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## Fire-Sale FDI

Paul Krugman

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Picture Mom, Dad, and the kids in an upper-middle-class Asian family in 10 years' time: After loading up with cash at the corner Citibank, they drive off to Walmart and fill the trunk of their Ford with the likes of Fritos and Snickers. On the way home, they stop at the American-owned Cineplex to catch the latest Disney movie, paying with their Visa card. In the evening, after putting the kids to bed, Mom and Dad argue furiously about whether to invest in a Fidelity mutual fund or in a life insurance policy issued by American International Group. (*New York Times*, 1 February 1998)

OK, it's a bit silly, and was meant to be. When the *New York Times* painted this portrait in early 1998, it was a deliberate caricature. Nonetheless, it drew attention to a real phenomenon: The Asian financial crisis, although 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. This inward investment to some extent reflects policy changes, as Asian governments, under pressure from the International Monetary Fund (IMF) and in any case desperate for cash, have dropped old policies unfavorable to foreign ownership. But it also reflects the perception of many multinational firms that they can now buy Asian companies and assets at fire-sale prices.

A similar, though probably less marked, boom in inward direct investment took place in Latin America, especially Mexico, during 1995; so we can, at least preliminarily, regard the nexus of crises, fire sales, and surging

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foreign direct investment (FDI) as an empirical regularity. As such, it raises several interesting questions:

1. Why should direct investment surge at a time when foreign capital in general is fleeing a country? What does this tell us about the nature of such crises?
2. Is the transfer of control that is associated with foreign ownership appropriate under these circumstances? That is, loosely speaking, are foreign corporations taking over control of domestic enterprises because they have special competence, and can therefore run them better, or simply because they have cash and the locals do not?
3. Does the fire sale of domestic firms and their assets represent a burden to the afflicted countries, over and above the cost of the crisis itself? (This question is likely to be raised with considerable force if the nationalistic backlash in Asia, which is clearly present although so far still surprisingly muted, becomes a more important aspect of the situation. “We must realize the great danger facing our country,” Malaysia’s Prime Minister Mahathir has already warned. “If we are not careful we will be recolonized.”) Or is the ability to sell firms to foreigners, on the contrary, a mitigating factor in the crisis?

These are all, I believe, relatively novel questions. As already noted, the phenomenon of “fire-sale FDI” was indeed present in earlier crises; but it has become far more prominent this time because of the scale of the Asian crisis, the extraordinary collapse of asset values, and—perhaps most important—the abruptness of our reevaluation of an economic and corporate system that before the crisis was widely regarded as superior to that of the West. Moreover, the Asian crisis—to a far greater extent than the Latin crisis of 1995—has led to the creation of a set of “new wave” crisis models that seem better suited to the discussion of direct investment than the traditional currency crisis literature.

This paper, then, has three purposes. The first is simply to draw attention to the phenomenon of fire-sale FDI and to stimulate discussion of what is likely to become a major economic and political issue in the coming years. The second is to indicate, in a preliminary way, how this phenomenon might emerge in the context of alternative crisis models. The third is to examine the welfare implications of crisis-induced sales of domestic assets to foreign firms, and in particular to ask how those implications depend on our diagnosis of the crisis itself.

## **2.1 The Fire Sale: What Is the Evidence?**

At the time of this writing, hard statistical evidence of a surge in FDI into Asia was not yet available. However, even a quick search of news databases turns up a plethora of anecdotes about foreign purchases of

Asian firms—actual, impending, or potential—especially in South Korea. Titles of recent articles in the financial press include “Korean Companies Are Looking Ripe to Foreign Buyers” (*New York Times*, 27 December 1997), “Some U.S. Companies See Fire Sale in South Korean Crisis” (*Los Angeles Times*, 25 January 1998), “Some Companies Jump into Asia’s Fire Sale with Both Feet” (ouch!) (*Chicago Tribune*, 18 January 1998), and “While Some Count Their Losses in Asia, Coca-Cola’s Chairman Sees Opportunity” (*Wall Street Journal*, 6 February 1998). The latter article described Coke’s buyout of its Korean bottling partner, as well as its increased stake in its Thai operations. Other reported deals in prospect or under negotiation included the following:

General Motors was reported in January 1998 to be considering buying stakes in South Korean manufacturers of both automobiles and parts, while Ford was reported to be planning to increase its stake in Kia Motors.

Seoul Bank and Korea First Bank were supposedly likely to be auctioned off to foreign bidders.

Procter & Gamble purchased a majority share of Ssanyong Paper Co., a producer of sanitary napkins, diapers, and kitchen towels.

Royal Dutch Shell was negotiating to buy Hanwha Group’s oil refining company; the group had already sold its half of a joint venture in chemicals to the German company BASF.

My favorite: “Michael Jackson is getting into the action, negotiating to acquire a ski resort from its owner, a bankrupt Korean underwear maker.”

In addition to being entertaining, lists like this one serve to demonstrate an important point about the new surge of acquisitions: It is very widely spread across industries. It is one thing for U.S. financial service companies to be buying up Asian counterparts; this is an area in which the United States has long been perceived to hold a substantial technological and managerial advantage, and has indeed been a focus of U.S. demands for liberalized trade and investment for precisely that reason. Until recently, however, few would have argued that U.S. firms held a comparable advantage across the board, in areas as diverse as auto manufacturing and paper products. This indicates clearly that the source of the investment surge must lie in a change in conditions that affect all industries, namely the financial situation.

In a proximate sense there is, of course, no mystery about that change in conditions. In 1997 South Korea’s currency lost half its value against the dollar, and its stock market lost 40 percent of its value in domestic currency. Thus the price of South Korean corporations to foreign buyers in effect fell by 70 percent, in some cases producing what appeared to be spectacular bargains (Korean Air, with a fleet of more than one hundred jets, had a market capitalization at the end of 1997 of \$240 million,

roughly the price of two Boeing 747s—although any buyer would also have acquired its \$5 billion debt). Moreover, heavily indebted corporations, facing a credit crunch, were desperate to sell off factories and subsidiaries to raise cash.

The more difficult question, however, is to explain why the prices of assets should have fallen so much, so suddenly—which comes down to the question of how to explain the crisis itself. As we will see, our assessment of the apparent surge in FDI depends in some ways on our model of the crisis.

The next step is therefore to set out two alternative (though not necessarily mutually exclusive) models of the Asian financial crisis; once we have these models under our belt we can try to see what they say about FDI.

## 2.2 Modeling the Crisis I: Moral Hazard and Asset Deflation

One thing that quickly became apparent in the Asian crisis was that the depth and scope of the calamity put it outside the range of what could be explained by traditional speculative-attack models—whether of the “first-generation” type developed in the late 1970s and early 1980s (Krugman 1979; Flood and Garber 1984) or the “second-generation” type that became popular after the European currency attacks of 1992 (Obstfeld 1994). A heavy majority of the theoretical efforts to make sense of the crisis focus on the role of financial intermediaries; indeed, many of us believe that as a first cut it may actually be useful to ignore exchange rates and monetary aspects entirely, focusing on the demand for and pricing of real assets.

Within this agreed-on focus on the financial system, much of the recent discussion of the Asian crisis has clustered around an approach that stresses the role of implicit guarantees in producing moral hazard, of moral hazard in producing overborrowing, and then of the implosion of the unsound financial system thus created, producing a self-reinforcing collapse of asset values. The moral hazard–overborrowing view was emphasized in a series of initially underappreciated papers by McKinnon and Pill (especially McKinnon and Pill 1996). My own simplified exposition of how moral hazard can create overpricing of assets, and how an endogenous policy regime—in which implicit guarantees are maintained only as long as they do not prove too expensive—can cause self-fulfilling crisis (Krugman 1998a, 1998b), seems for the moment at least to have provided the seed around which opinion has crystallized. As we will see, there are other possible models that are by no means out of the running. However, it seems appropriate to begin with this canonical-model-of-the-minute, since it does offer one way to make sense of fire-sale FDI.

Here is how the story goes: The problem began with financial intermediaries—institutions whose liabilities were perceived as having an implicit

government guarantee, but which were essentially unregulated and therefore subject to severe moral hazard problems. The excessive risky lending of these institutions created inflation—not of goods but of asset prices. The overpricing of assets was sustained in part by a sort of circular process, in which the proliferation of risky lending drove up the prices of risky assets, making the financial condition of the intermediaries seem sounder than it was.

And then the bubble burst. The mechanism of crisis, I suggest, involved that same circular process in reverse: Falling asset prices made the insolvency of intermediaries visible, forcing them to cease operations, leading to further asset deflation. This circularity can explain both the remarkable severity of the crisis and the apparent vulnerability of the Asian economies to self-fulfilling crisis, which in turn helps us understand the phenomenon of contagion between economies with few visible economic links.

The story can be illustrated using a highly simplified example, in which there exists a class of owners of financial intermediaries (“ministers’ nephews”) who are able to borrow money at the safe interest rate—because lenders perceive them as being backed by an implicit government guarantee—and invest that money in risky assets. For the sake of simplicity, the moral hazard involved in this situation is pushed to an extreme by assuming that (1) the owners of intermediaries are not obliged to put any of their own capital at risk, and (2) there are many ministers’ nephews competing to buy risky assets.

In such a worst-case scenario for moral hazard, the owner of an intermediary will view investing in an asset as profitable if there is *any* state of nature in which that asset yields a return greater than the safe interest rate. At the same time, competition among intermediaries will eliminate any economic profits. The result must therefore be that the prices of assets are driven to their “Pangloss values”: what they would be worth based not on the expected outcome but on what would happen if we lived in the best of all possible worlds.

To see the implications of this setup, consider first a one-stage game in which intermediaries initially compete to buy an asset with uncertain future payoff—call it land—and then learn what that payoff is. In particular, consider land that may yield a present value of future rent of either 100 (with probability 1/3) or 25 (with probability 2/3). In the absence of moral hazard, risk-neutral investors would be willing to pay a price of 50, the expected value of the land. In the extreme moral hazard regime we have described, however, each minister’s nephew will realize a profit in the favorable state of nature as long as the price is less than 100, and will simply walk away from the intermediary if the state of nature is unfavorable. So competition among the nephews will drive the price to its Pangloss value of 100.

Next consider a two-stage game. In period 1 land is bought. In period

2 initial rents are revealed and land may be resold. Finally, in period 3, a second round of rents are revealed. It simplifies matters, without changing the substance, if we suppose both that rents are identically independently distributed (iid) (specifically 25 with probability 2/3, 100 with probability 1/3) and that the safe interest rate is zero.

In an undistorted economy we can solve backward for the price. The expected rent in period 3, and therefore the price of land purchased at the end of period 2, is 50. The expected return on land purchased in period 1 is therefore the expected rent in period 2 (50) plus the expected price at which it can be sold (also 50), for a first-period price of 100. This is also, of course, the total expected rent over the two periods. (In this example, the price of land declines over time, from 100 to 50, even in the undistorted case. This is merely an artifact of the finite horizon and should simply be regarded as a baseline.)

Now suppose that intermediaries are in a position to borrow with guarantees. Again working backward, at the end of period 2 they will be willing to pay the Pangloss value of third-period rent, 100. In period 1 they will be willing to pay the most they could hope to realize from a piece of land: the Pangloss rent in period 2 plus the Pangloss price of land at the end of that period. So the price of land with intermediation will be 200 in period 1—again, twice the undistorted price.

Our next step is to allow for the possibility of changes in the financial regime. Let us continue to focus on our three-period economy, with random rents on land in periods 2 and 3. And let us also continue to assume that in the first period competition among intermediaries with guaranteed liabilities causes asset prices to be determined by Pangloss rather than expected returns. However, let us now introduce the possibility that this regime may not last—that liabilities carried over from period 2 to period 3 might *not* be guaranteed.

As a first step, let us simply posit that the regime change is exogenous, that from the point of view of investors there is simply some probability  $p$  that the government will credibly announce during period two that henceforth creditors of intermediaries are on their own. (Perhaps this reflects the election of a reformist government that is no longer prepared to tolerate “crony capitalism”; or perhaps the end of moral hazard is imposed by the IMF.)

Again, we work backward, and consider the price of land in the second period. If liabilities of intermediaries are not guaranteed, then nobody will lend to them (the moral hazard will remain, but its burden would now fall on investors rather than on the government). So intermediation will collapse and the price of land will reflect only its expected return of 50. On the other hand, if intermediaries are guaranteed, the price will still be 100.

What about the price of land in the first period? Investors now face two sources of uncertainty: They do not know whether the rent in the second

period will be high or low, and they do not know whether the price of land in the second period will reflect expected values or Pangloss values. As long as there is competition among intermediaries in the first period, however, the price of land will once again be driven to a level that reflects the most favorable possible outcome: rents of 100 and a price of 100. So even though this is now a multiperiod world in which everyone knows that disintermediation and a decline in asset prices is possible, current asset prices are still set as if that possibility does not exist.

Finally, let us ask what happens when the change in regime is endogenous. In reality, of course, throughout Asia's arc of crisis there has indeed been a major change in financial regime. Finance companies have been closed; banks have been forced to curtail risky lending at best and close their doors at worst. Even if the IMF were not insisting on financial housecleaning as a condition for aid, the days of cheerful implicit guarantees and easy lending for risky investment are clearly over for some time to come. But what provoked this change of regime? Not an exogenous change in economic philosophy. Rather, financial intermediaries have been curtailed *precisely because they were seen to have lost a lot of money*.

This suggests that a more or less realistic way to model the determination of implicit guarantees is to suppose that they are available only until they have had to be honored (or more generally until honoring them has turned out to be sufficiently expensive—the criterion used in Krugman 1998b). In the context of our three-period example, this criterion can be stated alternatively as the proposition that creditors of financial intermediaries will be bailed out precisely once.

To see what this means, first suppose that rents in period 2 are disappointing—25, not 100. Given the structure of our model, in the absence of intermediaries this should have no effect on the price of land at the end of the second period, since it does not change the probability distribution of future rents. But a less-than-panglossian rent in period 2 means that creditors of intermediaries need to be bailed out in that period, and therefore that future creditors can no longer expect the same. So the intermediaries collapse, and the price of land drops from 100 to the expected rent of 50.

Notice that this means that there is a magnification effect on the losses of the intermediaries established in the first period. The “real” news about the economy is that rents in period 2 were 25, not the hoped-for 100. But land bought for 200 will now yield only 25 in rents plus 50 in resale value, a loss of 125 rather than merely 75. The magnification effect is caused, of course, by the circular logic of disintermediation: The prospective end to intermediation, driven by the losses of the existing institutions, reduces asset prices and therefore magnifies those losses.

And now we come to the possibility of multiple equilibria. Suppose that in fact intermediaries have been lucky and that second-period rents do

turn out to be 100. Now if everyone then expects that the government will continue to guarantee intermediaries in the future, the land price at the end of the second period will also be 100. In that case no bailout will be needed; and so the government guarantee for intermediation will in fact continue.

But suppose, on the other hand, that despite the high rents in the second period potential creditors become convinced that there will be no guarantee on newly incurred liabilities of intermediaries. Then they will not be able to attract funds, and the price of land in the second period will be only 50. That means, however, that intermediaries that borrowed money in the first period based on Pangloss values, including the Pangloss value of 100 for land sales, will require a bailout—and since the government’s willingness to provide for bailouts is now exhausted, investors’ pessimism is justified.

In short, our stylized little model appears to generate a story about self-fulfilling financial crises, in which plunging asset prices undermine banks, and the collapse of the banks in turn ratifies the drop in asset prices. But it is not the only such story.

### **2.3 Modeling the Crisis II: Disintermediation and Liquidation**

Even as the conventional wisdom has appeared to crystallize around the view that moral hazard and the resulting asset price inflation created the preconditions for the Asian crisis, some observers have disagreed. Recently Radelet and Sachs (2000, 149) have argued that “the East Asian crisis resulted from vulnerability to financial panic . . . , combined with a series of policy missteps and accidents that triggered the panic. Since we view the crisis as a case of multiple equilibria, our hypothesis is that the worst of the crisis could have been largely avoided with relatively moderate adjustments. . . .” In effect, they argue that the precrisis asset values were more or less reasonable, and that it is the current deflated values that are an aberration—obviously an important point for assessing fire-sale FDI.

What kind of model could make sense of this view? The main contender is a “bank run” model along the lines of the classic paper by Diamond and Dybvig (1983). Such models, like the moral hazard model, attribute crisis to the collapse of financial intermediaries. However, financial intermediaries are now seen as essentially benign institutions, which reconcile the need for long-term commitment of capital to projects without short-term payoffs with the desire of individual investors to be able to withdraw funds on demand. The problem with such intermediaries, according to the model, is that they are vulnerable to self-fulfilling investor panics: If investors believe that sufficiently many other investors will try to cash in early, they will follow suit—and in so doing force destructive early liquidation of real investments.

In this section I offer a simplified exposition of a Diamond-Dybvig model. It is a highly abstract example, substantially harder to map into real-world developments than the simple Pangloss-collapse model of the previous section, but it does give us at least a first pass at the alternative view.

As in the crisis model above, we consider a three-period world. (Three periods is the minimum for financial crises, which must involve an initial investment and then something going wrong with expectations rather than or as well as actual earnings. While three-period models may seem artificial—why not an infinite horizon?—my own experience, in which the infinite-horizon Krugman 1998b actually preceded the finite-horizon Krugman 1998a, suggests that for exploratory theorizing simplicity wins out over the marginal gain in realism.) In this case, however, there are real investment opportunities of two kinds. Investors can put their wealth into a short-term asset—say, dollar treasury bills—that yields a known rate of return  $r$ . Or they can back investment projects that yield a higher rate of return, say  $\pi$ , but that take two periods to mature. That is, one of these projects takes one unit of initial capital and transforms it into  $(1 + \pi)^2$  units of output in period 3, where  $\pi > r$ .

Crucially, we assume that for some reason it is *not* possible to sell a half-way-completed project to some other investor who will finish it. One can imagine a variety of reasons for this—perhaps some kind of lemons problem—but for the purposes of this model we simply take the nonmarketability as a given. Thus an investor who decides to liquidate a long-term asset in period 2 must actually scrap the real investment, realizing only a liquidation value  $v$  that we assume less than  $1 + r$ .

The need for financial intermediaries is created, following Diamond and Dybvig, by the need of individuals for liquidity. Each individual starts with one unit of capital but does not know when he will want to consume: Only after investing does he discover whether he wants to consume in period 2 or in period 3. This creates a dilemma: An individual who invests in a long-term project, then discovers a need for short-term consumption, is stuck with only the liquidation value. On the other hand, an individual who invests in the safe asset, then discovers that his consumption will take place in period 3, has forgone an opportunity to achieve a higher standard of living.

Figure 2.1 illustrates the dilemma of an individual investor in state space, with consumption in period 2 (if he turns out to be a period-2 consumer) on the horizontal axis, consumption in period 3 (if he turns out to be a period-3 consumer) on the vertical. If he invests only in the short-term asset, he will have consumption of  $1 + r$  if he turns out to be a period-2 consumer,  $(1 + r)^2$  (because he must then reinvest his capital in the short term) if he turns out to be a period-3 consumer. On the other hand, if he invests only in the long-term asset, he will receive only  $v$  if he

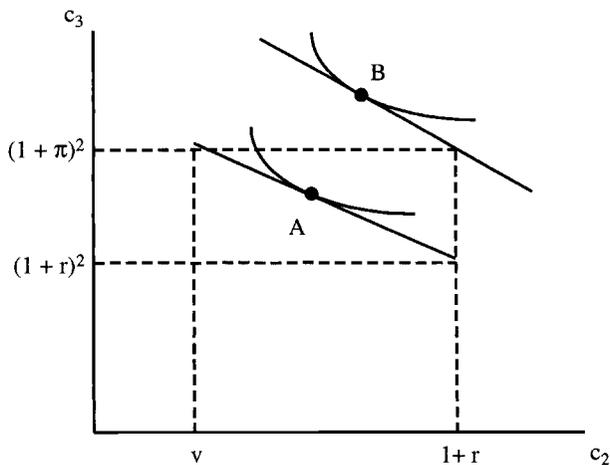


Fig. 2.1 The Diamond-Dybvig story

must consume in period 2, but  $(1 + \pi)^2$  if he consumes in period 3. And he can, of course, choose any convex combination of the two.

But now suppose that there is a financial intermediary that pools the capital of a large number of individuals, investing some in the short-term and some in the long-term asset. Ignoring for a moment the possibility of a bank run, such an intermediary can in effect exploit the law of large numbers to allow each investor to withdraw money at will, while still having a predictable aggregate withdrawal in period 2. To see the advantage of this, suppose that the intermediary were to allow each contributor of capital to withdraw  $1 + r$  in period 2, and suppose that the intermediary knows that a fraction  $p$  of the population will turn out to be period-2 consumers. Then all the intermediary needs to do is put a fraction  $p$  of the funds it receives into the short-term asset,  $1 - p$  into the long-term asset; then each investor will expect to receive  $1 + r$  if he consumes in period 2,  $(1 + \pi)^2$  if he consumes in period 3—dominating the range of possibilities available without the intermediary. In general, of course, investors will choose some other point on the budget constraint passing through that point, so that they will do even better.

So far so good. But such an intermediary is, as Diamond and Dybvig pointed out, potentially subject to a bank run. In our case this possibility arises because the liquidation value  $v$  is less than the promised payout to early withdrawers. The point is straightforward. Suppose that for some reason—it does not matter what that reason is—investors who would ordinarily not have withdrawn their funds become convinced that many other such investors will attempt to withdraw *their* funds. Should investors who plan to consume in period 3 nonetheless withdraw funds in period 2, the intermediary will not have enough of the safe asset and will therefore

have to liquidate projects in midstream; and since the liquidation value is less than the promised payout, not all investors will in fact be able to withdraw their funds. The rumor of such a run will therefore lead to a rush to withdraw funds by investors anxious not to be last in line. (Of course, in principle the possibility of a run should be taken into account in the initial investments and offers by the intermediary; one can justify the approach here by supposing that such a run is perceived as a very unlikely event.)

As in the previous model, this gives us a story about a crisis that can be sparked merely by self-fulfilling expectations. In the moral hazard model, however, the precrisis state of affairs is fundamentally unsustainable; in effect, the asset market is in a “metastable” state, like a sandpile with a “supercritical” slope, and any small shock causes an avalanche—a slump in asset values *toward* their appropriate level. In the bank-run model, the precrisis state is reasonable and capable of being sustained, but is undermined by an unnecessary panic—which produces real costs due to the premature interruption of productive activities.

Both views can be given some support from anecdotal evidence, as argued below. But let us turn next to the implications of the two views for FDI.

## 2.4 The Role of FDI

As Kindleberger (1969) pointed out long ago, FDI is essentially about transfer of control rather than movement of capital per se. Indeed, a quick look even at balance-of-payments measures of FDI for emerging market economies reveals that there is very little relationship between overall capital flows and FDI. Figures 2.2 and 2.3 show overall capital inflows and inward FDI for Mexico and Argentina from 1990 to 1996; even though such balance-of-payments numbers tend to confuse internal capital transfers within firms (which behave like portfolio capital) with true changes in

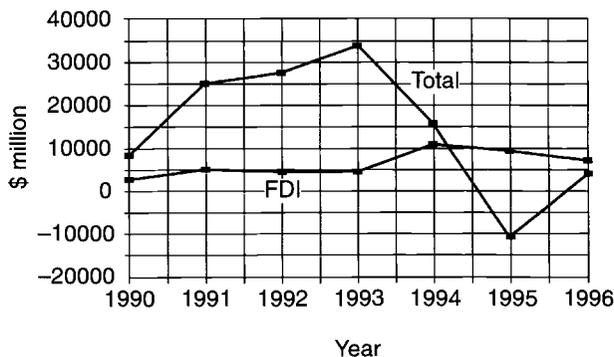


Fig. 2.2 Mexican capital inflows

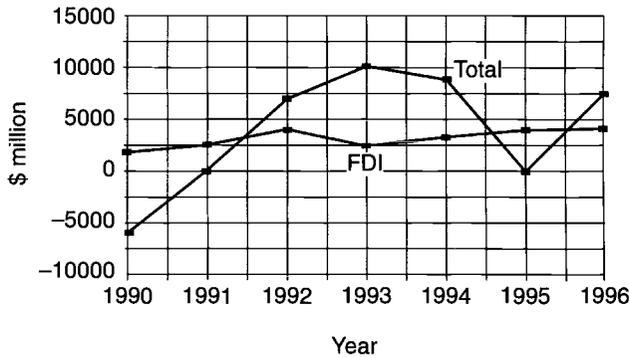


Fig. 2.3 Argentine capital inflows

control, there is still a striking lack of correlation—or perhaps even an inverse correlation—between overall capital inflow and FDI.

Kindleberger's discussion suggested that in order to think about FDI we must therefore not ask why capital might flow into a country, but rather why some particular asset would be worth more under foreign than under domestic control. This in turn could reflect either higher expected earnings under foreign control, or a lower foreign cost of capital and hence a higher valuation on given earnings. The interesting point is that this dichotomy between two possible reasons for foreign ownership neatly matches our two different stories about financial crisis.

Consider first the moral hazard view. The only reason for foreign ownership, in a pure model of that sort, would be that foreign firms could manage the assets better than domestic rivals, and therefore extract higher rents. Suppose, for example, that under foreign owners a given piece of land would yield 20 percent more than under domestic management. Then land would yield 120 in the good state, 30 in the bad, for an expected value of 60. Absent moral hazard, foreigners would outbid domestic investors for the physical assets.

But if domestic firms can borrow with implicit guarantees, they will be willing to pay higher prices than foreign owners despite their lower expected returns. As a result, foreign firms will be crowded out of the domestic market. (In terms of the balance of payments, this might well mean that domestic firms raise capital directly or indirectly by borrowing abroad.)

The fire-sale FDI story is now clear. Suppose that in period 2 there is a collapse of the Pangloss regime, either because of actual bad news or because of self-fulfilling expectations. Then the prices that domestic firms are willing to pay for assets will drop—in our case from 100 to 50—while foreign firms will still be willing to pay 60. So the result will be a transfer of ownership to the more efficient foreign firms. In a pure moral hazard version of the crisis, then, the drop in asset values is basically appropriate,

and the transfer of ownership is an efficient move from the world's point of view: Assets are being placed under the control of those who can use them best.

If we take a financial panic point of view, matters look quite different. Suppose that foreign firms, unlike domestic investors during a panic, are not liquidity constrained; they can borrow and lend at the safe rate  $r$  throughout. But they are less efficient at running domestic investment projects than domestic firms (which must be the case here, otherwise they would have made the investments in the first place). In the absence of a crisis the foreign firms will not get involved. But once there is a crisis, any foreign firm that can take over a project in midstream and do sufficiently well to earn a final return greater than  $v(1 + r)$ —that is, any firm that is not liquidity constrained and can earn more than the liquidation value by keeping the project in existence—will be in a position to buy the project from the crisis-stricken domestic intermediary. In this case there will truly be a fire sale. And such fire sales will typically transfer ownership to a foreign firm that is *less* efficient than the domestic firm but that is now able to outbid domestic residents because of its superior cash position.

Thus our two alternative crisis stories seem to have opposite implications for the efficiency consequences of fire-sale FDI. If the drop in asset values really reflects the collapse of a moral-hazard-driven bubble, the reallocation of control is putting assets into the “right” hands; if it reflects an essentially arbitrary run on domestic intermediaries, it puts assets into the “wrong” hands.

Before we make too much of this distinction, however, we should notice that in either case the presence of foreign buyers will limit the actual fall in asset prices. In the moral hazard case, land falls from 100 to 60, not 50, which means that the losses to domestic investors (and taxpayers) are less than they would have been if foreign acquisitions had been blocked. In the financial panic case, the willingness of foreign investors to buy half-completed projects means that the costs of liquidation are avoided, which is necessarily a gain that more than offsets the loss from the transfer into less efficient hands.

Finally, we should note a final point: The availability of potential foreign buyers may in itself be a stabilizing factor. Suppose that we take the pure financial panic model, but add a large number of potential foreign buyers who could complete a project with a return of at least  $d(1 + r)$ —that is, who would be willing to pay a price high enough to pay off all investors, even if everyone decided to withdraw funds early. In that case investors, knowing that they had nothing to lose by failing to join in a run on the intermediary, would not in fact withdraw their funds unless they needed to consume in period 2, which means that the possibility of a bank run would be eliminated. Or to put it a bit differently, the presence of potential foreign buyers would provide sufficient liquidity to make a liquidity crisis

impossible. This suggests an unconventional additional payoff to opening one's economy to foreign direct investment: Quite aside from any transfers of technology, managerial skills and so on, the mere potential for FDI may act as a stabilizer against the risk of domestic financial panics.

In any case, our analysis of both models seems to indicate that whether or not foreign investors are getting bargains—whether asset prices have fallen because they were initially overpriced or because they are now underpriced—given that a crisis *has* occurred, the “fire sale” of domestic companies is currently in the interest of the afflicted countries. It remains interesting, however, to ask which of these stories we believe to be closer to the truth.

## 2.5 What Kind of Fire Sale?

As long as we view the Asian crisis as a matter of collapsing financial intermediaries, it is easy to explain why that crisis should be accompanied by the sale of domestic assets to foreign firms. However, we have also seen that the efficiency implications of those sales—whether assets are being sold into or out of the “right” hands—depends on whether asset values are slumping toward or away from their appropriate levels.

What evidence do we have on the nature of the crisis? It seems hard to deny that there was a very significant moral hazard issue on the eve of the crisis. The role of “finance companies” in Thailand fits the “minister's nephew” story almost perfectly; in Indonesia many dubious investments (including the ambitious plans of a taxi company, which caused the spectacular failure of Hong Kong's Peregrine) involved members of the president's family. In South Korea, all accounts suggest that the *chaebol* were engaged in reckless, ill-conceived expansion plans—with the industrial groups moving into businesses far from their core competencies, and in many cases overseas ventures that seemed foolhardy even at the time—that would surely have come to grief even without the speculative attack. Indeed, a series of *chaebol* bankruptcies took place even before the onset of speculation against the currency.

To some extent the “overborrowing syndrome” (as McKinnon and Pill [1996] call it) shows up in balance of payments statistics. Figure 2.4 shows total capital flows into South Korea, inward direct investment, and *outward* direct investment. The striking points are both the very low level of inward investment given the size of overall inflow and the remarkable position of Korea as a net direct investor abroad. Whatever the strengths of Korean management, this seems a peculiar position for a middle-income country; a parsimonious explanation of the pattern is that moral-hazard-driven lending allowed Korean firms both to crowd out potential inward investors and to pursue grandiose schemes abroad.

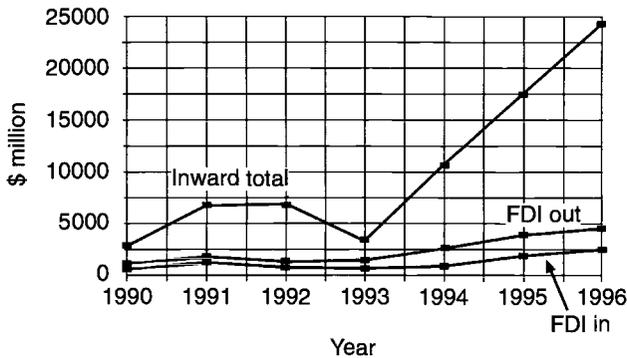


Fig. 2.4 Korean capital flows

And yet while asset prices were surely overheated on the eve of the crisis, it is also easy to make the case that the crisis itself has overshot. The market values of Asian firms do seem extraordinarily low, even given their debt burdens. Moreover, while much of the real slump in Asia may be due to demand-side effects of plunging asset values and to the effects of the high interest rates being used to defend currencies against hyperdevaluation, there is also considerable anecdotal evidence of a supply-side disruption of activity due to a breakdown of the credit system; this may be viewed as a version of the liquidation costs in our financial panic model.

So, does the foreign purchase of Asian assets represent the transfer of control to efficient owners who were previously unable to buy at a reasonable price? Or does it represent sales to inefficient owners who happen to have cash? Alas, probably some of both. What we need—surprise—is more research. Luckily, the issue of fire-sale FDI is not likely to go away anytime soon; even if the Asian crisis eases, its legacy of foreign ownership will be contentious for years to come.

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## Comment      Aaron Tornell

Krugman's paper concerns the sale of domestic assets in the aftermath of the Asian crisis. He states that there has been a wave of such sales to foreigners and at much lower prices than in preceding months. Does this constitute a fire sale of productive assets to foreigners that will use them less efficiently? Or does it actually constitute a productivity-enhancing transaction?

The answer depends on one's view regarding the lending mechanism underlying the Asian crisis. If domestic entrepreneurs are more efficient at running such projects, and the crisis simply reflected a run against the country, then the obvious conclusion is that the forced sale of assets to foreigners is inefficient. On the other hand, if domestic agents had access to cheap credit, the creditors did not monitor the quality of the investment projects, and the domestic agents invested in socially inefficient projects, then the sale of assets to foreigners is a good thing.

Krugman connects these two views to alternative crises models. In one model, there are implicit government bailout guarantees and a group of privileged agents that can borrow at the riskless interest rate and invest in very risky projects with low expected returns. As a result, a lending boom accompanied by asset price inflation develops. Once the future arrives and the country defaults on its debt, asset prices collapse and foreigners are able to acquire the assets at fair prices and (maybe) use them more efficiently.

The second view is connected with the celebrated Diamond-Dybvig model of bank runs. In this model the crisis is caused by liquidity problems, not by insolvency. As a result, domestic residents are forced to liquidate their assets at an unfairly low price.

The question then becomes which view is empirically correct? Was the