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Foreign Capital and Financial Crises

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FOREIGN CAPITAL AND FINANCIAL CRISES

by

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Professor Barry Eichengreen, Chair

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Abstract

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This dissertation consists of three essays on the impact of foreign capital during episodes of financial crises. In the first two essays, I analyze the impact of proximate exposure to foreign capital markets on crisis-period outcomes of firms from poorly regulated financial systems. In the first essay, I consider the scenario where there is a liquidity crisis in the firms' domestic financial markets. I investigate if East Asian firms, that previously raised portfolio capital through foreign public issuances, underperformed during the Asian financial crisis. I control for selection bias using propensity-score weighted difference-in-difference estimation which is a combination of two empirical strategies - propensity scores and difference-in-difference estimation. I find that firms that had previously raised debt or equity capital abroad had better crisis and post-crisis period outcomes than otherwise 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.

In the second essay, I analyze relative performance of firms, that had previously tapped international capital markets, during a foreign financial crisis. I focus on East Asian firm outcomes during the Global Financial crisis and test if these firms were negatively affected due to their direct linkages with financial markets in U.S. and Western Europe. I find that foreign-capital raising East Asian firms performed no better or no worse than domestically financed firms, during the Global Financial crisis. These results, while unexpected, can be explained somewhat by understanding the characteristics of firms that tap international capital markets. Both foreign-debt and foreign-equity raising firms tend to be very large and 'efficient' firms. There is extensive evidence from previous studies that large and more

productive firms face significantly fewer financial constraints in domestic capital markets, during periods of financial crises. When foreign liquidity became scarce for East Asian firms with direct linkages to international capital markets, it appears they were able to supplant their foreign capital gaps with domestic financing. I find evidence that larger foreign-capital raising firms had fewer liquidity constraints during the Global Financial crisis.

The third essay, a co-authored paper, synthesizes previous studies analyzing the effects of capital account liberalization on industry growth while controlling for financial crises, domestic financial development and the strength of institutions. We find reasonably strong evidence that financial openness has positive effects on the growth of financially-dependent industries, although these growth-enhancing effects evaporate during financial crises. Further analysis indicates that the positive effects of capital account liberalization are limited to countries with relatively well-developed financial systems, good accounting standards, strong creditor rights and rule of law. It suggests that countries must reach a certain threshold in terms of institutional and economic development before they can expect to benefit from capital account liberalization.

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Introduction

In the past decades, foreign capital has become an important source of finance. The unresolved debate about the macroeconomic costs and benefits from external financial liberalization, has shifted the focus towards micro-level analysis of the impact of foreign capital. It is argued that foreign capital helps firms and industries to overcome domestic market financial constraints and grow more rapidly. Nevertheless, reliance on foreign capital foreign capital can also increase the vulnerability of firms in weak domestic financial systems. This risk is pronounced during financial crises, especially those crises that are characterized by withdrawal of foreign capital or large currency depreciations.[1] While, a number of studies have looked at the impact of external financial liberalization, a majority of these are country-level studies that do not differentiate between good times and crisis times.

The following three chapters of my dissertation analyze the impact of foreign capital on industries and firms during episodes of financial crises. The first two chapters study the relative crisis-period performance of firms that rely on capital raised through prior issuances in foreign capital markets. Foreign financing can be raised as direct investment or portfolio investment and can be in the form of equity or debt, While there is extensive research about the firm-level benefits of foreign direct investment, much less is known about foreign portfolio investment and, especially its impact during financial crises. Chapter 1 and Chapter 2 attempt to fill this gap by analyzing the relative performance of East Asian firms during the Asian financial crisis of 1997-1998 and during the Global Financial crisis that started in 2007. The third chapter considers a relatively less micro-level analysis of the impact of foreign capital during financial crises, by focusing on industry outcomes.

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. In Chapter 1, I investigate if this is true for East Asian firms that raised portfolio capital through foreign public issuances prior to the Asian financial crisis. A major issue with such analyses is the self-selection bias of firms in raising capital abroad. Unlike previous studies, I control for selection bias using propensity-score weighted difference-in-difference estimation which is a combination of two empirical strategies - propensity scores and 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 during the Asian financial crisis. I present evidence that foreign

[1] Critics also argue that domestic financial market imperfections, fueled by large foreign capital movements, often lead to financial crises. The credit crisis of 2007-2008 and the ensuing Global Financial crisis is routinely blamed on massive capital flows from China and other Asian countries that led to real estate and other asset bubbles in the developed world. A number of economists favor re-imposition of capital controls, a view that only indicates the unsettled debate about foreign capital.

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.

While in Chapter 1, I analyze the relative performance of firms during a domestic financial crisis, in Chapter 2, I focus on relative firm performance during a financial crisis that occurs in the country where the foreign capital market is situated. I study if East Asian firm outcomes during the Global Financial crisis were negatively affected due to their direct linkages with financial markets in U.S. and Western Europe. I use the same empirical strategy as in Chapter 1 - propensity-score weighted difference-in-difference estimation, to control for selection bias.

I find that foreign-capital raising East Asian firms performed no better or no worse than domestically financed firms during the Global Financial crisis. Their liquidity levels were also not different from domestic firms. These results, while unexpected, can be explained somewhat by understanding the characteristics of firms that tap international capital markets. Both foreign-debt and foreign-equity raising firms tend to be very large and 'efficient' firms. There is extensive evidence from previous studies that large and more productive firms face significantly fewer financial constraints in domestic capital markets, during periods of crises. When foreign liquidity became scarce for East Asian firms with direct linkages to international capital markets, it appears they were able to supplant their foreign capital gaps with domestic financing. Using size in a triple interaction variable, I find evidence that larger foreign capital-raising firms had fewer liquidity constraints during the Global Financial crisis. I show that large firms, irrespective of being a PIF or not, had fewer financial constraints during the foreign financial crisis.

My results from the first two chapters, taken in conjunction, show that prior foreign capital issuances can help during domestic financial crises, but do not hurt during foreign financial crises. Foreign capital raisings can thus provide insurance against domestic financial shocks.

The third chapter attempts to understand how growth and volatility is affected at the industry level, when countries have opened up their capital accounts and experience a financial crisis. This chapter, coauthored with Barry Eichengreen and Ugo Panizza, synthesizes previous studies analyzing the effects of capital account liberalization on industry growth while controlling for financial crises, domestic financial development and the strength of institutions. We find reasonably strong evidence that financial openness has positive effects on the growth of financially-dependent industries, although these growth-enhancing effects evaporate during financial crises. Further analysis indicates that the positive effects of capital account liberalization are limited to countries with relatively well-developed financial systems, good accounting standards, strong creditor rights and

rule of law. It suggests that countries must reach a certain threshold in terms of institutional and economic development before they can expect to benefit from capital account liberalization.

Chapter 1

Does Foreign Portfolio Investment Help In Bad Times? Firm-Level Evidence from the Asian Financial Crisis

> *"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.[1]

1.1 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.[2] The crisis period instability of portfolio investment implies that firms that rely on FPI would have relatively worse outcomes during financial crises.

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

[1] World Investment Report 1998, UNCTAD, page 208. FDI: Foreign Direct Investment

[2] 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....".

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.[3] In this paper I investigate whether 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).[4]

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.[5] 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.[6]

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.[7]

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

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

[4]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.

[5]Firms could also have more immediate goals of raising larger amounts of capital or raising capital at cheaper costs.

[6]Cleary et al (2007) show that profitable firms that have less asymmetric information issues tend to be less financially constrained.

[7]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.

their market valuations dropping when there is sustained selling pressure (heightened by foreign investor panic) on their listed securities.[8] 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.[9]

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.[10]

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 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

[8]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.

[9]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).

[10]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).

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.[11]

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, 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.[12] My analysis underscores that even large and well-established firms were not immune to this effect.

[11]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).

[12]Krugman (1998),

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.[13]

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.[14] 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 a mix of foreign equity and debt fared better than firms that relied mainly or entirely on cheap foreign debt.[15]

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.[16] 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).[17]

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.[18] The distinction between foreign debt and foreign equity and its

[13]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.

[14]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.

[15]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)

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

[17]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.

[18]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.

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 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 1.3 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 1.4 and 1.5 respectively. The results of the empirical analysis are reported in Section 1.6. In section 1.7, I present robustness checks and other possible explanations for my results; and Section 1.8 concludes.

1.2 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.[19] Raising capital abroad enables a firm to establish credentials for better corporate governance or to expand its product reputation and export markets.[20] 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.[21] More analyst coverage and international exposure leads to greater scrutiny and thus reduces information asymmetry with respect to performance, accounting practices, governance and ownership.[22] 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 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

[19]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.

[20]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.

[21]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.

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

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.[23] 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 constraints 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

[23] 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 (Foerester 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.

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 Aguair (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.

1.3 THEORETICAL FRAMEWORK

This section presents a simple stylized framework, based on Aguair 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 (π_1) and anticipated productivity θ_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 θ_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:

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

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

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

1.3.1 *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 (θ_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 stocastically 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:

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

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

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

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:

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

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.

1.4 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 A.

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).[24]

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 countries leading to currency devaluations.[25] 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.[26]

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

[24]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".

[25]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.

[26]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.

systemic banking crisis.[27] 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).[28] 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.

1.4.1 *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.

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

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:

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

where α_i is firm-specific fixed effects; γ_{jt} are sector-specific year dummies andρ_{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

[27] 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).

[28] Karloyi (2002).

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.[29] 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.

1.5 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 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.

[29] Aguair 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.

The baseline econometric specification for DID estimation is expressed as:

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

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. β_1 measures the impact of being a PIF in any period.[30] 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.

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:

$$Y_{ijct} = \alpha_i + \beta_1 * PIF_i + \beta_{2,i} * PIF_i * Crisis + \beta_{3,i} * PIF_i * PostCrisis + \gamma_1 X_{iPre} * Crisis + \gamma_2 X_{iPre} * PostCrisis + \delta_t + \theta_c + \rho_{ct} + \mu_j + \varepsilon_{ijct} \quad (2)$$

1.5.1 *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

[30] 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.

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 B 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.[31] 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 $\frac{\binom{propensity}{score}}{\binom{1-propensity}{score}}$. Using these weights I re-estimate DID specification (2).

1.5.2 *Summary Statistics*

Table 1.3 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 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.[32] 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).

[31] As Freedman and Berk (2008) suggest it could be hard to tell how large are large weights.

[32] Sales growth and asset growth are considered proxies for a firm's future growth potential.

Table 1.3 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.

1.6 RESULTS FROM EMPIRICAL ESTIMATION

1.6.1 *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: 1999-2001*

Table 1.4 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 1. β_1, the coefficient for PIF_i measures the average impact, across periods, of being a PIF.

The results in Table 1.4 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.

1.6.2 *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 1.1, a s substantial number of debt PIFs are from Japan).

Table 1.5 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.[33] 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 parent based in non-crisis countries. The likelihood of firms with non-ownership, minority FDI investment relying on their foreign investors for

[33] 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.

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.[34]

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.

1.6.3 *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:

[34]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 1.6).

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

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 $W(.)$ 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 1.6 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.

1.6.4 *Weighted DID Estimation Results*

Table 1.7 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 1.7 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.[35]

The second panel in Table 1.7 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

[35]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.

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 1.8, 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.

1.6.5 *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 1.9. 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 1.7.

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 1.13 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 1.10b 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.

1.6.6 *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.[36] 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 1.3 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 conduct two additional tests to understand the role of pre-crisis leverage in crisis and post-crisis period outcomes. First, I control for pre-crisis leverage while estimating the impact of being a PIF during the crisis and post-crisis periods. The results are presented in Table 1.13. Pre-crisis leverage definitely does have a negative impact on crisis-period performance of debt PIFs. But even after controlling for this, I find that foreign debt raising PIFs were more liquidity constrained than non-PIFs.

Next, I analyze if the level and composition of debt prior to the crisis had any impact

[36]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.

on crisis-period outcomes. While data on maturity of debt is not available, I have data for debt that 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 1.10. 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.

It is possible that even prior to the crisis, highly levered debt PIFs were an under-performing group, relative to healthier debt PIFs. To test this, I look at the mean values for various firm characteristics before the crisis and undertake a t-test comparison in the difference in the mean values. Table 1.14 shows that highly-levered debt PIFs and less-levered debt PIFs were quite similar prior to the crisis. The only exceptions are their leverage levels and asset growth, both of which are reasonable given their subject difference. This evidence suggests that whatever crisis-period differences in outcomes were, they could have emerged from the pre-crisis level and composition of leverage of debt PIFs.

In Table 1.12, 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 1.11 and columns 3 and 4 of Table 1.12. 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.

1.7 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 (defines 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 1.15) as in Table 1.7: 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 1.16). In contrast, Japanese debt PIFs (80% of foreign-debt raising PIF sample) are driving the weaker crisis-period outcomes (Table 1.17). 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 1.17).

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.[37] The impact of being a debt PIF during crisis (or post-crisis) is similar to the results in Table 1.7.

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 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.[38] 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.

[37] 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.

[38] 60% of debt PIFs and 52% of equity PIFs are from the manufacturing sector in my sample.

1.8 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 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 Aguair 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.

Figure 1.1: **Foreign Investment Flows: Liabilities (1990-2002)**

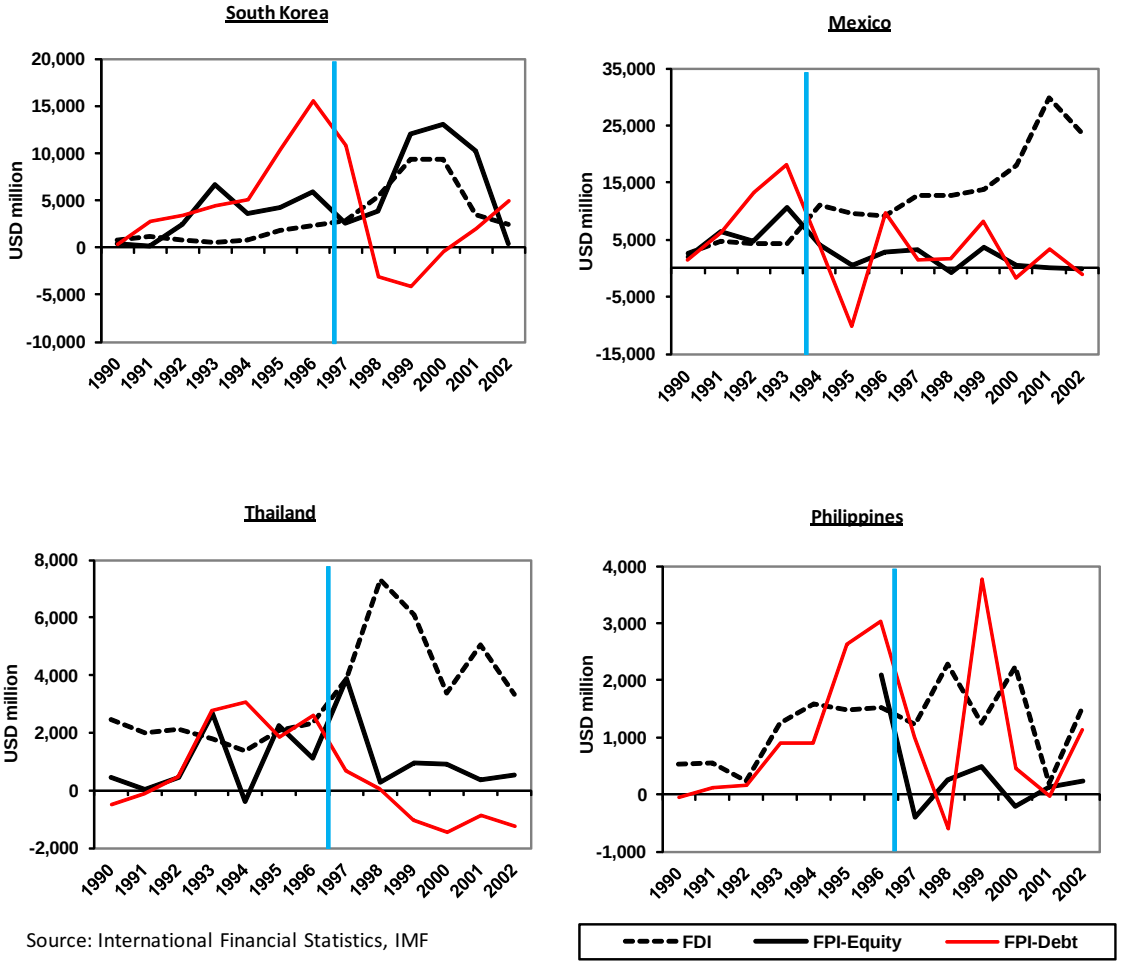


Figure 1 shows the pattern of foreign capital flows into the subject countries in the years prior to and subsequent to the financial crises. The vertical line marks the year when the systemic banking crisis affected the country. FDI: Foreign Direct Investment; FPI: Foreign Portfolio Investment.

Table 1.1: **Database Merge Summary for East Asian Firms that Raised Capital Abroad During 1991-1996**

	# PIFs in SDC Database	# Merged With Compustat	# Equity PIFs	# Debt PIFs	Merge %
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%
Total	**1022**	**773**	**174**	**626**	**76%**

Table 1.2: **Details of Sample Construction**

	Equity	Debt
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 1.3: **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	**5822**	402	3978	5112	367	4481	5738	404
Assets ($ mn)	5473	**6324**	432	5033	5892	408	4931	6384	416
Long Term Debt/Assets	0.162	0.201	**0.122**	0.201	0.190	0.120	0.197	0.164	0.110
Short Term Debt/Assets	**0.133**	0.172	0.174	0.195	0.185	0.192	0.137	0.149	0.169
Sales growth	**0.257**	0.095	0.132	-0.010	-0.005	-0.023	0.107	0.087	0.098
Volatility of sales growth	0.193	**0.144**	0.179	0.289	0.001	0.243	0.195	0.128	0.211
Asset growth	**0.260**	0.087	0.129	-0.010	0.065	0.000	0.049	0.049	0.085
Return on Assets	**0.114**	0.058	0.047	0.096	0.041	0.065	0.133	0.084	0.066
Investment/Assets	**0.113**	0.087	0.079	0.070	0.136	0.042	0.051	0.037	0.037
Cash Stock/Assets	0.165	**0.173**	0.157	0.144	0.093	0.152	0.142	0.114	0.147
Cash Flow/Sales	**0.190**	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 1.4: **Difference-In-Difference Estimation: Average Period Data**

Equity PIFs	**Average Sales Growth**	**Average Asset Growth**	**Volatility: Sales Growth**	**Return on Assets**	**Cash Flow/Output**	**Cash stock/Assets**
Crisis*Equity PIF	-0.016	-0.027	0.003	**0.013***	-0.003	0.007
	(-1.13)	*(-1.53)*	*(0.27)*	*(1.72)*	*(-0.32)*	(0.48)
Post*Equity PIF	0.008	-0.017	0.006	0.011	-0.006	0.023
	(0.58)	*(-1.21)*	*(0.50)*	*(1.53)*	*(-0.71)*	(1.63)
Equity PIF	**0.023****	**0.045*****	-0.008	**0.010***	**0.024*****	**0.031*****
	(2.27)	*(4.71)*	*(-0.94)*	*(1.88)*	*(4.08)*	(3.23)
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

Debt PIFs	**Average Sales Growth**	**Average Asset Growth**	**Volatility: Sales Growth**	**Return on Assets**	**Cash Flow/Output**	**Cash stock/Assets**
Crisis*Debt PIF	**0.023*****	**0.020****	**0.032*****	**0.012*****	-0.026	-0.005
	(2.96)	*(2.49)*	*(3.66)*	*(4.89)*	*(-1.40)*	(-0.49)
Post*Debt PIF	**0.036*****	**0.055*****	**0.025*****	**0.016*****	0.007	-0.003
	(4.01)	*(5.96)*	*(2.73)*	*(4.80)*	*(0.52)*	(-0.30)
Debt PIF	-0.005	**-0.015****	**-0.022*****	**-0.004****	**0.013*****	0.012
	(-1.00)	*(-2.47)*	*(-4.41)*	*(-2.20)*	*(3.36)*	(1.16)
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 1.5: Probit Regression Estimates on Firms' Likelihood of being a PIF at the beginning of 1997

	Equity PIF when Crisis Started	Debt PIF when Crisis Started
Size (Log, 1994-96)	**0.538*** **	**0.711*** **
	(10.18)	(24.21)
Average Asset Growth (1994-96)	**0.843*** **	-0.276
	(3.34)	(-0.57)
Leverage (1994-96)	0.4340	**1.534*** **
	(1.06)	(4.49)
Short-Term Debt/Assets (1994-96)	-0.060	**-0.329***
	(-0.17)	(-1.87)
Return on Assets (1994-96)	**3.908*** **	-1.414
	(3.08)	(-1.48)
PPE/Assets (1994-96)	0.205	-0.219
	(0.85)	(-1.50)
Average Sales Growth (1994-96)	0.165	**0.802** **
	(0.82)	(1.96)
Volatility: Sales growth (1994-96)	-0.575	**-0.672** **
	(-1.28)	(-2.30)
Working Capital/Assets (1994-96)	**1.495** **	**0.920*** **
	(2.58)	(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 1.6: **Balancing Test for Covariates Matching**

Variables (Pre-Crisis: 1994-1996)	Mean		% Bias		
	Treated	Control	% Bias	Reduction	t-stat
Panel A: Equity PIF					
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
Panel B: Debt PIF					
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 1.7: **Propensity Score Weighted DID Estimation: Equity and Debt PIFs**

Equity PIFs	Average Sales Growth	Average Asset Growth	Volatility: Sales Growth	Return on Assets	Cash Flow/Output	Cash stock/Assets
Crisis*Equity PIF	**0.088***	**0.095***	0.054	0.006	0.007	**0.018***
	(1.72)	*(1.95)*	*(0.93)*	*(0.55)*	*(0.46)*	(1.82)
Post*Equity PIF	**0.094***	**0.103****	0.015	0.011	0.004	0.025
	(1.93)	*(2.07)*	*(0.27)*	*(0.78)*	*(0.18)*	(1.54)
Equity PIF	-0.062	-0.066*	-0.072	-0.005	0.029	0.019
	(-1.55)	*(-1.76)*	*(-1.60)*	*(-0.53)*	*(1.52)*	(1.26)
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

DEBT PIFs	Average Sales Growth	Average Asset Growth	Volatility: Sales Growth	Return on Assets	Cash Flow/Output	Cash stock/Assets
Crisis*Debt PIF	0.006	0.012	0.009	0.003	0.002	**-0.009****
	(0.74)	*(0.91)*	*(0.67)*	*(1.26)*	*(0.41)*	(-2.18)
Post*Debt PIF	**0.030****	**0.041*****	-0.002	**0.017***	0.016	-0.008
	(2.20)	*(2.64)*	*(-0.13)*	*(1.67)*	*(1.48)*	(-1.06)
Debt PIF	-0.004	-0.019*	-0.003	-0.001	-0.002	-0.002
	(-0.51)	*(-1.74)*	*(-0.36)*	*(-0.35)*	*(-0.45)*	(-0.24)
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 1.8: **Propensity Score Weighted DID Estimation: Robustness Using [0.1, 0.9] Range for Propensity Scores**

Equity PIFs	Average Sales Growth	Average Asset Growth	Volatility: Sales Growth	Return on Assets	Cash Flow/Output	Cash stock/Assets
Crisis*Equity PIF	0.056	**0.104***	0.023	0.009	0.012	0.005
	(0.87)	*(1.81)*	*(0.32)*	*(0.71)*	*(0.53)*	(0.46)
Post*Equity PIF	0.080	**0.114***	0.007	0.023	0.019	0.012
	(1.29)	*(1.89)*	*(0.09)*	*(1.24)*	*(0.76)*	(0.65)
Equity PIF	-0.024	-0.073	-0.039	-0.001	0.036	0.02
	(-0.45)	*(-1.62)*	*(-0.69)*	*(-0.04)*	*(1.32)*	(1.08)
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

DEBT PIFs	Average Sales Growth	Average Asset Growth	Volatility: Sales Growth	Return on Assets	Cash Flow/Output	Cash stock/Assets
Crisis*Debt PIF	0.008	0.000	0.012	0.002	0.000	**-0.011****
	(0.90)	*(0.02)*	*(0.96)*	*(0.93)*	*(-0.12)*	(-2.54)
Post*Debt PIF	**0.022***	**0.031*****	-0.004	**0.007***	0.001	-0.009
	(1.83)	*(2.82)*	*(-0.30)*	*(1.78)*	*(0.18)*	(-1.20)
Debt PIF	-0.003	-0.011	-0.001	-0.003	-0.006	-0.002
	(-0.37)	*(-1.38)*	*(-0.16)*	*(-0.93)*	*(-1.18)*	(-0.26)
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 are 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 1.9: **Liquidity Constraints: New Finances Availed**

	EQUITY PIFs			DEBT PIFs		
Equity 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	**1.070***	0.069	**-0.596*****	-0.161	-0.037
	(0.68)	*(1.72)*	*(0.58)*	*(-2.91)*	*(-1.13)*	*(-0.78)*
Post* PIF	-0.293	**1.878****	0.071	**-0.523****	-0.256	0.008
	(-0.61)	*(2.12)*	*(0.82)*	*(-2.23)*	*(-1.22)*	*(0.17)*
PIF	-0.283	-0.520**	-0.034	0.442**	0.097	-0.012
	(-0.69)	*(-2.18)*	*(-0.72)*	*(2.36)*	*(0.96)*	*(-0.82)*
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 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. 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 1.10: **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	**0.148****	**0.162****	0.091	0.006	0.017	0.037
	(2.32)	*(2.40)*	*(1.35)*	*(0.18)*	*(0.31)*	(1.50)
Post*Equity PIF	**0.175*****	**0.177*****	0.04	0.01	-0.009	0.056
	(2.91)	*(2.97)*	*(0.65)*	*(0.31)*	*(-0.15)*	(1.61)
Crisis*Equity PIF*High Leverage	-0.077	-0.071	-0.032	-0.009	-0.016	-0.019
	(-1.56)	*(-1.39)*	*(-0.75)*	*(-0.26)*	*(-0.29)*	(-0.72)
Crisis* Equity PIF*High Short-Term Debt Proportion	-0.016	-0.051	-0.055	0.014	0.002	-0.031
	(-0.43)	*(-1.56)*	*(-1.42)*	*(0.57)*	*(0.04)*	(-1.28)
Post* Equity PIF*High Leverage	-0.073	-0.063	-0.022	0.009	0.013	-0.036
	(-1.45)	*(-1.49)*	*(-0.53)*	*(0.29)*	*(0.23)*	(-1.05)
Post*Equity PIF*High Short-Term Debt Proportion	-0.083*	-0.082**	-0.043	-0.013	0.009	0.007
	(-1.88)	*(-2.44)*	*(-1.17)*	*(-0.48)*	*(0.17)*	(0.23)
Equity PIF	-0.062	-0.066*	-0.067	-0.005	0.029	-0.002
	(-1.56)	*(-1.77)*	*(-1.55)*	*(-0.53)*	*(1.52)*	(-0.12)
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 1.11: **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	**0.040****	-0.002	**0.014*****	**0.021*****	**0.025*****
	(1.24)	*(2.47)*	*(-0.18)*	*(3.25)*	*(3.01)*	(2.74)
Post*Debt PIF	**0.040*****	**0.056*****	-0.013	**0.017*****	**0.027*****	**0.044*****
	(2.95)	*(3.81)*	*(-0.84)*	*(2.81)*	*(2.86)*	(3.83)
Crisis*Debt PIF*High Leverage	-0.002	-0.030**	0.015*	-0.012***	-0.018**	-0.037***
	(-0.23)	*(-2.48)*	*(1.66)*	*(-2.60)*	*(-2.51)*	(-3.95)
Crisis*Debt PIF*High Short-Term Debt Proportion	-0.019**	-0.021**	0.000	-0.011***	-0.021***	-0.021**
	(-2.40)	*(-2.14)*	*(0.02)*	*(-2.63)*	*(-3.44)*	(-2.56)
Post*Debt PIF*High Leverage	-0.005	-0.012	0.014	0.004	-0.007	-0.059***
	(-0.37)	*(-1.05)*	*(1.56)*	*(0.38)*	*(-0.61)*	(-5.87)
Post*Debt PIF*High Short-Term Debt Proportion	-0.022*	-0.023*	0.002	-0.008	-0.017**	-0.028***
	(-1.78)	*(-1.91)*	*(0.18)*	*(-1.56)*	*(-2.44)*	(-3.50)
Debt PIF	-0.004	-0.019*	-0.003	-0.001	-0.002	-0.002
	(-0.50)	*(-1.75)*	*(-0.34)*	*(-0.35)*	*(-0.46)*	(-0.28)
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 1.12: 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	1.475	**-0.467***	0.134
	(-0.83)	*(1.61)*	*(-1.95)*	*(0.44)*
Post*PIF	0.988	**1.414***	-0.029	-0.052
	(1.46)	*(1.71)*	*(-0.08)*	*(-0.14)*
Crisis*Debt PIF*High Long-Term Debt/Assets	2.291	-0.805	0.087	-0.408*
	(1.43)	*(-1.02)*	*(0.73)*	*(-1.65)*
Crisis*Debt PIF*High Short-Term Debt Proportion	-0.549	0.521	-0.377	-0.286
	(-1.14)	*(0.71)*	*(-1.32)*	*(-0.94)*
Post*Debt PIF*High Long-Term Debt/Assets	-0.499	-0.751	-0.502**	-0.062
	(-1.14)	*(-1.16)*	*(-2.41)*	*(-0.27)*
Post*Debt PIF*High Short-Term Debt Proportion	-0.582	-0.362	-0.483***	-0.105
	(-1.23)	*(-0.96)*	*(-4.82)*	*(-0.57)*
PIF	1.288	-0.944	0.394**	0.130
	(0.73)	*(-1.33)*	*(2.05)*	*(1.25)*
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 1.13: **Propensity-Score Weighted DID Estimation - Controlling for Pre-Crisis Leverage**

Debt PIFs	Average Sales Growth	Average Asset Growth	Return on Assets	Cash Flow/Output	Cash/Assets
Crisis*Debt PIF	0.006	0.011	0.003	0.001	**-0.008***
	(0.69)	(0.87)	(1.31)	(0.40)	(-1.94)
Post*Debt PIF	**0.030****	**0.041*****	**0.017***	0.016	-0.007
	(2.20)	(2.65)	(1.66)	(1.45)	(-0.97)
Debt PIF	-0.003	-0.019*	-0.001	-0.002	-0.002
	(-0.49)	(-1.74)	(-0.35)	(-0.42)	(-0.30)
Crisis*Pre-crisis Leverage	0.055*	0.065	-0.022**	0.004	-0.115**
	(1.83)	(0.65)	(-1.99)	(0.23)	(-2.57)
Post*Pre-crisis Leverage	0.008	-0.037	0.026**	0.054**	-0.099***
	(0.33)	(-1.16)	(2.13)	(2.12)	(-2.60)
R-squared	0.35	0.34	0.24	0.15	0.22
N	7809	7809	7809	7808	7809

The table reports the impact of being a PIF on firm outcomes during the crisis and post-crisis periods, controlling for pre-crisis level 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.

*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 1.14: **T-Test for Difference in Mean Values of Foreign-Debt Raising PIFs**

Pre-Crisis Variable	DebtPIFs - Above Median Leverage	DebtPIFs - Below Median Leverage	t-test comparison of mean values
Average sales growth	0.099	0.084	1.57
Volatility: sales growth	0.140	0.143	-0.28
Return on Assets	0.058	0.058	-0.07
Cash stock/Assets	0.166	0.197	-1.38
Growth in Assets	0.094	0.067	**2.01****
Growt: ST Debt	2.784	2.236	0.22
Growt: LT Debt	2.353	1.327	0.32
Long Term Debt/Assets	0.245	0.071	**19.34*****
Short Term Debt/Assets	0.179	0.130	**4.63*****
N	408	135	

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.

*Asterisks denote significance of coefficients with ***, **, and * and indicate significance at the 1%, 5% and 10% level respectively.*

Table 1.15: **Robustness Check: Including Operating Exposure of Firm as Independent Variable**

Equity PIFs	Average Sales Growth	Average Asset Growth	Volatility: Sales Growth	Return on Assets	Cash Flow/Output	Cash stock/Assets
Crisis*Equity PIF	**0.118****	**0.132****	0.096	0.009	0.012	0.009
	(2.00)	*(2.56)*	*(1.40)*	*(0.86)*	*(0.60)*	(0.94)
Post*Equity PIF	**0.113****	**0.107****	0.036	0.022	0.022	0.009
	(2.00)	*(2.03)*	*(0.56)*	*(1.22)*	*(0.81)*	(0.55)
Equity PIF	-0.082*	-0.091**	-0.099	-0.006	0.018	0.031*
	(-1.67)	*(-2.20)*	*(-1.63)*	*(-0.71)*	*(0.63)*	(1.96)
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

DEBT PIFs	Average Sales Growth	Average Asset Growth	Volatility: Sales Growth	Return on Assets	Cash Flow/Output	Cash stock/Assets
Crisis*Debt PIF	0.004	0.01	0.009	0.003	0.002	**-0.008****
	(0.55)	*(0.87)*	*(0.84)*	*(1.28)*	*(0.55)*	(-1.99)
Post*Debt PIF	**0.020***	**0.035****	-0.008	**0.015***	0.015	-0.006
	(1.69)	*(2.54)*	*(-0.65)*	*(1.73)*	*(1.55)*	(-0.82)
Debt PIF	0.000	-0.018*	0.001	-0.002	-0.003	-0.003
	(-0.03)	*(-1.75)*	*(0.12)*	*(-0.58)*	*(-0.75)*	(-0.38)
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 calculates 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 1.16: **Robustness Check: Japanese and Non Japanese Equity PIFs**

NON-JAPANESE EQUITY PIFs	**Average Sales Growth**	**Average Asset Growth**	**Volatility: Sales Growth**	**Return on Assets**	**Cash Flow/Output**	**Cash stock/Assets**
Crisis*Equity PIF	0.091	**0.107***	0.053	0.002	0.013	0.014
	(1.37)	*(1.71)*	*(0.69)*	*(0.18)*	*(0.59)*	(0.88)
Post*Equity PIF	**0.118***	**0.132****	0.031	0.010	0.008	**0.036***
	(1.87)	*(2.08)*	*(0.45)*	*(0.57)*	*(0.30)*	(1.67)
Equity PIF	-0.078	-0.073	-0.089	0.008	0.051*	0.025
	(-1.45)	*(-1.56)*	*(-1.50)*	*(0.62)*	*(1.94)*	(1.52)
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

JAPANESE EQUITY PIFs	**Average Sales Growth**	**Average Asset Growth**	**Volatility: Sales Growth**	**Return on Assets**	**Cash Flow/ Output**	**Cash stock/ Assets**
Crisis*Equity PIF	**0.081****	0.054	0.076	0.004	-0.015	0.002
	(2.02)	*(1.31)*	*(1.45)*	*(0.54)*	*(-1.29)*	(0.13)
Post*Equity PIF	0.028	0.003	0.000	0.006	-0.023	0.022
	(0.83)	*(0.10)*	*(-0.01)*	*(0.40)*	*(-1.27)*	(0.69)
Equity PIF	-0.02	-0.004	-0.005	-0.012	-0.02	0.003
	(-0.71)	*(-0.12)*	*(-0.13)*	*(-1.37)*	*(-1.16)*	(0.12)
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 1.17: **Robustness Check: Japanese and Non-Japanese Debt PIFs**

NON-JAPANESE DEBT PIFs	**Average Sales Growth**	**Average Asset Growth**	**Volatility: Sales Growth**	**Return on Assets**	**Cash Flow/Output**	**Cash stock/Assets**
Crisis*Debt PIF	0.024	0.034	0.062	0.009	**0.031****	-0.002
	(0.58)	*(0.49)*	*(0.84)*	*(1.23)*	*(2.36)*	(-0.20)
Post*Debt PIF	**0.109***	0.11	0.071	**0.080***	**0.126****	-0.017
	(1.72)	*(1.35)*	*(1.35)*	*(1.73)*	*(2.53)*	(-1.10)
Debt PIF	-0.043	-0.044	-0.087**	0.015	0.015	0.025*
	(-1.27)	*(-0.75)*	*(-2.04)*	*(1.32)*	*(0.97)*	(1.80)
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

JAPANESE DEBT PIFs	**Average Sales Growth**	**Average Asset Growth**	**Volatility: Sales Growth**	**Return on Assets**	**Cash Flow/Output**	**Cash stock/Assets**
Crisis*Debt PIF	0.003	0.007	-0.001	0.001	-0.004	**-0.010****
	(0.46)	*(1.03)*	*(-0.07)*	*(0.61)*	*(-0.96)*	(-2.35)
Post*Debt PIF	**0.016***	**0.028*****	-0.015	0.005	-0.004	-0.006
	(1.65)	*(3.31)*	*(-1.22)*	*(1.45)*	*(-0.58)*	(-0.74)
Debt PIF	0.001	-0.016***	0.011*	-0.003	-0.007	-0.007
	(0.15)	*(-2.90)*	*(1.79)*	*(-0.98)*	*(-1.33)*	(-0.80)
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 1.18: R**obustness 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	0.076	**0.079****	**0.012*****	**0.015****	**0.025*****
	(1.44)	*(1.46)*	*(2.22)*	*(3.07)*	*(2.21)*	(2.73)
Post*Debt PIF	**0.116****	**0.202*****	**0.108*****	**0.011****	0.013	**0.045*****
	(1.98)	*(3.27)*	*(2.90)*	*(2.23)*	*(1.49)*	(3.62)
Crisis*Debt PIF*High Long-Term Debt/Assets	-0.035	-0.026	-0.086**	-0.011***	-0.021***	-0.040***
	(-1.08)	*(-0.52)*	*(-2.33)*	*(-2.78)*	*(-2.88)*	(-4.21)
Crisis*Debt PIF*High Short-Term Debt Proportion	-0.021	-0.070***	-0.01	-0.008**	-0.014**	-0.023***
	(-1.31)	*(-2.90)*	*(-0.76)*	*(-2.37)*	*(-2.41)*	(-2.59)
Post*Debt PIF*High Long-Term Debt/Assets	-0.031	-0.059*	-0.133***	-0.006	-0.018**	-0.058***
	(-0.76)	*(-1.79)*	*(-3.54)*	*(-1.30)*	*(-2.42)*	(-5.55)
Post*Debt PIF*High Short-Term Debt Proportion	-0.026	-0.075***	-0.01	-0.007*	-0.011*	-0.031***
	(-0.97)	*(-2.84)*	*(-0.74)*	*(-1.79)*	*(-1.79)*	(-3.45)
Debt PIF	0.015	0.014	0.027*	-0.003	-0.007	-0.008
	(1.31)	*(0.86)*	*(1.95)*	*(-1.00)*	*(-1.36)*	(-0.84)
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 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.*

Appendix A: 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.[39] The Compustat databases covers firms from more than 80 countries and represents over 90% of the world's market capitalization.[40] 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.[41]

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

[39]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.

[40]Standard & Poor Compustat Global Data Brochure

[41]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.

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 issuances, to get a better estimate of causal effects of FPI without the confounding effects of FDI.[42] 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 1.1 and 2 provide details of the firms that issued foreign securities through public issues in the 6 years prior to the Asian financial crisis.

[42]These were not numerically not large. For example less than 3% of foreign equity issuances were by multinational affiliates.

Appendix B: Theoretical Foundation for Econometric Strategy of Propensity Score-Weighted Difference-In-Difference Estimation[43]

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:

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

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

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

Note that $E\left(Y(0) \middle| F = 1\right)$ is not observed. Substituting this for the counterfactual $E\left(Y(0) \middle| F = 0\right)$ 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):

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

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 τ_{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.

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

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.[44] The propensity score of firm i in year t (i.e. probability of raising capital abroad conditional on firm characteristics) formally is:

[43] Rosenbaum and Rubin 1985, Hirano and Imbens, 2001)

[44] One way to satisfy this reasonably is by combining propensity scores with other techniques like DID and regression adjustment.

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

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

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

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:

$$w(F,X) = F_{it} + (1 - F_{it}).\frac{\hat{p}\left(X_{i,t-1}\right)}{1 - \hat{p}\left(X_{i,t-1}\right)} \tag{9}$$

and the weighted ATT can be shown as:

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

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

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

Chapter 2

Does Foreign Portfolio Investment Hurt During a Foreign Liquidity Crunch? Firm-Level Evidence from the Global Financial Crisis

2.1 INTRODUCTION

In the previous chapter, I analyzed the relative performance of PIFs during a *domestic* financial crisis. In contrast, in this chapter, I focus on the relative performance of PIFs when the financial crisis and the ensuing liquidity constraints occur in foreign financial markets, where capital was previously raised by the PIFs. To study the impact of a *foreign* financial crisis on relative firm outcomes, I again consider East Asian firms that had previously raised capital abroad (i.e. PIFs). I assess how their outcomes were affected during the Global Financial crisis (GF crisis) of 2007-2008.

The GF crisis is a logical episode for my analysis since it has resulted in systemic liquidity constraints in the foreign financial markets where East Asian firms have capital issuances viz. U.S. and Europe.[1] While the GF crisis initially started in highly developed countries of Europe and in the U.S., it thereafter, propagated to East Asian countries through both trade and finance channels. Relatively though, its impact has been smaller on the financial systems of emerging market economies than those of the developed world.

The GF crisis started off in 2007 as a credit crisis, sparked by the meltdown of subprime mortgages across U.S. and Europe. It quickly transformed into a global financial crisis, severely affecting the solvency and liquidity of major financial institutions. Though the ensuing panic in domestic and international financial markets was alleviated through significant government intervention in various countries, the financial crisis nevertheless, led to a worldwide economic crisis, starting in 2009 and continuing to date.

[1]More than 85% of all the foreign capital raisings of East Asian firms during the period 1992-2006 have been in U.S. and Europe.

There are a large number of studies that have evidenced the impact of the GF crisis on U.S. firm liquidity and investment.[2] Particularly less is known about liquidity constraints of non-US firms that relied on US and European capital markets for their financing needs. My study attempts to fill this gap by analyzing firms that relied on foreign portfolio investment (like my treatment firms) and assessing if they had more adverse liquidity and growth outcomes during the GF crisis?

Evidence from U.S. firm studies cited above suggests that PIFs, due to their reliance on developed country financial markets (like U.S. firms), may have been more adversely affected than similar non-PIFs. In addition, there are a few studies that assess the impact of the financial crisis on non-US and non-European firms. Tong and Wei (2009) show that firms in emerging market economies, that attracted disproportionately higher non-FDI foreign capital flows, were affected more severely by liquidity constraints. Using firm-level data from 24 countries, they find that firms with greater dependence on external finance and those located in countries relying heavily on banking and FPI flows, experienced at-least .. percentage greater decline in their stock prices during 2008. Leitner and Stehrer (2012) analyze financial constraints facing Latin American firms during the GF crisis, using data based on responses to the World Bank Enterprise survey. They find that firms that could tap into internal funds or rely on a foreign parent, fared better during the financial crisis. In addition, they evidence that non-bank financial institutions became a more dominant channel for financing firm activity.

While the Tong and Wei (2009) study is a cross-country analysis, the analysis in this chapter is primarily a cross-firm study within a group of countries. Leitner and Stehrer (2012) rely on firm responses, while I study firm financial and accounting data; in addition, their study focuses more on the FDI and banking channels of exposure to foreign capital whereas the following analysis focuses on FPI. More specifically, my study focuses on prior direct access to foreign capital markets as a specific form of firm heterogeneity.

I hypothesize that firms with more direct exposure to foreign financial systems have a higher correlation with foreign systemic risk, and thus would experience greater liquidity constraints during a foreign financial crisis. For example, foreign-equity raising firms could see their stock prices decline more in response to stock market crises in US and Europe. Lower valuations could impact their borrowing ability during a credit crunch. Another example could be that during an overseas financial crisis, foreign-debt raising PIFs could find refinancing or repaying their foreign debt very challenging for their liquidity condition.

I therefore expect to find evidence that PIFs had worse outcomes than non-PIFs during the crisis period. Note that, to the extent domestic financial system liquidity is affected

[2]For example, Ivashina and Scharfstein (2010) show that new bank loans to large borrowers in U.S. fell by almost 79% by the end of 2008, relative to mid-2007 when the credit crisis had started. Gao and Yun in their 2009 working paper show how spreads between 3-month LIBOR, financial commercial paper rates and non-financial commercial paper rates over T-bill rates were under 0.5% since 2000 but skyrocketed (to more than 3%) at the peak of the crisis. Duchin et al (2010) provide evidence that U.S. firms, especially those that are historically more dependent on external finance, significantly reduced investment during the crisis period. Almeida et al (2009) show that U.S. firms whose long-term debt was maturing during the crisis reduced investment 2.5% more than similar firms.

by slowing down of capital flows from US and Europe to East Asia (notably foreign flows to the banking sector), as is the focus of the Tong and Wei study, the affect of liquidity constraints may not be differential for PIFs and non-PIFs. Direct FPI exposure of firms provides a source of identification to assess the relative crisis-period impact on PIFs through the finance channel.

In addition, I also expect that the relative outcomes of foreign-debt raising PIFs were worse than the relative performance of foreign equity-raising PIFs. Since debt has a fixed tenure and needs to be paid off or refinanced at its maturity, foreign debt and especially short-term foreign debt could aggravate firm financial constraints during a liquidity crisis.

To test my hypothesis if PIFs had relatively worse outcomes than non-PIFs during the GF crisis, I use the same empirical strategy and data from the same sources as in the previous chapter. I get my capital raisings data from SDC's New Issues database and firm financial and accounting information from the Compustat database. I control for firm selection bias using a combination of two empirical techniques: propensity score weighted difference-in-difference estimation. To recap briefly, I calculate propensity scores based on the probability of being a PIF prior to the crisis (i.e. prior to 2007), and then use these propensity scores as weights to analyze the crisis-period performance of PIFs, relative to non-PIFs and relative to the pre-crisis period (difference-in-difference estimation). To assess firm outcomes, I use various firm accounting and financial measures viz. sales growth, asset growth, return on investment, liquidity (cash stock and cash flow) and investment rates. The crisis period comprises of years from 2007 to 2009 whereas the pre-crisis period comprises of years from 2003 to 2006.

I find that PIFs, and surprisingly even foreign-debt raising PIFs, had no better or no worse outcomes than similar non-PIFs during the GF crisis. All my base specifications for foreign debt-raising, foreign-equity raising (and foreign-IPO PIFs), relative to similar non-PIFs, show that they did not have differential crisis-period outcomes with respect to sales or asset growth, investment, profitability or liquidity. I also do not material differences across PIFs in the different countries in my panel.

To understand deeper, if PIFs and non-PIFs had differential experiences in raising new finance during the crisis, I study the growth in long-term debt and short-term debt during the crisis. Again,I do not find new financing to be different across PIFs and non-PIFs. This is in contrast to my finding that PIFs are able to raise larger amounts of debt during a *domestic* financial crisis.

One reason why I do not find any differential outcomes for PIFs and similar non-PIFs could be due to specific PIF characteristics. As explained and evidenced in detail in the previous chapter, PIFs tend to be very large firms with a stable financial record. There is extensive previous research[3] which shows that large and efficient firms tend to be significantly less financially constrained than smaller firms during crises and even during normal times. Thus, when foreign liquidity became scarce, PIFs could have replaced any gaps in foreign financing with financing from domestic sources.

I test if firm size had any impact on crisis-period financial constraints. I divide PIFs

[3]For example see Beck et al. (2005), Beck et al (2008), Forbes (2003)

and non-PIFs into two groups each based on median size. I then study the crisis-period impact of size on PIFs and non-PIFs. Indeed, I find evidence that larger PIFs had better liquidity outcomes; in addition, consistent with previous research, I find that large firms (PIFs and non-PIFs) were less financially constrained during the crisis. Even while using weighted difference-in-difference estimations, I find that the difference, in crisis-period liquidity outcomes, between large and small firms was much greater than the difference between large PIFs and large local firms. Thus, in the domestic financial market, size played a bigger crisis-period role; in contrast, the results in the first chapter show that PIF status can play a larger crisis-period role than size in reducing financial constraints.

The results from this study indicate that when the financial crisis was largely in foreign capital markets, East Asian PIFs did not suffer or benefit from their differential status prior to the crisis. This can be contrasted to the evidence I provide in Chapter 1 that PIFs do seem to benefit from their status when there is a domestic financial crisis; which suggested that by having an easier access to foreign financing during a domestic financial crisis, there is an insurance motive for large firms in raising capital abroad through public issues. The evidence from the two different financial crises thus shows that the insurance that firms buy into through previous foreign capital raisings, pays off only during a domestic financial crisis and has little impact when the crisis is in foreign financial markets.

The results also provide evidence of course-correction by the East Asian financial systems and firms in the aftermath of the Asian financial crisis. In the run-up to the Asian financial crisis, many East Asian firms had weakened their corporate structures through excessive leverage , especially through short-term debt. In contrast, in the years prior to the GF crisis, I find that the financial position of East Asian firms was more sound. Consequently, controlling for pre-crisis level and composition of leverage has no impact on relative PIF performance during the GF crisis.This explains why, unlike during the Asian financial crisis, some foreign-debt raising PIFs did not have adverse outcomes during the GF crisis.

2.2 DATA USED IN EMPIRICAL ANALYSIS

In order to analyze firms that are PIFs in the Asian financial crisis, I identify firms that raised equity capital abroad during 1991-2006 and firms that raised foreign debt during the 2000-2006 period.[4] Since my treatment group assignment is determined prior to the crisis (see empirical strategy section of Chapter 1) and remains constant thereafter for my analysis, I exclude all firms that raised foreign capital through public issues during the crisis years. I also divide my foreign-equity raising PIFs into those that had raised equity through IPOs and those that had secondary offerings of equity.

[4]I look at a shorter period for debt because it has a shorter tenure, relative to equity which is relatively permanent in nature.

Similar to my analysis for the Asian financial crisis, I include firms from eight East Asian countries - Honk Kong, Japan, Taiwan, South Korea, Thailand, Philippines, Indonesia and Malaysia.

2.3 SUMMARY STATISTICS

Table 2.1 summarizes the characteristics of firms - equity PIFs versus debt PIFs versus non-PIFs - before the onset of the financial crisis. I also include a column to show characteristics of East Asian firms that had their Initial Public Offer (IPO) in foreign/global capital markets. About 3% of the 7,760 firms in my sample are debt PIFs and 9% are equity PIFs. Of the latter, half are PIFs that had IPOs abroad. As seen before, PIFs are much larger than non-PIFs in terms of asset size. An average equity PIF is 10 times larger in asset size than non-PIFs while an average debt PIF is 27 times larger than a non-PIF; this clearly indicates the bias inherent in being a PIF. Even firms that had IPOs abroad were 4 times larger than non-PIFs. The table shows that PIFs are superior in almost all respects of financial characteristics. They have higher growth opportunities relative to the other two groups (sales growth and asset growth are considered proxies for a firm's future growth potential), enjoy better return on assets, have higher investment rates and greater liquidity. PIFs tend to have higher leverage levels, but unlike non-PIFs, their leverage is less skewed towards short-term debt.

Table 2.1 also describes the comparative performance of equity PIFs, IPO PIFs and debt PIFs, relative to non-PIFs across the two analysis periods (pre-crisis and crisis period). Firms of all four groups had higher sales during the crisis period (2007-2009), relative to the pre-crisis period(2003-2006), but sales growth, asset growth, profitability and investment rates declined during the crisis years. The table also shows that leverage levels increased during the crisis period for equity PIFs and non-PIFs but declined marginally for the debt PIFs. Exposure to short-term debt increased for all groups of firms during the crisis years.

2.4 RESULTS

The empirical specification used in the analysis is similar to the average period specification in Chapter 1:

$$Y_{ijct} = \alpha_i + \beta_1 * PIF_i + \beta_2 * PIF_i * Crisis + \gamma X_{iPre} * Crisis + \delta_t + \theta_c + \rho_{ct} + \mu_j + \varepsilon_{ijct}$$

My coefficient of interest ($\beta_{2,i}$) is for the interaction variable $PIF_i * Crisis$. Table 2.2 shows the crisis-period outcomes of foreign-debt and foreign-equity raising firms. The co-

efficient estimate for the variable PIF (debt PIF, equity or IPO PIF) shows that PIFs are in general better firms. To control for this selection bias, I next estimate propensity scores to use them as weights in the difference-in-difference estimation. The results for the probit estimation (Table 2.9) show that firm characteristics that determine PIF status prior to the GF crisis are largely unchanged from what we saw for probit estimations prior to the Asian financial crisis. Table 2.10 provides results for the balancing tests which show how close the treatment group is to the propensity score-weighted control group of non-PIFs. Using propensity scores as weights, I have created appropriate weighted control groups for debt PIFs,equity PIFs and IPO PIFs.

2.5 WEIGHTED DID ESTIMATION RESULTS

Table 2.3 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 for the variable $PIF_i * Crisis$ in Table 2.3, show that PIFs had no better or no worse outcomes than similar non-PIFs. Even debt PIFs had similar outcomes as non-PIFs. These 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 outcomes are relative to the pre-crisis period.

I also look at how PIFs and non-PIFs were able to finance themselves during the crisis by analyzing the growth rates in their short-term debt and long-term debt levels, relative to the pre-crisis period. Table 2.6 presents the findings from these estimations. I find that PIFs did not have any problems, relative to similar non-PIFs, in raising additional financing during the crisis. These findings suggest that PIFs were not particularly hurt by their proximity to foreign financial markets that were experiencing severe liquidity constraints.

I conduct a number of additional tests to assess the robustness of my main findings. We can hypothesize that higher income countries are better able to withstand turmoil in foreign financial markets. I create controls for highly developed countries in my sample (Japan, South Korea, Hong Kong, Taiwan) and for less developed countries (Malaysia, Indonesia, Thailand and Philippines). As shown in Table 2.4, I find that foreign debt raising PIFs in lower income countries had lower levels of 14.3% lower asset growth. I also find that foreign debt-raising PIFs in richer countries had slightly lower profitability levels (1% lower) but the t-statistic for this coefficient estimate shows that the richer-country PIFs were only marginally worse off than non-PIFs.

Next, I focus on counties that were identified in Tong-Wei (2011) as those with higher dependence on non-FDI capital flows. These, amongst my sample, are South Korea, Malaysia and Indonesia. Based on Tong-Wei (2011) results, I should find that PIFs from these countries should have fared worse. The results detailed in Table 2.5, show that

equity and IPO PIFs in South Korea, Indonesia and Malaysia were marginally worse-off than non-PIFs in terms of return on investment and in generate adequate cash flows for financing their capital expenditures.

In addition, I also conducted robustness tests by analyzing only non-Japanese firms (similar results as base case), including operating exposure as a control for potential impacts of the trade channel (no change), altering the years included in my crisis period (no change in results).

2.5.1 *Leverage and Crisis-Period Outcomes*

In the previous analysis of PIF performance during a domestic financial crisis, I found that leverage played a critical role in crisis-period PIF performance, especially for foreign-debt raising PIFs, I test to see if pre-crisis level and composition of leverage had any similar impact on PIF outcomes during the GF crisis. The results are shown in Table 2.7. As can be seen, the results are not as conclusive during the GF crisis. Firms with higher levels of leverage have higher sales and asset growth but firms that greater pre-crisis levels of short-term debt seem to be under-performing on the liquidity front. These results indicate that corporate financial structures and leverage played a less destabilizing role during the GF crisis as opposed to the Asian financial crisis. The summary statistics in Table 2.1 also shows that East Asian firms had more sound and efficient corporate financing policies in the 2000s, relative to the 1990s.

2.6 DIFFERENTIAL IMPACT OF DOMESTIC FINANCIAL CRISIS AND FOREIGN FINANCIAL CRISIS

As the results of Chapter 1 indicate, East Asian PIFs largely benefited from their PIF status during a shock that paralyzed their domestic financial system. In such circumstances having already established themselves as 'premier' firms, and having overcome foreign financial market regulatory constraints, PIFs had an alternate source of financing available to them. Thus, through their prior access, they had an insurance against liquidity crunch in a domestic financial crisis.

In contrast, when the financial crisis is largely overseas[5], PIFs should have had more adverse outcomes due to their presumably immediate linkages to the ensuing liquidity crunch. The results above show that they did not fare worse than similar non-PIFs. One reason could be that PIFs overcame any frictions in their foreign financing channels by replacing those with finance from domestic sources.; and PIFs are in a position to

[5]The Global Financial crisis was largely a shock to the foreign financial systems. It is true that the crisis was propagated to the East Asian economies (especially South Korea), but the impact of the GF crisis was less debilitating and more short-lived than the Asian financial crisis.

do so because they are very large firms with generally stronger balance sheets. Their PIF status and greater compliance with stricter international accounting and disclosure standards would make it easier for them to attract lenders at home. So large firms - PIFs and similar non-PIFs, would face similar financing constraints during a foreign financial crisis. Note that to the extent that domestic financial markets are affected due to a slow-down or stoppage of foreign capital flows, PIFs and non-PIFs would be similarly affected.

2.6.1 *Firm Size and Crisis-Period Financial Constraints*

If PIFs did not suffer from their exposure to foreign capital in a GF crisis, it could be because they are large firms and are able to lower their financial constraints more than smaller firms, even during a crisis. I test if size played any role in the relative crisis-period outcomes of PIFs. I divide each group of PIFs and non-PIFs into two sub-groups based on size; then I create a triple interaction variable $Crisis * PIF * Large$ to analyze how large PIFs performed relative to smaller PIFs and non-PIFs during the crisis. I thus use the following econometric specification to estimate the impact of size on crisis-period financial constraints of PIFs. Note that I still use a propensity score-weighted DID estimation.

$$\begin{aligned} Y_{ijct} &= \alpha_i + \beta_1 * PIF_i + \beta_2 * PIF_i * Crisis + +\lambda_1 * PIF_i * Crisis * Large \\ &\quad +\lambda_2 * Crisis * Large + \gamma X_{iPre} * Crisis + \delta_t + \theta_c + \rho_{ct} + \mu_j + \varepsilon_{ijct} \end{aligned}$$

I estimate the above to consider the crisis-period impact on liquidity related variables i.e. the ratio of cash flow to capital expenditure and the ratio of cash stock to assets. The results are presented in Table 2.8. I find that, consistent with previous research, *Large* firms were less financially constrained during the financial crisis (statistically significant, positiveλ_2). I also find that *Large* foreign equity-raising PIFs (including IPO PIFs) had greater cash resources during the crisis ($\lambda_1$estimate in columns 4 and 6); but all types of $Large\ PIFs$ experienced higher crisis-period constraints for financing their capital expenditures through internal resources. This is evidenced by the negative coefficient estimate for $\lambda_1$in columns 1, 3 and 5 where the dependent variable is the standard measure for financial constraints viz. ratio of cash flow to capital expenditures (though the coefficient estimate is not statistically significant for IPO PIFs).

To consider the overall crisis-related effect of size on PIFs, relative to non-PIFs, I look at the joint impact of the three coefficient estimates i.e. $(\beta_2 + \lambda_1 + \lambda_2)$. The results are presented in the bottom panel of Table 2.8. The F-tests show that, while the overall effect of size on crisis-period liquidity of PIFs was positive (i.e. large PIFs had lower financial constraints during the crisis), the coefficients are jointly significant when the dependent variable is the ratio of cash flow to capital expenditure. For the ratio of cash stock to assets, the joint effect of the coefficients is positive but not statistically significant.

The results thus evidence that *Large* PIFs and *Large* non-PIFs were less financially constrained during the crisis. The difference between the crisis-period outcomes of large and small firms is bigger than the difference between large PIFs and large non-PIFs (weighted). This suggests that in the domestic financial market, size could play a greater crisis-period role than PIF status in affecting financial constraints of firms.

2.7 CONCLUSIONS

I have investigated the value of previous foreign issuances by East Asian firms during the Global Financial crisis. I find that prior direct access to foreign capital markets had, on balance, no impact on firm performance during a crisis that had predominantly affected financial systems where the foreign issuances were made. This suggests that, while foreign issuances provide insurance against a domestic financial shock when firms cannot rely on domestic sources of capital, by the same measure, they do not hurt during a foreign financial shock.

A natural extension, following this study, is to investigate the relative impact of the foreign financial crisis on stock prices of foreign-equity raising PIFs and similar non-PIFs. Due to higher correlation of the stock prices of equity PIFs with foreign market indices, a stock market crisis (as had concurrently occurred during 2008) would possibly have differential impact on stock prices of equity PIFs than non-PIFs that are listed only in their domestic stock markets. It would also be interesting to explore the difference in impact of the size of the foreign issuance on firm outcomes during the crisis. Such an analysis would require better tracking of firms' capital structures over time and also more nuanced data with respect to foreign currency and domestic currency financing. Lastly, it would also be interesting to extend this study to a wider panel of countries to understand the crisis-period impact of firm heterogeneity in conjunction with greater country heterogeneity.

Table 2.1: **Summary Statistics**

	Pre-Crisis (2003-2006)				Crisis (2008-2010)			
	Equity PIF	**IPO PIF**	**Debt PIF**	**Non-PIF**	**Equity PIF**	**IPO PIF**	**Debt PIF**	**Non-PIF**
Sales ($ mn)	3,234	1,258	8,201	303	4,116	1,790	10,525	386
Assets ($ mn)	6.192	5.555	7.962	4.414	6.518	5.908	8.157	4.640
Long Term Debt/Assets	0.138	0.149	0.188	0.087	0.165	0.205	0.179	0.083
Short Term Debt/Assets	0.096	0.102	0.101	0.141	0.125	0.129	0.110	0.171
Sales growth	0.213	0.205	0.190	0.181	0.088	0.099	0.077	0.075
Volatility of sales growth	0.277	0.281	0.204	0.291	0.262	0.247	0.248	0.290
Asset growth	0.191	0.168	0.159	0.166	0.088	0.091	0.059	0.070
Return on Assets	0.103	0.100	0.115	0.049	0.065	0.077	0.094	0.046
Investment/Assets	0.063	0.065	0.071	0.050	0.051	0.054	0.060	0.041
Cash Stock/Assets	0.189	0.197	0.136	0.176	0.200	0.200	0.160	0.189
Cash Flow/Sales	0.113	0.116	0.163	0.101	-0.043	-0.170	0.120	-0.127
N	675	332	195	6559	675	332	195	6559

Table 2.2: Difference-In-Difference Estimation Results

	Average Sales Growth	Average Asset Growth	Return on Investment	Cash Flow to Capex	Investment to Assets	Cash stock to Assets
Crisis*Debt PIF	-0.045***	-0.018	-0.022***	-0.131	-0.008**	0.043***
	(-2.88)	*(-1.32)*	*(-2.95)*	*(-0.35)*	*(-2.48)*	*(3.66)*
Debt PIF	0.035***	0.012	0.015***	-0.479*	0.015***	-0.021***
	(3.35)	*(1.30)*	*(3.00)*	*(-1.91)*	*(6.97)*	*(-2.58)*
R-squared	0.17	0.14	0.11	0.08	0.2	0.21
N	12388	12388	12388	12368	12378	12376
Crisis*Equity PIF	-0.015	-0.004	-0.015***	-0.354*	-0.001	0.015**
	(-1.64)	*(-0.51)*	*(-3.52)*	*(-1.66)*	*(-0.69)*	*(2.21)*
Equity PIF	0.025***	0.013**	0.026***	0.216	0.007***	0.008
	(3.94)	*(2.30)*	*(8.76)*	*(1.48)*	*(5.21)*	*(1.64)*
R-squared	0.17	0.15	0.11	0.08	0.19	0.21
N	14464	14464	14464	14436	14448	14462
Crisis*IPO PIF	0.006	0.009	-0.011*	-0.35	0	0.005
	(0.46)	*(0.80)*	*(-1.94)*	*(-1.17)*	*(0.20)*	*(0.57)*
IPO PIF	0.027***	0.014*	0.033***	0.460**	0.007***	0.011*
	(3.14)	*(1.81)*	*(8.04)*	*(2.20)*	*(3.99)*	*(1.66)*
R-squared	0.17	0.15	0.11	0.09	0.19	0.21
N	13324	13314	13324	13300	13308	13324

The table reports the impact of being a PIF on firm outcomes during the crisis using simple difference-in-difference estimation (without weights). Countries included in the estimations as: Indonesia, Malaysia, Thailand, Philippines, Hong Kong, Japan, Taiwan and South Korea. Pre-crisis period includes years 2003-2006 and crisis period years are 2007-2009. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues prior to 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. PIF and Crisis are dummy variables. 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. Cap-ex is defined as capital expenditure. All estimations include control for pre-crisis firm size, and fixed effects for sector, country,period and interactions between country and period.

*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 2.3: **Propensity Score-Weighted Difference-In-Difference Estimation Results**

	Average Sales Growth	Average Asset Growth	Return on Investment	Cash Flow to Capital Exp.	Investment to Assets	Cash stock to Assets
Crisis*Debt PIF	0.015	-0.007	-0.006	-0.397	0.003	0.006
	(0.43)	*(-0.24)*	*(-1.01)*	*(-0.79)*	*(0.77)*	*(0.58)*
Debt PIF	-0.002	0.004	0.008	-0.265	0.003	0.01
	(-0.08)	*(0.15)*	*(1.21)*	*(-0.46)*	*(0.61)*	*(0.81)*
R-squared	0.24	0.24	0.17	0.13	0.31	0.21
N	7358	7358	7358	7350	7354	7356
Crisis*Equity PIF	0.023	0.01	-0.091	0.27	-0.003	0.003
	(1.07)	*(0.55)*	*(-1.38)*	*(0.57)*	*(-0.93)*	*(0.45)*
Equity PIF	0.006	0.014	0.021	-0.266	0.006*	-0.002
	(0.36)	*(0.92)*	*(1.09)*	*(-0.59)*	*(1.81)*	*(-0.26)*
R-squared	0.13	0.12	0.01	0.09	0.12	0.21
N	12616	12616	12616	12592	12598	12616
Crisis*IPO PIF	0.025	0.027	-0.104	0.641	-0.004	-0.001
	(0.92)	*(1.18)*	*(-1.08)*	*(1.03)*	*(-0.89)*	*(-0.15)*
IPO PIF	0.019	0.004	0.034	0.209	0.008**	-0.001
	(0.88)	*(0.25)*	*(1.17)*	*(0.35)*	*(2.11)*	*(-0.09)*
R-squared	0.12	0.12	0.01	0.12	0.1	0.26
N	10674	10668	10674	10656	10662	10674

These are the main results of this study. The table reports the impact of being a PIF on firm outcomes during the crisis period. 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 2003-2006 and crisis period years are 2007-2009. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues prior to 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. PIF and Crisis are dummy variables. 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.Cap-ex is defined as capital expenditure. All estimations include control for pre-crisis firm size, and fixed effects for sector, country,period and interactions between country and period.
*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 2.4: **Propensity Score-Weighted DID - Controlling for Country Income Levels**

	Average Sales Growth	Average Asset Growth	Return on Investment	Cash Flow to Capex	Investment to Assets	Cash stock to Assets
Crisis*Debt PIF*HDC	0.016	0.003	**-0.010***	-0.424	0.003	0.004
	-0.44	-0.11	*(-1.75)*	*(-0.81)*	*(0.70)*	*(0.32)*
Crisis*Debt PIF*LDC	0.003	**-0.143*****	0.052	-0.037	0.007	0.039
	-0.05	(-2.59)	*(1.29)*	*(-0.02)*	*(0.61)*	*(1.26)*
Debt PIF	-0.002	0.004	0.008	-0.266	0.003	0.01
	(-0.08)	-0.15	*(1.19)*	*(-0.46)*	*(0.61)*	*(0.80)*
R-squared	0.24	0.25	0.18	0.13	0.31	0.21
N	7358	7358	7358	7350	7354	7356
Crisis*Equity PIF*HDC	0.034	0.02	-0.112	0.314	-0.003	0.005
	(1.45)	(1.00)	*(-1.38)*	*(0.58)*	*(-0.97)*	*(0.68)*
Crisis*Equity PIF*LDC	-0.015	-0.027	-0.013	0.107	-0.001	-0.005
	(-0.50)	*(-1.14)*	*(-0.66)*	*(0.13)*	*(-0.22)*	*(-0.33)*
Equity PIF	0.006	0.014	0.022	-0.266	0.006*	-0.002
	(0.35)	*(0.92)*	*(1.13)*	*(-0.59)*	*(1.87)*	*(-0.27)*
R-squared	0.13	0.12	0.01	0.09	0.11	0.21
N	12616	12616	12616	12592	12598	12616
Crisis*IPO PIF*HDC	0.035	0.034	-0.136	1.101	-0.006	-0.004
	(1.16)	*(1.28)*	*(-1.04)*	*(1.48)*	*(-1.15)*	*(-0.39)*
Crisis*IPO PIF*LDC	-0.002	0.009	-0.022	-0.55	0.002	0.006
	(-0.04)	*(0.32)*	*(-0.95)*	*(-0.56)*	*(0.25)*	*(0.41)*
IPO PIF	0.019	0.004	0.034	0.207	0.008**	-0.001
	(0.88)	*(0.25)*	*(1.17)*	*(0.35)*	*(2.12)*	*(-0.09)*
R-squared	0.12	0.12	0.01	0.12	0.10	0.26
N	10674	10668	10674	10656	10662	10674

The table reports the impact of being a PIF on firm outcomes during the crisis period after controlling for income-level of countries. 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 2003-2006 and crisis period years are 2007-2009. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues prior to 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.Cap-ex is defined as capital expenditure. PIF and Crisis are dummy variables. HDC is the dummy for high-income country while LDC is the dummy for being a firm in a low-income country. All estimations include control for pre-crisis firm size, and fixed effects for sector, country,period and interactions between country and period.

*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 2.5: **Propensity Score-Weighted DID - Countries with Higher Proportion of Foreign Portfolio Investment**

	Average Sales Growth	Average Asset Growth	Return on Investment	Cash Flow to Capex	Investment to Assets	Cash stock to Assets
Crisis*Debt PIF	0.054	-0.084	0.021	-1.120	0.004	0.017
	(1.13)	*(-1.43)*	*(1.03)*	*(-0.90)*	*(0.28)*	*(1.05)*
Debt PIF	-0.062**	-0.054	0.024*	1.341	0.005	0.015
	(-2.05)	*(-1.42)*	*(1.93)*	*(1.59)*	*(0.50)*	*(0.93)*
R-squared	0.44	0.45	0.26	0.28	0.48	0.36
N	1756	1756	1756	1756	1756	1756
Crisis*Equity PIF	0.051	-0.011	-0.015	**-1.448***	-0.001	0.004
	(0.84)	*(-0.31)*	*(-1.46)*	*(-1.83)*	*(-0.25)*	*(0.49)*
Equity PIF	-0.051	-0.011	0.031***	0.503	0.012*	-0.003
	(-1.17)	*(-0.39)*	*(2.79)*	*(0.71)*	*(1.94)*	*(-0.20)*
R-squared	0.2	0.26	0.17	0.16	0.29	0.33
N	3422	3422	3422	3418	3418	3422
Crisis*IPO PIF	0.077	0.028	**-0.022***	-1.861	0.000	0.022
	(1.29)	*(0.60)*	*(-1.87)*	*(-1.42)*	*(-0.00)*	*(1.62)*
IPO PIF	-0.05	-0.017	0.051***	1.792	0.020*	0.004
	(-1.19)	*(-0.60)*	*(3.05)*	*(1.52)*	*(1.81)*	*(0.20)*
R-squared	0.16	0.23	0.25	0.24	0.35	0.37
N	2594	2590	2594	2594	2594	2594

The table reports the impact of being a PIF on firm outcomes during the crisis period. Only firms with higher proportion of FPI (than FDI) are considered. Countries included in the estimation - South Korea, Malaysia and Indonesia - are identified based on data from Tong-Wei (2011). The weights used in the estimations are calculated using propensity scores obtained from the probit regressions. The weights are capped at 20. Pre-crisis period includes years 2003-2006 and crisis period years are 2007-2009. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues prior to 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.Cap-ex is defined as capital expenditure. PIF and Crisis are dummy variables. All estimations include control for pre-crisis firm size, and fixed effects for sector, country,period and interactions between country and period.

*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 2.6: **Liquidity Constraints - New Financing Availed During Crisis**

	DEBT PIFS		EQUITY PIFS		IPO PIFS	
	Growth: Short-term debt	Growth: Long-term debt	Growth: Short-term debt	Growth: Long-term debt	Growth: Short-term debt	Growth: Long-term debt
Crisis*PIF	0.567	-0.402	0.466	-0.288	0.248	-0.071
	(1.21)	*(-1.02)*	*(1.43)*	*(-0.89)*	*(0.61)*	*(-0.19)*
Debt PIF	-0.187	0.45	-0.266	0.286	-0.305	0.104
	(-0.57)	*(1.27)*	*(-1.04)*	*(1.29)*	*(-0.92)*	*(0.42)*
R-squared	0.09	0.05	0.04	0.03	0.04	0.04
N	6844	6288	11468	10334	9636	8666

The table reports the impact of being a PIF on new finances raised by firms during the Global Financial crisis. 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 2003-2006 and crisis period years are 2007-2009. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues prior to 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. The dependent variables are growth rates in short-term debt and long-term debt during crisis, relative to the pre-crisis period. PIF and Crisis are dummy variables. All estimations include control for pre-crisis firm size, and fixed effects for sector, country,period and interactions between country and period.

*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 2.7: **Role of Pre-Crisis Level and Composition of Leverage During Global Financial Crisis**

	Average Sales Growth	Average Asset Growth	Return on Investment	Cash Flow to Capex	Investment to Assets	Cash stock to Assets
Crisis*Debt PIF	0.067	0.029	-0.025	1.263	-0.006	**0.069****
	(1.26)	*(0.85)*	*(-1.00)*	-0.63	*(-0.52)*	*(2.21)*
Crisis*Debt PIF*High Leverage	-0.059	-0.024	0.037	-1.48	0.01	**-0.059***
	(-1.03)	*(-0.71)*	*(1.21)*	(-0.71)	*(0.77)*	*(-1.89)*
Crisis*Debt PIF*High Short-Term Debt'	*(0.00)*	*(0.03)*	***-0.026****	-0.78	*0.00*	***-0.026****
	(-0.08)	*(-1.12)*	*(-1.80)*	(-0.90)	*(0.21)*	*(-1.67)*
Debt PIF	-0.002	0.004	0.008	-0.27	0.003	0.01
	(-0.09)	*(0.15)*	*(1.26)*	*(-0.47)*	*(0.62)*	*(0.79)*
R-squared	0.24	0.25	0.18	0.13	0.32	0.22
N	7358	7358	7358	7350	7354	7356
Crisis*Equity PIF	0.016	-0.003	-0.085	**1.429****	**-0.011*****	**0.053*****
	(0.63)	*(-0.12)*	*(-1.07)*	*(2.24)*	*(-2.87)*	*(5.49)*
Crisis*Equity PIF*High Leverage	**0.050****	**0.042***	0.062	-1.277	**0.015*****	**-0.053*****
	(2.03)	*(1.80)*	*(1.13)*	*(-1.57)*	*(3.70)*	*(-4.59)*
Crisis*Equity PIF*High Short-Term Debt'	**-0.056****	-0.03	**-0.111****	-1.14	0.00	**-0.053*****
	(-2.39)	*(-1.30)*	*(-2.10)*	*(-1.49)*	*(-0.20)*	*(-5.33)*
Equity PIF	0.006	0.014	0.021	-0.264	0.006*	-0.002
	-0.36	-0.93	-1.1	(-0.58)	-1.81	(-0.25)
R-squared	0.13	0.12	0.01	0.1	0.12	0.23
N	12616	12616	12616	12592	12598	12616

The table reports the impact of being a PIF on firm outcomes during the Global Financial crisis, after 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 2003-2006 and crisis period years are 2007-2009. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues prior to 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. Cap-ex is defined as capital expenditure. 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. PIF and Crisis are dummy variables. All estimations include control for pre-crisis firm size, and fixed effects for sector, country,period and interactions between country and period.

*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 2.8: **Propensity Score-Weighted DID Estimation Results - Role of Size**

	DEBT PIFS		EQUITY PIFS		IPO PIFS	
	(1) Cash Flow to Capex	(2) Cash Stock to Assets	(3) Cash Flow to Capex	(4) Cash Stock to Assets	(5) Cash Flow to Capex	(6) Cash Stock to Assets
Crisis* PIF (β_2)	**4.792****	0.012	**3.897*****	-0.016	**2.284****	**-0.027***
	(2.08)	*(0.32)*	*(3.68)*	*(-1.18)*	*(2.05)*	*(-1.73)*
Crisis*PIF*Large (β_3)	**-4.989****	-0.003	**-4.312*****	**0.032***	-1.994	**0.043****
	(-2.14)	*(-0.08)*	*(-4.00)*	*(1.79)*	*(-1.57)*	*(2.07)*
Crisis * Large Size (λ_1)	**5.373****	0.009	**4.349*****	-0.01	**2.686*****	-0.009
	(2.36)	*(0.23)*	*(4.31)*	*(-0.74)*	*(2.87)*	*(-0.62)*
PIF (β_1)	-1.078**	-0.030**	-0.325	-0.023***	0.485	-0.01
	(-2.00)	*(-2.42)*	*(-0.72)*	*(-2.87)*	*(0.80)*	*(-1.00)*
R-squared	0.13	0.22	0.1	0.21	0.13	0.26
N	7350	7355	12591	12616	10656	10674
$\beta_2 + \beta_3 = 0$	0.22	1.29	0.73	4.13	0.18	2.40
Prob>F	*0.64*	*0.26*	*0.39*	***0.04***	*0.67*	*0.12*
$\beta_2 + \beta_3 + \lambda_1 = 0$	5.11	0.22	12.56	0.25	9.29	0.45
Prob>F	***0.02***	*0.64*	***0.00***	*0.62*	***0.00***	*0.50*

The table reports the impact of being a PIF on firm outcomes during the Global Financial crisis, after controlling for firm size. 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 2003-2006 and crisis period years are 2007-2009. PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues prior to 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. Cap-ex is defined as capital expenditure. PIF and Crisis are dummy variables. Large size is a dummy equal to 1 if PIF size is greater than median PIF size. All estimations include control for pre-crisis firm size. All estimations include control for pre-crisis firm size, and fixed effects for sector, country,period and interactions between country and period.

*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 2.9: Probit Estimation Results

	Debt PIF when Crisis Started	**Equity PIF when Crisis Started**	**IPO PIF when Crisis Started**
Size (Log, 2003-06)	**0.935*** **	**0.532*** **	**0.344*** **
	(17.63)	*(24.53)*	*(12.86)*
Average Asset Growth (2003-06)	**0.812*** **	**0.333** **	
	(3.06)	*(2.20)*	
Leverage (2003-06)	**3.643*** **	**0.648** **	**0.978*** **
	(6.35)	*(2.37)*	*(3.24)*
Short-Term Debt/Assets (2003-06)	-0.519	**-0.794*** **	**-0.638** *
	(-0.67)	*(-2.76)*	*(-1.89)*
Return on Assets (2003-06)		0.518	0.654
		(1.28)	*(1.33)*
Average Sales Growth (2003-06)		0.0120	0.1685
		(0.08)	*(0.92)*
Volatility: Sales growth (2003-06)	-0.2941		-0.1597
	(1.39)		*(1.01)*
Working Capital/Assets (2003-06)	**0.951** **	**0.999*** **	**0.837*** **
	(2.14)	*(4.94)*	*(3.34)*
Cash Flow to Cap-Exp. (2003-06)	**-0.010*** **	0.000	-0.001
	(-2.77)	*(-0.38)*	*(-0.59)*
Investment Rate (2003-06)	0.963	**2.233*** **	**2.095*** **
	(0.70)	*(3.62)*	*(2.81)*
Retained Earnings/Sales (2003-06)	-0.047	**-0.044*** **	-0.022
	(-0.92)	(-2.91)	(-1.17)
Psuedo R-square	0.61	0.40	0.34
Number of Firms	6508	7402	6814
Country Dummies	Y	Y	Y
Sector Dummies	Y	Y	Y

*PIF: Publicly internationalized firms (treatment firms i.e. firms that raised capital abroad through public issues prior to the 2007 crisis; foreign debt raisings from 2001-2006; foreign equity raisings from 1992-2006). The dependent variable is a binary indicator for a firm being a PIF when the crisis starts. Pre-crisis period includes years 2003-2006. Data is from SDC's 'New Issues Database'. Financial data for firms is obtained from the merger of Compustat North America and Compustat Global. Robust standard errors in parentheses. Asterisks denote significance of coefficients with ***, **, and * and indicate significance at the 1%, 5% and 10% level respectively.*

Table 2.10: **Balancing Tests for Propensity Score-Based Weights**

Variables (Pre-Crisis: 2003-2006)	Mean		% Bias		
	Treated	Control	% Bias	Reduction	t-stat
Panel A:Debt PIF					
Average Sales Growth	0.207	0.187	7.2	7.1	0.36
Size (Log Assets)	**6.392**	**6.470**	**-5.2**	**97.7**	**-0.32**
Leverage	**0.152**	**0.145**	**5.8**	**93.0**	**0.31**
Return on Assets	0.109	0.084	2.0	59.6	0.24
Short Term Debt Proportion	0.114	0.119	-2.4	86.5	-0.22
Cash Flow/Capital Exp.	**4.439**	**4.832**	**-2.0**	**87.9**	**-0.14**
Working Capital/Assets	**0.186**	**0.102**	**0.6**	**52.5**	**0.08**
Investment/Assets	0.055	0.053	3.7	91.0	0.23
Cash Stock/Assets	0.162	0.150	9.1	68.3	0.53
Average Asset Growth	0.212	0.164	17.0	-3445.3	0.77
Operating Exposure	0.002	-0.078	12.1	-20.1	0.69
Panel B:Equity PIF					
Average Sales Growth	0.215	0.205	2.9	77.0	0.56
Size (Log Assets)	**6.067**	**6.058**	**0.5**	**99.5**	**0.09**
Leverage	**0.132**	**0.125**	**3.0**	**81.3**	**0.79**
Return on Assets	0.101	0.080	1.7	65.5	0.39
Short Term Debt Proportion	0.098	0.111	-2.7	77.4	-1.28
Cash Flow/Capital Exp.	**5.213**	**5.807**	**-2.5**	**-86.1**	**-0.49**
Working Capital/Assets	**0.140**	**-0.024**	**1.3**	**23.0**	**0.28**
Investment/Assets	0.062	0.055	11.4	48.0	2.32
Cash Stock/Assets	0.191	0.192	-0.3	97.2	-0.05
Average Asset Growth	0.195	0.175	6.2	46.6	1.22
Operating Exposure	0.021	0.008	1.9	80.2	0.36
Panel C:IPO PIF					
Average Sales Growth	0.212	0.178	10.4	10.4	1.42
Size (Log Assets)	**5.448**	**5.623**	**-10.5**	**82.8**	**-1.29**
Leverage	**0.137**	**0.135**	**0.7**	**95.6**	**0.12**
Return on Assets	0.099	0.061	3.0	36.7	0.39
Short Term Debt Proportion	0.105	0.119	-3.2	70.0	-0.78
Cash Flow/Capital Exp.	**1.378**	**-1.572**	**1.1**	**-162.6**	**0.11**
Working Capital/Assets	**0.190**	**-0.132**	**2.6**	**-22.2**	**0.32**
Investment/Assets	0.066	0.055	17.0	35.2	2.41
Cash Stock/Assets	0.202	0.194	4.8	69.4	0.6
Average Asset Growth	0.178	0.145	10.1	-62.8	1.42
Operating Exposure	0.060	-0.022	11.8	22.0	1.55

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.

Chapter 3

Capital Account Liberalization, Financial Development and Industry Growth: A Synthetic View

3.1 INTRODUCTION

The growth effects of capital account liberalization are an issue that will not go away. Since the turn of the century additional countries have moved to relax and remove restrictions on capital flows (Figure 1). The subsequent decade then saw the fastest global growth in more than 30 years, an outcome in which many low-income and middle-income countries shared. This coincidence of timing encouraged causal arguments that capital mobility was contributing to growth. Indeed some explanations made the connection explicit, such as the so-called Bretton Woods II model which portrays capital mobility as an essential element of high global growth in recent years.[1]

[Insert Figure 1 here]

The crisis of 2007-8 then turned these arguments on their head. It is now argued that an open capital account, combined with high savings in countries like China, fueled the capital flows that inflated housing markets and asset valuations in the United States. Openness to capital flows, it is further argued, allowed current account deficits to widen unsustainably in Central and Eastern Europe and encouraged the development of dangerous currency and maturity mismatches everywhere from Hungary to South Korea.[2] A movement to reimpose restrictions on capital flows may now be getting underway in response. Recent experience thus highlights the fact that the debate over the growth effects

[1]The locus classicus of Bretton Woods II is Dooley et al. (2003).

[2]The idea that the costs and benefits of capital mobility leave a different impression in crisis and non-crisis periods is hardly novel. Thus, Eichengreen and Leblang (2003) distinguish crisis and noncrisis periods using the standard model of the macroeconomic effects of capital account liberalization.

of capital account liberalization remains fundamentally unresolved.

Since Rodrik (1998), who found no correlation between capital account liberalization and growth, large amounts of computer time have been consumed in attempts to identify or discredit the existence of an effect.[3] It is of course possible to find no evidence of an effect when one exists; this can result from noisy data, omitted variables or other forms of model mis-specification.[4] But it is equally possible to find evidence of an effect when none exists owing to reverse causality running from growth and higher incomes to capital account liberalization.

These problems are likely to be acute in studies using national growth rates as the dependent variable. Economy-wide growth and capital account liberalization are simultaneously determined. With growth comes higher incomes, and with higher incomes come the stronger institutions and policies needed to manage capital flows and heighten the likelihood that the benefits of an open capital account exceed the costs. But those stronger policies and institutions which influence the decision to open the capital account also affect growth directly. In other words, they do not satisfy the exclusion restriction for a valid instrument for capital account liberalization. This renders identification problematic in regressions involving aggregate growth and a measure of capital account liberalization.

The same endogeneity confounds attempts to identify the impact of financial development on growth. In response investigators have moved to the analysis of firm and industry data. In an influential contribution, Rajan and Zingales (1998) asked whether firms and sectors that depend more on external finance benefit more from the presence of deep and liquid domestic financial markets. Specifically, they ask whether the value added of such sectors grows more quickly in countries with better developed financial markets. They found for the period 1980-90 strong evidence that financial development mattered in this sense.

This approach has two advantages relative to the earlier literature. It gets around the reverse causality problem insofar as there is no reason why the growth of a specific industry, defined at the three- or four-digit level, should affect financial development in the country as a whole. And it tests a specific mechanism through which financial development matters, namely by relaxing financing constraints.

Extending this approach to the growth effects of capital account liberalization is straightforward. In principle firms can tap foreign as well as domestic financial markets. The question then becomes whether firms that depend more on external finance grow more quickly in countries with an open capital account. It is whether the answer depends on the strength of policies and institutions in the country.

We know of five studies posing this question: Galindo et al. (2002), Vanassche (2004), Vlachos and Waldenstrom (2006), Prasad et al. (2007), and. Levchenko et al. (2009). But Galindo et al. (2002), while considering various measures of financial liberalization,

[3]Recent surveys of this literature are Eichengreen (2001), Kose et al. (2006), Henry (2007), and Rodrik and Subramanian (2008).

[4]As one economist once put it, the secret of successful research is to define one's null so that failure to estimate a significant coefficient can be claimed as success.

do not at the same time consider financial development. And unlike recent work focusing on the effects of financial development they do not distinguish crisis and noncrisis periods, where there is a presumption that the effects of an open capital account will differ between such periods. Vanassche (2004) similarly does not distinguish crisis and non-crisis periods, and her findings for whether domestic financial development or international financial liberalization matters for industry growth are sensitive to how these variables are measured. Vlachos and Waldenstrom utilize data only through 1990 and again do not distinguish crisis and non-crisis periods. Prasad et al. (2007) use more recent data and split their sample across types of countries but they also do not separate crisis periods from normal times. Finally Levchenko et al. (2009) consider the effect of liberalization on both output growth and volatility, but they do not explicitly separate crisis and non-crisis periods. Nor do they check whether the growth effect of capital account liberalization varies across countries.[5]

So what is the message of studies adopting this approach? At this point there is none. In other words, there still is no synthetic analysis that controls for other factors also plausibly influencing industry growth, such as the development of domestic financial markets and the strength of institutions, and which at the same time distinguishes crisis and non-crisis periods.

It is that synthetic view that we attempt to provide in this paper. We find evidence that capital account openness has positive effects on the growth of financially-dependent industries. But those effects are eliminated by crises: the growth of financially-dependent sectors is no faster in financially open than financially closed economies in decades marked by crises. But neither is the growth of financially-dependent sectors slower in crisis periods. This suggests that countries that have succeeded in avoiding crises have benefited from capital account liberalization while countries that have not so succeeded have neither benefited nor suffered on average.

But these results are driven mainly by the high-income countries. Probing deeper, we find that the positive effects of capital account openness are limited to countries with well developed financial systems, good accounting standards, strong creditor rights, and rule of law. The same is true of the crisis-period offset: just as there is no evidence for low-income

[5]Several other studies have attempted to distinguish the effects of financial development in crisis periods as distinct from more normal times and in countries with stronger and weaker institutions but, in contrast to our work, do not distinguish countries with open and closed capital accounts. Kroszner et al. (2007) postulate that the financial development-growth link for more financially-dependent sectors should operate in normal times but not crisis periods. As their measure of crises they use the Caprio and Klingebiel (2002) index of systemic banking crises. (They do not also consider currency crises.) They find that more financially-dependent sectors experience sharper contractions in crisis periods in countries with well-developed financial systems. The external dependence/financial development interaction has a significantly positive coefficient in pre-crisis periods but no effect in crisis periods. Dell'Ariccia et al. (2008) do consider this relationship indirectly. Their conjecture is that when the capital account is open and financially dependent firms can tap foreign finance even if the domestic banking system seizes up, financially dependent sectors should suffer less. Their proxy for capital account openness is the flow of foreign loans and bonds to the private sector. They confirm that the impact of banking crises on financially dependent sectors is less when the capital account is open.

and middle-income countries of an additional boost from capital account liberalization in financially-dependent sectors in normal times, there is no evidence of smaller benefits (or of those benefits disappearing entirely) in crisis periods, whether underdevelopment is measured by low incomes, shallow financial markets or weak institutions. This provides an explanation for why so many other earlier studies did not find a consistent effect – namely, they failed to probe for such threshold effects. It is a reminder of the importance of sequencing capital account liberalization with other policies associated with this larger process of economic and institutional development.

3.2 EMPIRICAL SPECIFICATION

We start by estimating the baseline equation:

$$VAGR_{c,i,d} = cd + id + \alpha SHARE_{c,i,d} + EF_{i,d}(\beta FD_{c,d} + \gamma LIB_{c,d} + \delta LIB_{c,d} * CR_{c,d}) + \varepsilon_{c,i,d} \quad (1)$$

Here $VAGR$ is the value added of industry i, in country c, in decade d; cd and id are country-decade and industry-decade fixed effects; $SHARE$ is the share of value added of industry i on total industrial value added in country c at the beginning of decade d; EF is the index of external financial dependence of industry i, decade d; FD measures financial development in country c during decade d; LIB measures capital account liberalization in country c and decade d; and CR is a dummy variables that takes value one if country c suffered a crisis in decade d.[6] Following prevailing practice, we combine annual observations into decade averages in order to filter out short-term noise. Since our data end in 2004, we estimate the model using two decades (1980-89 and 1990-1999) and a half decade (2000-2004) using methods appropriate for panel data.[7]

β and γ are the now standard coefficients measuring the extent to which financial development and capital account liberalization favor sectors that are depend more on external finance. Our first innovation is to introduce the interaction between capital account liberalization and crises. If financial integration is good for more externally dependent industries in tranquil period but not during crisis periods is correct, then γ should be positive and δ negative. This specification and argument run in parallel with those of Kroszner, Laeven and Klingebiel (2007), who introduce an interaction between banking crises and domestic financial development and hypothesize that financial development should be good for more externally dependent industries in tranquil times but it should render them more vulnerable to setbacks in crisis periods.

[6]The model could also include a set of country-industry fixed effects, but the inclusion of these fixed effects generates multicollinearity problems and yields unstable estimates.

[7]The results do not change substantially when we exclude the 2000-2004 period.

Equation (1) yields unbiased estimates of our parameters of interest even if there is a causal link from financial liberalization to crises.[8] Assume, for instance, that $CR_{cd} = \psi LIB_{cd} + u_{cd}$, we can then rewrite Equation (1) as:

$$VAGR_{c,i,d} = cd + id + \alpha SHARE_{c,i,d} + EF_{i,d}(\beta FD_{c,d} + \gamma LIB_{c,d} + \lambda LIB^2_{c,d}) + \varepsilon_{c,i,d} \quad (2)$$

With $\lambda = \delta\psi$, u_{cd} being fully absorbed by the country-decade fixed effects, it is not part of the error term of model (2).[9] But while a potential causal effect running from liberalization to crises is not a source of bias, it has two potential implications for our findings. The first is multi-collinearity: a strong correlation between crises and financial liberalization could lead to unbiased but unstable estimates. The second implication has to do with the interpretation of the parameters of model (1). If it is true that high levels of financial globalization increase the probability of a crisis (i.e., $\psi > 0$) and if we were to find (as we do) that γ is positive and δ negative, then there would be a range of parameters for which growth is maximized at intermediate levels of liberalization (in equation (2) $\gamma > 0$ and $\lambda < 0$). In fact equation (2) shows that, for any industry with a positive value of EF and with $\gamma > 0$ and $\lambda < 0$, growth reaches a maximum when $LIB = \frac{\gamma}{2\lambda}$.[10]

3.3 DATA AND SAMPLE[11]

To calculate the growth of value added, we draw annual observations from UNIDO's Industrial Statistics Data Base 2006. This data base covers manufacturing firms at the three-digit and four-digit International Standard Industrial Classification (ISIC) level. Data from both revisions 2 and 3 were matched to the three and four-digit ISIC codes in revision 2. We matched sector codes in the two revisions using the official correspondence table available in the website of the U.N. statistical division. When the correspondence table did not provide a perfect match we manually matched the various sectors by using our own judgment based on the qualitative description of the ISIC sectors provided by

[8] We would like to thank an anonymous referee for making us think about these issues.

[9] Even if it where, it would not bias our model because u_{cd} is not correlated with the other variables.

[10] While much casual commentary has attributed the East Asian crisis of 1997-1998 to capital account liberalization, several statistical studies find no evidence of a causal link (see for instance Kose et al., 2006). In our data there is a positive but statistically insignificant correlation between capital account liberalization and crises. (Estimating the direction of the causal link between these two variables is beyond the scope of this paper.) If we estimate model (2), we find some evidence of a concave relationship between capital account liberalization and industry growth, but none of the parameters is statistically significant. In particular, if we estimate Equation (2) using the data of Table 4 (to estimate equation 2, we need a continuous measure of capital account liberalization), we find that γ=0.13 and λ=0.025. If $EF > 0$, these point estimates suggest that industry growth reaches a maximum when the index of capital account openness is 2.6 (in our data the index of capital account openness ranges between -1.8 and 2.6 with an average value of 0.7).

[11] Table 3.8 lists all the variables used in the empirical analysis with their sources and definitions.

the two revisions.[12] We calculate the growth of real value added in the periods 1980-1989, 1990-1999, and 2000-2004 for same the three-digit and four-digit ISIC sectors used by Rajan and Zingales.[13]

Rajan and Zingales create their index of external financial dependence (EF) at the ISIC industry-level for a sample of US firms for the 1980-1990 decade. EF is computed as capital expenditures minus cash flow from operations, divided by capital expenditures. Rajan and Zingales compute these variables over a ten-year period to smooth fluctuations. They then use the median value of this industry-specific variable as the measure of EF. We combined the original Rajan and Zingales indices for 1980-1990 with new indices for 1990-2000 and 2000-2004 generated using Worldscope data.[14] The correlation between the 1980-1990 Rajan-Zingales index and that for 1990-2000 is 0.68, while the correlation between the 1980-1990 Rajan-Zingales index and that for 2000-2004 les index computed with Worldscope data is 0.74.[15]

We measure financial development (FD) as private credit scaled by GDP. The numerator and denominator are both obtained from the International Financial Statistics.[16]

To capture capital account openness (LIB) we utilize Lane and Milesi-Ferretti's (2007) measure of external capital stock as a share of GDP. The authors estimate external assets and liabilities for 145 industrial and developing countries using the international-investment-position figures published by national central banks and governments. We set LIB to be equal to one for all countries for which this index is above the cross-country average in a given decade.[17] An alternative is to use the *de jure* measure of capital account liberalization or openness as assessed by the IMF and published in its Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER). Chinn and Ito (2006) have tabulated these data for 182 countries for the period 1970-2006 and created a measure of financial openness. Up until 1996 the measure is based on a set of four proxies for government restrictions on capital mobility viz. (a) openness of the capital account, (b) openness of the current account, (c) the stringency of requirements for the repatriation and/or surrender of export proceeds, and (d) the existence of multiple exchange rates for

[12]Official correspondence table at http://unstats.un.org/unsd/cr/registry/regso.asp?Ci=1&Lg=1

[13]To deflate value added we use consumer price index (CPI) data from the International Financial Statistics (IFS) of the International Monetary Fund.

[14]For the 1980s, we used the original Rajan and Zingales data because Worldscope has limited coverage for this decade. The Worldscope database is managed by Thomson Reuters and includes balance-sheet information in a standardized format. Worldscope covers more than 90 percent of the world's market value and covers more than 60 developed and emerging countries. The main problem with Worldscope that information starts in the mid 1980s. Unfortunately, we cannot, instead use Compustat for the 1990s and 2000s because we do not have access to this database. Note that Kroszner et al. (2007) and Dell'Ariccia et al. (2008) also use Compustat data for the 1980s and Worldscope data for the 1990s.

[15]The correlation between the 1990-2000 index and the 2000-2004 index is 0.96.

[16]Private credit is the default option in most previous research. However, some studies as noted above use alternative measures of financial development, stock market capitalization for example. We consider some of these alternatives in our sensitivity analysis.

[17]We obtain similar results when we use a continuous measure of capital account liberalization (see below). However, the results are easier to interpret with the discrete version of the index.

capital account transactions. These binary variables are set equal to one when restrictions are non-existent, and zero otherwise. Since 1997 the classification in AREAER for proxy (a) has been disaggregated, allowing Chinn-Ito use binary variables for each of the sub-categories as well. For controls on the capital account they use a five-year moving average of the capital controls (for the current year and four previous years). Yet another $KAOPEN$ measure is based on the first principal component of the four categories. This index has a higher value for countries that are more open to cross-border financial transactions. The index is constructed such that the series has a mean of zero. Country values range from 2.603 to -1.767.

For banking crises we use the Honohan and Laeven (2005) data base, which updates Caprio and Klingebiel (1999). This covers systemic and non-systemic banking crisis episodes in the period 1974-2002. For 2003 and 2004, we used publications of the IMF, World Bank, Moody's and Fitch Ratings to identify crisis episodes. A binary measure is used for the annual banking crisis variable (1= banking crisis in a particular year in a country, 0 = no crisis). The resulting variable takes value one if a country suffered a crisis in a given decade.

Currency crisis dates are obtained from the Glick-Hutchison data base.[18] Glick and Hutchison first construct a measure of exchange market pressure as a weighted average of monthly real exchange rate changes and monthly percentage reserve losses. They identify a currency crisis when (i) exchange market pressure is more than two standard deviations than the country-specific mean over the sample period and (ii) the change in pressure is greater than 5 per cent. The currency crisis variable is also entered in binary form (1 if there was a currency crisis in a given decade and 0 otherwise).

In order to ensure sufficient representativeness and that results for a country or industry are not driven by a few influential observations, we dropped countries with fewer than ten industries in any given decade and all the industries with fewer than 5 observations per country-decade.[19] Since industry-level data tend to be noisy, we also dropped some extreme outliers. We first estimated a standard Rajan-Zingales regression (i.e., a model that does not include the interaction between external financial dependence and capital account liberalization). We then recovered the regression's residuals and computed their standard deviation. Last we dropped all the observations which had residuals with an absolute value greater that three standard deviations. After cleaning the data using the steps described above, we were left with a data set that includes 36 industries and up to 49 countries or a total of 3979 observations.[20]

Table 3.1 reports summary statistics for the main variables. Average real industry value added growth in the sample is 1.2 per cent and ranges from -100 per cent to 145 per

[18] 2006 update of database originally constructed in Glick et al. (2006).

[19] For the 2000-2004 period we dropped all industries that had fewer than 3 observations per country.

[20] The dataset is almost balanced across periods, we have 1042 observations for the 1989-1989 decade, 1495 observations for the 1990-1999 decade, and 1442 observations for the 2000-2004 period. By cleaning our data we lose nearly 100 observations (the full sample would have 4060 observations). Our results are robust to using a sample that includes all observations.

cent. The index of external financial dependence has an average value of 0.02 and ranges between -3.2 and 10.8. Financial development has an average value of 58 per cent and ranges between 2 per cent and 190 per cent. About 7 per cent of our observations include a currency crisis, while almost one third of our observations include a banking crisis.[21]

3.4 RESULTS

Table 3.2 reports the baseline results. It pools the three cross sections and winsorizes the dependent variable at 100 per cent. The basic Rajan-Zingales interaction (EF_FD) is always positive over this period but it is rarely significant at standard confidence levels. Other authors extending Rajan and Zingales' results for the 1980s to a longer period and adding additional controls, such as Levchenko et al. (2008), have found similar results.

The next coefficient of interest is that on the EF_LIB interaction (γ in Equation (1)). γ captures whether capital account liberalization stimulates faster growth of value added in industries that rely more on external finance. The coefficients on this interaction are uniformly positive. In four of the six columns of Table 3.2 they are statistically significant at conventional confidence levels. The point estimates imply that in countries with an open capital account a one standard deviation difference in external financial dependence is associated with additional value added growth of slightly more than 1 per cent per annum ($1.56 * 0.679 = 1.06$). Alternatively, in countries with an open capital account, the difference between the industry at the 25th percentile of the distribution of external financial dependence (-0.44) and the industry at the 75 percentile of external financial dependence (0.26) is associated with a growth differential in real value added of approximately 0.5 per cent per annum.

The other parameter of interest (δ) captures the extent to which more externally dependent industries in countries with an open capital account suffer relatively more at times of crisis. In column 1 we let the crisis dummy take on a value one for all types of crises (banking and currency crises alike). δ is negative and statistically significant and of the same order of magnitude as γ. This indicates that the positive effect of capital account liberalization is eliminated in crisis periods ($\gamma + \delta = 0$). That is, while both γ and δ are significantly different from zero, their sum is not significantly different from zero (if we test the null $\gamma + \delta = 0$ we do not reject with a p value of 0.86).[22] More externally dependent industries, it would appear, grow more rapidly with liberalization in normal times but they do not grow more slowly in crisis periods. This is analogous to what Kroszner et al. (2007) find for banking crises and the effects of domestic financial development. On balance, then, there is no evidence that countries experiencing crises

[21]The fact that almost one third of our observations are associated with a banking crisis should not be interpreted as meaning that the countries were in a banking crisis for one-third of the years covered in our sample because the crisis dummy takes value one if a country had at least one crisis year in a given decade.

[22]Note that both the interaction of external financial dependence and capital account liberalization and the further interaction of these variables with a crisis are statistically significant at conventional confidence levels.

are worse off on average as a result of either financial development or capital account liberalization. They just forego the benefits.

In column 2 we consider only currency crises. We still find that γ is positive and statistically significant and that δ is negative and statistically significant. If anything, the crisis effect is now stronger. That is, the total effect on more externally-finance-dependent industries in crisis periods is negative ($\gamma + \delta = -0.15$), although the difference from zero is still not statistically significant.

In columns 3 and 4 we follow an approach similar to that of Dell'Ariccia et al. (2008) and Kroszner et al. (2007) and interact the crisis dummy with the country-level measure of financial development. When we consider all crises (column 3) we find that the main effect of financial development (EF_FD) is positive and statistically significant, the liberalization interaction (EF_LIB) is positive but not statistically significant, and the crisis triple interaction (EF_FD_AC) is negative and statistically significant. This parallels the results of Kroszner et al. But when we focus on banking crises (column 4) as in their study, we find that while all coefficients have the right sign they are no longer significant (individually nor jointly).

In column 5 we include both the interaction between the banking crisis dummy and financial development (EF_FD_BC) and the interaction between currency crisis and capital account liberalization (EF_LIB_CC). The coefficient on the capital account liberalization-currency crisis interaction remains large and statistically significant at the 1 per cent confidence level, while the financial development-banking crisis interaction is only marginally significant. Importantly, the two triple interactions picking up differences between crisis and noncrisis periods are jointly significant (the p value is 0.009).

Some of the benefits of capital account liberalization could conceivably go through the creation of a larger domestic financial sector, as argued by *inter-alia* Vanassche (2004). In the last two columns of Table 3.2 we therefore re-estimate the models of columns 1 and 2 but without the EF_FD interaction. Any induced impact on FD will now be fully captured by the interaction terms in AC. The results are basically identical to those of columns 1 and 2. This confirms that controlling for the level of financial development does not disguise the benefits (or cost) of capital account liberalization.

The bottom line is that domestic financial development and capital account liberalization both benefit the growth of financially dependent sectors in countries that are able to avoid the crisis problem. But when banking and currency crises intervene, those benefits are neutralized. Still, there is no evidence that countries experiencing crises are worse off on balance as a result of financial development and capital account liberalization.

3.5 SENSITIVITY ANALYSIS

In Table 3.3, we estimate the same model as in Table 3.2 but replace de facto capital account liberalization with de jure liberalization. The results go in the same direction as those in Table 3.2, although the estimates are somewhat less precise. In Table 3.4 we

replace our discrete measures of liberalization with a continuous measure based on the Chinn and Ito (2006) *de jure* index of capital account liberalization ($KAOPEN$) and the Lane and Milesi-Ferretti (2007) *de facto* measure of external capital stock as a share of GDP ($KSTOCK$). When we use $KAOPEN$ we fully reproduce our baseline results, but when we use $KSTOCK$ we find that the coefficients are often insignificant and that the crisis-liberalization interaction tends to be positive and insignificant.

Next, we estimate the same model as in Table 3.2 using a robust regression estimator to check whether the results are driven by outliers.[23] Controlling for outliers in fact only strengthens the results.[24] We also check whether our results depend on the Winsorization used in Table 3.2. Including all observations does not affect our result of a positive impact on more financially dependent sectors of external financial liberalization in normal periods that is neutralized in periods of currency crisis. As a further robustness analysis, we augment our model with the interaction between the index of external finance and the percentage change of the real exchange rate (where we measure real appreciation as an increase in the real exchange rate). The rationale for including this term is that industries relying more on external finance may be more export oriented than other industries and thus benefit from a currency depreciation associated with currency crises.[25] Consistent with this hypothesis, we find that the EF_DRER interaction is always positive; however, it is never statistically significant, and adding it to the model does not change the baseline results.

To check whether our results are sensitive to treating crises as discrete events, with the crisis variable taking value one if a country suffered a crisis in a given decade and zero otherwise, we re-estimate the regression of Table 3.2 using a continuous definition of the crisis variables. In this case, the crisis variables range from zero to one and measure the share of years in the relevant sub-period marked by either a banking or currency crisis. The results are again similar to those of Table 3.2, the main exception being that the external finance-financial development-banking crisis triple interaction is never statistically significant.

As a final robustness check, we experimented with alternative measures of financial development. In particular, we substitute credit to the private sector with either bank deposits over GDP or stock market capitalization over GDP and find results which are similar to those of Table 3.2, the exception being that when we use stock market capitalization we lose about 140 observations and find that that the interaction between crisis and financial development is never statistically significant.

[23]This is important insofar as outliers can be particularly problematic with interacted variables. To check for outliers we use the robust regression routine in STATA. This starts by estimating and OLS regression and dropping observations which have a Cook's distance of greater than 1. Next, it re-estimates the model by weighing observations with the inverse of the absolute value of the residuals. The process then continues until the differences in weights before and after the regression converges to zero.

[24]For a full set of results (including those listed below) see the working paper version of the paper (Eichnegreen et al., 2009).

[25]This is a possible interpretation of the effect of real depreciation in the Dell'Ariccia et al. (2008) study (see above).

3.6 WHICH COUNTRIES BENEFIT FROM FINANCIAL LIBERALIZATION?

The Rajan-Zingales (1998) methodology is rarely used to test whether the effect of financial development differs across different classes of countries.[26] In this section, we reproduce the analysis of the previous section but allow the effects of financial development and capital account liberalization to vary across country groupings. We start by interacting all of our variables of interest with a dummy that takes value one for developing countries.[27] We thus estimate the following model:

$$VAGR_{c,i,d} = cd + id + \alpha SHARE_{c,i,d} + EF_{i,d}(\beta FD_{c,d} + \gamma LIB_{c,d} + \delta LIB_{c,d} * CR_{c,d}) + DEV_i * EF_{i,d}(bFD_{c,d} + gLIB_{c,d} + dLIB_{c,d} * CR_{c,d}) + \varepsilon_{c,i,d} \quad (3)$$

β, γ and δ now measure the effect of financial development, capital account liberalization, and crisis in the industrial countries, and $\beta + b$, $\gamma + g$, and $\delta + d$ measure the effect of financial development, capital account liberalization, and crisis in developing countries (b, g, d measure the difference between developing and industrial countries).

Table 3.5 shows that β and b are always positive bur rarely statistically significant. Their sum is marginally significant (with a p value of 0.09) in only one equation (column 3, see the F-test on EF_FD+EF_FD_DEV at the bottom of the table). In contrast, capital account liberalization always has a positive and statistically significantly impact in the industrial countries (this is the γ coefficient), but the coefficient for the developing countries is always negative (albeit not statistically significant), and $\gamma + g$ is never close to being statistically significant (see the EF_LIB+ EF_LIB_DEV F-test at the bottom of Table 3.5). The interaction between crisis and liberalization is negative and statistically significant in the industrial countries but never significant in developing countries. Like Kroszner et al. (2007) and Dell'Ariccia et al. (2008), we find that banking and, in the case of our results, currency crises are particularly costly for more financially dependent industries. However, this result is mostly driven by the developing countries (see columns 3-5). The effect, albeit still negative, is smaller (and, in most cases, not statistically significant) in the industrial countries.

[26] An exception is Prasad et al. (2007) who look at whether the level of financial development affects the way in which capital account liberalization affects the performance of more financially dependent industries.

[27] We use the World Bank's definition of developing country and classify as developing all countries that are not classified as industrial or high income by the World Bank's World Development Indicators.

In Table 3.6 we interact our variables of interest with a dummy variable that takes on a value of one in countries with high levels of financial development. We so classify all country-decades with a value of FD which is above the sample median. β,$\gamma$and δ now measure the effect of financial development, capital account liberalization, and crisis in countries with low levels of financial development, while $\beta + b$, $\gamma + g$, and $\delta + d$ measure the effect of financial development, capital account liberalization, and crisis in countries with high levels of financial development (b, g, d measure the difference between the two groups of countries).

The results suggest that capital account liberalization has no statistically significant effect in countries with low levels of financial development (consistent with the findings of Prasad et al. (2008), but it has a positive effect in countries with high levels of financial development. Consider, for instance, column 1 of Table 3.6 which shows that γ=0.11 (not statistically significant) and $\gamma + g$ =0.77 (and statistically significant, see the I_EF_LIB+I_EF_LIB_HFD F-test in the bottom part of Table 3.6). We also find that the negative effect of crises is statistically significant in countries with high levels of financial development but not in countries with a poorly developed financial sector.

Probing further, we interact our variables of interest with proxies for the strength of macroeconomic policies and institutions. We start by computing the country-by-country mean and standard deviation of inflation and budget deficits for the 1980-1989, 1990-1999, and 2000-2004 periods.[28] We then construct a measure of (poor) macroeconomic policies by extracting the first principal component of these four measures of macroeconomic policies. Next, we consider the distribution of our measure of macroeconomic polices within our sample of developed countries and label as having good macro policies all countries with policies at least as good as those of the country at bottom 25th percentile of this distribution. Finally, we interact the resulting dummy variables using the same procedure as in Table 3.6. The results indicate that the effect of capital account liberalization is negative in countries with poor policies but positive in countries with good policies. However, neither the individual coefficients nor their sums are statistically significant.[29] This may reflect the fact that we define a country as having good policies if it is above a certain percentile in a given decade. If the quality of policies has improved over time, our method would lead us to include too many countries in the good-policy category in earlier periods and too few countries in the good policies category in later periods.[30] If we address this issue by replacing our discrete measure of good policies with the original continuous measure, we still find that the good policy interaction is never statistically significant.[31] Another problem may be that lower deficits (or lower inflation) are not fully

[28]We deal with outliers by capping inflation at 100 per cent and budget deficit at 35 per cent.

[29]See Eichengreen et al (2009) for details. A possible interpretation is that our measure of policies does not capture well the differential effect of capital account liberalization. Another possible reason explanation is that our measure of polices is highly correlated with the crisis variables (thus, in a sense, it captures very well the probability of a crisis) and that our unstable estimates are due to multi-collinearity.

[30]We would like to thank an anonymous referee for pointing us this potential problem.

[31]Results available upon request.

capturing the strength of macroeconomic policies.[32]

Next we focus on accounting standards. Countries are placed in the "good standards" category (GAS) if the quality of their accounting standards is above the sample median.[33] We find that capital account liberalization has a positive and statistically significant effect in countries with good accounting standards but no effect in those with poor standards (Table 3.7).[34] It would appear that countries with good accounting standards can benefit from capital account liberalization even in times of crisis in (column 1 of Table 3.7, the total effect, measured by EF_LIB+_EF_LIB_AC+ EF_LIB_GAS+ EF_LIB+EF_LIB_GAS_AC, is about 0.4 and close to being statistically significant with a p value of 0.16).[35]

We repeat the exercise in Table 3.7, substituting rule of law and creditor rights for accounting standards. The results are similar, capital account liberalization mostly befits countries with high rule of law and strong creditor rights. However, we no longer find that good institutions (measured by rule of law or creditor rights) guarantee benefits from capital account liberalization in crisis periods.[36]

3.7 CONCLUSION

In this paper we have synthesized previous studies examining the effects of capital account liberalization on industry growth, controlling for financial crises, domestic financial development and institutional strength. While a large number of robustness checks inevitably produce a large number of somewhat different point estimates, the result is, nonetheless, a coherent picture. Our findings suggest that while capital account openness has positive effects on the growth of financially-dependent industries, those effects are neutralized by crises; that is, the growth of financially-dependent sectors is no faster in financially open than financially closed economies in decades punctuated by crises. But neither is their growth slower in crisis periods. This suggests that on average countries that have succeeded in avoiding crises have benefited from capital account liberalization while countries that have not so succeeded have neither benefited nor suffered.

Disaggregating country subgroups shows that these results are driven mainly by the high-income countries. Among low-income developing countries, there is neither further

[32]Ideally, we would like to have a measure of the cyclicality of macroeconomic policies, but building such a measure is far from being trivial (see Jaimovich and Panizza, 2007) and it goes well beyond the scope of this paper.

[33]We obtain data on accounting standard from Rajan and Zingales (1998). Since they only report data for the mid 1980s and mid 1990s, we use the 1990s data to measure accounting standard in the 2000-2004 period. We do not think that this is a serious issue because accounting standard do not vary much over time.

[34]Both the total effect (measured by EF_LIB+EF_LIB_GAS) and the difference between good and bad account standards (measured by EF_LIB_GAS) are statistically significant.

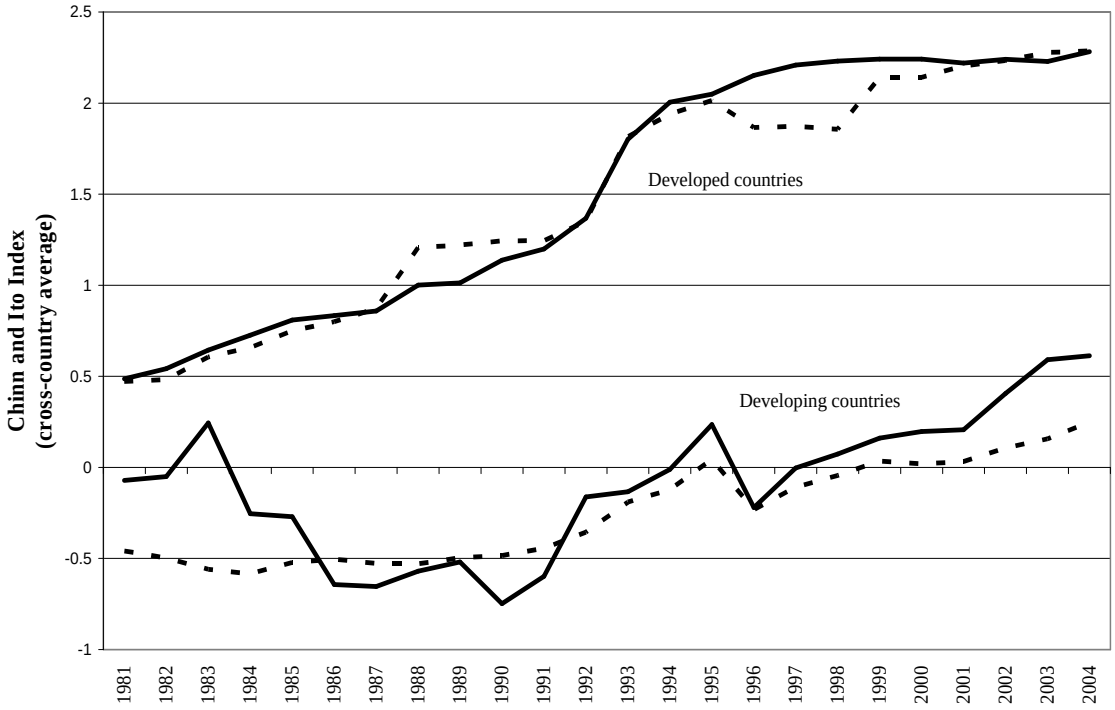
[35]This result, however, only holds for the regression of column 1 and it is not robust to the specifications of columns 2-7.

[36]Again see Eichengreen et al. (2009) for details.

impetus to growth from financial openness in normal times nor its opposite in times of crisis. Probing deeper, we find that the positive effects of capital account openness are limited to countries with relatively well developed financial systems, good accounting standards, strong creditor rights and rule of law – and its disappearance in crisis periods is similarly limited to the high-income world. This result is consistent with other recent work (e.g. Klein 2005, Prasad et al. 2007) suggesting the existence of threshold effects – that countries must reach a certain threshold in terms of economic and institutional development before they can expect to benefit from capital account liberalization. This explains why many earlier studies failed to find a consistent effect – namely, they failed to probe for threshold effects. And it is a reminder of the importance of carefully sequencing capital account liberalization with other policies associated with this larger process of economic and institutional development.[37]

[37]We would like to thank Raghuram Rajan for sharing his data on external financial dependence and the editor, an anonymous referee, Luc Laeven, Andy Powell and seminar participants at the Bank of England and LACEA in Buenos Aires for helpful comments and suggestions.

Figure 3.1: **The Evolution of Capital Account Liberalization**



The solid lines are cross-country averages for the countries used in the empirical analysis of this paper. The dotted lines are cross-country averages for all the countries included in the Chinn and Ito (2006) dataset.

Table 3.1: **Summary Statistics**

Variable	N. Obs	Mean	Std. Dev.	Min	Max
Variables that vary at the country-industry-decade level					
GRVA	3979	1.2%	19.7%	-100.0%	145.4%
SHARE	3979	3.08%	4.36%	-0.01%	75.39%
Variables that vary at the industry-decade level					
EF	108	0.02	1.56	-3.18	10.80
Variables that vary at the country- decade level					
FD	131	0.58	0.43	0.02	1.93
Crisis (Currency)	131	0.07	0.25	0	1
Crisis (Bank)	131	0.29	0.46	0	1
LIB de facto	131	0.49	0.50	0	1
LIB de jure	131	0.48	0.50	0	1

Table 3.2: **All countries, decade panel, Winsorized at 100%, FINLIB is KSTOCK**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COEFFICIENT	GRVA	GRVA	GRVA	GRVA	GRVA	GRVA	GRVA
SHARE	-9.49**	-9.49**	-9.36**	-9.37**	-9.47**	-9.47**	-9.46**
	(3.836)	(3.842)	(3.828)	(3.828)	(3.838)	(3.84)	(3.84)
EF_FD	0.0820	0.0917	0.452*	0.260	0.222		
	(0.195)	(0.198)	(0.244)	(0.227)	(0.221)		
EF_LIB	0.679**	0.598**	0.277	0.275	0.567**	0.717***	0.636***
	(0.275)	(0.235)	(0.188)	(0.191)	(0.227)	(0.26)	(0.22)
EF_LIB_AC	-0.64**					-0.652**	
	(0.282)					(0.28)	
EF_LIB_CC		-0.75***			-0.76***		-0.763***
		(0.276)			(0.268)		(0.28)
EF_FD_AC			-0.60***				
			(0.217)				
EF_FD_BC				-0.311	-0.316*		
				(0.206)	(0.187)		
Constant	-1.167	-1.170	-1.203	-1.496	-0.969	-2.202*	-2.209*
	(1.530)	(1.541)	(1.518)	(1.517)	(1.538)	(1.29)	(1.29)
Observations	3979	3979	3979	3979	3979	3979	3979
R-squared	0.813	0.813	0.813	0.813	0.813	0.81	0.81

*This table estimates a model in which the dependent variable is value added growth (GRVA) for industry i, country c, decade d. The controls include country-decade fixed effects and industry-decade fixed effects (the coefficients are not reported). SHARE is the initially share of value added; EF_FD is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial development in country c decade d, EF_LIB is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial openness (proxied by the Lane and Milesi-Ferretti, 2007, measure of external capital stock) in country c decade d, EF_LIB_AC is the interaction among the Rajan-Zingales index of external financial dependence, financial openness and a dummy variable that takes value one if a country suffered either banking or currency crisis in the decade (EF_LIB_BC is similar to EF_LIB_AC but with the dummy variable taking value one if a country suffered a banking crisis in the decade), EF_FD_AC and EF_FD_BC are triple interactions between the index of external financial dependence, financial development, and crisis dummies. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Table 3.3: **All countries, decade panel, Winsorized at 100%, FINLIB is KAOPEN**

	(1)	(2)	(3)	(4)	(5)
COEFFICIENT	GRVA	GRVA	GRVA	GRVA	GRVA
SHARE	-9.399**	-9.408**	-9.287**	-9.293**	-9.388**
	(3.833)	(3.838)	(3.824)	(3.824)	(3.835)
EF_FD	0.217	0.170	0.519**	0.337	0.293
	(0.208)	(0.206)	(0.255)	(0.242)	(0.235)
EF_LIB	0.412	0.409*	0.132	0.109	0.364
	(0.251)	(0.238)	(0.199)	(0.206)	(0.234)
EF_LIB_AC	-0.533*				
	(0.276)				
EF_LIB_CC		-0.595**			-0.565**
		(0.258)			(0.250)
EF_FD_AC			-0.615***		
			(0.225)		
EF_FD_BC				-0.334	-0.290
				(0.214)	(0.200)
Constant	-1.178	-1.143	-1.097	-1.370	-0.979
	(1.522)	(1.524)	(1.520)	(1.517)	(1.521)
Observations	3979	3979	3979	3979	3979
R-squared	0.813	0.813	0.813	0.813	0.813

*This table estimates a model in which the dependent variable is value added growth (GRVA) for industry i, country c, decade d. The controls include country-decade fixed effects and industry-decade fixed effects (the coefficients are not reported). SHARE is the initially share of value added; EF_FD is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial development in country c decade d, EF_LIB is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial openness (proxied by the Chinn-Ito, 2006 measure of de jure openness) in country c decade d, EF_LIB_AC is the interaction among the Rajan-Zingales index of external financial dependence, financial openness and a dummy variable that takes value one if a country suffered either banking or currency crisis in the decade (EF_LIB_BC is similar to EF_LIB_AC but with the dummy variable taking value one if a country suffered a banking crisis in the decade), EF_FD_AC and EF_FD_BC are triple interactions between the index of external financial dependence, financial development, and crisis dummies. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Table 3.4: **All countries, decade panel, Winsorized at 100%, FINLIB is the continuous measure of capital account liberalization**

	(1)	(2)	(3)	(4)	(5)	(6)
	De jure index (KAOPEN)			De facto index (KSTOCK)		
VARIABLES	GRVA	GRVA	GRVA	GRVA	GRVA	GRVA
SHARE	-9.489**	-9.472**	-9.389**	-8.648**	-8.645**	-8.635**
	(3.883)	(3.887)	(3.876)	(4.20)	(4.20)	(4.20)
EF_FD	0.114	0.0876	0.372	0.203	0.201	0.500**
	(0.198)	(0.193)	(0.237)	(0.19)	(0.19)	(0.23)
I_EF_LIB	0.170**	0.172**	0.0838	0.489	0.464	0.509**
	(0.0834)	(0.0749)	(0.0646)	(0.31)	(0.30)	(0.21)
I_EF_LIB_AC	-0.176*			0.0844		
	(0.103)			(0.49)		
I_EF_LIB_CC		-0.237**			0.168	
		(0.0965)			(0.51)	
EF_FD_AC			-0.552**			-0.570***
			(0.221)			(0.22)
Constant	-3.130**	-3.067**	-2.873**	-2.900**	-2.882**	-2.795**
	(1.375)	(1.378)	(1.387)	(1.36)	(1.36)	(1.33)
Observations	3852	3852	3852	3742	3742	3742
R-squared	0.815	0.815	0.815	0.81	0.81	0.81

*This table estimates a model in which the dependent variable is value added growth (GRVA) for industry i, country c, decade d. The controls include country-decade fixed effects and industry-decade fixed effects (the coefficients are not reported). SHARE is the initially share of value added; EF_FD is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial development in country c decade d, EF_LIB is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial openness (proxied by FINLIB to be equal to one for all countries for which this index is above the cross-country average in a given decade) in country c decade d, EF_LIB_AC is the interaction among the Rajan-Zingales index of external financial dependence, financial openness and a dummy variable that takes value one if a country suffered either banking or currency crisis in the decade, EF_FD_AC is a triple interaction between the index of external financial dependence, financial development, and crisis dummies. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Table 3.5: **All countries, decade panel, developing versus industrial countries, Winsorized at 100%, FINLIB is KSTOCK**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COEFFICIENT	GRVA	GRVA	GRVA	GRVA	GRVA	GRVA	GRVA
SHARE	-9.523**	-9.558**	-9.399**	-9.395**	-9.517**	-9.505**	-9.537**
	(3.84)	(3.84)	(3.83)	(3.83)	(3.83)	(3.84)	(3.84)
EF_FD	0.0114	-0.0479	0.251	0.0796	0.0281		
	(0.20)	(0.20)	(0.24)	(0.24)	(0.23)		
EF_LIB	0.793***	0.848***	0.579**	0.521**	0.921***	0.760***	0.750***
	(0.30)	(0.28)	(0.26)	(0.27)	(0.28)	(0.25)	(0.21)
EF_LIB_AC	-0.648**					-0.648**	
	(0.28)					(0.28)	
EF_FD_DEV	0.108	0.191	1.075*	0.753	0.901		
	(0.45)	(0.47)	(0.64)	(0.62)	(0.59)		
EF_LIB_DEV	-0.319	-0.547	-0.494	-0.376	-0.674	-0.269	-0.439
	(0.86)	(0.51)	(0.35)	(0.35)	(0.45)	(0.87)	(0.51)
EF_LIB_AC_DEV	0.161					0.140	
	(0.90)					(0.92)	
EF_LIB_CC		-0.890***			-0.983***		-0.884***
		(0.29)			(0.30)		(0.30)
EF_LIB_CC_DEV		0.436			0.684		0.431
		(0.62)			(0.54)		(0.63)
EF_FD_AC			-0.514**				
			(0.22)				
EF_FD_BC				-0.141	-0.145		
				(0.21)	(0.19)		
EF_FD_BC_DEV				-0.876	-1.027*		
				(0.58)	(0.55)		
EF_FD_AC_DEV			-0.926				
			(0.60)				
Constant	-3.661***	-3.527***	-3.723***	-3.953***	-3.251**	-2.213*	-2.196*
	(1.29)	(1.32)	(1.26)	(1.25)	(1.29)	(1.29)	(1.29)
Observations	3979	3979	3979	3979	3979	3979	3979
R-squared	0.81	0.81	0.81	0.81	0.81	0.81	0.81
EF_FD+EF_FD_DEV=0	0.06	0.08	4.04	1.64	2.22		
Prob>F	0.80	0.78	0.09	0.20	0.54		
EF_LIB+EF_LIB_DEV=0	0.32	0.40	0.05	0.24	0.38	0.33	0.40
Prob>F	0.57	0.42	0.76	0.62	0.52	0.57	0.43
EF_LIB_CR+EF_LIB_CR_DEV=0	0.32	0.64				0.32	0.63
Prob>F	0.57	0.53				0.57	0.53
EF_FD_CR+EF_FD_CR_DEV=0			6.06	3.20	4.71		
Prob>F			0.01	0.07	0.14		

*This table estimates a model in which the dependent variable is value added growth (GRVA) for industry i, country c, decade d. The controls include country-decade fixed effects and industry-decade fixed effects (the coefficients are not reported). SHARE is the initially share of value added; EF_FD is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial development in country c decade d, EF_LIB is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial openness (proxied by the Lane and Milesi-Ferretti, 2007, measure of external capital stock) in country c decade d, EF_LIB_AC is the interaction among the Rajan-Zingales index of external financial dependence, financial openness and a dummy variable that takes value one if a country suffered either banking or currency crisis in the decade (EF_LIB_BC is similar to EF_LIB_AC but with the dummy variable taking value one if a country suffered a banking crisis in the decade), EF_FD_AC and EF_FD_BC are triple interactions between the index of external financial dependence, financial development, and crisis dummies. EF_LIB_AC_DEV is the interaction between the index of external dependence, financial openness and two dummy variables- the first dummy is one if any financial crises has occurred in country I during that decade and the other dummy is one for developing countries. It is a quadruple interaction. The other quadruple interactions can be defined accordingly. The last few rows show the results of F-tests for the variable coefficients specified in the first column. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Table 3.6: **All countries, decade panel, high versus low financial development, Winsorized at 100%, FINLIB is KSTOCK**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COEFFICIENT	GRVA	GRVA	GRVA	GRVA	GRVA	GRVA	GRVA
SHARE	-9.485**	-9.525**	-9.348**	-9.372**	-9.523**	-9.484**	-9.538**
	(3.84)	(3.84)	(3.83)	(3.83)	(3.83)	(3.84)	(3.84)
EF_FD	-0.164	-0.297	0.726	0.303	0.225		
	(0.97)	(0.98)	(1.19)	(1.02)	(1.00)		
EF_LIB	0.113	0.216	0.225	0.250	0.229	0.0893	0.203
	(0.62)	(0.41)	(0.31)	(0.32)	(0.40)	(0.59)	(0.39)
EF_LIB_AC	-0.161					0.160	
	(0.66)					(0.65)	
EF_FD_HFD	0.195	0.267	-0.308	-0.0734	-0.133		
	(0.88)	(0.88)	(1.10)	(0.92)	(0.91)		
EF_LIB_ HFD	0.667	0.517	0.0833	0.0391	0.476	0.738	0.552
	(0.68)	(0.49)	(0.39)	(0.40)	(0.47)	(0.62)	(0.41)
EF_LIB_AC_ HFD	-0.984					-0.985	
	(0.69)					(0.69)	
EF_LIB_CC		-0.0168			-0.0442		-0.0242
		(0.50)			(0.49)		(0.50)
EF_LIB_CC_ HFD		-0.956*			-0.945*		-0.943*
		(0.54)			(0.52)		(0.54)
EF_FD_AC			-1.121				
			(1.08)				
EF_FD_BC				-0.595	-1.022		
				(1.04)	(1.03)		
EF_FD_BC_ HFD				0.296	0.760		
				(1.04)	(1.04)		
EF_FD_AC_ HFD			0.527				
			(1.08)				
Constant	-3.562***	-3.400**	-3.555***	-3.915***	-3.165**	-2.225*	-2.228*
	(1.29)	(1.33)	(1.27)	(1.27)	(1.32)	(1.29)	(1.30)
Observations	3979	3979	3979	3979	3979	3979	3979
R-squared	0.81	0.81	0.81	0.81	0.81	0.81	0.81
EF_FD+EF_FD_ HFD =0	0.02	0.02	2.36	0.75	0.14		
Prob>F	0.89	0.83	0.13	0.39	0.71		
EF_LIB+EF_LIB_ HFD V=0	7.16	7.37	1.81	1.53	7.33	9.87	10.84
Prob>F	0.00	0.00	0.18	0.22	0.00	0.00	0.00
EF_LIB_CR+EF_LIB_CR_HFD=0	7.78	10.4			11.2	7.68	10.37
Prob>F	0.00	0.00			0.00	0.00	0.00
EF_FD_CR+EF_FD_CR_HFD=0			7.48	2.047	2.01		
Prob>F			0.00	0.153	0.16		

*This table estimates a model in which the dependent variable is value added growth (GRVA) for industry i, country c, decade d. The controls include country-decade fixed effects and industry-decade fixed effects (the coefficients are not reported). SHARE is the initially share of value added; EF_FD is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial development in country c decade d, EF_LIB is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial openness (proxied by the Lane and Milesi-Ferretti, 2007, measure of external capital stock) in country c decade d, EF_LIB_AC is the interaction among the Rajan-Zingales index of external financial dependence, financial openness and a dummy variable that takes value one if a country suffered either banking or currency crisis in the decade (EF_LIB_BC is similar to EF_LIB_AC but with the dummy variable taking value one if a country suffered a banking crisis in the decade), EF_FD_AC and EF_FD_BC are triple interactions between the index of external financial dependence, financial development, and crisis dummies. EF_LIB_AC_HFD is the interaction between the index of external dependence, financial openness and two dummy variables- the first dummy is one if any financial crises has occurred in country I during that decade and the other dummy is one for countries with above-median level of financial development. It is a quadruple interaction. The other quadruple interactions can be defined accordingly. The last few rows show the results of F-tests for the variable coefficients specified in the first column. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Table 3.7: **All countries, decade panel, Good versus bad accounting standards, Winsorized at 100%, FINLIB is KSTOCK**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
COEFFICIENT	GRVA	GRVA	GRVA	GRVA	GRVA	GRVA	GRVA
SHARE	-15.17*	-15.32**	-15.27**	-14.84*	-15.67**	-15.34**	-15.49**
	(7.739)	(7.743)	(7.743)	(7.764)	(7.740)	(7.748)	(7.752)
EF_FD	-0.0858	-0.0428	0.0780	-0.111	-0.0198		
	(0.252)	(0.254)	(0.263)	(0.261)	(0.257)		
EF_LIB	0.284	0.326	0.0346	-0.0904	0.424	0.391	0.506
	(0.341)	(0.317)	(0.280)	(0.270)	(0.313)	(0.342)	(0.334)
EF_LIB_AC	-0.400					-0.408	
	(0.323)					(0.310)	
EF_FD_GAS	-0.220	-0.361	0.857	-0.139	0.261		
	(0.316)	(0.292)	(0.699)	(0.471)	(0.496)		
EF_LIB_GAS	0.858*	0.863**	0.414	0.712*	0.600	0.747**	0.535*
	(0.439)	(0.380)	(0.385)	(0.372)	(0.393)	(0.324)	(0.293)
EF_LIB_AC_GAS	-0.349					-0.508	
	(0.477)					(0.408)	
EF_LIB_CC		-0.764*			-0.918**		-0.836*
		(0.425)			(0.429)		(0.437)
EF_LIB_CC_GAS		-0.0408			-0.0609		-0.0481
		(0.456)			(0.449)		(0.468)
EF_FD_AC			-0.127				
			(0.291)				
EF_FD_AC_GAS			-1.137**				
			(0.579)				
EF_FD_BC				0.396	0.326		
				(0.300)	(0.305)		
EF_FD_BC_GAS				-0.630	-0.917**		
				(0.442)	(0.464)		
Constant	0.709	1.165	1.887	1.353	1.427	0.0292	1.040
	(1.886)	(1.527)	(2.165)	(1.858)	(2.245)	(1.773)	(1.853)
Observations	2020	2020	2020	2020	2020	2020	2020
R-squared	0.705	0.705	0.705	0.704	0.705	0.704	0.704
EF_FD+EF_FD_GAS=0	1.49	3.66	1.82	0.40	0.25		
Prob>F	0.22	0.06	0.18	0.53	0.62		
EF_LIB+EF_LIB_GAS=0	7.50	9.07	1.59	2.92	7.10	9.45	8.83
Prob>F	0.00	0.00	0.21	0.09	0.00	0.00	0.00
EF_LIB_CR+EF_LIB_CR_GAS=0	3.85	5.45			7.52	8.28	6.36
Prob>F	0.05	0.02			0.01	0.00	0.00
EF_FD_CR+EF_FD_CR_GAS=0			5.13	0.47	2.58		
Prob>F			0.02	0.53	0.11		

*This table estimates a model in which the dependent variable is value added growth (GRVA) for industry i, country c, decade d. The controls include country-decade fixed effects and industry-decade fixed effects (the coefficients are not reported). SHARE is the initially share of value added; EF_FD is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial development in country c decade d, EF_LIB is the interaction between the Rajan-Zingales index of external financial dependence in industry i, decade d and financial openness (proxied by the Lane and Milesi-Ferretti, 2007, measure of external capital stock) in country c decade d, EF_LIB_AC is the interaction among the Rajan-Zingales index of external financial dependence, financial openness and a dummy variable that takes value one if a country suffered either banking or currency crisis in the decade (EF_LIB_BC is similar to EF_LIB_AC but with the dummy variable taking value one if a country suffered a banking crisis in the decade), EF_FD_AC and EF_FD_BC are triple interactions between the index of external financial dependence, financial development, and crisis dummies. . EF_LIB_AC_GAS is the interaction between the index of external dependence, financial openness and two dummy variables- the first dummy is one if any financial crises has occurred in country I during that decade and the other dummy is one for countries with good accounting standards. It is a quadruple interaction. The other quadruple interactions can be defined accordingly. The last few rows show the results of F-tests for the variable coefficients specified in the first column. Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1*

Table 3.8: **Variables sources and definitions**

Variable	Description	Source
GRVA	Real value added growth in industry i, country, c, decade d. Real value added is computed by deflating value added data by the CPI index	UNIDO Industrial Statistics Database, 2006 (INDSTAT 2006); Revisions 2 and 3 CPI data from International Finance Statistics, IMF
INITSHARE or SHARE	Share of sector's value added in total manufacturing value-added of the country in the start year of sample	INDSTAT 2007
EFD	External Finance Dependence	Rajan-Zingales (1998); Worldscope Database
FD	Financial Development measured as ratio of private credit to GDP	International Finance Statistics, IMF
LIB *de facto*	Capital Account Openness measured by External capital stock as a proportion of GDP (KSTOCK)	Lane and Miles-Feretti database
LIB *de jure*	Capital Account Openness (KOPEN)	Chinn-Ito Database
CC	Currency Crisis dummy	Glick-Hutchison database
BC	Banking Crisis dummy	Laeven-Honohan database
AC	All Crisis dummy	From currency and banking crises databases
CR	Dummy for crisis in decade d	From the currency and banking crises databases
DEV	Developing country dummy. All countries that are not classified as high-income or industrialized in the WDI database.	World Bank, World Development Indicators (WDI)
HFD	High financial development dummy. Countries with level of financial development higher than the median level	FD data from IFS (see row above)
GAS	Countries with level of accounting standards higher than the median level. Data on accounting standard from Rajan and Zingales (1998). Since they only report data for the mid 1980s and mid 1990s, we use the 1990s data to measure accounting standard in the 2000-2004 period.	Rajan and Zingales (1998)
HRL	High rule of law dummy.	La Porta et al. (1998)
GCR	Good creditor rights dummy.	La Porta et al. (1998)

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