# Fire Sale FDI[1]

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# Fire Sale FDI

**Abstract**

Some financial crises are characterized by the simultaneous outflow of foreign portfolio investment and an inflow of foreign direct investment (FDI) in which foreign investors take controlling stakes in distressed firms. We explore an agency-theoretic framework for this phenomenon. Transfer of control that overcomes agency problems are made possible during crises, but, at the same time, efficient owners (e.g. other domestic firms) face financing constraints. The result is a transfer of ownership to foreign firms, including inefficient ones, at fire sale prices. These stakes are subsequently re-sold, or "flipped" back to local investors once the crisis abates. The theory finds strong empirical support during the Asian crisis.

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## 1 Introduction

Some financial crises are marked by the contrast between massive capital *outflows* of portfolio investments, but the simultaneous *inflows* in the form of foreign direct investment (FDI). Thus, even as foreign investors flee as the crisis unfolds, there is an accompanying surge in direct inward investment where foreign investors take stakes in the firms in the crisis-stricken country. Whereas the reversal of foreign portfolio inflows would suggest a lack of confidence in the economy of the crisis-stricken country, the fact that FDI flows surge strongly suggests a qualitative difference between portfolio flows and FDI flows.

The Asian financial crisis of 1997-9 is perhaps the best studied instance of such an episode. The bare facts for the Asian crisis countries are laid out in Table 1, which reports the correlation between FDI and foreign portfolio investment (FPI) (also the debt component of FPI) over the period 1980-2005, split into two sub-samples - the period 1996-2000 that straddle the crisis years, versus the rest (1980-1995 and 2001-2005). The pattern is striking. Except for Indonesia, the correlation changes sign across the two sub-periods. Correlation is negative

for 1996-2000, but positive for the remainder.[1] The time series for South Korea (Figure 1a) shows the contrasting pattern, and the scatter chart highlights the reversal in correlation (Figure 1b). The message is clear. The crisis and the non-crisis years behave as though there is a regime shift in the relationship between FDI and FPI.

In a contemporaneous comment on the unfolding events, Krugman (1998) pointed to the distressed nature of many of the acquisitions made by foreign FDI investors in Asia across a broad range of sectors ranging from automobiles to household products, and suggested that fire sales by distressed firms had made the prices attractive to less financially constrained foreign buyers. The fire sale hypothesis was examined in detail by Aguiar and Gopinath (2005), which remains the relevant benchmark empirical study of the fire sale hypothesis. Using firm level data, they documented how the offer price relative to book value varies across firms according to measures of financial distress, especially in the immediate aftermath of the crisis in 1998.

In Aguiar and Gopinath (2005), foreign ownership is seen as resolving many agency issues that are not addressed by portfolio investment, and they see it as being doubly beneficial since foreign owners may have superior technology and expertise. However, in normal times, foreigners face barriers to entry and high acquisition costs that make transfer of control expensive. The crisis is one way for such inefficient barriers to be overcome. In the same spirit, discussion of the role of private equity, which by and large plays an important role in such acquisitions, often focuses on the beneficial effects of control by private equity investors, such as strengthening management practices, improvements in incentives and control systems and the streamlining of operations in the acquired firm (Stromberg (2008)). Having increased the "organizational capital" of the firm in this way, the acquirer can exit the investment by selling a more valuable firm.

Against this benign views, the recent global financial crisis has also revealed a less flattering perspective on the role of private equity, as having achieved its returns not through fundamental improvements in the firm's operations, but simply through greater leverage during periods of lax credit (Axelson, Stromberg and Weisbach (2009)), or at least more through greater leverage than fundamental improvement in lax times (Acharya, Gottschalg, Hahn and Kehoe, 2008).[2]

[1] In spite of the fact that we have a limited time-series (there are only five annual data points for the crisis period), several of the correlation coefficients are statistically different (at at least 10% level of confidence) between the non-crisis and crisis years. This is the case for FDI and FPI correlation for Thailand, Philippines and Korea (for the last two, this is also the case for FDI and FPI Debt correlation). Individually, the non-crisis period's FDI and FPI correlation is significantly *positive* at 1% level for all countries except Malaysia, and the same holds for FDI and FPI Debt correlation except for Thailand and Malaysia; in contrast, the crisis period's FDI and FPI Debt correlation is significantly *negative* at 5% level for all countries except Thailand and Indonesia.

[2] While foreign investors may bring in superior technology, superior capital financing, or both, the liter-

The debate becomes even more heated when foreign investors are involved. The popular accusation is that the foreign acquirer is an opportunistic player who cynically exploits the widespread financial distress by picking up valuable corporate assets on the cheap, only to turn around and re-sell the asset to local buyers for a large profit before departing. The Koreans have even coined the unflattering term *mok-twi* (loosely, "eat and flee") to describe such activity by foreign investors after the 1997 crisis. According to this less sympathetic view of inward investment during crises, the FDI surge has to do with exploitation of financial distress of local firms, not the greater productive skills of the buyers.

Our paper is an attempt to shed light on this important debate, both theoretically and empirically. Empirically, we investigate just how many of the new owners do, indeed, sell and exit relative to the cyclical benchmark given by the level of re-selling by domestic investors. We find that, consistent with the less benign view of inward investment, the foreign investors are much more likely to re-sell, or "flip" their investment after their initial acquisition. Specifically, of the firms in our sample acquired during the crisis period of July 1997 to December 1999, foreign investors are almost twice as likely to flip their investment relative to their domestic counterparts within a five year window. There is no such discrepancy between foreign and domestic investors in the acquisitions made in the pre-crisis control period. Interestingly, the discrepancy in the "flipping rate" between domestic and foreign investors can be attributed to the subdued nature of the resale activity by *domestic* investors for the assets acquired during the crisis.

Our empirical results will be described in detail in the body of the paper, but we give a foretaste here of the results to come. Figure 2 charts the re-sale, or "flip" in the 2.5 years following the crisis period of July 1997-Dec 1999 in the countries hit by the Asian crisis. Defining FDI as the purchase of at least 10% of the target, Figure 2 plots the cumulative percentage of flipped deals in each class as a function of the number of years since the acquisition in the crisis period. The apparently higher flipping rates by foreign investors are confirmed in the statistical exercise.

Our contribution is to construct a framework that accommodates this revisionist view of foreign inward investment. We present a theoretical framework in which domestic firms face a sequence of investment opportunities. A moral hazard friction means that firms must self-finance a part of the investment. If a firm is short of cash, it may not have enough financing to fund the next investment opportunity and is put up for sale. Other domestic

ature on the effect of foreign investments on development and growth of the domestic economic has mixed results. Aitken and Harrison (1999) show that only small domestic enterprises realize productivity gains from acquisistions by foreigner investors and foreign investment negatively affects the productivity of other domestic firms. Furthermore, various studies show that foreign investments only generate economic growth in certain environments where the domestic country has a highly educated workforce (Borensztein et al., 1998), a sufficiently developed financial markets (Alfaro et al., 2004), to cite a few.

firms are the natural owners of the distressed assets, but if they are short of cash also, then foreigners must enter. Crucially, the foreign investors are less efficient than domestic firms, and are not the natural holders of the assets.[3] They re-sell at the first opportunity, back to domestic firms. Our paper builds on Acharya and Yorulmazer (2008) modified to highlight the interplay between FDI (control) and FPI (ownership of cashflow).

The remainder of the paper is structured as follows. Sections 2 and 3 present the theoretical model and its analysis. Section 4 presents extensions of the benchmark model. In Section 5, we present in detail existing and new evidence supporting the three key implications of our model. Section 6 concludes.[4]

# 2 Model

The timeline of our benchmark model is outlined in Figure 4. We have an economy with three dates, indexed by $t \in \{0, 1, 2\}$. We have a domestic economy with a measure 1 of ex-ante identical firms. Firms are risk-neutral and maximize the sum of expected profits over time. Firms have a unit of endowment at date $t = 0$ and nothing else at other dates.

Each firm has two consecutive investment opportunities, one at date $t = 0$ and the other at date $t = 1$. Each date $t$ project requires one unit of input at date $t$ and yields a random outcome at date $t + 1$. Provided that a firm exerts effort, the random return $\tilde{R}_t$ on its date $t$ project is $R_t$ with probability $\alpha_t$, and 0 with probability $1 - \alpha_t$, where $R_t > 1$ is a constant. The returns across firms are independent, so that by law of large numbers, exactly a proportion $\alpha_t$ of the firms have return $R_t$, and a proportion $1 - \alpha_t$ have the low return 0.

There is potential for moral hazard at the individual firm level. We assume that at date 0, the entire share of the firm profits belongs to the firm owners, and therefore, moral hazard is not a concern at the beginning. This may not be the case however at date 1 when the firm may require to raise external financing. We assume that if the firm does not exert effort, then when the return is high, it cannot generate $R_1$ but only $R_1 - \bar{\Delta}$ and its owners enjoy a non-pecuniary benefit of $B \in (0, \bar{\Delta})$. For the firm owners to exert effort, appropriate incentives have to be provided by giving them a minimum share of the future profits. We denote this share as $\theta$ and get the incentive compatibility constraint as:

$$\alpha_1 \theta R_1 \geqslant \alpha_1 \left(\theta(R_1 - \bar{\Delta}) + B\right). \tag{IC}$$

Hence, firm owners need a minimum share of $\bar{\theta} = B/\bar{\Delta}$ to exert effort.[5]

[3] Please see Section 3.3 for the analysis of the case with differential efficiency among foreign investors, where some foreign investors are more efficient than the domestic firms, whereas the others are less efficient as in the benchmark case.

[4] Proofs not contained in the text are contained in an online appendix.

[5] Alternatively, we could have assumed that when the firm does not exert effort, the value of the high

Therefore, the firm can pledge at most a fraction $\tau = 1 - \bar{\theta}$ of its future income if it is required to exert effort. Note that, once the firm is left with a share that is less than $\bar{\theta}$, it can pledge the entire future return of $\alpha_1(R_1 - \bar{\Delta})$, if needed to raise maximal amount of external finance. For $\bar{\Delta} > \sqrt{BR_1}$, this is less than $\alpha_1(1-\bar{\theta})R_1$, the amount that can be pledged when the firm exerts effort. Throughout, we assume that $\bar{\Delta} > \sqrt{BR_1}$. Hence, the net present value for a domestic firm from the risky investment when it exerts effort is $\bar{p} = \alpha_1 R_1 - 1$.

In addition to domestic firms, there is a group of risk-neutral foreign investors who have total funds of $w$ that can be used to purchase or finance domestic firms. For now (to be relaxed later) we make two assumptions. First, we assume that $w$ is unlimited so that foreign investors have sufficient funds to acquire and finance all domestic firms. Second, foreign investors are not able to realize the full value from domestic assets, perhaps due to limited expertise in domestic markets. It is also a simple way of introducing barriers to entry into the domestic market. To capture this formally, we assume that foreigners cannot generate $R_1$ but only $R_1 - \Delta$, for some constant $\Delta > 0$. We assume $\alpha_1 (R - \Delta) \geqslant 1$.

The notion that foreigners may not be able to run domestic assets as efficiently as the domestic firms is akin to the notion of *asset-specificity*, introduced by Williamson (1988) and Shleifer and Vishny (1992), which examines the implications of assets that cannot be readily redeployed by firms outside of the industry (or country), are likely to experience lower liquidation values because they may suffer from "fire-sale" discounts, especially when firms within an industry get simultaneously into financial or economic distress. There is strong empirical support for this idea in the corporate-finance literature, as shown, for example, by Pulvino (1998) for the airline industry, and by Acharya, Bharath, and Srinivasan (2007) for the entire universe of defaulted firms in the US over the period 1981 to 1999 (see also Berger, Ofek, and Swary (1996) and Stromberg (2000)).

If the return from the first-period investment is high, then the firm operates one more period and makes the second-period investment using some of its proceeds from the first investment. If the return is low, then the firm's entire capital is wiped out. In that case, if the firm cannot raise financing for the second investment, then it is put up for sale, where the potential buyers are the surviving domestic firms (if any) and foreigners.[6]

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return is $R_1$, but the probability of having the high return is lower, say $\alpha_1^L < \alpha_1$, and its owners enjoy a non-pecuniary benefit of $B$, with $\left(\alpha_1 - \alpha_1^L\right) R_1 > B$. In that case, the incentive compatibility constraint can be written as $\alpha_1 \theta R_1 \geqslant \alpha_1^L \left[\theta R_1 + B\right]$. Hence, firm owners need a minimum share of $\bar{\theta} = \frac{\alpha_1^L B}{\left(\alpha_1 - \alpha_1^L\right) R_1}$ to exert effort. Therefore, the firm can pledge at most a fraction $\tau = 1 - \bar{\theta}$ of its future income if it is required to exert effort. For simplicity, we model moral hazard using returns, rather than probabilities, and assume that the returns are not verifiable. While this does not change any of our results, it simplifies our expressions considerably.

[6]Here, we do not model the bankruptcy of the firm. One can assume some fixed costs for staying in business such as overhead costs like rent for office space, labor costs etc. A firm needs to cover these costs to

Domestic firms that had the high return from the first period investment are potential acquirers of failed firms' assets. Because of moral hazard, the surviving domestic firms cannot pledge all their future income, but only a fraction $\tau$. Hence, the total resources available to a surviving domestic firm at date 1 to purchase failed firm assets is

$$\ell = R_0 - 1 + \tau\bar{q}, \tag{1}$$

where $\bar{q} = \alpha_1 R_1$ is the expected return from the second period investment. The firm has $R_0$ from the first period investment but needs to set aside the cost of investment of 1, and can raise $\tau\bar{q}$ units of funds from outside investors.[7]

We solve the model proceeding backwards from the second period to the first period. We denote the proportion of firms that fail at $t = 1$ by $k$. Since firms are identical at date 0, the proportion $k$ can be regarded as the state variable at date 1.

A firm which had the low return from the first period investment still has the second period investment ahead and it can pledge $\tau\bar{q}$ units of funds against its future return. For $\tau\bar{q} \geqslant 1$, that is, for $\alpha_1 \geqslant \alpha_1^* = \frac{1}{\tau R_1}$, this domestic firm can generate the needed funds for the second period investment and does not need to be liquidated. However, for $\alpha_1 < \alpha_1^*$, the domestic firm with the low return from the first investment cannot generate the necessary funds and is put up for sale. In other words, when the agency problem gets severe, firms with adverse first-period shock are rendered as financially constrained, and a transfer of control is necessary for their second period investment to be feasible.[8] Hence, asset sales take place only when $\alpha_1 < \alpha_1^*$.

Note that for $\alpha_1 > \frac{1}{R_1 - \Delta}$, domestic firms and foreigners are willing to pay a positive price for failed firms' assets. Hence, for $\frac{1}{R_1-\Delta} < \alpha_1^*$, that is, for $\Delta < \bar{\theta} R_1$, foreigners and surviving firms are not willing to finance failed firms, but are willing to purchase them. We summarize these points in terms of the following proposition.

**Proposition 1** *There is a critical value of $\alpha_1$, given as $\alpha_1^* = \frac{1}{\tau R_1}$, such that, if $\alpha_1 \geqslant \alpha_1^*$, a firm which had the low return from the first period investment can generate the needed funds for the second period investment. Otherwise, it is put up for sale.*

Next, we analyze the sale of failed firms' assets and the resulting price function. In examining the sale of failed firms, several interesting issues arise. First, surviving firms and foreigners may compete to acquire failed firms. Second, unless the game for asset acquisition

stay in business, otherwise, it needs to be sold.

[7] Alternatively, we can allow firms to generate funds against the assets they purchase as well. This does not change our results qualitatively.

[8] We can allow for partial liquidation. In particular, the domestic firm can use $\tau\bar{q}$ units for the second period investment and liquidate the rest. This would not change our results qualitatively.

is specified with reasonable restrictions, an abundance of equilibria arises. Third, surviving firms in fact may not have enough resources to acquire all failed firms.

To keep the analysis tractable we make the following assumptions:

(i) All failed firms' assets are pooled and competitively auctioned to the surviving firms and the foreigners.

(ii) Denoting the surviving firms as $i \in [0, (1-k)]$ and the foreigners as $i = 2$, each surviving firm and foreigners submit a schedule $y_i(p)$ for the amount of assets they are willing to purchase as a function of the price $p$ at which a unit of the asset is being auctioned, where $y_i(p) \in [0, k]$.

(iii) The price $p$ clears the market subject to the natural constraint that assets allocated to surviving firms and foreigners add up at most to the proportion of failed firms, that is, $y_2(p) + \int_{i=0}^{1-k} y_i(p)di \leq k$. Given the allocation inefficiency of selling assets to foreigners, it turns out that if the surviving firms and the foreigners pay the same price for the failed firms' assets, maximum amount of failed firms' assets are allocated to the surviving firms.

(iv) We focus on the symmetric outcome where all surviving firms submit the same schedule, that is, $y_i(p) = y(p)$ for all $i \in [0, (1-k)]$.

First, we derive the demand schedule for surviving firms. The expected profit of a surviving firm from the asset purchase can be calculated as: $y(p)[\bar{p} - p]$. Note that for each unit of asset purchased, the acquiring firm needs 1 unit of funds to undertake the second period investment. The surviving firm wishes to maximize these profits subject to the resource constraint $y(p) \cdot (1+p) \leq \ell$.

Hence, for $p < \bar{p}$, surviving firms are willing to purchase the maximum amount of assets using their resources. Thus, their demand schedule is $y(p) = \frac{\ell}{1+p}$. For $p > \bar{p}$, the demand is $y(p) = 0$, and for $p = \bar{p}$, surviving firms are indifferent between any value of $y(p)$.

We can derive the demand schedule for foreigners in a similar way. Note that, foreigners can generate only $R_1 - \Delta$ in the high state. Let $\underline{p} = \alpha_1(R_1 - \Delta) - 1 = \bar{p} - \alpha_1\Delta$, the expected profit for the foreigners from the risky asset in the second period. For $p < \underline{p}$, foreigners are willing to supply all their funds for the asset purchase. Thus, their demand schedule is $y_2(p) = \frac{w}{1+p}$. For $p > \underline{p}$, the demand is $y_2(p) = 0$, and for $p = \underline{p}$, $y_2(p)$ is infinitely elastic. Note that, in the benchmark model, we assume that $w$ is unlimited so that foreigners always have enough funds to purchase all domestic firms at the price $\underline{p}$ and take all the second period investments.[9]

Next we analyze how failed firms' assets are allocated and the price function that results.

[9]Please see Section 3.4 for extension of the benchmark model where foreigners have limited funds that results in a complete shut down of FPI during severe crises.

The resulting price function is formally stated in the following proposition and is illustrated in Figure 5.

**Proposition 2** *The price as a function of the proportion of failed firms is*

$$p^*(k) = \begin{cases} \bar{p} & for \quad k \leqslant \underline{k} \\ \frac{\ell}{k} - (1+\ell) & for \quad k \in (\underline{k}, \overline{k}] \\ \underline{p} & for \quad k > \overline{k} \end{cases} . \tag{2}$$

*Foreigners acquire assets whenever* $k > \overline{k}$.

In the absence of financial constraints, the efficient outcome is to sell failed firms' assets to surviving firms. However, surviving firms may not be able to pay the threshold price of $\underline{p}$ for all assets. If price falls further, these assets become profitable for foreigners and they participate in the auction.

In the first region, that is, for $k \leqslant \underline{k}$, the proportion of failures and surviving firms have enough funds to acquire assets at the full price $\bar{p}$. For moderate values of $k$, that is, for $k \in (\underline{k}, \overline{k}]$, surviving firms cannot pay the full price for all failed firms' assets but can still pay at least the threshold value of $\underline{p}$, below which foreigners have a positive demand. In this region, surviving firms use all available funds and the price falls as the proportion of failures increases.[10] For $k > \overline{k}$, surviving firms cannot pay the threshold price of $\underline{p}$ for all assets and profitable options emerge for foreigners, where foreigners are willing to supply their funds for the asset purchase. With the injection of foreigners' funds, prices find the floor at $\underline{p}$.

So far, we treated failures in the first period ($k$) and prospects of firms in the second period ($\alpha_1$) independently. However, these two are likely to be affected by a common macroeconomic factor so that when macroeconomic performance is poor, a larger proportion of firms go into distress (high $k$) and firms' prospects deteriorate (low $\alpha_1$). It is also possible that the return $R_0$ can be affected by the same macroeconomic factor in the same way as $\alpha_1$, which would only strengthen our results. More formally, let $\phi$ be a parameter that represents the underlying macroeconomic factor such that an increase in $\phi$ represents a better macroeconomic performance overall. Hence, we have $\frac{\partial k}{\partial \phi} < 0$ and $\frac{\partial \alpha_1}{\partial \phi} > 0$. As the macroeconomy worsens (low $\phi$), the price of assets falls because of two separate reasons. First, the prospects for the second period project worsen (low $\alpha_1$) so that the fundamental value $\bar{p}$ of the assets falls. Second, the proportion of failures ($k$) increases when the economy is weak, and for high enough

[10] This effect is basically the cash-in-the-market pricing as in Allen and Gale (1994, 1998) and is also akin to the industry-equilibrium hypothesis of Shleifer and Vishny (1992) who argue that when industry peers of a firm in distress are financially constrained, the peers may not be able to pay a price for assets of the distressed firm that equals the value of these assets to them.

proportion of failures, there is cash-in-the-market prices due to lack of liquidity in domestic markets.

We now present the main result on the inverse relation between portfolio investment and FDI during crisis periods.

Recall that for $\alpha_1 \geqslant \alpha_1^*$, even domestic firms that had the low return from the first period investment can generate the needed funds so that there are no asset sales. The more interesting case is when $\alpha_1 < \alpha_1^*$, where only surviving domestic firms can generate funds in the capital market. Hence, the total borrowing capacity of the domestic economy, denoted by $BC$, is equal to $[(1-k)\tau\bar{q}]$. Note that $BC$ is decreasing in $k$, that is, the more severe the crisis, the lower the borrowing capacity of the domestic economy. And, for $k < \overline{k}$, the price for failed firms' assets is higher than $\underline{p}$ so that foreigners do not purchase any domestic assets, that is, $FDI$ is equal to 0.[11]

Note that surviving firms may not need to utilize the entire borrowing capacity since profits from the first period investment may provide enough liquidity to keep the price at $\bar{p}$ for low proportion of failures. In particular, for $k \leqslant \underline{\underline{k}}$, where $\underline{\underline{k}} = \frac{R_0-1}{\bar{p}+R_0}$, surviving firms do not need to generate any additional funds so that the actual capital flow, denoted by $C$, is 0. For $k \in (\underline{\underline{k}}, \underline{k}]$, surviving firms generate funds for asset purchases given as $C = k(1+\bar{p}) - (1-k)(R_0-1)$, which is increasing in $k$. And for $k > \overline{k}$, surviving firms use up their entire borrowing capacity so that $C = BC$.

For $k > \overline{k}$, all failed firms' assets cannot be purchased by surviving firms at the price $\underline{p}$ and profitable options emerge for foreigners. Formally, for $k > \overline{k}$, surviving firms can purchase only $\frac{(1-k)\ell}{1+\underline{p}}$ units of failed firms' assets and the rest, which is equal to $k - \frac{(1-k)\ell}{1+\underline{p}}$ units, is acquired by foreigners at a price of $\underline{p}$. Hence, for $k > \overline{k}$, we have $FDI = k(1+\underline{p}+\ell) - \ell$.

Note that $FDI$ is (weakly) increasing in $k$ while the borrowing capacity $BC$ of the domestic economy is decreasing in $k$, resulting in a negative correlation between capital flows and foreign direct investment. We have the following Proposition. Also see Figure 6.

**Proposition 3** *For $\alpha_1 < \alpha_1^*$, we have:*

(i) $BC = (1-k)\tau\bar{q}$ *and* $\frac{\partial BC}{\partial k} < 0$.

(ii) *For $k \geqslant \overline{k}$, we have $FDI = k(1+\underline{p}+\ell) - \ell$, and $\frac{\partial FDI}{\partial k} > 0$. For $k < \overline{k}$, we have $FDI = 0$.*

[11] Note that our model can easily be extended to allow for differential efficiency among foreigners where efficient foreigners always enter domestic markets, resulting in a positive level of FDI for all values of $k$. See Section 3.3 for such an extension. Since our focus in this paper is FDI flows during crisis periods, we refrain from such a feature in the benchmark model to keep the model simple.

(iii) For $k \leqslant \underline{k}$, we have $C = 0$. *For* $k \geqslant \underline{k}$, *we have* $C = BC$, *and for* $k \in \left(\underline{k}, \underline{k}\right)$, *we have* $C = k(\bar{p} + R_0) - (R_0 - 1)$, *and* $\frac{\partial C}{\partial k} > 0$.

Proposition 3 states our key theoretical result: In the midst of a crisis, we have the juxtaposition of decreased portfolio investment into domestic firms and increased FDI. During crisis periods the borrowing capacity of surviving domestic firms as a whole diminishes, resulting in a decrease in FPI. In addition, during these periods, the supply of failed firms' assets searching for buyers surges. This, in turn, results in cash-in-the-market prices for domestic assets and makes domestic assets profitable for foreigners even though their ability to manage these assets is limited. Hence, we observe an increase in FDI during crisis periods.

# 3 Extensions

We consider four extensions of our basic framework, each with sharp empirical predictions. First, we analyze the recovery of the domestic economy and the subsequent flipping of assets acquired by foreigners back to their natural users. Second, we analyze the optimal resolution of the crisis and show that regulatory changes to allow for foreign investment are endogenous to the severity of the crises. Third, we allow for differential levels of efficiency among foreigners and analyze effects of financial crisis and barriers of entry on foreign entry. Finally, we analyze how illiquidity can lead to spillover effects from the real to the financial side of the economy, which can eventually lead to a complete shutdown of the domestic capital market.

## 3.1 Recovery and asset flipping

During crises, outsiders (foreigners in our model) purchase assets at fire sale prices but once the economy recovers and insiders (domestic firms in our model) are less constrained, assets change hands, going back to their most natural users. We model this using a simple extension of our benchmark model. Suppose that we have a third period, that is, we have date $t = 3$. Firms can take a risky investment at $t = 2$, similar to the two investments in the benchmark model. In particular, firms invest one unit in a risky technology at $t = 2$, where the return is realized at $t = 3$. The random return from these investments is denoted by $\widetilde{R}_2$, where $\widetilde{R}_2 \in \{0, R_2\}$, and $\alpha_2$ is the probability of the high return from the investment at date 2. Foreigners cannot generate $R_2$ in the high state but only $R_2 - \Delta_2$.[12] Hence, insiders are willing to pay a price of $\bar{p}_2 = \alpha_2 R_2 - 1$, whereas outsiders value these assets at $\underline{p}_2 = \alpha_2(R_2 - \Delta_2) - 1$.

[12]Note that outsiders have operated these assets for one period so they may learn how to run these assets efficiently. Therefore, we allow for $\Delta_2$, possibly $\Delta_2 < \Delta$.

Suppose that a proportion $\sigma$ of assets were purchased by outsiders at $t = 1$. Hence, insiders manage a proportion $1-\sigma$ of assets. Also, suppose that a fraction $k_1$ of insiders have the low return from their investment taken at $t = 1$. An insider that had the high return has funds of $\ell_1 = (R_1 - 1) + \tau\alpha_2 R_2$ to be used for asset purchase. If a high proportion of insiders have the high return, then insiders have enough funds to pay the full price of $\bar{p}_2$ for failed firms as well as the firms that have been acquired by outsiders at $t = 1$, and assets change hands back to the efficient users. In particular, for $k_1 \leqslant \underline{k}_1$, where

$$\underline{k}_1 = \frac{\ell_1 - \sigma(\ell_1 + 1 + \bar{p}_2)}{(1-\sigma)(\ell_1 + 1 + \bar{p}_2)}, \tag{3}$$

insiders purchase all failed firms and also buy back the assets that have been purchased by outsiders, at the fundamental price $\bar{p}_2$. This is associated with a full recovery from the crisis. Note that, $\frac{\partial \underline{k}_1}{\partial \sigma} < 0$ so that full recovery is more difficult after a severe crisis.

For moderate values of $k_1$, surviving firms cannot pay the full price for all failed firms' and outsiders' assets but can pay at least the threshold value of $\underline{p}_2$. So, for $k \in (\underline{k}_1, \overline{k}_1]$, where

$$\overline{k}_1 = \frac{\ell_1 - \sigma(\ell_1 + 1 + \underline{p}_2)}{(1-\sigma)(\ell_1 + 1 + \underline{p}_2)}, \tag{4}$$

the price is $p_2^* = \frac{(1-\sigma)(1-k_1)\ell_1}{(1-\sigma)k_1+\sigma} - 1$, and all assets are acquired by insiders.[13]

## 3.2 Resolution and lifting restrictions on foreigners

Regulations that restrict foreign inward investment are swept away severe crises, as we will document shortly. Thus regulatory changes are endogenous to the severity of the crisis. In this section, we provide an extension of our model where the regulator chooses between maintaining restrictions on acquisitions by foreigners when the crisis is not too severe (low levels of $k$) and lifting such restrictions during severe crises (high $k$). There are important welfare implications associated with regulatory intervention in the form of re-capitalization of failed domestic firms and lifting of restrictions on foreign acquisitions during the resolution stage of financial crisis.[14]

Suppose, to start with, that we have restrictions on foreign acquisitions, that is, as long as there is enough capital within the domestic economy to recapitalize all failed domestic firms,

[13]For sligthly higher values of $k_1$, insiders can buy back only a fraction of the assets, that is, the recovery is partial. For higher values of $k_1$, more assets may be sold to outsiders, resulting in a deepening of the crises.

[14]In practice, the role of the governments in the resolution of financial crises has been significant. Examples include the establishment of institutions such as Resolution Trust Corporation (RTC) in the U.S. following the Savings and Loans crisis, the Bank Support Authority (BSA) in Sweden following the 1992 financial crisis, and the Korea Asset Management Company (KAMCO) following the Asian crisis of 1997.

even though foreigners can pay more for the failed domestic firms' assets, assets are sold to surviving domestic firms. Formally, for $k \leqslant k^r$, where $k^r = \frac{\ell}{1+\ell}$, all failed domestic assets can be acquired and recapitalized by surviving domestic firms even though the price can be lower than what foreigners are willing to pay (can be as low as zero).

In contrast, for $k > k^r$, the funds within the surviving domestic firms is not even sufficient to only recapitalize all failed domestic firms' assets. In that case, the regulator either recapitalizes failed domestic firms to prevent misallocation of domestic assets or lift restrictions on foreigners. In particular, the regulator compares the misallocation cost resulting from sales to foreigners with the cost of recapitalizing the failed firms. The regulator recapitalizes failed firms as long as the marginal cost of recapitalization is less than the misallocation cost of $\alpha_1\Delta$.[15] However, when the cost of recapitalization is high, the regulator chooses (or is forced) to lift restrictions on foreign acquisitions.

We proceed to analyze the regulator's decision by making the following assumption: The government incurs a fiscal cost of $f(a)$ when it injects $a$ units of funds into domestic firms, with $f(0) = 0$. We assume this cost function is strictly increasing and convex: $f' > 0$ and $f'' > 0$.[16] Thus, when the regulator recapitalizes $b$ of the $k$ failed firms, the fiscal cost incurred is $f(b)$. Note that recapitalizations entail a fiscal cost to the regulator.

The government's objective is to maximize the total expected output of the economy net of any recapitalization or liquidation costs. The government does not intervene when $k \leqslant k^r$. For $k > k^r$, the government's problem is to choose $b$ to maximize:

$$E(\Pi(b)) = \alpha_1 R_1 - f(b) - (k - (1-k)\ell - b)\,\alpha_1\Delta, \tag{5}$$

where $(k - (1-k)\ell - b)\,\alpha_1\Delta$ is the misallocation cost resulting from sales to foreigners. The first order condition for the government's problem is given as $f'(b) = \alpha_1\Delta$. Since the marginal cost $f'(b)$ is increasing in $b$, there is an upper bound, denoted by $\bar{b}$, up to which recapitalization costs are smaller than misallocation costs. Formally, $\bar{b} = g(\alpha_1\Delta)$, where $g$ is the inverse of $f'$. Since the maximum proportion of firms that can be acquired and recapitalized by the

[15] In this section, we only model the fiscal costs of intervention. There is also a question of incentives for the incumbent management. If the government takes ownership of the failed firm, the existing management may not have incentives to exert effort. Thus, the optimal resolution strategy should also include the incentive costs created by government ownership. A detailed analysis that involves these incentive costs is available from the authors.

[16] The provision of immediate funds to recapitalize firms entails fiscal costs for the regulator (assumed to be exogeneous to the model). These fiscal costs can be linked to a variety of sources: (i) distortionary effects of tax increases required to fund recapitalizations; and, (ii) the likely effect of huge government deficits on the country's exchange rate, manifested in the fact that banking crises and currency crises have often occurred as "twins" in many countries (especially, in emerging market countries). Ultimately, the fiscal cost we have in mind is one of immediacy: Government expenditures and inflows during the regular course of events are smooth, relative to the potentially rapid growth of liabilities during crisis periods.

surviving domestic firms is $(1-k)\ell$, the regulator recapitalizes $b^*(k)$ firms, where

$$b^*(k) = \min\left\{\bar{b},\ (k-(1-k)\ell)\right\}. \tag{6}$$

We summarize the resolution policy as follows. Also, see Figure 7 for an illustration.

**Proposition 4** *For $\alpha_1 \geqslant \alpha_1^*$, the regulator does not intervene. For $\alpha_1 < \alpha_1^*$, the resolution policy is as follows:*

*(i) When $k \leqslant k^r$, surviving domestic firms acquire and recapitalize all failed firms and the regulator does not intervene.*

*(ii) When $k > k^r$, the regulator recapitalizes $b^*(k)$ of the $k$ failed firms, where $b^*(k)$ is given by (6). When $k > k^r + \bar{b}$,* the regulator lifts restrictions on foreigners and foreigners acquire a proportion $k - k^r - \bar{b}$ of failed domestic firms.

## 3.3 Differential efficiency among foreigners

It is possible that some foreigners are more efficient than domestic firms but they may not be able to enter the domestic market due to various costs of entry related with protection for domestic industries and other political economy reasons. As a result, even efficient foreigners can enter these markets only when prices fall sufficiently. Here, we show that in the presence of such costs of entry, during crises, first the efficient foreigners enter, which may be beneficial for crisis-stricken countries. However, for severe crises, the price may fall so low that even inefficient foreigners may enter to take advantage of fire sales.[17]

To model this, we introduce differential levels of efficiency among foreigners and a cost of entry to the domestic markets. Suppose that foreigners have funds of $1+\underline{p}$, uniformly distributed among themselves, so that they can purchase all domestic firms at a price of $\underline{p}$ and can take all second period investments using their funds. Suppose that a proportion $z<1$ of foreigners are of efficient type with total funds of $w_e = z(1+\underline{p})$. Efficient foreigners can generate a return of $(R_1+\rho)$, where $\rho > 0$, from the second period investment when the return is high. The remaining foreigners, a proportion $1-z$, are inefficient and can only generate $R_1 - \epsilon$, where $\epsilon > 0$. Hence, in the absence of entry costs, efficient foreigners are willing to pay a price of $\overline{\overline{p}}$ for failed firms, where $\overline{\overline{p}} = \alpha_1(R_1+\rho) - 1 > \bar{p}$. Suppose that there is a cost of entry to the domestic market, where foreigners incur a cost of $\gamma$ per unit of domestic asset acquired, with $\gamma > \overline{\overline{p}} - \bar{p}$.[18] Hence, even efficient foreigners can enter only

[17] See Krugman (1998) and Loungani and Razin (2001) for a discussion.

[18] We assume that the cost $\gamma$ is a private cost for the foreigners who want to enter domestic markets but not a social cost in the sense that it is a transfer from foreigners to the domestic economy (or to the domestic regulators).

when prices fall below the price $\widetilde{p} = \overline{\overline{p}} - \gamma$. To keep the notation simple and aligned with the benchmark model, we assume that $\underline{p} = \alpha_1 (R_1 - \epsilon) - 1 - \gamma$, so that inefficient foreigners enter the domestic market only when price is below $\underline{p}$.

As in the benchmark case, for $k \leq \underline{k}$, the price is set at $p = \bar{p}$ and only domestic firms purchase failed firms. For moderate values of $k$, surviving firms cannot pay the full price for all failed firms' assets but can still pay at least the threshold value of $\widetilde{p}$, below which efficient foreigners have a positive demand. Formally, for $k \in (\underline{k}, \widetilde{k}]$, where $\widetilde{k} = \frac{\ell}{\ell+1+\widetilde{p}}$, the price is set at $p = \frac{\ell}{k} - (1 + \ell)$, and again, all assets are acquired by surviving firms.

For $k > \widetilde{k}$, surviving firms cannot pay the threshold price of $\widetilde{p}$ for all assets and profitable options emerge for efficient foreigners. Hence, for $k > \widetilde{k}$, efficient foreigners have a positive demand and are willing to supply their funds for the asset purchase. With the injection of efficient foreigners' funds, prices can be sustained at $\widetilde{p}$ for $k \in (\widetilde{k}, \widetilde{\widetilde{k}}]$, where $\widetilde{\widetilde{k}} = \frac{\ell+w_e}{\ell+1+\widetilde{p}}$. However, for $k > \widetilde{\widetilde{k}}$, the injection of efficient foreigners' funds is not enough to keep the price at $\widetilde{p}$ and the price starts to fall again. In particular, for $k \in (\widetilde{\widetilde{k}}, \widehat{k}]$, where $\widehat{k} = \frac{\ell+w_e}{\ell+1+\underline{p}}$, the price is again strictly decreasing in $k$ and is given by $p^* = \frac{\ell+w_e}{k} - 1 + \ell$.

For $k > \widehat{k}$, surviving firms and efficient foreigners cannot pay the threshold price of $\underline{p}$ for all assets, inefficient foreigners have a positive demand and are willing to supply their funds for asset purchase. With the injection of inefficient foreigners' funds, price is sustained at $\underline{p}$.

This price function is stated below and is illustrated in Figure 8.

**Proposition 5** *The price as a function of the proportion of failed firms is as follows:*

$$p^*(k) = \begin{cases} \bar{p} & \text{for} \quad k \leqslant \underline{k} \\ \frac{\ell}{k} - 1 + \ell & \text{for} \quad k \in (\underline{k}, \widetilde{k}] \\ \widetilde{p} & \text{for} \quad k \in (\widetilde{k}, \widetilde{\widetilde{k}}] \\ \frac{\ell+w_e}{k} - 1 + \ell & \text{for} \quad k \in (\widetilde{\widetilde{k}}, \widehat{k}] \\ \underline{p} & \text{for} \quad k > \widehat{k} \end{cases} . \tag{7}$$

Observe that when the crisis is not very severe, that is, for $k \in (\widetilde{k}, \widehat{k}]$, the crisis is efficient in the sense that it helps remove barriers for efficient foreigners to enter domestic markets. However, for very severe crises, while efficient foreigners enter these markets, also, inefficient foreigners enter to take advantage of fire-sale prices, which results in a misallocation of domestic assets leading to welfare losses for domestic economies.

### 3.4 Illiquidity and capital market breakdown

So far, we have examined the case where foreigners have unlimited funds so that they can purchase all domestic firms at the price $\underline{p}$ and will still have enough funds to finance all second period projects. We relax this assumption and allow for limited funds for foreigners, that is, $w \in \left(1, 1+\underline{p}\right)$. This allows us to examine the relationship between the cost of capital and illiquidity spillover between the asset and equity markets of domestic firms.

When foreigner funds are limited, we have a fourth region for $k > \overline{\overline{k}}$, where $\overline{\overline{k}} > \overline{k}$, and

$$\overline{\overline{k}} = \frac{R_0 - 1 + w}{\underline{p} + R_0}, \tag{8}$$

so that even with the injection of foreigners' funds, the price cannot be sustained at $\underline{p}$ and is again strictly decreasing in $k$ (see Figure 7). For $k > \overline{\overline{k}}$, since purchasing assets at such prices becomes profitable for foreigners, in equilibrium they need to be compensated for purchasing shares of surviving firms. As a result, the share price of surviving firms falls below their fundamental value $\bar{q}$. The aggregate shortage of liquidity affects not only the price of failed firms' assets but also the price of shares of surviving firms.

We focus on the outcome where the participation of foreigners in the equity market is maximum, which results in the maximum price for assets. However, even in this case, for a large proportion of failures, the share price of surviving firms falls below $\bar{q}$. Furthermore, for low values of foreigners' funds, during severe crises, the capital market completely breaks down. The price functions for failed firms' assets ($p^*(k)$) and for shares of surviving firms ($q^*(k)$) are formally stated in the following proposition and are illustrated in Figure 9a.[19]

**Proposition 6** *For limited foreigners' funds, in equilibrium, we have:*

$$p^*(k) = \begin{cases} \bar{p} & for \quad k \leqslant \underline{k} \\ \dfrac{\ell}{k} - (1+\ell) & for \quad k \in (\underline{k}, \overline{k}] \\ \underline{p} & for \quad k \in (\overline{k}, \overline{\overline{k}}] \\ \frac{R_0 - 1 + w}{k} - R_0 & for \quad k > \overline{\overline{k}} \end{cases} \tag{9}$$

*and*

$$q^*(k) = \begin{cases} \bar{q} & for \quad k \leqslant \overline{\overline{k}} \\ \mu p^*(k) & for \quad k > \overline{\overline{k}} \text{ and } w \geqslant w^* \\ \mu p^*(k) & for \quad k \in (\overline{\overline{k}}, k^*] \text{ and } w < w^* \\ \textit{Market breaks down} & for \quad k > k^* \text{ and } w < w^* \end{cases}, \tag{10}$$

[19] Proposition 6 states the results for the case $w \geqslant \tau\bar{q}$. Similar results hold for $w < \tau\bar{q}$.

*where* $\mu = \dfrac{\bar{q}}{\underline{p}}$, $w^* = \dfrac{\bar{q}}{\bar{q}-\underline{p}}$, *and* $k^* = \dfrac{\left(\bar{q}-\underline{p}\right)\left(R_0-1+w\right)}{\underline{p}+\left(\bar{q}-\underline{p}\right)R_0}$.

As Proposition 6 shows, when the proportion of failures is large, cash-in-the-market pricing creates profitable options for foreigners for asset purchases. Hence, in equilibrium, share price of surviving firms falls below their fundamental value $\bar{q}$ to compensate foreigners for purchasing shares. In other words, surviving firms can raise equity financing only at discounts. Thus, limited funds within the whole system affects not only the price of failed firms' assets but also the price of shares of surviving firms. Furthermore, the discount surviving firms need to suffer in issuing equity is higher when the crisis is more severe (high $k$).

When foreigners' wealth is low ($w < w^*$), the price for failed firms' assets falls sufficiently. This, in turn, leads to high discounts in the capital market and for $k > k^*$, the discount is so high that surviving firms cannot generate the needed funds by issuing shares, that is, $q^*(k) < 1 + p^*(k)$. Hence, the capital market breaks down completely (see Figure 9b). Thus, for $w < w^*$, at $k = k^*$, the domestic economy experiences a structural break where foreign funds enter the domestic market only through FDI, that is, $BC = C = 0$. Formally, for $k \in (\overline{\overline{k}}, k^*]$, even though surviving firms need to suffer some discount, they can generate funds in the capital market and can purchase $\frac{(1-k)[(R_0-1)+\tau q^*(k)]}{1+p^*(k)}$ units of failed firms' assets. The rest is acquired by foreigners, that is, $FDI = k(1+p^*(k)) - (1-k)\left[(R_0-1)+\tau q^*(k)\right]$. However, for $k > k^*$, the capital market breaks down completely and the surviving firms are restricted to their first period profits for the asset purchase, that is, they can only purchase $\frac{(1-k)(R_0-1)}{1+p^*(k)}$ units of failed firms' assets. Hence, at $k = k^*$, we have a structural break and $FDI$ jumps to $w$ since for $k > k^*$, all foreign funds enter the domestic economy in the form of FDI. Using the prices $p^*(k)$ and $q^*(k)$ in Proposition 6, for $w < w^*$, we get

$$FDI = \begin{cases} 0 & for \quad k \leqslant \overline{k} \\ k(1+\underline{p}) - (1-k)\ell & for \quad k \in (\overline{k}, \overline{\overline{k}}] \\ w - (1-k)\left[\tau q^*(k)\right] & for \quad k \in (\overline{\overline{k}}, k^*] \\ w & for \quad k > k^* \end{cases} . \tag{11}$$

# 4 Empirical evidence

We organize our discussion of the empirical evidence under three propositions. (i) FDI flows surge precisely when there is an outflow of portfolio capital; (ii) FDI inflows during financial crises are associated with the acquisition of stakes that grant control, rather than simply acquisition of a cash-flow stakes; and (iii) "flipping" of assets acquired in fire sales once prices rebound.

## 4.1 FDI and portfolio flows during crises

Figures 6 and 9b highlight the prediction from our model on the negative correlation between FDI and portfolio flows. Figure 6 shows that in normal times (low values of $k$), FPI, characterized by $C$, and FDI will be positively correlated, albeit weakly so. However, during crises (high values of $k$), FPI and FDI are negatively correlated. Relative to normal times, crises are associated with higher levels of FDI, implying that the negative correlation between FDI and FPI should be coincident with higher levels of FDI. Figure 9b shows that when foreign capital that can enter is limited, during severe crises, FPI may dry up completely but FDI will be significant. Figure 1b showing the correlation between FPI and FDI for South Korea captures these patterns.[20] There is not only a switching of the sign of the correlation between normal and crisis periods, but more of the crises data points correspond to higher levels of FDI.

In his early commentary, Krugman (1998) observed that the Asian financial crisis, marked by massive flight of short-term capital and large-scale sell-offs of foreign equity holdings, has at the same time been accompanied by a wave of inward direct investment.[21] Krugman argues that a similar, though probably less marked, boom in inward direct investment took place in Latin America, especially in Mexico during 1995 and also for Argentina. A report for the United Nations Conference on Trade and Development in October 1999 (UN (1999)) notes that inflows into South Korea rose five-fold in 1998 compared to its average performance during the first half of the decade, followed by Thailand with an almost four-fold jump to $7 billion over the same period. In Thailand, the only country for which systematic data by industry are available, significant FDI flows to financial institutions (which were about 10 times higher in 1997 than in 1996, and continued at a similar level in 1998) reflected significant buy-outs by foreign firms. The report argues that one of the main reasons for the surge in FDI is that transnational corporations were taking advantage of cheaper asset prices

[20] Also see Smith and Valderrama (2009) who look at the degree of substitutability and complementarity between different forms of foreign investments. However, they use 10 year rolling correlations between FDI and FPI rather than focusing on the correlation during crisis and non-crisis periods separately.

[21] Krugman's article provides a vivid run-down of the headlines: "Korean companies are looking ripe to foreign buyers" (New York Times, Dec 27, 1997), "Some U.S. companies see fire sale in South Korea"(Los Angeles Times, Jan 25, 1998), "Some companies jump into Asia's fire sale with both feet" (Chicago Tribune, Jan 18, 1998), "While some count their losses in Asia, Coca-Cola's chairman sees opportunity" (Wall Street Journal, Feb 6, 1998). Krugman provides further anectodal evidence for the fact that these sales were widespread across all industries, such as some related news about General Motors considering buying stakes in South Korean manufacturers of both automobiles and parts; Ford planning to increase its stake in Kia Motors; Seoul Bank and Korea First Bank being auctioned off to foreign bidders; Procter & Gamble purchasing a majority share of Ssanyong Paper Co., a producer of sanitary napkins, diapers, and kitchen towels; and Royal Dutch Shell negotiating to buy Hanwha Group's oil refining company, the group that had already sold its half of a joint venture in chemicals to the German company BASF.

in the crisis-stricken countries.

The surge in inward investment coincided with the reforms of rules on inward investment in crisis stricken countries. Claessens, Djankov and Klingebiel (1999) describes the main reforms.[22] In Korea, the previously cautious attitude to foreign stakes were swept away with the Foreign Investment Promotion Act in November 1998 as part of its IMF package. The ceilings on foreign ownership (15% for financial firms, 20% for manufacturing and retail firms) were removed, and the ban on utilities was changed to a ceiling of 49%. Indonesia removed the 49% ceiling on manufacturing and financial firms and removed the restrictions on the number of branches in the case of the latter. However, it chose to maintain the restrictions on utilities. Given the severity of the liquidity crisis and the lack of domestic capital, foreign investment was the only alternative for the crisis countries, and these reforms could be seen as the reaction by the government to changed circumstances in capital markets, rather than an exogenous event which subsequently led to the surge. In other words, regulatory changes should be seen as the *consequence* rather than the *cause* of the FDI surge.

Aguiar and Gopinath (2005) is the benchmark firm-level study of the inflows. They document evidence that the high FDI flows into the crisis-stricken Asian countries had many of the features of fire-sales: median offer price to book ratios were substantially lower for cash-strapped firms' purchase, especially in 1998 when national players had low liquidity, resulting in a boost in mergers and acquisitions (M&As) involving foreign players. They use a firm-level dataset to show that the number of foreign M&As in East Asia increased by 91% between 1996 and the crisis year of 1998 while domestic M&As declined by 27% over the same period. In regard to the price paid for an acquired firm, the median ratio of offer price to book value declined from 3.5 in 1996 to 1.3 in 1998. They also find that firm liquidity (proxied by cash flow or sales) played a significant and sizeable role in explaining both the increase in foreign acquisitions and the decline in the price of acquisitions during the crisis: While during non-crisis years high cash flow for a firm was weakly associated with the likelihood of its acquisition, in 1998 additional cash implied a lower probability of acquisition. Furthermore, in support of the hypothesis that cash-strapped firms sold at a steeper discount during the crisis, their cross-sectional regressions find that an additional dollar of cash in a firm had a larger impact on sale price in 1998 than in other years. In fact, the elasticity of price-to-book with respect to cash flow is roughly 0.7 in 1998 while negligible during the other years of the sample. Given that liquidity shocks are typically thought to be short-lived, they argue this is further support for the fire-sale hypothesis, raised by Krugman.[23]

[22] An online appendix lays out the reforms in greater detail.

[23] Our conclusions would be further strengthened if the exchange rate of a country is also hit by the financial crisis. This is because the dollar price of the target firm will fall as the price of the target firm falls in local currency terms and also as the exchange rate moves in favor of the foreign acquirers paying dollars. Indeed, the exchange rate effect on FDI has been observed for the FDI flows into the United States. Froot and Stein

## 4.2 Controlling stakes during crises

The second implication of our model is that during crisis times, acquisitions are associated with higher levels of shares acquired in target firms, and FDI inflows, on average, are associated with foreigners acquiring controlling stakes, whereas FDI inflows during normal times are associated with smaller stakes, not necessarily granting control.

We use the Thompson Financial Securities Data Company's (SDC) mergers and acquisition database. SDC reports detailed information about the target and the acquiring firm, including income statement and balance sheet items, industry, and ownership. Public and private transactions are all included. Given the focus of our paper, we analyze Mergers and Acquisitions (M&A) transactions in which the target firms are in those Asian countries most affected by the crisis, namely Malaysia, Thailand, Indonesia, South Korea and the Philippines, as well as other countries in the region that did not suffer so much - Singapore, Vietnam, Cambodia, Myanmar (Burma), Brunei, and Laos. Our sample includes all acquisitions that were completed during 1991 and 2000. This choice of sample period enables us to compare the patterns in takeovers around the Asian financial crisis (July 1997 to December 1999) with those before the crisis. While we have ownership and transaction information on most of the deals, income statement and balance sheet items are missing for a number of deals because many of the targets are private firms. Hence, we primarily focus on ownership and transaction patterns in the data.

Table 2 provides a summary. The deals are categorized by the target firm's country and the year of acquisition. In total, we have 6955 completed deals, 67% of which are domestic acquisitions (target and acquirer firms are from the same country) and 33% of which are foreign acquisitions (target and acquirer firms are from different countries). In the sample, 40.3% of target firms are in Malaysia, 22.3% in Singapore, 11.1% in Thailand, 9.0% in South Korea, 8.6% in the Philippines, 7.3% in Indonesia, and less than 1% in Vietnam, Cambodia, Myanmar (Burma), Brunei, and Laos. The median Enterprise value is $309 million and the median Transaction value is $8.4 million.[24]

(1991) show that FDI flows into the U.S. are negatively correlated with the value of the US dollar, while FPI in the same period is positively correlated with the value of the U.S. dollar (though insignificant). Also, Blonigen (1997), using data from 1975-1992, find evidence in support of the hypothesis that real dollar depreciations make Japanese acquisitions more likely in U.S. industries. The exchange rate movements associated with the Asian financial crisis were much sharper, and so we may expect the exchange rate effects to have been significant.

[24]Enterprise value is a measure of a company's value, and it is calculated as market capitalization plus debt, minority interest and preferred shares, minus total cash and cash equivalents. Enterprise value can be thought as the theoretical takeover price. Transaction value, on the other hand, is the actual price paid by the acquirer to the target for the portion of equity stake acquired. Transaction value and enterprise value can differ for at least two reasons. First, enterprise value measures the value of the entire firm, whereas transaction value measures only the portion of equity acquired. Second, transaction value includes potential

Table 3 breaks down the acquisitions into Domestic acquisitions, Regional acquisitions (within South East Asia but not domestic) and Foreign acquisitions. In Panel A, we compare the total number of deals that took place during the financial crisis with that before the crisis. The crisis period is between July 1997 and December 1999 and the pre-crisis comparison period is chosen to be between 1991 to 1994.[25] In Panel B, we compare the total value of the acquisitions (measured by transaction value) between the same two periods. By number of deals (Panel A), domestic acquisitions fell from 68.2% of all acquisitions in 1991-1994 to 63.6% of all acquisitions in July 1997-Dec 1999, and foreign acquisitions climbed from 24.2% of all acquisitions to 30.4% of all acquisitions. These percentages are much more striking by total deal value (Panel B). Based on transaction values, the total value of domestic acquisitions fell from 84.0% of the total value of all acquisitions in 1991-1994 to 57.0% in July 1997-Dec 1999. The total value of foreign acquisitions, on the other hand, climbed from 14.3% of the total value of all acquisitions in 1991-1994 to 39.7% in July 1997-Dec 1999. Tests of crisis and pre-crisis values show that the fall of domestic acquisitions and the rise of foreign acquisitions are both highly significant (in deal number and deal value). Figure 10 corroborates Table 3. Foreign acquisitions rose sharply after 1997. As measured by deal number, 22.2% of acquisitions are made by foreign acquirers in 1994. In 1998, foreign acquirers' share jumped to 32%. Again, the magnitude of the increase is even more striking when measured by deal value. As a percentage of total deal value (measured by transaction value), foreign acquisitions accounted for only 7.2% of acquisitions in 1994. But in 1998, this figure increased to 47.3%. This signifies the role of foreign entry following the crisis and the suitability of this period for studying its characteristics and implications.

Next, we show that acquirers took larger stakes in their target firms during the Asian financial crisis. Table 4 reports the summary statistics for the average shares acquired, shares sought, and shares owned of our sample acquisitions. Looking at the 1991-1994 (non-crisis) period and the July 1997-Dec 1999 (crisis) period, we observe that a higher percentage of shares was acquired in the crisis period. For Southeast Asian acquirers, the average shares acquired was 64.9% in July 1997-Dec 1999 and 53.4% in 1991-1994. For foreign acquirers, the average shares acquired was 54.6% in July 1997-Dec 1999 and 48.3% in 1991-1994. A test of the means across the two periods show that the increase in shares acquired in July 1997-Dec 1999 was significant. The reported results for shares sought and shares owned are very similar. These figures also increased significantly during the financial crisis. Figure 11 plots the yearly average of shares acquired across 1991-2000. We observe that the average shares acquired by both foreign and domestic acquirers were at their highest levels in 1997,

synergies from the merger and is affected by the bargaining powers of the parties involved.

[25] We chose the pre-crisis period to be 1991-1994 to allow for a gap between the crisis and the pre-crisis period. All of our results are robust across alternative definitions of the pre-crisis period, for example, 1991-1995 and 1991-June 1997.

1998, and 1999, which coincides with the crisis period.

We also perform probit regressions, where the dependent variable is the percent shares acquired in South East Asia for the period 1991-2000. As the right-hand-side variables, we use the dummy $Crisis$, which equals 0 if the acquisition took place in 1991-1994 and equals 1 if the acquisition took place in July 1997- Dec 1999; the dummy $Foreign$ that equals 0 if the acquirer is from Southeast Asia and equals 1 if the acquirer is not from Southeast Asia; and the interaction dummy $Foreign*Crisis$. Results are reported in Table 5, where the standard errors are clustered by the interaction of the target country and the year of acquisition.

The positive and significant coefficient on the $Crisis$ dummy indicates that firms acquired larger shares in their targets during the crisis, which substantiates our earlier results presented in Tables 3 and 4, and Figures 10 and 11. The coefficient on the $Foreign$ dummy is negative, which indicates that the foreign acquirers on average take a smaller share compared to the local acquirers for the whole sample of 1991-2000, which again confirms our earlier results. The insignificant loading on $Foreign * Crisis$ indicates that, in July 1997- Dec 1999, while both foreign and local acquirers increased their shares acquired, we do not observe significant differences between the increase in shares acquired by foreign and Southeast Asian acquirers. When we repeat the estimation for the deals from the Asian nations that suffered most severely from the crisis (column (4)) and when we add country fixed effects (column (5)), we do not observe any significant changes in the results.

Overall, our empirical findings indicate that acquirers took larger stakes in their target firms during the Asian financial crisis. These findings are supportive of the key assumptions and the results of our theoretical analysis on asset sales during crises, fire sales, and entry of outsiders and foreign institutions.

In related evidence, Chari, Ouimet and Tesar (2010) investigate shareholder value gains from developed-market acquisitions of emerging-market targets and show that acquirer returns increase when the cost of capital, proxied by sovereign bond spreads, increases, which is a common feature of financial crises. While they show that including a dummy for whether the acquirer had the majority control after the acquisition renders the coefficient on the spread insignificant, it should be noted that it is more likely that the acquirers can get the majority control during crisis periods, as evidence provided from our empirical results, and as Aguiar and Gopinath (2005) suggests. Hence, combined with the evidence we provide and Aguiar and Gopinath (2005), we can interpret their findings as further evidence for our results.

This ownership with control view of FDI has also been taken by some recent studies analyzing the relative advantages of FDI and foreign portfolio investments (FPI) from the investors' viewpoint.[26] Goldstein and Razin (2006), for example, build a theoretical model

[26]For an introduction to this issue, see Albuquerque (2003).

where FDI investors take both ownership and control positions in the domestic firms and, hence, are in effect the managers of the firms under their control. Thus, when they invest directly through FDI, investors get more information about the fundamentals of the investment, and thereby can manage the project more efficiently, compared to their counterparts who invest indirectly through FPI. However, this generates a lemon's problem in that when direct investors try to sell the investment before maturity, a low resale price results due to asymmetric information between the owner and the potential buyers. Hence, investors with high expected liquidity needs who may experience a greater extent of forced sales are more likely to choose less control, that is, they would prefer FPI over FDI. They also show that an increase in transparency between owners and managers, that is, an increase in corporate governance standards, improves the efficiency of portfolio investments and thus attracts more FPI.[27] Our overall focus is different from their analysis in that we are concerned with the negative correlation of FPI and FDI (especially) during crisis, rather than on the overall composition of foreign investment.

## 4.3 Flipping

We now turn to perhaps the most distinctive prediction of our theory as compared to the previous literature - namely that assets acquired during a crisis are subsequently re-sold, or "flipped", once the crisis abates. We examine firms that were first sold during the period of July 1997 to December 1999, which were then subsequently re-sold.

Figure 2 provides a summary graph. It defines a "flip" as the subsequent sale for an acquisition that occurred during the crisis period (July 1997-Dec 1999), where the subsequent sale took place before July 2002, five years after the beginning of the crisis period (July 1997).[28] We employ the standard definition of a controlling acquisition as corresponding to a purchase of at least 10% of the target, but also a variant which requires the controlling acquisition to be at least 25% of the target. The identity of the first acquirer during the crisis period is then used to classify all acquisitions into Domestic acquisitions and Foreign acquisitions. The figure plots the cumulative percentage of flipped deals in each class as a function of the number of years since the acquisition. There is clear evidence of greater flipping for targets acquired by foreign firms during the crisis period. Foreign deals are flipped more often than domestic deals starting from year one, and the gap between the two only

[27] In a related paper, Goldstein, Razin and Tong (2007) empirically test the prediction of the theoretical model that source countries with higher probability of aggregate liquidity crises export relatively more FPI and less FDI, using data from 140 source countries for the period 1990-2004. They show that liquidity shocks have strong effects on the composition of foreign investment.

[28] Our flipping results are not senstive to our choice of the re-sale ending date of July 2002. We also examined subsequent sales that took place after July 2002 and find that all of our flipping results hold.

widens as more time elapses. Five years after acquisition, 6.16% of foreign deals get flipped as compared to 3.49% of domestic deals.

Notably, the flipping pattern is not present in non-crisis periods. Using deals that occurred during the pre-crisis period of 1991-1994 from SDC Platinum and we repeat our flipping analysis. For the pre-crisis period, a "flip" is defined as the subsequent sale for an acquisition that occurred during 1991-1994, where the subsequent sale took place before June 1997.[29] We find that foreign acquirers did not flip more often than domestic acquirers during 1991-1994. Figures 3 is the counterpart of Figure 2, and it shows that the percentage of domestic flip is actually slightly higher than that of foreign flip. This finding is the opposite of that found during the July 1997-Dec 1999 period, supporting the model's prediction that foreign buyers flip more often when the initial acquisition took place during the crisis period (when assets are available at fire-sale prices).

As a further robustness check, we divided our sample into deals from Asian countries that suffered severely from the Asian financial crisis (Indonesia, Malaysia, Philippines, Thailand, South Korea) and deals from other Southeast Asian countries that were not as severely affected by the crisis. Our goal is to show that our main findings are driven by deals from countries that suffered severely from the crisis. Figure 12A shows that, for the severe crisis countries, 6.24% of foreign deals are flipped, much higher compared to the 3.38% of domestic firms that are flipped. Note that this flipping-rate difference is slightly higher than that of the overall sample. On the contrary, Figure 12B shows that, for the mild crisis countries, flipping rates are not different between foreign and domestic acquirers. Finally, Figure 13A and 13B replicate Figure 12A and 13B with the 1991-1994 (pre-crisis) sample period. Just as in the overall sample, we find that in neither the high-crisis nor non-crisis nations, foreign acquirers flipped more than domestic acquirers during 1991-1994.

A few descriptive statistics about the flipped deals are noteworthy. First, on average as well as based on medians, the flip involves a sale of at least as much as the original acquisition of the target, and generally 25% greater, for both domestic and foreign flips. Second, the result on greater flipping by foreign acquirers during crisis is also robust to employing a majority stake of 50% being employed as the threshold for identifying controlling acquisitions.

To provide further back-up, we run the following probit regression on acquisitions made during July 1997-Dec 1999.

$$\Pr[Flip = 1] = f(Foreign) + e. \tag{12}$$

The above equation represents the probability of flipping of a deal as a function of whether its acquirer is foreign or domestic. *Flip* equals 1 if the deal is eventually flipped by and equals

[29] Again, our flipping results are not senstive to our choice of the re-sale ending date of June 1997. We chose June 1997, just before the start of the crisis, to avoid any crisis period effect.

0 if the deal is not flipped, and $Foreign$ is a dummy variable that equals zero if the acquirer is from South East Asia (including South Korea) and equals one if the acquirer is not from Southeast Asia.

Table 6 column (1) presents the estimation results. The standard errors are clustered by the interaction of the target nation and the year of acquisition. Observe that the estimated coefficient of $Foreign$ is 0.402 and is highly significant, indicating that the flipping rate of foreign buyers is higher than that of domestic buyers. When we repeat the estimation for the sample of deals from the Asian nations that suffered most severely from the crisis (Indonesia, Malaysia, Philippines, Thailand, South Korea), we find stronger results. Table 6 column (2) shows that the estimated coefficient of $Foreign$ is 0.428 for this high-crisis sample.

To bolster the earlier evidence that foreign firms flipping more is a phenomenon restricted to the financial crisis period, we modify the test as follows:

$$\Pr[Flip = 1] = f(Foreign + Crisis + Foreign * Crisis) + e. \tag{13}$$

We estimate this equation using all deals completed from July 1997 to December 1999. For each deal, $Crisis$ equals one if it took place in July 1997-Dec 1999 and equals zero if it took place in 1991-1994. The $Crisis$ variable is then interacted with $Foreign$. Table 6 column (3) reports the estimation result. The standard errors are again clustered by the interaction of the target nation and year of acquisition. We observe that the estimated coefficients of $Foreign$ and $Foreign{*}Crisis$ are -0.050 and 0.451. The coefficient on $Foreign$ is insignificant, which suggests that, overall, foreign acquirers did not flip more than domestic acquirers. The positive and significant loading on $Foreign * Crisis$ indicates that it is only in July 1997-Dec 1999, that foreign acquirers flipped more than domestic acquirers. When we repeat the estimation for the sample of deals from the Asian nations that suffered most severely from the crisis, we find similar results (Table 6 column (4)). We repeat the estimation by adding a country fixed effect in column (5) and country and time fixed effects in column (6). The country fixed effect controls for the target's nation and the time fixed effect controls for the year of acquisition. The results in columns (5) and (6) are close to that in column (3).

The evidence is supportive that flipping of acquisitions made by foreign firms during a financial crisis is a robust economic phenomenon. However, the overall picture is that domestic acquisitions from the crisis are less likely to be flipped than domestic acquisitions during non-crisis periods. Rate of flipping by foreign acquisitions appear to be stable over periods while domestic crisis acquisitions are less likely to be flipped. In this sense, using the domestic acquisitions as the relevant benchmark is important, as the overall flipping rate varies. The interpretation would be that there is some underlying "natural" cyclical rate of flipping and that domestic acquirers are the relevant benchmark.

# 5 Concluding Remarks

After the Asian financial crisis, the evils of short-term debt financing were much decried, and stable FDI financing was held up as the model for how development can be financed. Our paper is a more nuanced take on the issue. Ironically, it is only when matters are very bad that FDI comes into its own.

The role of such foreign takeovers has generated much heated popular debate. Newbridge Capital, a US private equity group that paid the Korean government $480m for the 49 percent shares of the Korea First Bank during the crisis, but who managed to exit by selling to Standard Chartered for $3.3bn in cash. Newbridge Capital is reported to have made a nearly three-fold return on its initial investment.[30] The consortium led by Carlyle Group, a Washington D.C. based global private equity investment firm, and J.P. Morgan Chase sold 36.6 percent of KorAm Bank, South Korea's sixth-largest bank, to Citigroup Inc. in cash in February 2004 for a deal that valued the bank at $2.73 billion. The consortium of Carlyle and J.P. Morgan Chase has been reported to have made a return of 2.3 times its original KorAm investment of $430 million in 2000.[31]

However, not all foreign investors have done as well. Emblematic of the controversy has been the saga of Korea Exchange Bank (KEB), which is still grabbing news headlines 13 years after the Asian financial crisis. KEB was acquired by Commerzbank during the crisis, and was sold to Lone Star Funds, a Dallas-based buyout company, for $1.4 billion in October 2003. In January 2006, Lone Star announced plans to sell its controlling stake to Kookmin bank, one of the large local banks. The price had tripled to $4.9 billion. However, the regulators raised objections and the deal was scuppered. In 2010, Lone Star reached agreement with Hana Financial, one of the large local bank holding companies in Korea. At the time of writing, this deal, too, has come into trouble due to legal and regulatory hurdles.

The key messages of our paper is that financial distress explains much of FDI. We have highlighted how agency problems in distress prevent arm's length investors from providing

[30] Newbridge also exercised its rights to require the South Korean government, which controls the remaining 51 percent, to sell its shares as part of the same deal.

[31] While there may be alternative explanations for foreign investors flipping their domestic acquisitions, empirical and anecdotal evidence does not support such explanations. One possible explanation can be that during a crisis it is much more difficult to ascertain the quality of potential acquisition targets compared to the normal times. Hence, foreign investors can make poor choices during crises and sell their assets at the first opportunity. However, the evidence from Aguiar and Gopinath (2005) discussed in Section 4.1 and the (anecdotal) evidence here about the profits foreign investors make through acquisitions and subsequent flipping does not support this alternative explanation. Another possibility is related with the definition of FDI, that is, investments over the 10 percent equity threshold. However, the evidence presented in section 4.2 shows that the acquisitions during the crisis years 1996-2000 represented, on average, stakes greater than 50 percent. Furthermore, our flipping results are robust when we use the 25 percent equity threshold.

much finance, but that transfer of significant control could get around these agency costs. By modeling the critical factors that determine efficiency of such flows, our model offers a framework to analyze normative issues.

# References


[1] Acharya, Viral, Sreedhar Bharath and Anand Srinivasan, 2007, Does Industry-wide Distress Affect Defaulted Firms? - Evidence from Creditor Recoveries, *Journal of Financial Economics*, 85(3): 787-821.

[2] Acharya, Viral, Oliver Gottschalg, Moritz Hahn and Conor Kehoe. 2009. Corporate Governance and Value Creation: Evidence from Private Equity, Working paper, New York University Stern School of Business.

[3] Acharya, Viral, and Tanju Yorulmazer, 2008, Cash-in-the-market Pricing and Optimal Resolution of Bank Failures, *Review of Financial Studies*, 21, 2705-2742.

[4] Aguiar, Mark, and Gita Gopinath, 2005, Fire-Sale FDI and Liquidity Crises, *The Review of Economics and Statistics*, 87(3): 439-542.

[5] Aitken, Brian J. and Ann E. Harrison, 1999, Do Domestic Firms Benefit from Foreign Investment? Evidence from Venezuela, *American Economic Review*, 89(3), 605-618.

[6] Albuquerque, Rui, 2003, The Composition of International Capital Flows: Risk Sharing Through Foreign Direct Investment, *Journal of International Economics*, 61: 353-83.

[7] Alfaro, Laura, Areendam Chanda, Sebnem Kalemli-Ozcan and Selin Sayek, 2004, FDI and Economic Growth: The Role of Local Financial Markets, *Journal of International Economics*, 64(1), 89-112.

[8] Allen, Franklin, and Douglas Gale, 1994, Liquidity Preference, Market Participation and Asset Price Volatility, *American Economic Review*, 84: 933–955.

[9] Allen, Franklin, and Douglas Gale, 1998, Optimal Financial Crises, *Journal of Finance*, 53: 1245–1284.

[10] Axelson, Ulf, Per Stromberg and Michael Weisbach. 2009. "Why Are Buyouts Levered? The Financial Structure of Private Equity Firms" *Journal of Finance*, 64:4, 1549-1582

[11] Baker, Malcolm, C. Fritz Foley and Jeffrey Wurgler, 2009, Multinationals as Arbitrageurs? The Effect of Stock Market Valuations on Foreign Direct Investment, *Review of Financial Studies*, 22(1), 337-369.

[12] Berger, Philip, Eli Ofek and Itzhak Swary, 1996, Investor Valuation of the Abandonment Option, *Journal of Financial Economics,* 42: 257–287.

[13] Blonigen, Bruce A., 1997, Firm Specific Assets and the Link Between Exchange Rates and Foreign Direct Investment, *American Economic Review*, 87(3), 447-465.

[14] Borensztein, E., J. De Gregorio and J.W. Lee, 1998, How Does Foreign Investment Affect Growth?, *Journal of International Economics*, 45, 115-135.

[15] Chari, Anusha, Paige Ouimet and Linda Tesar, 2010, "The Value of Control in Emerging Markets" *Review of Financial Studies*, 23 (4), 1741-1770.

[16] Froot, Kenneth A. and Jeremy C. Stein, 1991, Exchange Rates and Foreign Direct Investment: An Imperfect Capital Markets Approach, *The Quarterly Journal of Economics*, 106(4): 1191-1217.

[17] Goldstein, Itay and Assaf Razin, 2006, An Information-based Trade off Between Foreign Direct Investment and Foreign Portfolio Investment, *Journal of International Economics*, 70: 271-95.

[18] Goldstein, Itay, Assaf Razin and Hui Tong, 2007, Systemic Liquidity and the Composition of Foreign Investment: Theory and Empirical Evidence, Mimeo.

[19] Hart, Oliver, and John Moore, 1994, A Theory of Debt Based on the Inalienability of Human Capital, *Quarterly Journal of Economics*, 109(4): 841–879.

[20] Holmstrom, Bengt, and Jean Tirole, 1998, Private and Public Supply of Liquidity, *Journal of Political Economy*, 106(1): 1–40.

[21] Krugman, Paul, 1998, Fire-sale FDI, http://web.mit.edu/krugman/www/FIRESALE.htm.

[22] Loungani, Prakash, and Assaf Razin, 2001, How Beneficial Is Foreign Direct Investment for Developing Countries?, *Finance and Development*, IMF, 38 (2) http://www.imf.org/external/pubs/ft/fandd/2001/06/loungani.htm.

[23] Pulvino, Todd C., 1998, Do Asset Fire Sales Exist: An Empirical Investigation of Commercial Aircraft Sale Transactions, *Journal of Finance*, 53: 939-978.

[24] Shleifer, Andrei, and Robert Vishny, 1992, Liquidation Values and Debt Capacity: A Market Equilibrium Approach, *Journal of Finance*, 47: 1343-1366.

[25] Smith, Katherine A. and Diego Valderrama, 2009, The Composition of Capital Flows When Emerging Market Firms Face Financing Constraints, *Journal of Development Economics*, 89(2), 223-234.

[26] Stromberg, Per, 2000, Conflicts of Interest and Market Illiquidity in Bankruptcy Auctions: Theory and Tests, *Journal of Finance*, 55: 2641–2692.

[27] Stromberg, Per, 2008, "The New Demography of Private Equity" working paper, Stockholm School of Economics http://www.sifr.org/pdfs/stromberg(demography2008).pdf

[28] Williamson, Oliver E., 1988, Corporate Finance and Corporate Governance, *Journal of Finance*, 43: 567–592.

**Table 1: Correlation between Foreign Direct Investment (FDI) and Foreign Portfolio Investment (FPI) in Asia in sub-periods.**

| Country | Thailand | Philippines | Malaysia | Korea | Indonesia |
|---|---|---|---|---|---|
| **1980-1995, 2001-2005** | | | | | |
| Correl(FDI,FPI) | 0.51 | 0.66 | 0.00 | 0.74 | 0.72 |
| Correl(FDI,FPI Debt) | 0.05 | 0.73 | -0.20 | 0.68 | 0.78 |
| **1996-2000** | | | | | |
| Correl(FDI,FPI) | -0.52 | -0.61 | -0.11 | -0.43 | 0.59 |
| Correl(FDI,FPI Debt) | -0.45 | -0.75 | -1.00 | -0.85 | 0.85 |

Source: IMF International Financial Statistics. FDI is line 78bed (Direct investment in the Reporting Economy), which represents flows of direct investment capital into the country. This includes equity capital, reinvested earnings, other capital, and financial derivatives associated with various intercompany transactions between affiliated enterprises. Excluded are flows of direct investment capital for exceptional financing, such as debt-for-equity swaps. FPI is line 78bgd (Portfolio Investment Liabilities), which include transactions with non-residents in financial securities of any maturity (such as corporate securities, bonds, notes, and money market instruments) other than those included in direct investment, exceptional financing, and reserve assets. Under this we have: Debt securities liabilities (line 78bnd) cover (i) bonds, debentures, notes, etc. and (ii) money market or negotiable debt instruments.

**Table 2: Summary of Deals by Target Country**

| Target Nation | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | Total Obs. | Total % | Median Ent. Value ($mil) | Median Trans. Value ($mil) | % Domestic Acq. | % Foreign Acq. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Malaysia | 130 | 59 | 120 | 183 | 366 | 504 | 431 | 358 | 356 | 298 | 2805 | 40.33 | 342.89 | 5.91 | 86.10 | 13.90 |
| Singapore | 91 | 97 | 104 | 123 | 146 | 144 | 144 | 170 | 263 | 269 | 1551 | 22.30 | 241.70 | 5.55 | 64.86 | 35.14 |
| Thailand | 22 | 23 | 29 | 37 | 78 | 48 | 90 | 164 | 158 | 124 | 773 | 11.11 | 179.09 | 10.14 | 51.62 | 48.38 |
| South Korea | 22 | 7 | 12 | 16 | 33 | 44 | 44 | 98 | 179 | 171 | 626 | 9.00 | 2170.56 | 38.37 | 47.76 | 52.24 |
| Philippines | 17 | 9 | 30 | 41 | 82 | 99 | 56 | 70 | 112 | 83 | 599 | 8.61 | 295.49 | 11.00 | 55.43 | 44.57 |
| Indonesia | 29 | 18 | 29 | 33 | 50 | 84 | 74 | 61 | 53 | 76 | 507 | 7.29 | 1366.27 | 16.80 | 38.86 | 61.14 |
| Vietnam | 0 | 1 | 8 | 10 | 3 | 7 | 6 | 3 | 17 | 5 | 60 | 0.86 | * | 1.27 | 25.00 | 75.00 |
| Cambodia | 0 | 0 | 1 | 1 | 1 | 3 | 2 | 1 | 1 | 2 | 12 | 0.17 | * | 0.36 | 16.67 | 83.33 |
| Myanmar | 2 | 0 | 2 | 0 | 2 | 1 | 3 | 1 | 0 | 0 | 11 | 0.16 | * | 4.68 | 9.09 | 90.91 |
| Brunei | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 | 1 | 2 | 8 | 0.12 | * | 1.17 | 0.00 | 100 |
| Laos | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0.04 | * | 10.20 | 0.00 | 100 |
| Total | 313 | 214 | 337 | 444 | 761 | 934 | 850 | 930 | 1140 | 1032 | 6955 | 100 | 308.93 | 8.42 | 67.09 | 32.91 |

* Data is missing.

## Table 3: Summary of Deals by Acquirer Type

**Panel A: Total Deal Count**

| | Crisis (July 1997- Dec 1999) | | Non-crisis (Jan 1991- Dec 1994) | | Crisis - Non-crisis |
|---|---|---|---|---|---|
| Acquirer Type | Deals (#) | Deals (%) | Deals (#) | Deals (%) | Diff (Deals (%)) |
| Domestic | 1499 | 63.6% | 858 | 68.2% | -4.6%*** |
| Within SE Asia (but not domestic) | 142 | 6.0% | 95 | 7.6% | -1.5%* |
| Foreign | 717 | 30.4% | 305 | 24.2% | 6.2%*** |
| Total | 2358 | 100.0% | 1258 | 100.0% | |

**Panel B: Total Deal Value (Transaction Value ($mil))**

| | Crisis (July 1997- Dec 1999) | | Non-crisis (Jan 1991- Dec 1994) | | Crisis - Non-crisis |
|---|---|---|---|---|---|
| Acquirer Type | Total Value ($mil) | Total Value (%) | Total Value ($mil) | Total Value (%) | Diff (Total Value (%)) |
| Domestic | 53,153 | 57.0% | 29,489 | 84.0% | -26.9%*** |
| Within SE Asia (but not domestic) | 3,064 | 3.3% | 613 | 1.7% | 1.5%*** |
| Foreign | 36,959 | 39.7% | 5,010 | 14.3% | 25.4%*** |
| Total | 93,176 | 100.0% | 35,112 | 100.0% | |

## Table 4: Summary Statistics of M&A Transactions

**Panel A: Southeast Asian Acquirers**

| | All | | | Crisis (July 1997- Dec 1999) | | | Non-crisis (Jan 1991- Dec 1994) | | | Crisis - Non-crisis |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Std. Dev. | Mean | Median | Std. Dev. | Mean | Median | Std. Dev. | Diff (Mean) |
| Shares Acquired (%) | 61.1 | 60.0 | 36.7 | 64.9 | 70.9 | 36.5 | 53.4 | 50.0 | 36.7 | 11.5*** |
| Shares Owned (%) | 66.6 | 75.0 | 35.0 | 70.9 | 100.0 | 34.4 | 58.1 | 55.0 | 35.9 | 12.8*** |
| Shares Sought (%) | 61.3 | 60.0 | 36.6 | 64.6 | 70.0 | 36.5 | 54.2 | 50.0 | 36.5 | 10.4*** |

**Panel B: Foreign Acquirers**

| | All | | | Crisis (July 1997- Dec 1999) | | | Non-crisis (Jan 1991- Dec 1994) | | | Crisis - Non-crisis |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mean | Median | Std. Dev. | Mean | Median | Std. Dev. | Mean | Median | Std. Dev. | Diff (Mean) |
| Shares Acquired (%) | 51.8 | 49.0 | 35.1 | 54.6 | 50.0 | 34.6 | 48.3 | 44.2 | 33.8 | 6.3** |
| Shares Owned (%) | 58.4 | 51.0 | 35.8 | 62.5 | 60.1 | 34.9 | 51.7 | 49.0 | 34.7 | 10.8*** |
| Shares Sought (%) | 52.4 | 49.0 | 35.1 | 54.4 | 50.0 | 34.6 | 49.5 | 46.0 | 33.9 | 4.9** |

**Table 5: Determinants of Shares Acquired (%)**

This table analyses the shares acquired (%) in acquisitions as a function of the time period (July 1997-Dec 1999 vs. 1991-1994) and the acquire type (domestic vs. foreign). The six columns report the estimation results (coefficients and p-values) of six different probit regressions. Column (1) analyses only acquisitions made in July 1997-Dec 1999. It models % shares acquired as a function of whether the acquirer is foreign or domestic as follows:

$$Acq\%_i = f(Foreign_i) + e_i$$

The above is a probit regression, in which $Acq\%_i$ is the % of shares acquired and $Foreign_i$ is a dummy variable that equals zero if the acquirer is from Southeast Asia (including South Korea) and equals one if the acquirer is not from Southeast Asia.

Column (2) repeats the estimation of (1), but only with deals from the Asian nations that suffered most severely from the Asian financial crisis (Indonesia, Malaysia, Philippines, Thailand, South Korea). Column (3) analyses all acquisitions from 1991-2000, and adds a crisis period dummy, and an interaction of the crisis dummy with $Foreign_i$ as follows::

$$Acq\%_i = f(Foreign_i + Crisis_i + Foreign_i * Crisis_i) + e_i$$

In the above, $Crisis_i$ equals one if the acquisition took place in July 1997-Dec 1999 and equals zero if it took place in 1991-1994.

Column (4) repeats the estimation of (3), but only with deals from the Asian nations that suffered most severely from the Asian financial crisis (Indonesia, Malaysia, Philippines, Thailand, South Korea). Column (5) adds a country fixed effect to (3) to control for the target's country. Column (1) is estimated from 2209 observations, column (2) from 1733 observations, columns (3) and (5) from 3380 observations, and column (4) from 2505 observations.

| | | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|---|
| **Constant** | Coefficient | 0.232 | 0.254 | 0.071 | 0.089 | |
| | p-value | 0.0004 | 0.0015 | 0.166 | 0.187 | |
| **Foreign** | Coefficient | -0.158 | -0.240 | -0.116 | -0.179 | -0.087 |
| | p-value | 0.005 | <0.0001 | 0.091 | 0.053 | 0.193 |
| **Crisis period** | Coefficient | | | 0.163 | 0.168 | 0.216 |
| | p-value | | | 0.051 | 0.109 | 0.001 |
| **Foreign * Crisis period** | Coefficient | | | -0.043 | -0.062 | -0.077 |
| | p-value | | | 0.629 | 0.558 | 0.380 |
| **Country fixed-effects** | | | | | | x |
| **Crisis nations only** | | | x | | x | |

**Table 6: Determinants of the probability of flipping**

This table analyses the flipping rates of domestic and foreign buyers. The six columns report the estimation results (coefficients and p-values) of six different probit regressions. Column (1) analyses only acquisitions made in July 1997-Dec 1999. It models the probability of flipping as a function of whether the acquirer is foreign or domestic as follows:

$$Acq\%_i = f(Foreign_i) + e_i$$

The above is a probit regression, in which $Flip_i$ equals one if the deal is flipped and equals zero if the deal is not flipped. $Foreign_i$ is a dummy variable that equals zero if the acquirer is from Southeast Asia (including South Korea) and equals one if the acquirer is not from Southeast Asia.

Column (2) repeats the estimation of (1), but only with deals from the Asian nations that suffered most severely from the Asian financial crisis (Indonesia, Malaysia, Philippines, Thailand, South Korea). Column (3) analyses all acquisitions from 1991-2000, and adds a crisis period dummy, and an interaction of the crisis dummy with $Foreign_i$ as follows:

$$Pr\ (Flip_i=1)=f(Foreign_i + Crisis_i + Foreign_i * Crisis_i) + e_i$$

In the above, $Crisis_i$ equals one if the acquisition took place in July 1997-Dec 1999 and equals zero if it took place in 1991-1994.

Column (4) repeats the estimation of (3), but only with deals from the Asian nations that suffered most severely from the Asian financial crisis (Indonesia, Malaysia, Philippines, Thailand, South Korea). Column (5) adds a country fixed effect to (3) to control for the target's nation. Column (6) has both country and time fixed effects. The time fixed effect is added to control for the year of acquisition. Column (1) is estimated from 1960 observations, column (2) from 1552 observations, columns (3), (5), and (6) from 2930 observations, and column (4) from 2204 observations.

| | | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|---|
| **Constant** | Coefficient | -1.948 | -1.980 | -1.345 | -1.312 | | |
| | p-value | <0.0001 | <0.0001 | <0.0001 | <0.0001 | | |
| **Foreign** | Coefficient | 0.402 | 0.428 | -0.050 | -0.041 | -0.105 | -0.087 |
| | p-value | <0.0001 | <0.0001 | 0.69 | 0.83 | 0.42 | 0.52 |
| **Crisis period** | Coefficient | | | -0.603 | -0.610 | -0.521 | |
| | p-value | | | <0.0001 | <0.0001 | <0.0001 | |
| **Foreign * Crisis period** | Coefficient | | | 0.451 | 0.418 | 0.319 | 0.274 |
| | p-value | | | 0.004 | 0.056 | 0.040 | 0.088 |
| **Time fixed-effects (acquisition year)** | | | | | | | x |
| **Country fixed-effects** | | | | | | x | x |
| **Crisis nations only** | | | x | | x | | |

**Figure 1a: FDI and FPI for S Korea (1990-2005)**

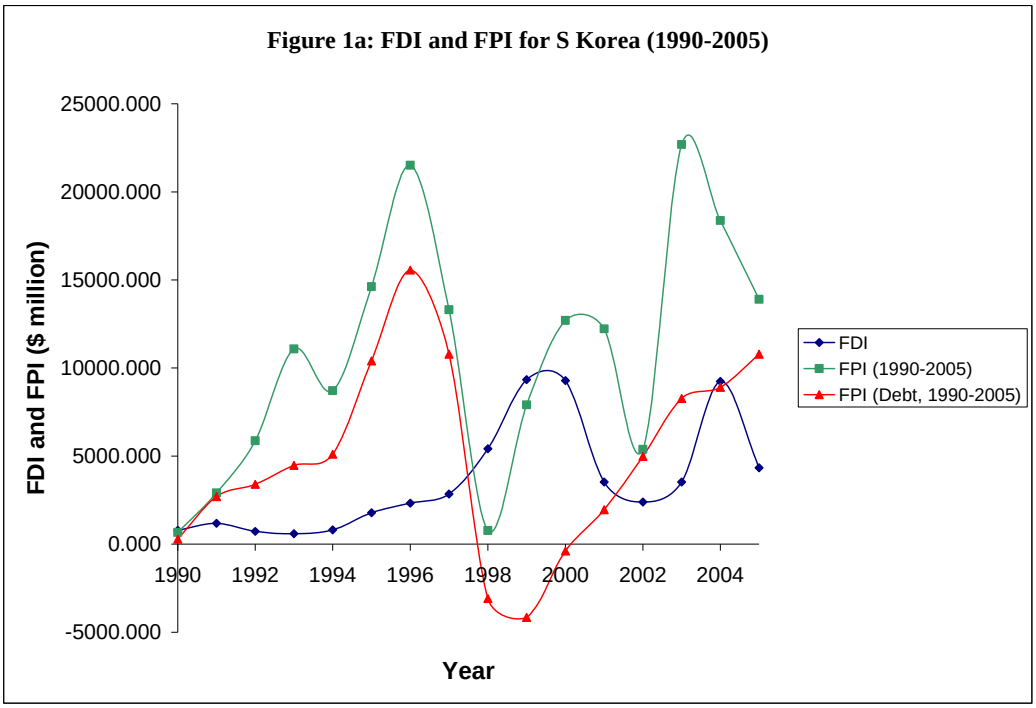
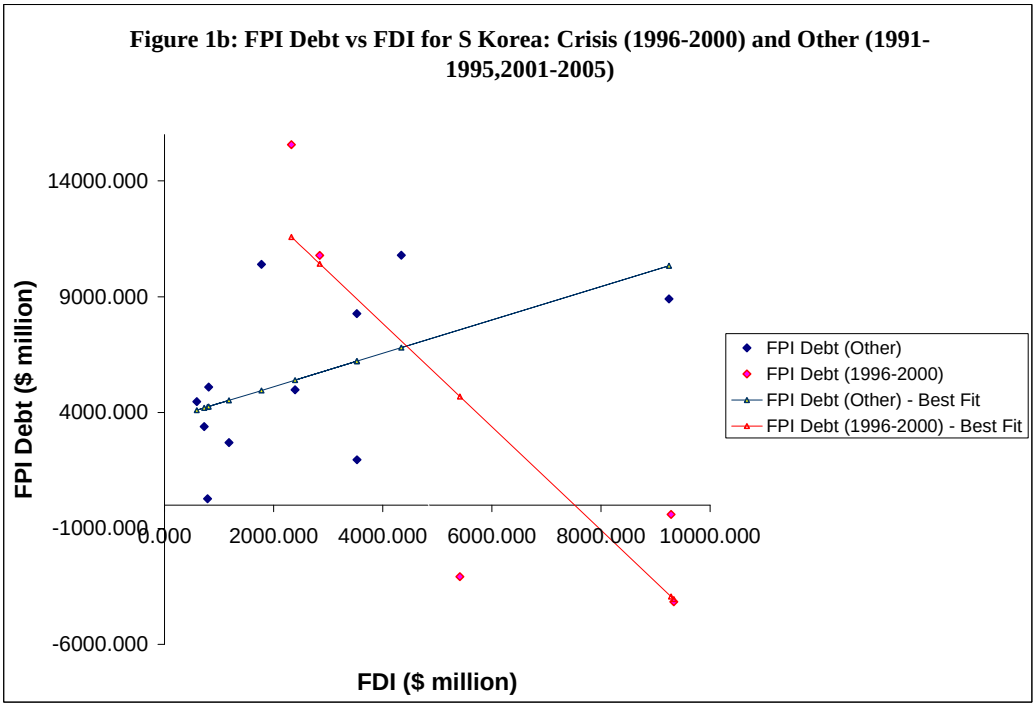
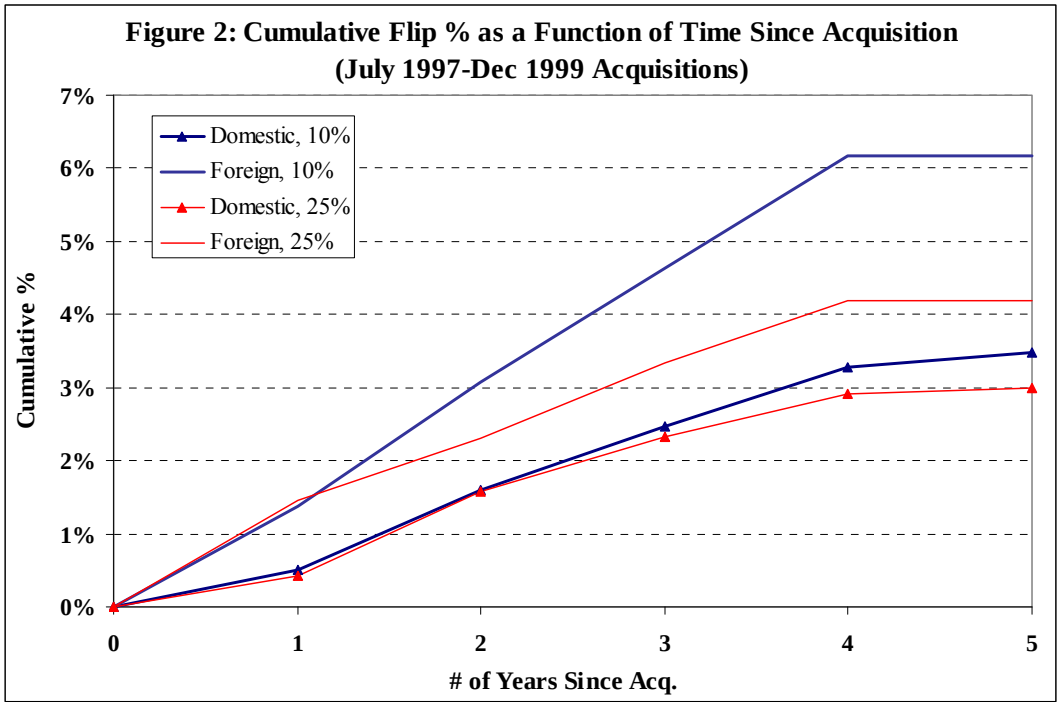
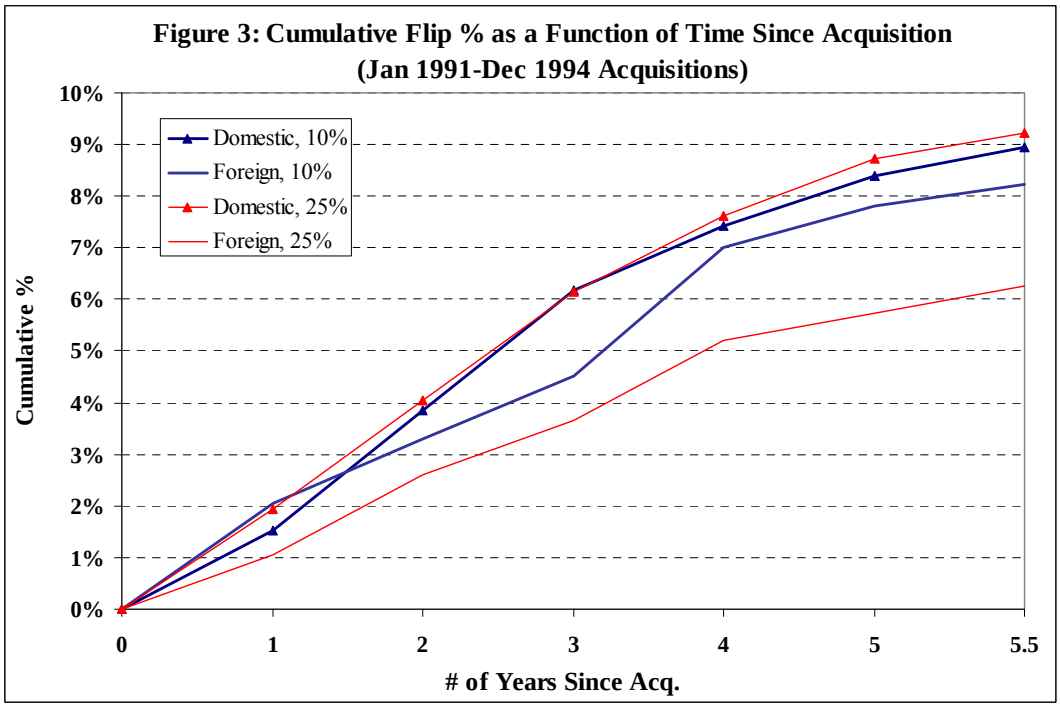



**Figure 1b: FPI Debt vs FDI for S Korea: Crisis (1996-2000) and Other (1991-1995,2001-2005)**




Figure 2: Cumulative Flip % as a Function of Time Since Acquisition
(July 1997-Dec 1999 Acquisitions)
Domestic, 10%
Foreign, 10%
Domestic, 25%
Foreign, 25%
Cumulative %
7%
6%
5%
4%
3%
2%
1%
0%
0
1
2
3
4
5
# of Years Since Acq.


Figure 3: Cumulative Flip % as a Function of Time Since Acquisition
(Jan 1991-Dec 1994 Acquisitions)
Domestic, 10%
Foreign, 10%
Domestic, 25%
Foreign, 25%
Cumulative %
10%
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
0
1
2
3
4
5
5.5
# of Years Since Acq.

| $t = 0$ | $t = 1$ | States | |
|---|---|---|---|
| | • Returns from the risky investments are realized. | $k \leq \underline{k}$ | • Price is the full price, $\overline{p}$.<br>• All assets are purchased by surviving firms. |
| • Domestic firms invest in risky projects using their own capital. | • A proportion $k$ of domestic firms fail. | $\underline{k} < k \leq \overline{k}$ | • Price is decreasing as a function of $k$ but is still above the threshold value of foreigners, $\underline{p}$.<br>• All assets are purchased by surviving firms. |
| | • Failed firms are auctioned to surviving firms and foreigners. | $k > \overline{k}$ | • Price is the threshold value of foreigners, $\underline{p}$.<br>• Some assets are purchased by foreigners. |

**Figure 4**: Timeline of the benchmark model.

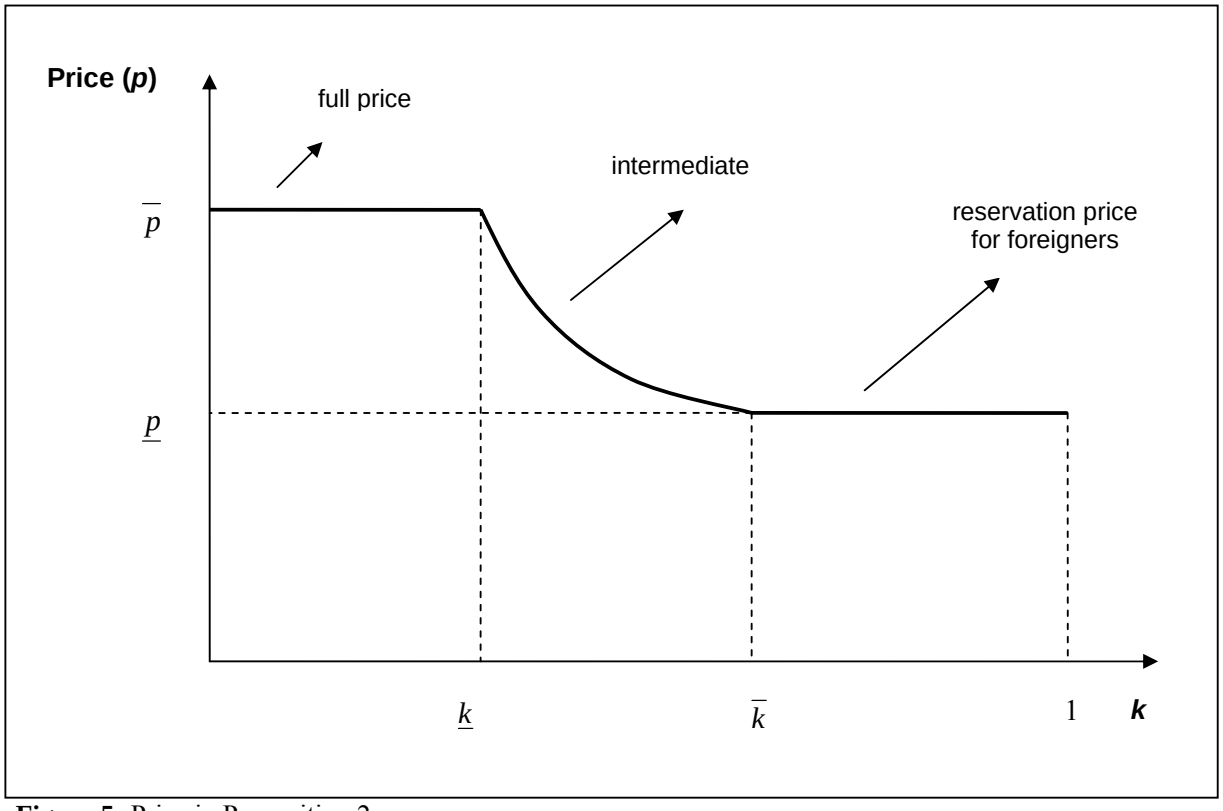



**Figure 5:** Price in Proposition 2.

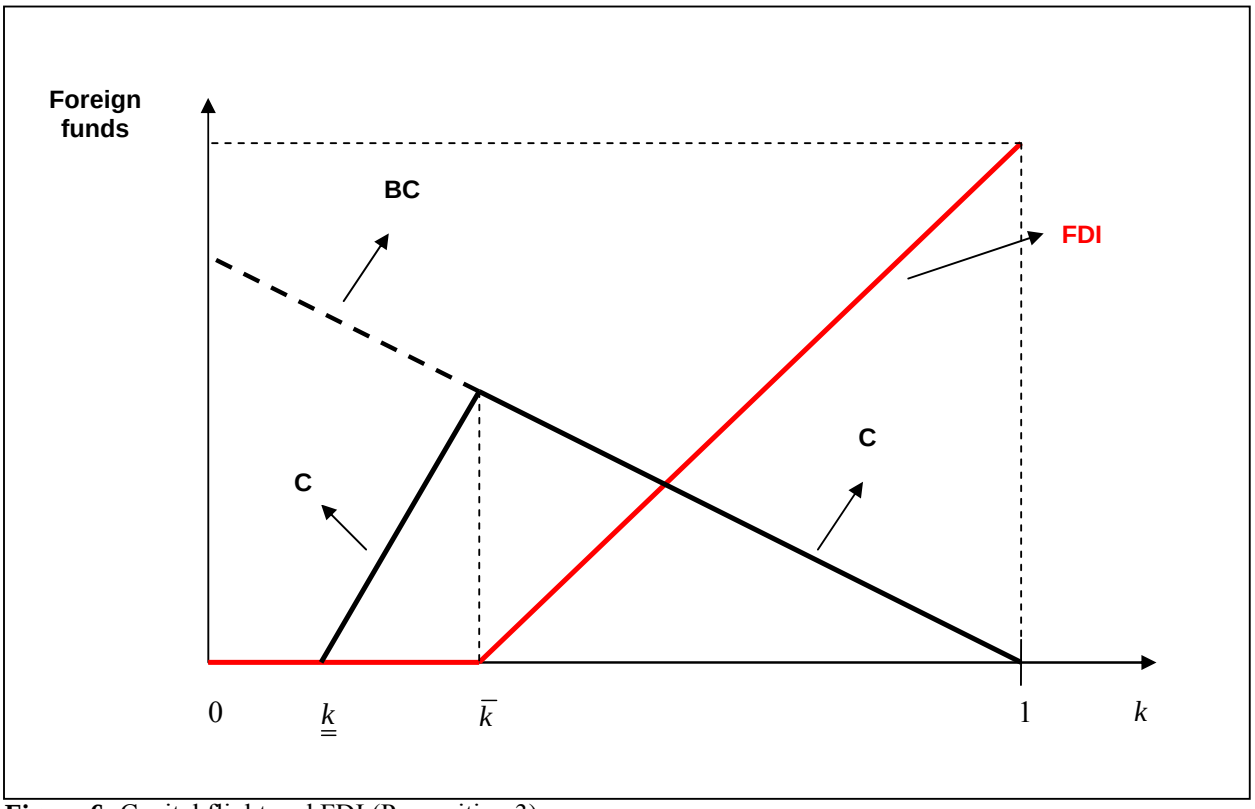



**Figure 6:** Capital flight and FDI (Proposition 3).

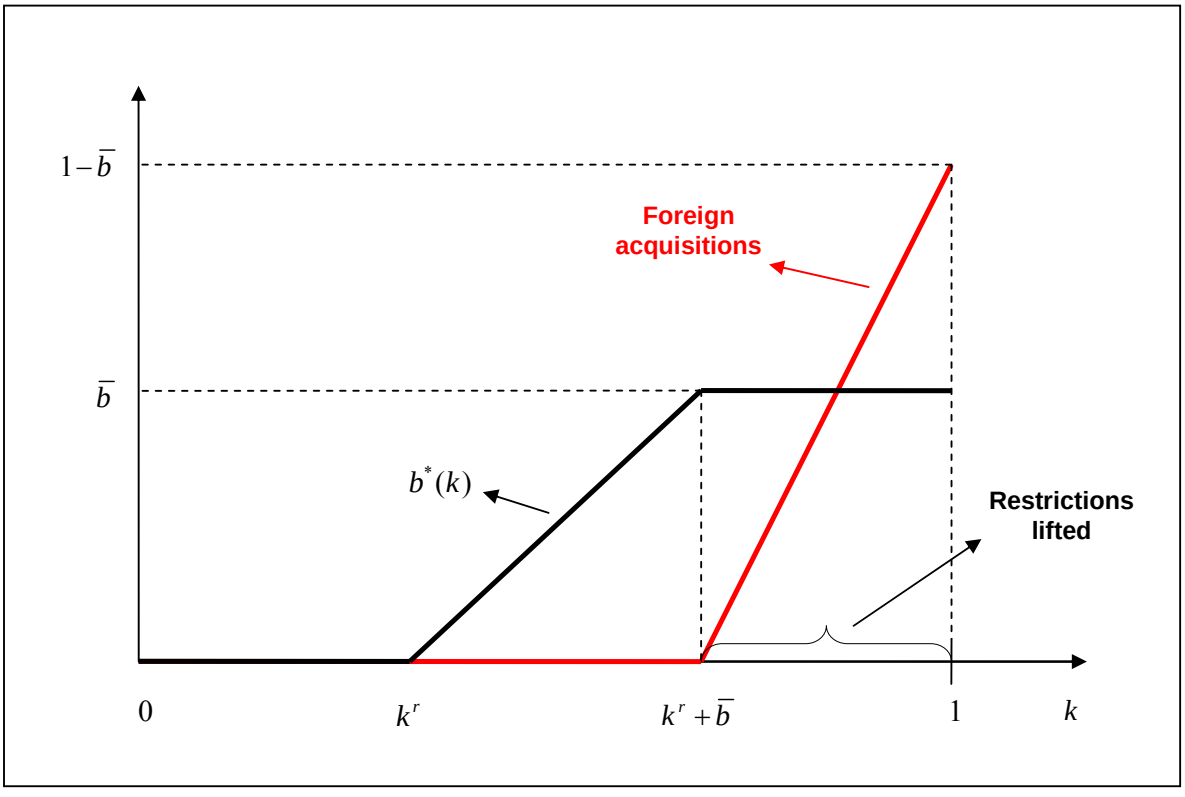



**Figure 7:** Resolution policy (Proposition 4)

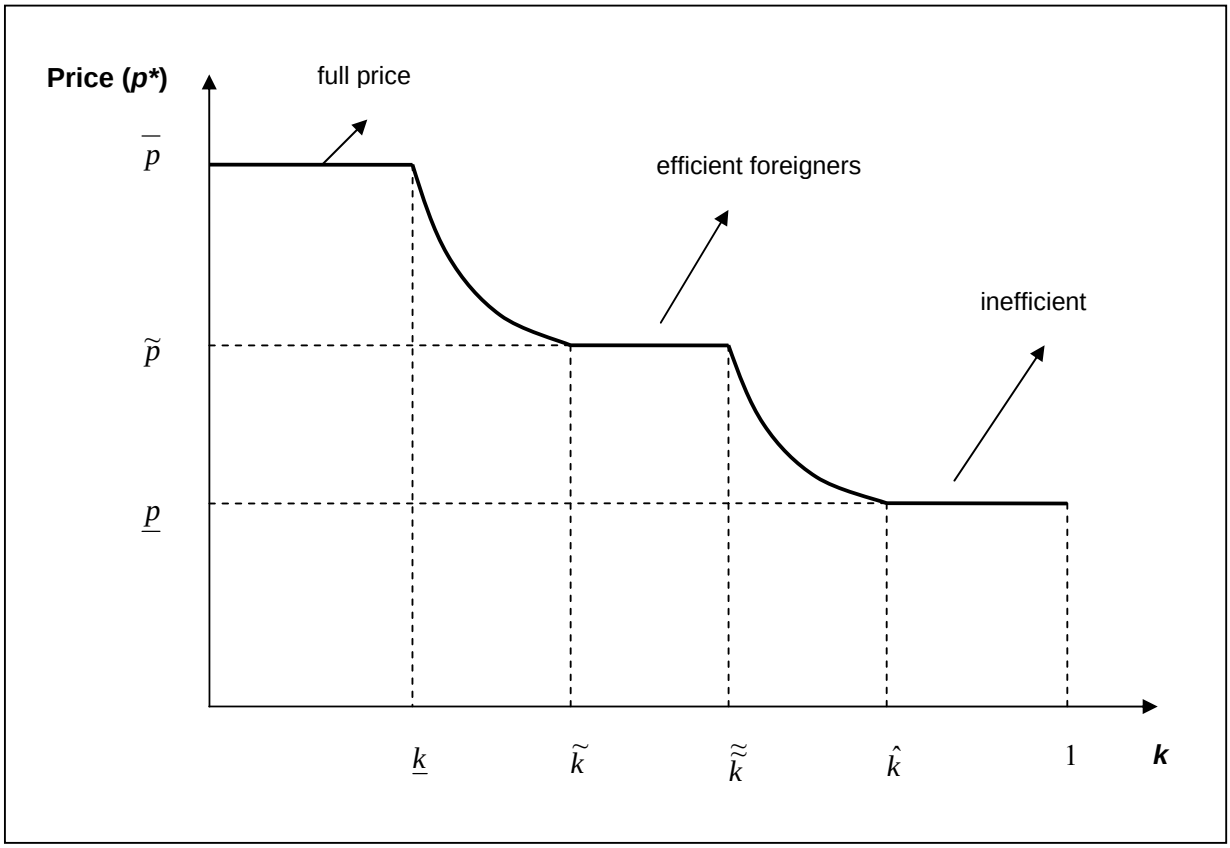



**Figure 8:** Price with differential efficiency levels of foreigners (Proposition 5).

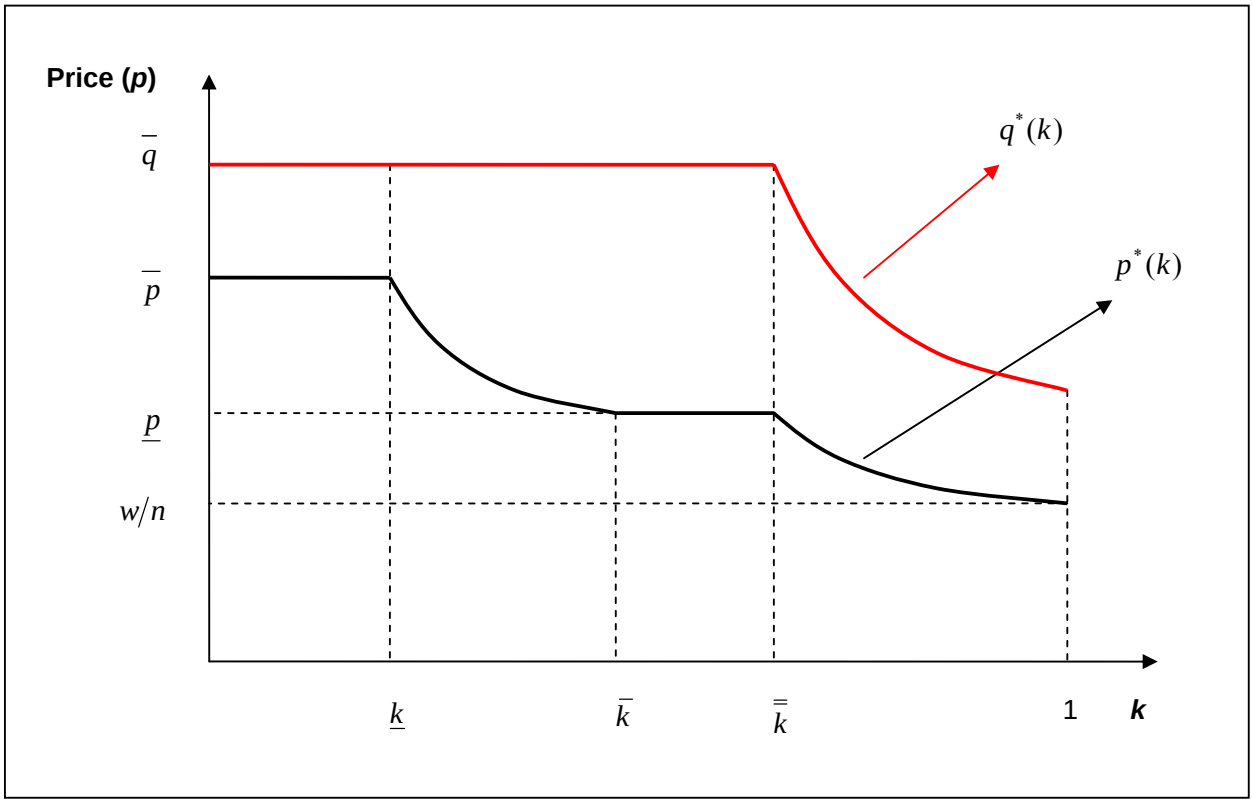



**Figure 9a:** Prices with limited outsider funds (Proposition 6).

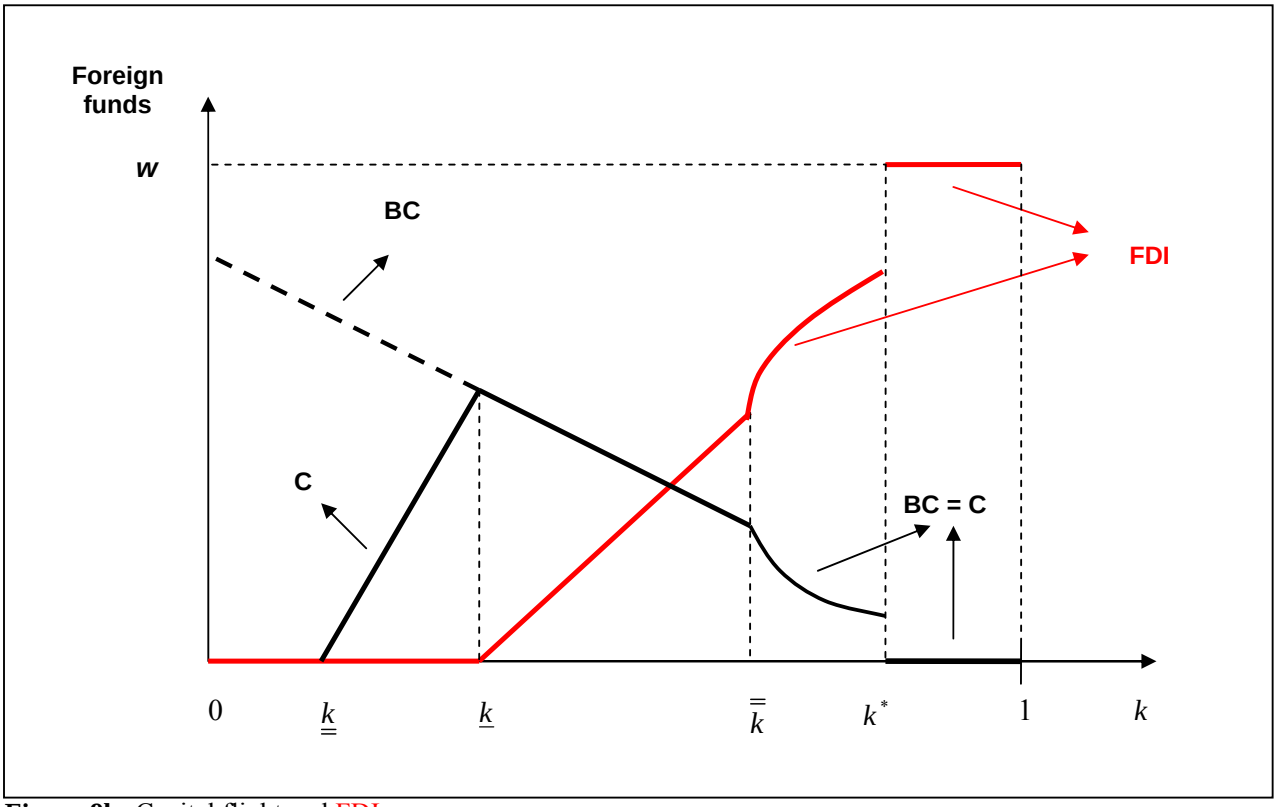
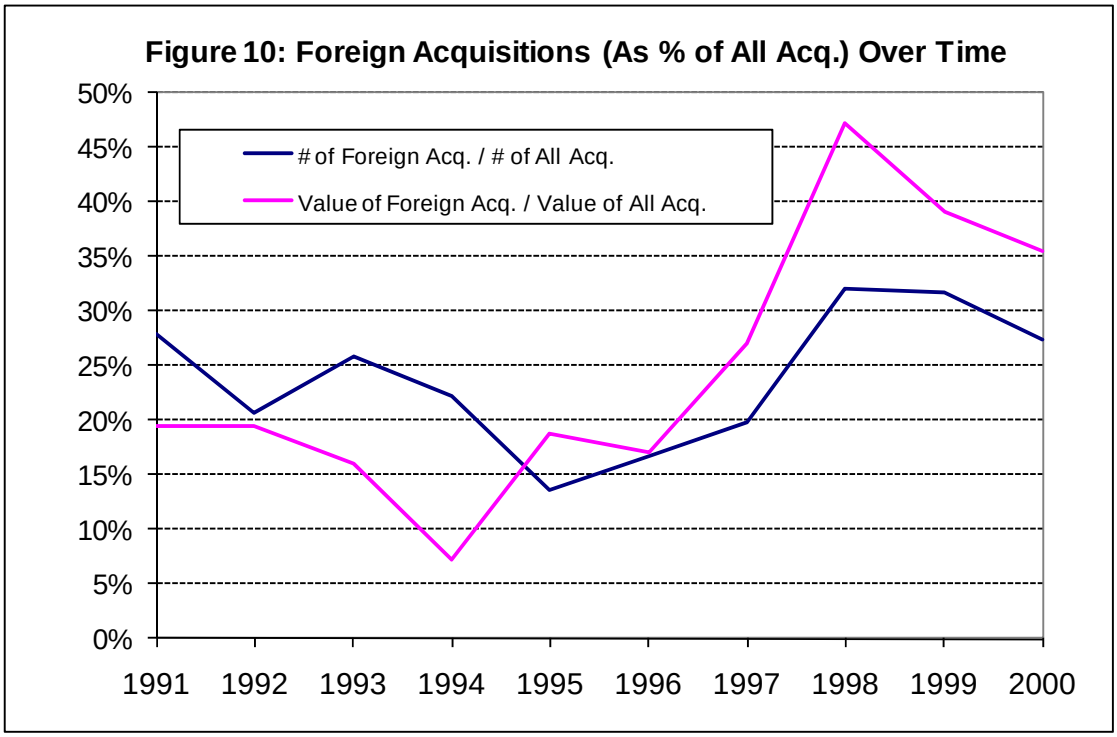



**Figure 9b:** Capital flight and FDI.


Figure 10: Foreign Acquisitions (As % of All Acq.) Over Time
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
# of Foreign Acq. / # of All Acq.
Value of Foreign Acq. / Value of All Acq.
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

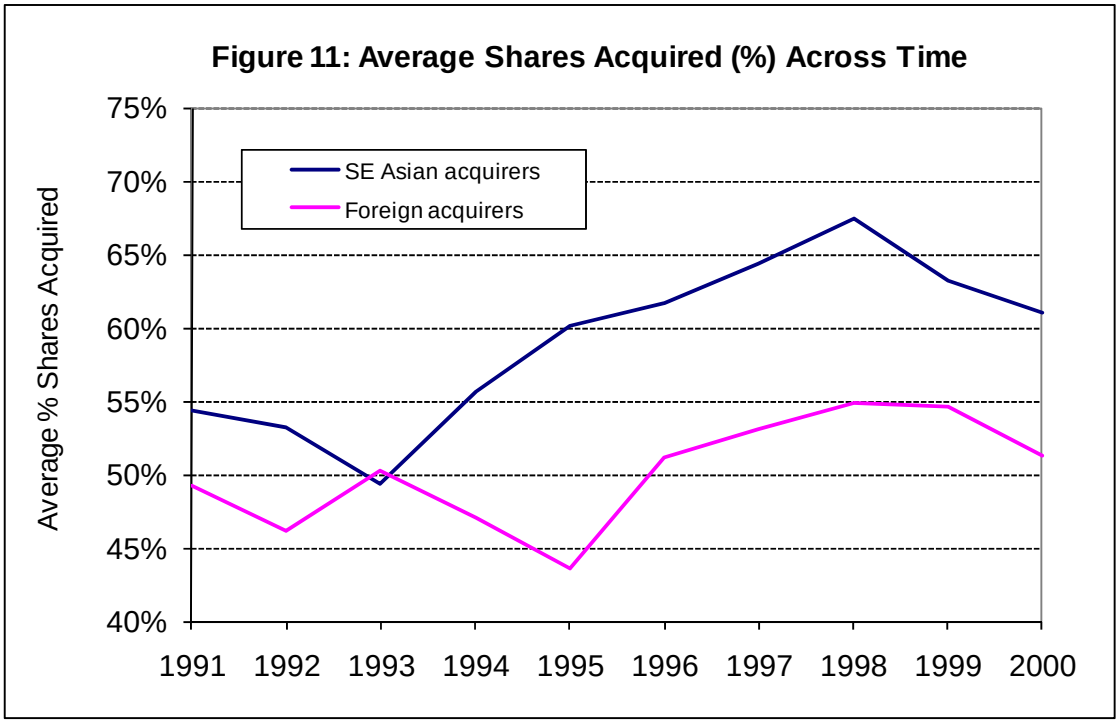

Figure 11: Average Shares Acquired (%) Across Time
Average % Shares Acquired
75%
70%
65%
60%
55%
50%
45%
40%
SE Asian acquirers
Foreign acquirers
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000

**Figure 12A: Cumulative Flip % as a Function of Time Since Acquisition in Crisis Nations (July 1997-Dec 1999 Acquisitions)**

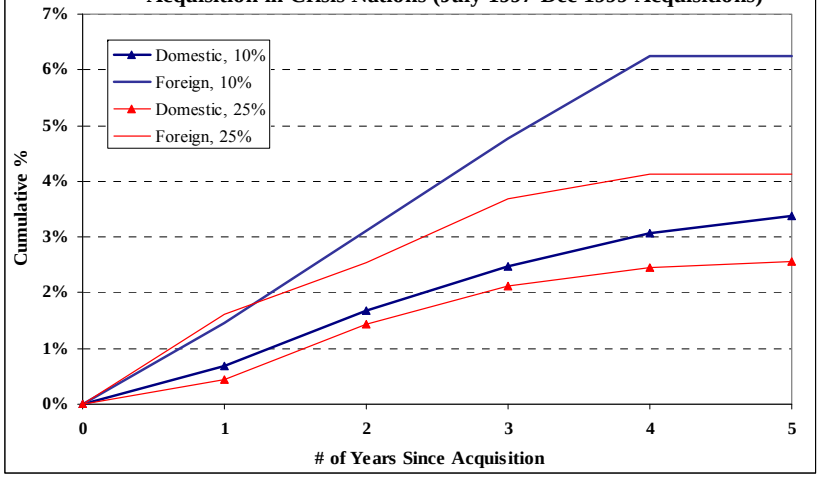



**Figure 13A: Cumulative Flip % as a Function of Time Since Acquisition in Crisis Nations (Jan 1991-Dec 1994 Acquisitions)**

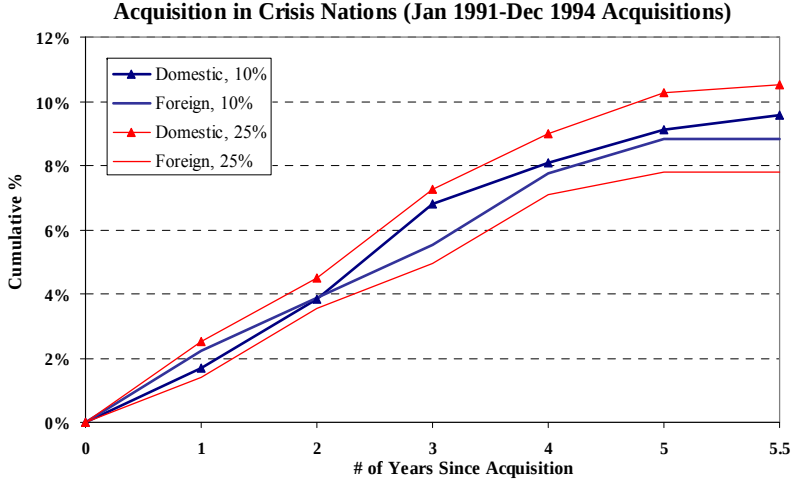



**Figure 12B: Cumulative Flip % as a Function of Time Since Acquisition in Non-crisis nations (July 1997-Dec 1999 Acquisitions)**

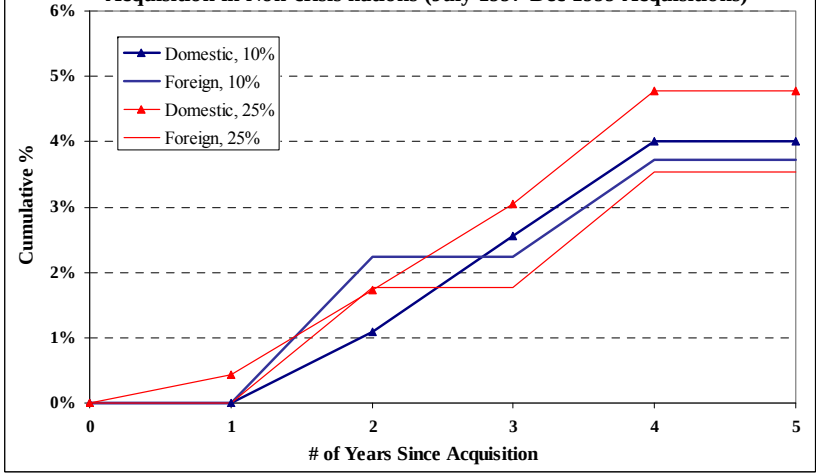



**Figure 13B: Cumulative Flip % as a Function of Time Since Acquisition in Non-crisis nations (Jan 1991-Dec 1994 Acquisitions)**

