1 X_{iPre} * Crisis \\
& + \gamma_2 X_{iPre} * PostCrisis + \delta_t + \theta_c + \rho_{ct} + \mu_j + \varepsilon_{ijct}
\end{aligned} \tag{2}$$

## 5.1 Selection Bias

Despite using various controls (size, profitability), there could be a self-selection bias from time-varying firm characteristics. Since I am not able to estimate the counterfactual outcome (PIF being a local firm) and it is difficult to find an identical twin for the PIF, a practical way to address selection bias lies in matching or weighting control group firms based on observable characteristics. Various methods have been employed to estimate causal affects in this fashion. Some of these include estimating the conditional regression function of the outcomes given covariates, propensity score methods including propensity score matching, regression adjustment, Mahalabonis distance and pairwise matching.

When the number of observable characteristics (i.e. covariates) is large, it results in a situation of high dimensionality ('curse of dimensionality'), which makes estimation difficult. Instead of using the covariates directly, Rosenbaum and Rubin (1983) suggest using balancing scores, conditional on the covariates to measure the treatment effect. Propensity score is an example of a balancing score. It is defined as the probability of being in the treatment group given observable firm characteristics X. Propensity score methods are a frequent strategy used to deal with selection bias.

Propensity score methods involve creating an appropriate control group (firms that never raised capital abroad) for these treatment firms (firms that raised capital abroad prior to the crisis) based on the estimated likelihood of firms being a PIF prior to the crisis. The propensity scores can then be used to weight firms to estimate the causal effect of being a PIF on crisis and post-crisis period firm outcomes. This weighting technique is based on the work of Robins and Rotnitzky (1995) and Hirano and Imbens (2001). Essentially, I calculate the propensity score (i.e. probability) of being a PIF during the pre-crisis period, and using these scores I calculate weights that I combine with my difference-in-difference estimation. Control group firms that have a high likelihood of being a PIF (even though they are not) will thereby be assigned a larger weight whereas firms that have a low probability of being a PIF are assigned a smaller weight. Appendix 2 provides a brief theoretical explanation for my strategy.

Propensity score-weighted regressions control for bias based on observable characteristics of firms. Combining this with DID estimation further helps to eliminate differences between PIFs and non-PIFs that are unobservable and time-invariant (Ho et al 2007). I am thus able to account for observable firm characteristics like size and profitability of firms and also time-invariant unobservable firm characteristics such as managerial sophistication, market power and political affiliation. But my weighted DID estimator assumes that any unobservable time trends are on average same for the treatment group firms and the control group firms. As a result, time-variant unobservable  $X$  could be mismeasured. For example, if the management of the PIF changed between the pre-crisis period and crisis period, the propensity score weighted DID estimator may yield biased results. However, these effects may not be substantial since the analysis period is not very long.

The advantage of a weighted DID regression over standard propensity score matching technique is that I am able to include all data and hence obtain a good comparison with the benchmark analysis that used only DID techniques. Another advantage is that unlike matching, propensity weighted regressions allow for inclusion of additional covariates in estimating the causal effects of being a PIF during crisis and post-crisis periods. Further, the estimated coefficients do not depend on random sampling of control group firms.

At the same time, propensity scores used to calculate weights can vary depending on the model used, which can result in differential results. Hirano and Imbens (2001) show that using a flexible model combined with additional controls in the weighted regression can help alleviate some of these concerns. Another critique is that weights can be too large for firms with high propensity scores; and these units could bias the results.<sup>31</sup> A better way to consider this would be to see if results are sensitive to a few weights. To control the large weight issue I therefore cap the maximum firm weight at 20 and do a robustness check by capping weights at 10. Another practical issue could be inadequate overlap between the covariate distributions of the treatment and control group firms. To address this, I first look at only the group of firms with common distribution of propensity of scores. Alternately, as suggested by Crump, Imbens et al (2009) I discard observations outside the  $[\alpha, 1 - \alpha]$  range of the covariate distributions. This latter approach has the drawback of reducing some external validity by focusing on a sub-sample.

The steps in doing propensity score weighted DID estimation involve:

1. Determining covariates in the set X that are significant in matching firms i.e. for calculation of propensity scores. I use past research and institutional methodology to determine these characteristics (explained in the next section).

2. Calculate propensity scores based on a probit model and the choice of X. Based on the propensity scores, create a control group.

3. Calculating weights based on the estimated propensity scores: use a weight of one for treatment group firms and a weight equal to  $\frac{\textit{propensity score}}{(1-\textit{propensity score})}$ . Using these weights I re-estimate DID specification 2.

## 5.2 *Summary Statistics*

Table 3 summarizes the characteristics of firms - equity PIFs versus debt PIFs versus non-PIFs - before the onset of the financial crisis. About 12% of the 4,700 firms in my sample are debt PIFs and 3% are equity PIFs. Not surprisingly, PIFs are much larger than non-PIFs in terms of asset size. An average equity PIF is 12 times larger in asset size than non-PIFs while an average debt PIF is 14

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<sup>31</sup>As Freedman and Berk (2008) suggest it could be hard to tell how large are large weights.

times larger than a non-PIF; this clearly indicates the bias inherent in being a PIF. The table shows that Equity PIFs have superior growth opportunities relative to the other two groups.<sup>32</sup> Equity PIFs also enjoy higher return on assets and greater liquidity (cash stock, cash flow). The only summary measure where non-PIFs outperform relative to equity PIFs is with respect to volatility of sales growth.

Debt PIFs on average, tend to be the largest in size, most leveraged and also the most stable in terms of sales growth. Debt PIFs have 66% more long-term debt than non-PIFs. Their lower return on assets (and lower growth rate of assets) during the sample period confirms evidence in previous studies that firms were increasing leverage before crisis even while their profitability rates were declining (Harvey and Roper 1999).

Table 3 also shows the comparative performance of equity PIFs and debt PIFs, relative to non-PIFs across the three analysis periods (pre-crisis, crisis and post-crisis period). All firms experience a decline in sales and increase in volatility during the crisis years; the trend reverses in the post-crisis period. Debt PIFs have the smallest declines while non-PIFs had the largest decline.

## 6 RESULTS FROM EMPIRICAL ESTIMATION

### 6.1 *Baseline Estimations*

The pre-crisis years are three years before the Asian financial crisis started in 1997. The crisis lasted from 2 to 5 years across the eight countries. Post-crisis years are three years from the end of crisis. The division of years for each country, across the three time periods is as follows:

Indonesia, Philippines, Thailand, Japan - *Pre-crisis: 1994-1996; Crisis: 1997-2001; Post-Crisis: 2002-2004*

Malaysia - *Pre-Crisis: 1994-1996; Crisis: 1997-1999; Post-crisis: 2000-2002*

South Korea, Hong Kong, Taiwan - *Pre-crisis: 1994-1996; Crisis: 1997-1998; Post-crisis: 1999-*

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<sup>32</sup>Sales growth and asset growth are considered proxies for a firm's future growth potential.

Table 4 shows the results of my unweighted D-I-D estimation for equity and debt PIFs using data averaged by period for Equation (2). I calculate the impact of being a PIF during crisis (or post-crisis period) relative to the pre-crisis period, on average sales growth, volatility of sales growth, asset growth, return on assets and the two liquidity measures. This is measured by coefficient  $\beta_2(\beta_3)$  for  $Crisis * PIF_i$  ( $PostCrisis * PIF_i$ ) in Equation 2.  $\beta_1$ , the coefficient for  $PIF_i$  measures the average impact, across periods, of being a PIF.

The results in Table 4 show that foreign equity-raising firms have better outcomes than non-PIFs (coefficient for  $EquityPIF_i$ ). During the crisis, the relative impact of being an equity PIF was statistically significant only for profitability (return on assets). On all other measures, equity PIFs are no worse than non-PIFs. Similarly equity PIFs were no better than non-PIFs during the post-crisis period. The second panel shows that while debt PIFs under-perform non-PIFs in general, they outperformed non-PIFs during the crisis and post-crisis periods. Arguably, these estimates are biased as there is a large element of self-selection into being a PIF.

## 6.2 Propensity Scores

I next estimate propensity scores to weight firms in the sample to account for selection bias. I estimate the probability of being a PIF using a probit model on a set of observable firm characteristics. I base my choice of covariates on theory and previous empirical research. Observable variables include those would affect both the firm's decision to be a PIF as well as their future outcomes. Since assignment into treatment should not be determined by crisis and post-crisis period outcomes, I use data on variables for the pre-crisis years (1994-1996) to determine the firm's propensity to be a PIF before the crisis started.

Firm size has been shown to be one of the most important characteristic determining a firm's decision to raise capital abroad through a public issue of debt or equity. The unweighted DID

estimations confirm this. In addition, sales and asset growth rates are good proxies for future growth opportunities and are significant factors in calculating propensity scores for raising capital abroad. Other covariates that are strongly significant for being a PIF include profitability (measured by earnings before interest and taxes as a ratio of assets), liquidity (cash stock or working capital as a ratio of assets, cash flow measures), leverage (debt to asset ratio that captures the effect of financial distress, and short-term debt to asset ratio) and capital intensity (fixed assets ratio).

There are a few differences between significant characteristics that determine the probability of being an equity PIF or a debt PIF before the crisis. For example, high profitability is very important characteristic of an equity PIF while leverage and lower sales volatility are important features of a debt PIF.

I include sector and country dummies in my covariate set  $X$ . Sector dummies are based on the 3-digit SIC code. These fixed effects are pertinent because firms in certain sectors (capital intensive) and countries were more likely to go abroad for foreign capital (for example as can be seen from Table 1, a substantial number of debt PIFs are from Japan).

Table 5 shows the coefficient estimates from the probit models used to estimate propensity score for being a equity PIF and for being a debt PIF during the pre-crisis period.<sup>33</sup> Two variables that are potentially important in estimating the propensity of being a PIF, could not be directly included because data was not available for all firms. The first is ownership information. Previous studies (Leuz et al 2006, Baek et al 2004) have shown that firms that have close financial or political ties at home to business groups and financial entities are less likely to raise capital abroad. While I could not include this information in calculating propensity scores, I do a robustness test using business affiliate information that I have for debt and equity PIFs (described in Section 7). The other aspect of ownership is that if any firm has significant FDI investment, for example multinational affiliates or being foreign subsidiaries, I would not be able to identify my causal effect robustly, since these firms could also rely on their foreign owners for additional liquidity during crises (Desai et al 2006, Blalock et al). To alleviate these concerns, I have excluded multinational affiliates that have a

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<sup>33</sup>I used a number of alternate probit models to determine the important covariates and the estimates of propensity scores were not significantly different from those that I use. The only issue was reduction in sample size from usage of certain variables.

parent based in non-crisis countries. The likelihood of firms with non-ownership, minority FDI investment relying on their foreign investors for crisis-period liquidity is much smaller so it should not bias my results if there are PIFs with such FDI investment. However, if my sample of non-PIFs includes firms that have FDI ownership then it works in my favor when PIFs show stronger crisis or non-crisis period outcomes. In this case, essentially, I achieve identification at the cost of obtaining a *conservative* estimate of the impact of being a PIF during the analysis period.

The other significant factor that would affect raising capital abroad is exporting and importing activity of firms. Firms are more likely to raise capital abroad if they also have some form of foreign exposure. But, in so far as foreign activity (especially exports) is correlated with firm size, unavailable exposure information is less of a concern. Foreign exposure is also necessary to assess relative firm outcomes that can be affected by the depreciation of the East Asian currencies during the crisis. Aggregate export revenue or import expenditures may by themselves, not fully capture the impact of currency devaluations since the destination/origin of such activity is also important. To address these concerns, I calculate a measure of the operating exposure of firms' to exchange rates based on the work of Adler and Dumas(1984) and Desai et al (2008). This is the correlation between a firm's operating profitability and the real exchange rate. I do robustness tests by including a proxy for foreign exposure in calculating propensity scores. This is explained more in the section on robustness tests.<sup>34</sup>

Using propensity scores, I calculate weights to create an appropriate control group for my treatment group. Note that the baseline results are based on a DID estimator that assigns the same weight to all firms, irrespective of their characteristics. In contrast, the propensity score-weighted DID estimator assigns more weight to control group firms that are more likely to be a PIF, than a non-PIF local firm. This weighting could underestimate the coefficient estimates but it also ensures that identification is more robust and that I am not just picking up differences between PIFs and non-PIFs that are unrelated with being a PIF.

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<sup>34</sup>Even without including this variable explicitly in my propensity score calculation I am able to match the average operating exposure of the treatment firms and the weighted-control firms (Table 6).

### 6.2.1 *Balancing Tests*

One way of assessing the quality of a propensity score calculation is to look at the standardized differences for the covariates in the probit estimation. Following Rosenbaum and Rubin (1985), I take the weighted average difference between the treated firms (PIFs) and the non-PIFs for each covariate and then normalize this difference by the pooled standard deviation of the covariate in the PIF and non-PIF sample. This measure is also called as the absolute standardized bias and can be expressed as:

$$StandardizedBias(X_a) = 100 \frac{\frac{1}{n_1} \sum_{i \in \{F_i=1\}} \left[ X_{ai} - \sum_{j \in \{F_k=0\}} W(P_i, P_k) X_{ak} \right]}{\sqrt{\frac{var_{i \in \{F_i=1\}}(X_{ai}) + var_{k \in \{F_k=0\}}(X_{ak})}{2}}}$$

where  $n_1$  is the number of treatment firms,  $i$  is a treatment firm and  $k$  is a control group firm,  $a$  is the transcript for variables and  $W(\cdot)$  is the weighting function described in Appendix 2. Rosenbaum and Rubin suggest that a value of 20 is large for the absolute standardized bias. As there is no clear statistical inference for this standardized difference, I also include the results of a formal t-test comparison for covariate means for the treatment and control firm groups. Table 6 presents the results of the balancing tests. In addition to the covariates in my probit estimation, I also include other firm variables that I use in the analysis. As the table shows, the absolute standardized bias for all the probit covariates is under 20% (except for volatility of sales growth for Equity PIFs, but the t-statistic shows that the difference is insignificant). The t-statistics confirm that the difference in mean values (of variables) between the treatment group and the weighted control group are insignificant.

### 6.3 *Weighted DID Estimation Results*

Table 7 provides the results of propensity score-weighted DID estimates for equity and debt PIFs. The underlying estimations include additional covariates with respect to time, size, country\*time period fixed effects and sector fixed effects. The coefficient estimates in Table 7 show that equity

PIFs outperformed comparable local firms during the crisis and post-crisis periods in terms of sales growth, asset growth and liquidity as measured by the stock of cash and marketable securities. Specifically, foreign equity-raising PIFs had almost 9% higher sales growth and 10% higher asset growth than non-PIFs during the crisis and post-crisis periods. Their liquidity as measured by cash holdings was 2% higher than that of non-PIFs. These better outcomes are robust whether I use the entire sample of firms with assigned weights or if I look at only the common support (i.e. firms in the overlapping part of the propensity score distributions). Note that these higher outcomes are relative to the pre-crisis period.<sup>35</sup>

The second panel in Table 7 shows that foreign debt-raising PIFs had better post-crisis outcomes but they underperformed, relative to comparable local firms, in the crisis period. Considering all the firms in the common support for propensity scores, I find that debt raising PIFs had 3% higher sales growth, 4% higher asset growth and 2% higher profitability than local-firms during the post-crisis period. Their crisis period outcomes were similar on most measures, but debt PIFs had worse liquidity than local firms during the crisis period. These weaker outcomes are robust when if I use propensity scores in the range [0.1, 0.9] as suggested by Crump et al (2008). As can be seen in Table 8, the effect of such exclusion is that a substantial portion of firms drop out of the analysis, but the results are still robust.

The other distinction between equity and debt PIFs is that the coefficient estimates are smaller for debt PIFs than for equity PIFs. Equity PIFs have 9-10% asset and sales growth while debt PIFs have only 2-4% higher growth levels. I do a number of alternate robustness checks (alternate cut-offs for propensity scores, alternate probit estimations and resulting propensity scores, excluding PIF without the interaction as an independent variable as I assume that the treatment group and control group firms are good matches and have same pre-crisis performance). In all these estimations I find the same results: equity PIFs have larger coefficient estimates and have *better or no worse* outcomes than similar local firms in crisis whereas debt PIFs have *similar or worse* outcomes as other local firms during the crisis years.

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<sup>35</sup>The low t-statistics for the coefficient estimates for 'Equity PIF' indicate that, on average outcomes of equity PIFs and comparable non-PIFs are similar i.e. there seems to be no advantage in being a PIF during good times.

#### 6.4 *Testing for the Liquidity Mechanism*

If liquidity constraints contributed to the relative under-performance of debt PIFs then I should be able to see that in the finances raised by these different groups of firms. Data on foreign currency share of firms' capital or more granular data on the duration of debt capital is not available. But one way to assess financial constraints, in addition to the liquidity measures of cash flow and cash stock, is to analyze changes in the different types of financing available to these firms. Specifically, I investigate growth rates in three financial measures - short-term debt, long-term debt and paid-in capital. All these measures are expressed in US dollar terms.

The results for the impact of being a PIF on crisis-period growth rates of the different forms of financing are presented in Table 9. It shows that equity PIFs had higher growth in long-term borrowings during and after the crisis (column 2), which helped improve their liquidity outcomes. In contrast, debt PIFs had smaller increases in short-term debt (or greater amounts of debt maturing during the period) than similar local firms during the crisis and post-crisis periods. This provides strong evidence that equity PIFs and debt PIFs faced different liquidity constraints which could possibly explain the weaker liquidity outcomes of debt PIFs during the crisis period in Table 7.

The higher growth rate of long-term or short-term debt may have more than one interpretation. On one hand it could mean that fresh capital is flowing (in net terms) to firms. Short-term debt levels declined during the crisis for all firms in the common support of propensity score distribution; so the negative coefficient in column 1 of Table 13 indicates that decline in short-term debt levels was greater for foreign debt-raising PIFs. This could indicate debt PIFs' inability to roll-over a larger portion of their debt. On the other hand, it could also mean that if firms' debt is in home currency and there is a currency depreciation then a decrease in dollar value of debt is merely a reflection of a downward revaluation of existing loans. So a stronger performance of PIFs in raising more finances may be an optimistic estimate since PIFs have a higher propensity of relying on foreign currency finances. By the same measure, their weaker performance could show that these

PIFs had lower growth rates in their finances even though their comparison group (non-PIFs) had a downward revaluation of their debt - the estimate for debt PIFs in column 1 of Table 10b is thus a *conservative* estimate. In other words, it only strengthens the evidence that debt PIFs were more financially constrained than non-PIFs during the crisis years.

### **6.5 *Source of Financial Constraints for Debt PIFs***

Why were debt PIFs more financially constrained during the crisis period? Like equity raising PIFs, foreign debt-raising PIFs also had strong financial positions; and similar to foreign equity-raising firms, debt PIFs experienced a reduction in firm's financial constraints with access to foreign capital markets. One explanation can be found in a widely documented issue during and after the crisis: the risky financial policies of East Asian firms in the years leading up to the crisis. Studies show that leverage levels were increasing before the crisis even while profitability was falling (Claessens et al 2000, Harvey and Roper 1999). Further, they show this was more characteristic of firms that raised capital abroad.<sup>36</sup> Harvey and Roper (1999) show that a typical non-financial Asian firm that issued foreign debt was more highly leveraged than an average non-financial Asian firm that did not issue foreign debt. Table 3 also confirms that leverage of equity and debt PIFs was higher than that of non-PIFs, and that foreign debt issuing PIFs were the most leveraged prior to the crisis.

While access to both foreign equity and foreign debt reduces firm's financial constraints, data shows that debt issuances are more popular than equity issuances. This is not surprising especially given that firms in countries with under-developed financial systems face higher interest rates relative to interest rates in developed countries. But this form of cheap finance also increases the risk of financial distress. In a liquidity crisis, the high cost of debt servicing or repayment of debt could result in relative under-performance or even worse it could force the firm into financial distress.

I therefore analyze if the level and composition of debt prior to the crisis had any impact on crisis-period outcomes. While data on maturity of debt is not available, I have data for debt that

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<sup>36</sup>It is not surprising because once a firm is able to successfully have a public issue of debt or equity abroad, it has sent a signal of being a good investment opportunity, thereby attracting more investors.

is maturing during the financial year as well as data on long-term debt. I compute the firm-level average *long-term debt to asset ratio* and average *short-term debt to total debt ratio* for the period 1994-1996. Then, using the sample median for the level and composition of debt, I classify debt PIFs and non-PIFs into above or below median groups. I interact the high median groups with the interaction term of interest in the base specification ( $PIF * Crisis$  and  $PIF * Post$ ). The coefficient on this triple interaction provides a measure of the impact of pre-crisis leverage and composition of leverage on crisis-period (and post-crisis) outcomes.

The adverse effects of high-levels of leverage, especially short-term debt, are evident from the negative coefficients for the variables ' $Crisis * DebtPIF * Leverage$ ' and ' $Crisis * DebtPIF * Short - TermDebtProportion$ ' in Table 10. Foreign-debt raising PIFs with high levels of debt prior to the crisis have 1-3% worse outcomes than debt PIFs which were less levered. In fact, debt PIFs with *below* median long-term and short-term debt levels had higher asset growth, profitability and liquidity during the crisis period. Short-term debt (which also includes all long-term debt maturing in 12 months) had a strong negative influence on outcomes in the crisis period as well as post-crisis period.

In Table 12, I present the results of estimating the same specification using potential new financing - the growth in short-term and long-term debt as dependent variables. Leverage is often used as a measure of financial constraints. Once again it is evident that highly levered debt PIFs had little success in raising new debt during the crisis and post-crisis period. The negative coefficient for the interaction term ' $Crisis * DebtPIF$ ' in column 1 (growth in short-term debt) shows that all debt PIFs had difficulty raising short-term debt. I estimate these equations separately for Japanese and non-Japanese firms and find that the leverage and composition results extend to both sets of firms. In alternate estimations, I used total debt to assets as a measure of leverage and short-term debt to assets ratio and the results were quite similar.

I repeat these exercises for equity PIFs and non-PIFs and present the results in Table 11 and columns 3 and 4 of Table 12. The impact of leverage and composition of debt had very little effect on equity PIF outcomes. These results show that the distinction between foreign equity issuances

and foreign debt issuances is important. Even though equity PIFs also borrowed extensively prior to the crisis, their leverage levels had little impact on their crisis and post-crisis period outcomes, presumably because equity provides a natural counterbalance to higher levels of debt.

This suggests that firms that based their pre-crisis growth plans around a mix of foreign equity and debt had better crisis-period outcomes than firms that relied primarily and excessively on debt. The results are consistent with earlier studies that argue that the weak crisis period outcomes of firms were also in major part due to the weak corporate structures in the years leading up to the crisis. My findings provide micro-evidence that even large and financially powerful firms that had the PIF status were susceptible to financial constraints during bad times.

## **7 ALTERNATE EXPLANATIONS & ROBUSTNESS CHECKS**

As explained in Section 6.2, I define an additional variable 'operating exposure' as a proxy for product market exposures of firms. Following Adler-Dumas (1994), this is calculated as the correlation between real exchange rates and value of the firm. As the Compustat databases do not have comprehensive data on firm value, I substitute market value with operating profitability (defined as ratio of earnings before interest, taxes and depreciation to sales). Further, as the pre-crisis period is short I calculate this exposure over the entire analysis period of 1994-2004. A positive value for operating exposure indicates that the firm's profitability rises when the local currency is devalued as revenue from exports is higher, relative to pre-devaluation. I then include this variable in my probit estimation to calculate propensity scores. I find that operating exposure is a significant variable for being an equity PIF before the crisis but not for being a debt PIF. The new propensity score-weighted DID estimations provide similar results (Table 13) as in Table 7: equity PIFs perform better or no worse than other comparable local firms but debt PIFs under-perform other local firms.

Due to the distinctiveness of Japan amongst the countries in my sample, I test whether the results are different for Japanese and non-Japanese firms. Japan with its seemingly more sophisticated financial system and industrialized economy could be better placed to raise finances from sources

both within and outside the domestic economy. I find that while non-Japanese equity PIFs have better crisis and post-crisis period outcomes, Japanese equity PIFs also performed better or no worse than non-PIFs (Table 14). In contrast, Japanese debt PIFs (80% of foreign-debt raising PIF sample) are driving the weaker crisis-period outcomes (Table 15). Crisis-period outcomes of non-Japanese debt PIFs are better or no worse than local non-Japanese firms. I also test the pre-crisis leverage story for Japanese and non-Japanese debt PIFs. I find that highly levered debt PIFs from Japan as well as from countries excluding Japan, have adverse outcomes during the crisis and post-crisis periods (Table 16).

I conduct additional tests to see if the relative under-performance of foreign debt raising PIFs could possibly reflect other factors. First, I look at the impact of government guarantees on firm performance. Only a few (28 in my sample) of foreign debt-raising PIFs received a government guarantee prior to their foreign issuance. An explicit government guarantee can assure foreign investors of being repaid if the firm experiences distress. As a result, debt PIFs that obtained such guarantees could be less adversely affected by liquidity issues during crisis. The government guarantee dummy is interacted with my variable of interest. I find that, despite the small number of explicit sovereign guarantees, the impact of guarantee on firm outcomes was positive but only during the post-crisis period.<sup>37</sup> The impact of being a debt PIF during crisis (or post-crisis) is similar to the results in Table 7.

Second, I test the impact of credit ratings for the foreign bond issuances from international rating agencies viz. Standard & Poors and Moody's. Not all foreign debt issuances received a rating from Standard & Poors and Moody's. Specifically, I create a dummy which is equal to 1 if the foreign debt issue had an investment grade rating and 0 if it had a speculative grade rating or no rating. The rating dummy is interacted with my variable of interest. I find that debt PIFs (especially non-Japanese debt PIFs) with rating above BBB or Baa had better outcomes (asset growth and profitability) during the crisis and post-crisis period. Debt PIFs with speculative rating under-performed on the liquidity measure of cash stock to assets. As ratings are also a measure

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<sup>37</sup>Past research suggests that though there were few explicit guarantees, a number of foreign investments could have been based on implicit guarantees. Presumably these could be sovereign or guarantees from business group of the subject firm.

of firm's financial health, these results are consistent with my results for the impact of pre-crisis leverage on crisis period outcomes of debt PIFs.

Third, I test if the crisis-period performance of debt PIFs was different across sectors. I find that manufacturing sector debt PIFs had lower crisis-period cash stocks than debt PIFs from other sectors.<sup>38</sup> Mining, utilities and transportation sectors had the strongest liquidity measures during the crisis amongst all the sectors. Manufacturing also experienced a strong decline in sales growth during crisis and strong recovery in sales growth after the crisis.

Fourth, I test if having a separate parent firm (i.e. being a business group affiliate) has any impact on the outcomes of debt and equity PIFs. Plausibly if the PIF is in financial trouble and its parent is financially sound, the affiliate can rely on the internal financial markets of the parent to reduce its liquidity constraints during the crisis. Data on business affiliation is available only for firms that had issuances abroad. I create a dummy equal to 1 if the PIF is a business affiliate and 0 otherwise. All non-PIFs have a value of 0 for the dummy. Using the triple interactions ( $Crisis * PIF * Affiliate / PostCrisis * PIF * Affiliate$ ) I find that being a business affiliate did not affect the crisis and post-crisis performance of equity and debt PIFs.

## 8 CONCLUSIONS

I have investigated the value of previous foreign issuances by East Asian firms during and after the Asian financial crisis. I find that foreign issuances had, on balance, a positive impact on firm performance during and after the crisis. This suggests that, similar to FDI, tapping international financial markets benefits firms when they cannot rely on domestic sources of capital. But the form of the foreign portfolio capital matters. I show that while foreign equity-raising firms were less financially constrained than similar local firms, foreign debt-raising firms were more financially constrained during and after the crisis. Evidently, while foreign long-term debt can be cheaper than foreign equity, it also heightens risk. To highlight the liquidity constraints channel I show that crisis

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<sup>38</sup>60% of debt PIFs and 52% of equity PIFs are from the manufacturing sector in my sample.

and post-crisis period borrowing ability and associated firm outcomes were negatively affected by high pre-crisis levels of debt. My analysis underscores that firms whose growth plans were based on foreign equity had better crisis-period outcomes than firms that relied primarily on debt.

A natural extension, following this study, is to investigate the impact on firm outcomes when the liquidity crisis is in the foreign capital markets where the issuances were made. I use the same empirical strategy as the subject analysis to assess relative firm outcomes during the current financial crisis that has affected the U.S. and Western European countries much more than the emerging economies. My study does not explore the difference in impact of the size of the foreign issuance on firm outcomes during and after crisis. Such an analysis would require better tracking of firms' capital structures over time. Another related question that arises from the findings of my study as well as that of Aguirre and Gopinath (2005), is if foreign debt-raising firms were more likely to be acquired during the Asian financial crisis. These firms had good growth opportunities prior to the crisis but were liquidity constrained due to the crisis-induced credit crunch, that exacerbated their already weakened financial structures. I would be exploring the investment dynamics of Japanese firms which, in general, had more intangible assets that could be exploited by foreign direct investors.

Finally, it could be useful to understand the signaling and hedging motives for firms in raising capital abroad through public issues of equity versus debt, in the framework of a theoretical model. This would also help assess if foreign issuances have a persistent impact on the level and volatility of firm returns over different time-horizons and over different parts of the business cycle.

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## Appendix 1: Data Merge and Cleaning

Compustat has two major datasets that provides firm-level financial and accounting information. The data for US and Canadian firms and also foreign firms listed in the US is obtained from Compustat North America (Compustat NA) while data for firms in rest of the world is obtained from Compustat Global. The advantage of these datasets is that they provide standardized financial statement information and consistent, comparable data which helps in cross-country firm analysis. As of 2007, Compustat NA has data on nearly 15,000 active (and over 16,000 inactive), publicly held companies that dates back to the 1950s. Compustat Global has data on more than 24,000 active (and over 10,000 inactive) publicly traded non-US and non-Canadian companies and dates back to 1987; but data is sparse for the early 1990s.<sup>39</sup> The Compustat databases covers firms from more than 80 countries and represents over 90% of the world's market capitalization.<sup>40</sup> Since there are hardly any private firms in these databases the sample of firms would be overrepresented by relatively larger firms.

I combine the merged Compustat datasets with new security issuances data. I get public equity and debt issuance data from Securities Development Corporation's (SDC) New Issues database. The earliest transaction recorded are for domestic filings in US and dates back to 1970, but the most common overlap of information from regions across the world is from 1991 onwards. The database is divided into twelve sub-databases for each of the major regions: USA ; Canada; Continental European; UK; International; Japan; South Korea; Asia-Pacific; India; Australia & New Zealand; Latin America; Rest of the World. Most of the data is collected based on filings with the regulatory agencies, but for some countries (example India) data is obtained from domestic offering prospectus, news sources and wires. Henderson et al (2007) details the information collection process underlying the New Issues database.<sup>41</sup>

I exclude public-sector and government issuances because I am interested in corporate outcomes. Further as I focus on firm liquidity and real outcomes I also exclude issuances by financial firms like investment companies, investment trusts and mortgage-backed security issuances from my analysis. Financial institutions, especially those that relied on foreign finance, were liquidity constrained during the crisis. But a large number of these institutions also curtailed their primary activities due to unwillingness to lend in an uncertain environment that is characterized by a substantial increase in information asymmetry, an input that is critical for the functioning of the financial system.. As it is hard to separate the impact of liquidity constraints on these entities from their diffidence to engage in the full-scope of their activities, I exclude these firms from both sets of data. The accounting standards for income and profits for these entities is also different from those in other sectors. For the major part of my analysis I also exclude private placements by firms but do include this data in robustness checks. In order to determine whether an issue is international or domestic I use the information provided in the database. As this data item was incomplete I also compared the capital market of issue with the country where the firm is located and classified as foreign issues that were conducted exclusively in the capital market of home country. After these exclusions I have a sample comprising of 28,302 foreign issuances over the period 1990-2010.

The challenge in merging the two datasets was that there is no common unique firm identifier to merge the data. Using public identifiers like the International Security Identification Number (ISIN), Stock Exchange Daily Official List (SEDOL) and the common American identifier 'CUSIP' (Committee on Uniform Security Identification Procedures) I was able to merge approximately 70% of the foreign issuances by firms in the two datasets. I was able to match approximately another 10% of the firm issuances by using simple matching algorithm. More than 90% of the security issuances are made by publicly listed firms which makes the two databases quite compatible.

Most of the foreign equity issuance data is for 1990 and later years. For my analysis I consider East Asian firms that had foreign public debt issuances between 1990 and 1996 (In general, data shows that the median tenure of foreign bonds is five years (Hale 2010). The SDC database includes only debt issues with tenure greater than one year). I exclude domestic affiliates of foreign multinational parents that had international

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<sup>39</sup>This data-set has the advantage that accounting principles, specific data definitions and disclosures are normalized across countries which makes the underlying data highly comparable.

<sup>40</sup>Standard & Poor Compustat Global Data Brochure

<sup>41</sup>Due to the possibilities of sampling bias I use only data regarding foreign capital issues of firms in East Asia. Most of the foreign raisings occurred in US and European markets where data is collected based on regulatory filings and is therefore likely to be more accurate.

issuances, to get a better estimate of causal effects of FPI without the confounding effects of FDI.<sup>42</sup> I was thus able to match approximately 80% of the foreign raisings and 76% of the East Asian firms in the SDC new issues database with firm data in Compustat. Foreign Capital Flows to East Asian Countries. Table 1 and 2 provide details of the firms that issued foreign securities through public issues in the 6 years prior to the Asian financial crisis.

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<sup>42</sup>These were not numerically not large. For example less than 3% of foreign equity issuances were by multinational affiliates.

**Appendix 2: Theoretical Foundation for Econometric Strategy of Propensity Score-Weighted Difference-In-Difference Estimation<sup>43</sup>**

I denote the binary treatment indicator as  $F_{i,t}$ , which equals one if firm  $i$  receives treatment i.e. raises capital abroad through public issue before the onset of crisis, and zero otherwise. The potential firm outcome in crisis (or post-crisis period) is defined as  $Y_{i,t}(F_{i,t})$  for each firm  $i$ . The impact of raising capital abroad through public issue on firm outcomes when hit by the financial shock in period  $t$  can be shown as:

$$\tau_i = Y_{i,t}(1) - Y_{i,t}(0) \quad (3)$$

Since I can only observe the firm in one state I cannot calculate  $\tau_i$ ; instead I calculate the average treatment effect on treated firms (ATT) using the population of firms.  $\tau_{ATT}$  can therefore be expressed as:

$$\tau_{ATT} = E(\tau_i | F = 1) = E(Y_{i,t}(1) | F = 1) - E(Y_{i,t}(0) | F = 1) \quad (4)$$

Note that  $E(Y(0) | F = 1)$  is not observed. Substituting this for the counterfactual  $E(Y(0) | F = 0)$  is not appropriate because covariates that impact firm's decision to raise capital abroad could also impact firm outcome; as a result the firms in the control and treatment group would differ even in the absence of matching leading to a self-selection bias. Rewriting (4):

$$E(Y_{i,t}(1) | F = 1) - E(Y_{i,t}(0) | F = 1) = \tau_{ATT} + E(Y_{i,t}(0) | F = 1) - E(Y_{i,t}(0) | F = 0) \quad (5)$$

The difference between the last two terms is the so called *self-selection bias*. Only if the difference between the last two terms is 0 can  $\tau_{ATT}$  be identified. One possible identification strategy that is commonly used is known as the 'unconfoundedness assumption' or the conditional independence assumption i.e. given a set of observable pre-treatment covariates  $X$ , the treatment assignment is independent of future potential outcomes.

$$Y_{i,t}(1), Y_{i,t}(0) \perp F_{i,t} | X_{i,t-1} \quad (6)$$

where  $X_{i,t-1}$  is the set of observable firm characteristics. So in order that firms raising capital abroad not be affected by the crisis and post-crisis period outcomes I model PIF membership based on pre-crisis period firm characteristics ( $t-1$ ). This is a very strong assumption; according to Hirano and Imbens (2001), the assumption that all relevant variables are observed can be a reasonable approximation.<sup>44</sup> The propensity score of firm  $i$  in year  $t$  (i.e. probability of raising capital abroad conditional on firm characteristics) formally is:

$$p(X)_{i,t-1} = E(F_{i,t} | X_{i,t-1}) \quad (7)$$

An additional requirement other than unconfoundedness is the common support or overlap condition which rules out the possibility of perfect predictability of  $F$  given  $X$ ; i.e:

$$0 < Pr(F_{i,t} = 1 | X_{i,t-1}) < 1 \quad (8)$$

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<sup>43</sup>Rosenbaum and Rubin 1985, Hirano and Imbens, 2001)

<sup>44</sup>One way to satisfy this reasonably is by combining propensity scores with other techniques like DID and regression adjustment.

This ensures that firms with same X have a positive probability of being a PIF whether in fact they are or not a PIF in the pre-crisis period. Once the propensity scores are estimated, there are a number of ways to calculate the average treatment effect on the treated firms. Most techniques use a weighting function to weight the control group firm matches and calculate the average treatment effect or the treatment effect on treated units. I use propensity scores to calculate weights to estimate weighted DID regressions. My approach is based on the work of Hirano and Imbens (2001) and is similar to the work of Robins and Rotnitzky (1995). Essentially, since I am interested in estimating the average treatment effect of being a PIF before the crisis started, I give a weight of one to each firm in the treatment group; and the ratio of the propensity score to one minus the propensity score is used as the weight for the control group firm. Thus control group firms with a high propensity score will have a large weight in my estimation and those with a low probability of raising capital abroad will be given a low weight. The weights (w) can be formally expressed as:

$$w(F, X) = F_{it} + (1 - F_{it}) \cdot \frac{\hat{p}(X_{i,t-1})}{1 - \hat{p}(X_{i,t-1})} \quad (9)$$

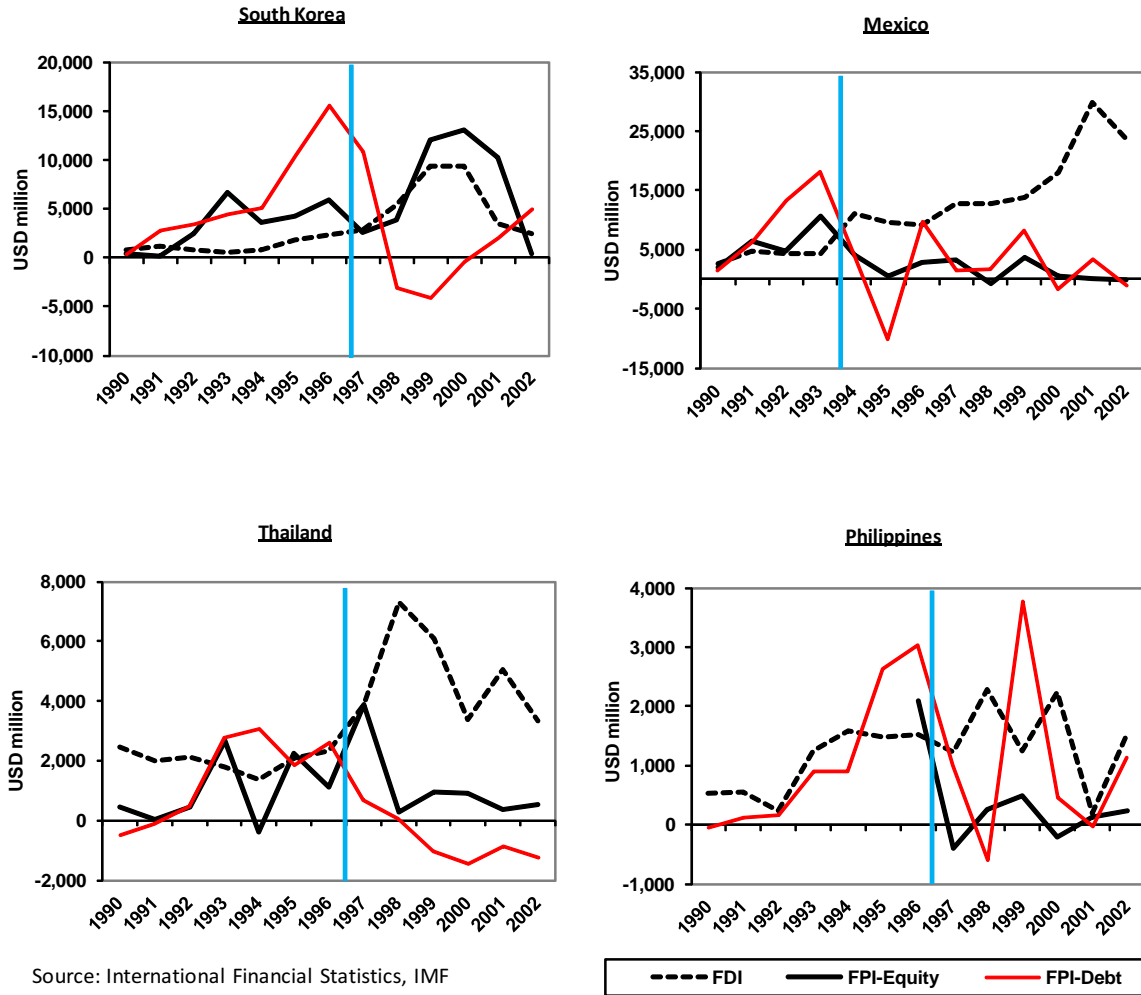
and the weighted ATT can be shown as:

$$\tau = E \left[ (Y_{i,t} - Y_{i,t-1}) \cdot F_i - \frac{(Y_{i,t} - Y_{i,t-1}) \cdot (1 - F_i) \cdot \hat{p}(X_{i,t-1})}{1 - \hat{p}(X_{i,t-1})} \right] \quad (10)$$

If I normalize weights to one, my simple weighting DID estimator can be shown as:

$$\hat{\tau}_{ATT, wtd.DID} = \frac{\sum_{i=1}^N F_i \cdot (Y_{i,t} - Y_{i,t-1})}{\sum_{i=1}^N F_i} - \frac{\sum_{i=1}^N (1 - F_i) \cdot (Y_{i,t} - Y_{i,t-1}) \cdot \hat{p}(X_i) / (1 - \hat{p}(X_i))}{\sum_{i=1}^N (1 - F_i) \cdot \hat{p}(X_i) / (1 - \hat{p}(X_i))} \quad (11)$$

Figure 1: Foreign Investment Flows: Liabilities (1990-2002)



Source: International Financial Statistics, IMF



Figure 1 shows the pattern of foreign capital flows into the subject countries in the years prior to and subsequent to the financial crises. The vertical line marks the year when the systemic banking crisis affected the country. FDI: Foreign Direct Investment; FPI: Foreign Portfolio Investment.



Table 1: Database Merge Summary for East Asian Firms that Raised Capital Abroad During 1991-1996

	<b># PIFs in SDC Database</b>	<b># Merged With Compustat</b>	<b># Equity PIFs</b>	<b># Debt PIFs</b>	<b>Merge %</b>
Hong Kong	87	45	33	12	52%
Indonesia	67	42	38	9	63%
Japan	588	502	25	488	85%
Malaysia	16	11	6	6	69%
Phillipines	48	24	16	8	50%
South Korea	97	65	11	60	67%
Thailand	72	45	27	18	63%
Taiwan	47	39	18	25	83%
<b>Total</b>	<b>1022</b>	<b>773</b>	<b>174</b>	<b>626</b>	<b>76%</b>

Table 2: Details of Sample Construction

	<b>Equity</b>	<b>Debt</b>
Number of Firms in Merged Database	174	626
Number of Firms with Parent from Non-	7	22
Number of Firms with Data	130	579
Number of Firms in Balanced Panel	106	543

*Source: SDC New Issues Database, Compustat Global and Compustat North America*

Table 3: Summary Statistics for All Analysis Time Periods

	Pre-Crisis (1994-1996)			Crisis			Post-Crisis		
	Equity PIF	Debt PIF	Non-PIF	Equity PIF	Debt PIF	Non-PIF	Equity PIF	Debt PIF	Non-PIF
Sales (\$ mn)	4923	<b>5822</b>	402	3978	5112	367	4481	5738	404
Assets (\$ mn)	5473	<b>6324</b>	432	5033	5892	408	4931	6384	416
Long Term Debt/Assets	0.162	0.201	<b>0.122</b>	0.201	0.190	0.120	0.197	0.164	0.110
Short Term Debt/Assets	<b>0.133</b>	0.172	0.174	0.195	0.185	0.192	0.137	0.149	0.169
Sales growth	<b>0.257</b>	0.095	0.132	-0.010	-0.005	-0.023	0.107	0.087	0.098
Volatility of sales growth	0.193	<b>0.144</b>	0.179	0.289	0.001	0.243	0.195	0.128	0.211
Asset growth	<b>0.260</b>	0.087	0.129	-0.010	0.065	0.000	0.049	0.049	0.085
Return on Assets	<b>0.114</b>	0.058	0.047	0.096	0.041	0.065	0.133	0.084	0.066
Investment/Assets	<b>0.113</b>	0.087	0.079	0.070	0.136	0.042	0.051	0.037	0.037
Cash Stock/Assets	0.165	<b>0.173</b>	0.157	0.144	0.093	0.152	0.142	0.114	0.147
Cash Flow/Sales	<b>0.190</b>	0.083	0.050	0.183	0.093	0.025	0.173	0.107	0.052
N	130	579	4030	128	571	4006	117	538	3821

The table reports summary statistics for various financial variables for the three different types of East Asian firms. Equity PIFs (Debt PIFs) are firms that had a equity (debt) issue in a foreign capital market during 1991-1996. Data on foreign issuances is obtained from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and depreciation and cash stock is measured as the stock of cash and marketable securities. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis.

Table 4: Difference-In-Difference Estimation: Average Period Data

<b>Equity PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/Output</b>	<b>Cash stock/Assets</b>
Crisis*Equity PIF	-0.016 <i>(-1.13)</i>	-0.027 <i>(-1.53)</i>	0.003 <i>(0.27)</i>	<b>0.013*</b> <i>(1.72)</i>	-0.003 <i>(-0.32)</i>	0.007 <i>(0.48)</i>
Post*Equity PIF	0.008 <i>(0.58)</i>	-0.017 <i>(-1.21)</i>	0.006 <i>(0.50)</i>	0.011 <i>(1.53)</i>	-0.006 <i>(-0.71)</i>	0.023 <i>(1.63)</i>
Equity PIF	<b>0.023**</b> <i>(2.27)</i>	<b>0.045***</b> <i>(4.71)</i>	-0.008 <i>(-0.94)</i>	<b>0.010*</b> <i>(1.88)</i>	<b>0.024***</b> <i>(4.08)</i>	<b>0.031***</b> <i>(3.23)</i>
R-squared	0.54	0.52	0.31	0.22	0.34	0.15
N	8985	8985	8698	8985	8982	8985
N - Equity PIFs	117	117	117	117	117	117
Country * Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

<b>Debt PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/Output</b>	<b>Cash stock/Assets</b>
Crisis*Debt PIF	<b>0.023***</b> <i>(2.96)</i>	<b>0.020**</b> <i>(2.49)</i>	<b>0.032***</b> <i>(3.66)</i>	<b>0.012***</b> <i>(4.89)</i>	-0.026 <i>(-1.40)</i>	-0.005 <i>(-0.49)</i>
Post*Debt PIF	<b>0.036***</b> <i>(4.01)</i>	<b>0.055***</b> <i>(5.96)</i>	<b>0.025***</b> <i>(2.73)</i>	<b>0.016***</b> <i>(4.80)</i>	0.007 <i>(0.52)</i>	-0.003 <i>(-0.30)</i>
Debt PIF	-0.005 <i>(-1.00)</i>	<b>-0.015**</b> <i>(-2.47)</i>	<b>-0.022***</b> <i>(-4.41)</i>	<b>-0.004**</b> <i>(-2.20)</i>	<b>0.013***</b> <i>(3.36)</i>	0.012 <i>(1.16)</i>
R-squared	0.30	0.29	0.14	0.15	0.02	0.12
N	10416	10416	10297	10416	10415	10416
N - Debt PIFs	536	536	536	536	536	536
Country	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

The table reports the impact of being a PIF on firm outcomes during the crisis and post-crisis periods. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and depreciation and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables. The coefficient for the interaction variable, Crisis \* PIF (Post\*PIF), provides a measure of the difference across firms and over time periods of being a PIF. All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.

Table 5: Probit Regression Estimates on Firms' Likelihood of being a PIF at the beginning of 1997

	<b>Equity PIF when Crisis Started</b>	<b>Debt PIF when Crisis Started</b>
Size (Log, 1994-96)	<b>0.538***</b> (10.18)	<b>0.711***</b> (24.21)
Average Asset Growth (1994-96)	<b>0.843***</b> (3.34)	-0.276 (-0.57)
Leverage (1994-96)	0.4340 (1.06)	<b>1.534***</b> (4.49)
Short-Term Debt/Assets (1994-96)	-0.060 (-0.17)	<b>-0.329*</b> (-1.87)
Return on Assets (1994-96)	<b>3.908***</b> (3.08)	-1.414 (-1.48)
PPE/Assets (1994-96)	0.205 (0.85)	-0.219 (-1.50)
Average Sales Growth (1994-96)	0.165 (0.82)	<b>0.802**</b> (1.96)
Volatility: Sales growth (1994-96)	-0.575 (-1.28)	<b>-0.672**</b> (-2.30)
Working Capital/Assets (1994-96)	<b>1.495**</b> (2.58)	<b>0.920***</b> (4.08)
R-square	0.51	0.43
Number of Firms	3203	3697
Country Dummies	Y	Y
Sector Dummies	Y	Y

*PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). The dependent variable is a binary indicator for a firm being a PIF when the crisis starts. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables.*

*Robust standard errors in parentheses. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.*

Table 6: Balancing Test for Covariates Matching

Variables (Pre-Crisis: 1994-1996)	Mean		% Bias		t-stat
	Treated	Control	% Bias	Reduction	
<b>Panel A: Equity PIF</b>					
Average Sales Growth	0.257	0.241	4.3	87.0	0.29
Volatility- Sales growth	0.193	0.241	-22.5	-234.7	-1.13
Size (Log Assets)	7.041	7.205	-9.6	91.8	-0.74
Leverage	0.162	0.157	3.6	88.0	0.28
Return on Assets	0.114	0.114	0	99.2	-0.05
Fixed Assets/Total Assets	0.587	0.560	7.8	32.1	0.63
Short Term Debt Proportion	0.133	0.136	-2.3	92.5	-0.19
Working Capital/Assets	0.166	0.128	16.7	23.0	1.48
Cash Flow/Output	0.190	0.205	-2.1	89.5	-0.46
Capital Invested/Output	1.804	2.124	-4.5	53.2	-0.36
Cash & equivalents/Assets	0.165	0.161	2.9	58.1	0.20
Growth in Assets	0.260	0.293	-11.1	75.1	-0.71
Operating Exposure	0.045	0.025	4.2	67.9	0.32
<b>Panel B: Debt PIF</b>					
Average Sales Growth	0.095	0.099	-1.9	89.3	-0.59
Volatility- Sales growth	0.144	0.150	-3.7	82.7	-0.9
Size (Log Assets)	7.572	7.548	1.7	99.0	0.28
Leverage	0.201	0.188	10.6	83.6	1.51
Return on Assets	0.058	0.056	0.1	87.0	0.56
Fixed Assets/Total Assets	0.620	0.589	8.8	56.9	1.56
Short Term Debt Proportion	0.172	0.178	-4.7	-166.6	-0.81
Working Capital/Assets	0.124	0.140	-7.9	-161.1	-1.49
Cash Flow/Output	0.083	0.077	0.9	82.0	1.25
Capital Invested/Output	0.988	0.819	2.3	-25.5	1.06
Cash & equivalents/Assets	0.173	0.173	-0.2	98.2	-0.03
Growth in Assets	0.087	0.099	-6.8	70.2	-1.59
Operating Exposure	-0.177	-0.169	-1.8	95.2	-0.31

*This table presents the results of tests that check whether the propensity scores approach is effective in grouping together similar firms. The result for each financial variable shown above is the average difference between PIFs and weighted non-PIFs. Differences are normalized by the pooled standard deviation of the covariate in the two samples.*

Table 7: Propensity Score Weighted DID Estimation: Equity and Debt PIFs

<b>Equity PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/Output</b>	<b>Cash stock/Assets</b>
Crisis*Equity PIF	<b>0.088*</b> <i>(1.72)</i>	<b>0.095*</b> <i>(1.95)</i>	0.054 <i>(0.93)</i>	0.006 <i>(0.55)</i>	0.007 <i>(0.46)</i>	<b>0.018*</b> <i>(1.82)</i>
Post*Equity PIF	<b>0.094*</b> <i>(1.93)</i>	<b>0.103**</b> <i>(2.07)</i>	0.015 <i>(0.27)</i>	0.011 <i>(0.78)</i>	0.004 <i>(0.18)</i>	0.025 <i>(1.54)</i>
Equity PIF	-0.062 <i>(-1.55)</i>	-0.066* <i>(-1.76)</i>	-0.072 <i>(-1.60)</i>	-0.005 <i>(-0.53)</i>	0.029 <i>(1.52)</i>	0.019 <i>(1.26)</i>
R-squared	0.32	0.36	0.25	0.3	0.4	0.37
N	3372	3372	3286	3372	3372	3372
N: Equity PIFs	93	93	93	93	93	93
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y
<b>DEBT PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/Output</b>	<b>Cash stock/Assets</b>
Crisis*Debt PIF	0.006 <i>(0.74)</i>	0.012 <i>(0.91)</i>	0.009 <i>(0.67)</i>	0.003 <i>(1.26)</i>	0.002 <i>(0.41)</i>	<b>-0.009**</b> <i>(-2.18)</i>
Post*Debt PIF	<b>0.030**</b> <i>(2.20)</i>	<b>0.041***</b> <i>(2.64)</i>	-0.002 <i>(-0.13)</i>	<b>0.017*</b> <i>(1.67)</i>	0.016 <i>(1.48)</i>	-0.008 <i>(-1.06)</i>
Debt PIF	-0.004 <i>(-0.51)</i>	-0.019* <i>(-1.74)</i>	-0.003 <i>(-0.36)</i>	-0.001 <i>(-0.35)</i>	-0.002 <i>(-0.45)</i>	-0.002 <i>(-0.24)</i>
R-squared	0.35	0.34	0.23	0.24	0.15	0.21
N	7809	7809	7720	7809	7808	7809
N: Debt PIFs	494	494	494	494	494	494
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

*These are the main results of my study. The table reports the impact of being a PIF on firm outcomes during the crisis and post-crisis periods. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables.*

*All estimations include control for pre-crisis firm size. Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.*

Table 8: Propensity Score Weighted DID Estimation: Robustness Using [0.1, 0.9] Range for Propensity Scores

	Average	Average	Volatility:	Return on	Cash	Cash
Equity PIFs	Sales Growth	Asset Growth	Sales Growth	Assets	Flow/Output	stock/Assets
Crisis*Equity PIF	0.056 <i>(0.87)</i>	<b>0.104*</b> <i>(1.81)</i>	0.023 <i>(0.32)</i>	0.009 <i>(0.71)</i>	0.012 <i>(0.53)</i>	0.005 <i>(0.46)</i>
Post*Equity PIF	0.080 <i>(1.29)</i>	<b>0.114*</b> <i>(1.89)</i>	0.007 <i>(0.09)</i>	0.023 <i>(1.24)</i>	0.019 <i>(0.76)</i>	0.012 <i>(0.65)</i>
Equity PIF	-0.024 <i>(-0.45)</i>	-0.073 <i>(-1.62)</i>	-0.039 <i>(-0.69)</i>	-0.001 <i>(-0.04)</i>	0.036 <i>(1.32)</i>	0.02 <i>(1.08)</i>
R-squared	0.35	0.43	0.26	0.34	0.41	0.6
N	687	687	659	687	687	687
N: Equity PIFs	77	77	77	77	77	77
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

	Average	Average	Volatility:	Return on	Cash	Cash
DEBT PIFs	Sales Growth	Asset Growth	Sales Growth	Assets	Flow/Output	stock/Assets
Crisis*Debt PIF	0.008 <i>(0.90)</i>	0.000 <i>(0.02)</i>	0.012 <i>(0.96)</i>	0.002 <i>(0.93)</i>	0.000 <i>(-0.12)</i>	<b>-0.011**</b> <i>(-2.54)</i>
Post*Debt PIF	<b>0.022*</b> <i>(1.83)</i>	<b>0.031***</b> <i>(2.82)</i>	-0.004 <i>(-0.30)</i>	<b>0.007*</b> <i>(1.78)</i>	0.001 <i>(0.18)</i>	-0.009 <i>(-1.20)</i>
Debt PIF	-0.003 <i>(-0.37)</i>	-0.011 <i>(-1.38)</i>	-0.001 <i>(-0.16)</i>	-0.003 <i>(-0.93)</i>	-0.006 <i>(-1.18)</i>	-0.002 <i>(-0.26)</i>
R-squared	0.36	0.3	0.26	0.36	0.39	0.23
N	3366	3366	3331	3366	3366	3366
N: Debt PIFs	407	407	407	407	407	407
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

The table reports the test to check the robustness of the impact of being a PIF on firm outcomes during the crisis and post-crisis periods. I include only those firms which have propensity scores in the range of [0.1,0.9]. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables. All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.

Table 9: Liquidity Constraints: New Finances Aailed

Equity PIFs	EQUITY PIFs			DEBT PIFs		
	Growth: ST Debt	Growth: LT Debt	Growth: Paid -in Capital	Growth: ST Debt	Growth: LT Debt	Growth: Paid -in Capital
Crisis*PIF	0.467 <i>(0.68)</i>	<b>1.070*</b> <i>(1.72)</i>	0.069 <i>(0.58)</i>	<b>-0.596***</b> <i>(-2.91)</i>	-0.161 <i>(-1.13)</i>	-0.037 <i>(-0.78)</i>
Post* PIF	-0.293 <i>(-0.61)</i>	<b>1.878**</b> <i>(2.12)</i>	0.071 <i>(0.82)</i>	<b>-0.523**</b> <i>(-2.23)</i>	-0.256 <i>(-1.22)</i>	0.008 <i>(0.17)</i>
PIF	-0.283 <i>(-0.69)</i>	-0.520** <i>(-2.18)</i>	-0.034 <i>(-0.72)</i>	0.442** <i>(2.36)</i>	0.097 <i>(0.96)</i>	-0.012 <i>(-0.82)</i>
R-squared	0.13	0.12	0.13	0.04	0.03	0.10
N	3169	3030	3372	7591	7327	7788
N - Equity PIFs	93	93	93	523	523	523
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

The table reports the impact of being a PIF on new finances raised by firms during the crisis and post-crisis periods. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations are: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. The dependent variables are growth rates in short-term debt, long-term debt and paid-in capital, relative to the pre-crisis period. PIF, Crisis and Post-Crisis are dummy variables. All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.

Table 10: Impact of Pre-Crisis Debt Levels on Crisis and Post-Crisis Firm Outcomes - Equity PIFs

EQUITY PIFs	Average Sales Growth	Average Asset Growth	Volatility: Sales Growth	Return on Assets	Cash Flow/Output	Cash/Assets
Crisis*Equity PIF	<b>0.148**</b> <i>(2.32)</i>	<b>0.162**</b> <i>(2.40)</i>	0.091 <i>(1.35)</i>	0.006 <i>(0.18)</i>	0.017 <i>(0.31)</i>	0.037 <i>(1.50)</i>
Post*Equity PIF	<b>0.175***</b> <i>(2.91)</i>	<b>0.177***</b> <i>(2.97)</i>	0.04 <i>(0.65)</i>	0.01 <i>(0.31)</i>	-0.009 <i>(-0.15)</i>	0.056 <i>(1.61)</i>
Crisis*Equity PIF*High Leverage	-0.077 <i>(-1.56)</i>	-0.071 <i>(-1.39)</i>	-0.032 <i>(-0.75)</i>	-0.009 <i>(-0.26)</i>	-0.016 <i>(-0.29)</i>	-0.019 <i>(-0.72)</i>
Crisis* Equity PIF*High Short-Term Debt Proportion	-0.016 <i>(-0.43)</i>	-0.051 <i>(-1.56)</i>	-0.055 <i>(-1.42)</i>	0.014 <i>(0.57)</i>	0.002 <i>(0.04)</i>	-0.031 <i>(-1.28)</i>
Post* Equity PIF*High Leverage	-0.073 <i>(-1.45)</i>	-0.063 <i>(-1.49)</i>	-0.022 <i>(-0.53)</i>	0.009 <i>(0.29)</i>	0.013 <i>(0.23)</i>	-0.036 <i>(-1.05)</i>
Post*Equity PIF*High Short-Term Debt Proportion	-0.083* <i>(-1.88)</i>	-0.082** <i>(-2.44)</i>	-0.043 <i>(-1.17)</i>	-0.013 <i>(-0.48)</i>	0.009 <i>(0.17)</i>	0.007 <i>(0.23)</i>
Equity PIF	-0.062 <i>(-1.56)</i>	-0.066* <i>(-1.77)</i>	-0.067 <i>(-1.55)</i>	-0.005 <i>(-0.53)</i>	0.029 <i>(1.52)</i>	-0.002 <i>(-0.12)</i>
R-squared	0.32	0.36	0.25	0.30	0.40	0.37
N	3372	3372	3466	3372	3372	3372
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

The table reports the impact of being a PIF on firm outcomes during the crisis and post-crisis periods, controlling for pre-crisis level and composition of leverage. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables. High Leverage before crisis and High short-term debt share before crisis are both dummy variables. The dummies are equal to one if the firm's leverage or short-term debt share is above the median leverage (median short-term debt share). All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.

Table 11: Impact of Pre-Crisis Debt Levels on Crisis and Post-Crisis Firm Outcomes: Debt PIFs

Debt PIFs	Average Sales Growth	Average Asset Growth	Volatility: Sales Growth	Return on Assets	Cash Flow/Output	Cash/Assets
Crisis*Debt PIF	0.013 <i>(1.24)</i>	<b>0.040**</b> <i>(2.47)</i>	-0.002 <i>(-0.18)</i>	<b>0.014***</b> <i>(3.25)</i>	<b>0.021***</b> <i>(3.01)</i>	<b>0.025***</b> <i>(2.74)</i>
Post*Debt PIF	<b>0.040***</b> <i>(2.95)</i>	<b>0.056***</b> <i>(3.81)</i>	-0.013 <i>(-0.84)</i>	<b>0.017***</b> <i>(2.81)</i>	<b>0.027***</b> <i>(2.86)</i>	<b>0.044***</b> <i>(3.83)</i>
Crisis*Debt PIF*High Leverage	-0.002 <i>(-0.23)</i>	-0.030** <i>(-2.48)</i>	0.015* <i>(1.66)</i>	-0.012*** <i>(-2.60)</i>	-0.018** <i>(-2.51)</i>	-0.037*** <i>(-3.95)</i>
Crisis*Debt PIF*High Short-Term Debt Proportion	-0.019** <i>(-2.40)</i>	-0.021** <i>(-2.14)</i>	0.000 <i>(0.02)</i>	-0.011*** <i>(-2.63)</i>	-0.021*** <i>(-3.44)</i>	-0.021** <i>(-2.56)</i>
Post*Debt PIF*High Leverage	-0.005 <i>(-0.37)</i>	-0.012 <i>(-1.05)</i>	0.014 <i>(1.56)</i>	0.004 <i>(0.38)</i>	-0.007 <i>(-0.61)</i>	-0.059*** <i>(-5.87)</i>
Post*Debt PIF*High Short-Term Debt Proportion	-0.022* <i>(-1.78)</i>	-0.023* <i>(-1.91)</i>	0.002 <i>(0.18)</i>	-0.008 <i>(-1.56)</i>	-0.017** <i>(-2.44)</i>	-0.028*** <i>(-3.50)</i>
Debt PIF	-0.004 <i>(-0.50)</i>	-0.019* <i>(-1.75)</i>	-0.003 <i>(-0.34)</i>	-0.001 <i>(-0.35)</i>	-0.002 <i>(-0.46)</i>	-0.002 <i>(-0.28)</i>
R-squared	0.35	0.34	0.23	0.24	0.15	0.22
N	7809	7809	7720	7809	7808	7809
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

The table reports the impact of being a PIF on firm outcomes during the crisis and post-crisis periods, controlling for pre-crisis level and composition of leverage.. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables. High Leverage before crisis and High short-term debt share before crisis are both dummy variables. The dummies are equal to one if the firm's leverage or short-term debt share is above the median leverage (median short-term debt share). All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.

Table 12: Impact of Pre-Crisis Debt Levels on Firm Liquidity: Equity and Debt PIFs

	EQUITY PIFs		DEBT PIFs	
	Growth: Short Term Debt	Growth: Long Term Debt	Growth: Short Term Debt	Growth: Long Term Debt
Crisis*PIF	-1.342 <i>(-0.83)</i>	1.475 <i>(1.61)</i>	<b>-0.467*</b> <i>(-1.95)</i>	0.134 <i>(0.44)</i>
Post*PIF	0.988 <i>(1.46)</i>	<b>1.414*</b> <i>(1.71)</i>	-0.029 <i>(-0.08)</i>	-0.052 <i>(-0.14)</i>
Crisis*Debt PIF*High Long-Term Debt/Assets	2.291 <i>(1.43)</i>	-0.805 <i>(-1.02)</i>	0.087 <i>(0.73)</i>	-0.408* <i>(-1.65)</i>
Crisis*Debt PIF*High Short-Term Debt Proportion	-0.549 <i>(-1.14)</i>	0.521 <i>(0.71)</i>	-0.377 <i>(-1.32)</i>	-0.286 <i>(-0.94)</i>
Post*Debt PIF*High Long-Term Debt/Assets	-0.499 <i>(-1.14)</i>	-0.751 <i>(-1.16)</i>	-0.502** <i>(-2.41)</i>	-0.062 <i>(-0.27)</i>
Post*Debt PIF*High Short-Term Debt Proportion	-0.582 <i>(-1.23)</i>	-0.362 <i>(-0.96)</i>	-0.483*** <i>(-4.82)</i>	-0.105 <i>(-0.57)</i>
PIF	1.288 <i>(0.73)</i>	-0.944 <i>(-1.33)</i>	0.394** <i>(2.05)</i>	0.130 <i>(1.25)</i>
R-squared	0.12	0.16	0.05	0.04
N	3169	3030	7614	7350
Country * Time FE	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y

The table reports the impact of being a PIF on firm financing during the crisis and post-crisis periods, controlling for pre-crisis level and composition of leverage.. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables. High Leverage before crisis and High short-term debt share before crisis are both dummy variables. The dummies are equal to one if the firm's leverage or short-term debt share is above the median leverage (median short-term debt share). All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.

Table 13: Robustness Check: Including Operating Exposure of Firm as Independent Variable

<b>Equity PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/Output</b>	<b>Cash stock/Assets</b>
Crisis*Equity PIF	<b>0.118**</b> <i>(2.00)</i>	<b>0.132**</b> <i>(2.56)</i>	0.096 <i>(1.40)</i>	0.009 <i>(0.86)</i>	0.012 <i>(0.60)</i>	0.009 <i>(0.94)</i>
Post*Equity PIF	<b>0.113**</b> <i>(2.00)</i>	<b>0.107**</b> <i>(2.03)</i>	0.036 <i>(0.56)</i>	0.022 <i>(1.22)</i>	0.022 <i>(0.81)</i>	0.009 <i>(0.55)</i>
Equity PIF	-0.082* <i>(-1.67)</i>	-0.091** <i>(-2.20)</i>	-0.099 <i>(-1.63)</i>	-0.006 <i>(-0.71)</i>	0.018 <i>(0.63)</i>	0.031* <i>(1.96)</i>
R-squared	0.25	0.36	0.17	0.19	0.16	0.35
N	3027	3027	2956	3027	3027	3027
N: Equity PIFs	93	93	93	93	93	93
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

<b>DEBT PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/Output</b>	<b>Cash stock/Assets</b>
Crisis*Debt PIF	0.004 <i>(0.55)</i>	0.01 <i>(0.87)</i>	0.009 <i>(0.84)</i>	0.003 <i>(1.28)</i>	0.002 <i>(0.55)</i>	<b>-0.008**</b> <i>(-1.99)</i>
Post*Debt PIF	<b>0.020*</b> <i>(1.69)</i>	<b>0.035**</b> <i>(2.54)</i>	-0.008 <i>(-0.65)</i>	<b>0.015*</b> <i>(1.73)</i>	0.015 <i>(1.55)</i>	-0.006 <i>(-0.82)</i>
Debt PIF	0.000 <i>(-0.03)</i>	-0.018* <i>(-1.75)</i>	0.001 <i>(0.12)</i>	-0.002 <i>(-0.58)</i>	-0.003 <i>(-0.75)</i>	-0.003 <i>(-0.38)</i>
R-squared	0.35	0.33	0.24	0.24	0.15	0.22
N	7773	7773	7686	7773	7772	7773
N: Debt PIFs	492	492	492	492	492	492
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

The table reports the check for robustness of the impact of being a PIF on firm outcomes during the crisis and post-crisis periods when a new variable operating exposure is included in calculation of propensity scores and weights for the DID regression. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables. Operating exposure is calculated as the correlation of firm's operating profitability (ratio of earnings before interest, tax and depreciation) to the real exchange rate over the sample period. All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.

Table 14: Robustness Check: Japanese and Non Japanese Equity PIFs

<b>NON-JAPANESE EQUITY PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/Output</b>	<b>Cash stock/Assets</b>
Crisis*Equity PIF	0.091 <i>(1.37)</i>	<b>0.107*</b> <i>(1.71)</i>	0.053 <i>(0.69)</i>	0.002 <i>(0.18)</i>	0.013 <i>(0.59)</i>	0.014 <i>(0.88)</i>
Post*Equity PIF	<b>0.118*</b> <i>(1.87)</i>	<b>0.132**</b> <i>(2.08)</i>	0.031 <i>(0.45)</i>	0.010 <i>(0.57)</i>	0.008 <i>(0.30)</i>	<b>0.036*</b> <i>(1.67)</i>
Equity PIF	-0.078 <i>(-1.45)</i>	-0.073 <i>(-1.56)</i>	-0.089 <i>(-1.50)</i>	0.008 <i>(0.62)</i>	0.051* <i>(1.94)</i>	0.025 <i>(1.52)</i>
R-squared	0.34	0.4	0.28	0.38	0.43	0.37
N	1581	1581	1525	1581	1581	1581
N: Equity PIFs	78	78	78	78	78	78
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y
<b>JAPANESE EQUITY PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/ Output</b>	<b>Cash stock/ Assets</b>
Crisis*Equity PIF	<b>0.081**</b> <i>(2.02)</i>	0.054 <i>(1.31)</i>	0.076 <i>(1.45)</i>	0.004 <i>(0.54)</i>	-0.015 <i>(-1.29)</i>	0.002 <i>(0.13)</i>
Post*Equity PIF	0.028 <i>(0.83)</i>	0.003 <i>(0.10)</i>	0.000 <i>(-0.01)</i>	0.006 <i>(0.40)</i>	-0.023 <i>(-1.27)</i>	0.022 <i>(0.69)</i>
Equity PIF	-0.02 <i>(-0.71)</i>	-0.004 <i>(-0.12)</i>	-0.005 <i>(-0.13)</i>	-0.012 <i>(-1.37)</i>	-0.02 <i>(-1.16)</i>	0.003 <i>(0.12)</i>
R-squared	0.18	0.20	0.24	0.48	0.47	0.4
N	1791	1791	1761	1791	1791	1791
N: Equity PIFs	22	22	22	22	22	22
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

The table reports the impact of being a Equity PIF on firm outcomes during the crisis and post-crisis periods. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables. All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.

Table 15: Robustness Check: Debt PIFs - Japan and Excluding Japan

<b>NON-JAPANESE DEBT PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/Output</b>	<b>Cash stock/Assets</b>
Crisis*Debt PIF	0.024 <i>(0.58)</i>	0.034 <i>(0.49)</i>	0.062 <i>(0.84)</i>	0.009 <i>(1.23)</i>	<b>0.031**</b> <i>(2.36)</i>	-0.002 <i>(-0.20)</i>
Post*Debt PIF	<b>0.109*</b> <i>(1.72)</i>	0.11 <i>(1.35)</i>	0.071 <i>(1.35)</i>	<b>0.080*</b> <i>(1.73)</i>	<b>0.126**</b> <i>(2.53)</i>	-0.017 <i>(-1.10)</i>
Debt PIF	-0.043 <i>(-1.27)</i>	-0.044 <i>(-0.75)</i>	-0.087** <i>(-2.04)</i>	0.015 <i>(1.32)</i>	0.015 <i>(0.97)</i>	0.025* <i>(1.80)</i>
R-squared	0.53	0.5	0.19	0.44	0.11	0.27
N	1677	1677	1657	1677	1676	1677
N: Debt PIFs	69	69	69	69	69	69
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y
<b>JAPANESE DEBT PIFs</b>	<b>Average Sales Growth</b>	<b>Average Asset Growth</b>	<b>Volatility: Sales Growth</b>	<b>Return on Assets</b>	<b>Cash Flow/Output</b>	<b>Cash stock/Assets</b>
Crisis*Debt PIF	0.003 <i>(0.46)</i>	0.007 <i>(1.03)</i>	-0.001 <i>(-0.07)</i>	0.001 <i>(0.61)</i>	-0.004 <i>(-0.96)</i>	<b>-0.010**</b> <i>(-2.35)</i>
Post*Debt PIF	<b>0.016*</b> <i>(1.65)</i>	<b>0.028***</b> <i>(3.31)</i>	-0.015 <i>(-1.22)</i>	0.005 <i>(1.45)</i>	-0.004 <i>(-0.58)</i>	-0.006 <i>(-0.74)</i>
Debt PIF	0.001 <i>(0.15)</i>	-0.016*** <i>(-2.90)</i>	0.011* <i>(1.79)</i>	-0.003 <i>(-0.98)</i>	-0.007 <i>(-1.33)</i>	-0.007 <i>(-0.80)</i>
R-squared	0.16	0.13	0.23	0.34	0.39	0.2
N	6132	6132	6063	6132	6132	6132
N: Debt PIFs	429	429	429	429	429	429
Country*Time FE	Y	Y	Y	Y	Y	Y
Sector FE	Y	Y	Y	Y	Y	Y

The table reports the impact of being a PIF on firm outcomes during the crisis and post-crisis periods. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables. All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.

Table 16: Robustness Test: Pre-crisis Leverage, Japanese Debt PIFs and non-Japanese Debt PIFs

	NON-JAPANESE DEBT PIFs			JAPANESE DEBT PIFs		
	Return on Assets	Cash Flow/Output	Cash/Assets	Return on Assets	Cash Flow/Output	Cash/Assets
Crisis*Debt PIF	0.048 <i>(1.44)</i>	0.076 <i>(1.46)</i>	<b>0.079**</b> <i>(2.22)</i>	<b>0.012***</b> <i>(3.07)</i>	<b>0.015**</b> <i>(2.21)</i>	<b>0.025***</b> <i>(2.73)</i>
Post*Debt PIF	<b>0.116**</b> <i>(1.98)</i>	<b>0.202***</b> <i>(3.27)</i>	<b>0.108***</b> <i>(2.90)</i>	<b>0.011**</b> <i>(2.23)</i>	0.013 <i>(1.49)</i>	<b>0.045***</b> <i>(3.62)</i>
Crisis*Debt PIF*High Long-Term Debt/Assets	-0.035 <i>(-1.08)</i>	-0.026 <i>(-0.52)</i>	-0.086** <i>(-2.33)</i>	-0.011*** <i>(-2.78)</i>	-0.021*** <i>(-2.88)</i>	-0.040*** <i>(-4.21)</i>
Crisis*Debt PIF*High Short-Term Debt Proportion	-0.021 <i>(-1.31)</i>	-0.070*** <i>(-2.90)</i>	-0.01 <i>(-0.76)</i>	-0.008** <i>(-2.37)</i>	-0.014** <i>(-2.41)</i>	-0.023*** <i>(-2.59)</i>
Post*Debt PIF*High Long-Term Debt/Assets	-0.031 <i>(-0.76)</i>	-0.059* <i>(-1.79)</i>	-0.133*** <i>(-3.54)</i>	-0.006 <i>(-1.30)</i>	-0.018** <i>(-2.42)</i>	-0.058*** <i>(-5.55)</i>
Post*Debt PIF*High Short-Term Debt Proportion	-0.026 <i>(-0.97)</i>	-0.075*** <i>(-2.84)</i>	-0.01 <i>(-0.74)</i>	-0.007* <i>(-1.79)</i>	-0.011* <i>(-1.79)</i>	-0.031*** <i>(-3.45)</i>
Debt PIF	0.015 <i>(1.31)</i>	0.014 <i>(0.86)</i>	0.027* <i>(1.95)</i>	-0.003 <i>(-1.00)</i>	-0.007 <i>(-1.36)</i>	-0.008 <i>(-0.84)</i>
R-squared	0.44	0.11	0.30	0.34	0.39	0.21
N	1677	1676	1677	6132	6132	6132

The table reports the impact of being a PIF on firm outcomes during the crisis and post-crisis periods, controlling for pre-crisis level and composition of leverage. The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Countries included in the estimations are: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 1994-1996. Crisis period years are 1997-1998 for Hong Kong, Taiwan and South Korea; 1997-1999 for Malaysia and 1997-2001 for the other countries. Post-crisis years are three years immediately following the crisis. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues during 1991-1996). Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Return on Assets (profitability) is measured as earnings to assets ratio; cash flow by earnings before interest and taxes and cash stock is measured as the stock of cash and marketable securities. PIF, Crisis and Post-Crisis are dummy variables. High Leverage before crisis and High short-term debt share before crisis are both dummy variables. The dummies are equal to one if the firm's leverage or short-term debt share is above the median leverage (median short-term debt share). All estimations include control for pre-crisis firm size.

Errors are clustered at firm level. Robust t-statistics in italics. Asterisks denote significance of coefficients with \*\*\*, \*\*, and \* and indicate significance at the 1%, 5% and 10% level respectively.