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# Understanding the financial crisis in Asia

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## Abstract

The financial crisis of East Asia in 1997 was largely unanticipated and was characterized by sharp falls in asset prices and currency values in several countries simultaneously. Many empirical models have been developed to predict the occurrence of such crisis. However, the out-of-sample performance of these models is disappointing. Most theoretical explanations of the crisis emphasize the role of banking sector and revolve around models of moral hazard or self-fulfilling runs on liquidity. Empirical tests of the models are, however, rare. Much work remains to be done to explain the contagion, and the effects of equity capital flows. © 2000 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

The financial crisis that engulfed much of East Asia in 1997 and thereafter appeared to be largely over by the dawn of the new millennium. However, the analysis of the causes and the consequences of the crisis, of the lessons we have learned, and of the policy implications one can derive from such analyses, is likely to continue unabated well into the new millennium. Much has been written and debated about the crisis, in academic circles as well as in the popular press.<sup>1</sup> The

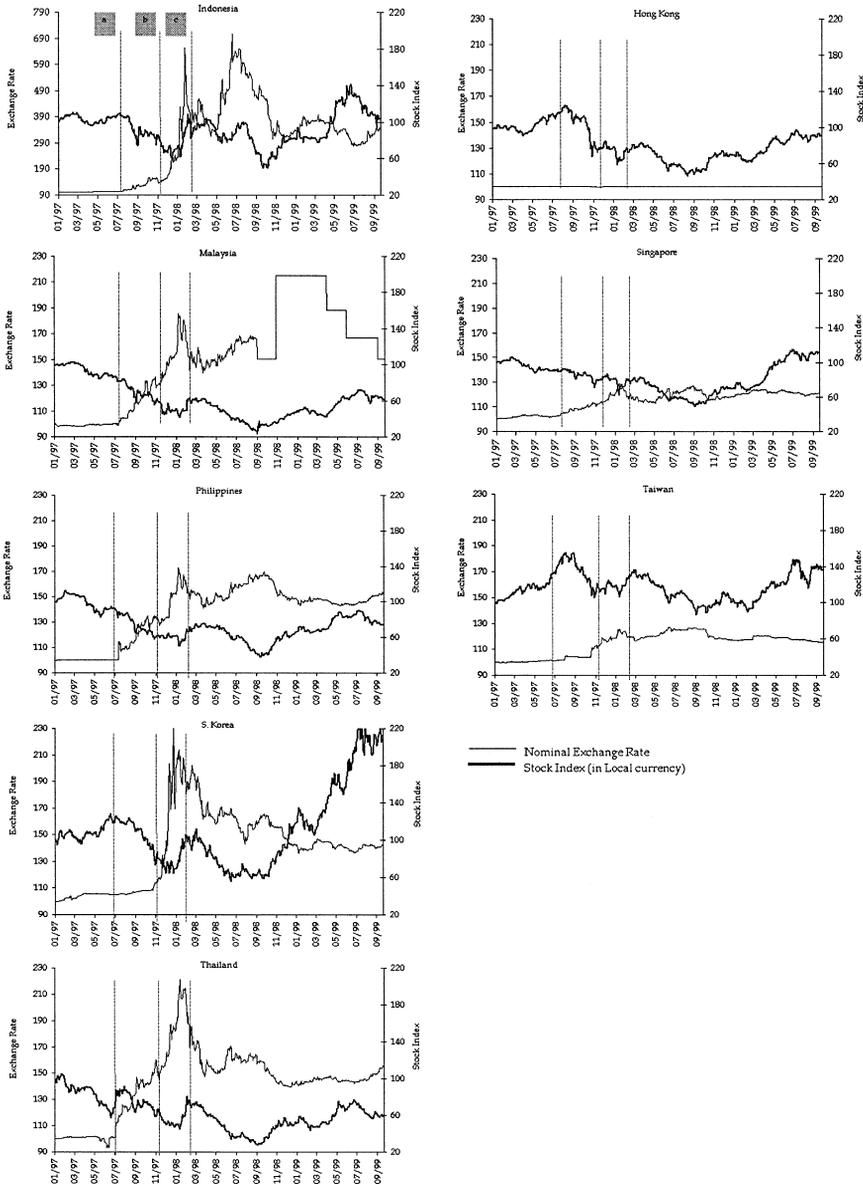
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<sup>1</sup> See Prof. Nouriel Roubini's amazingly comprehensive website at [www.stern.nyu.edu/~nroubini/asia/AsiaHomepage.html](http://www.stern.nyu.edu/~nroubini/asia/AsiaHomepage.html).

articles that appear in this issue contribute to the scholarly research on this topic by providing us with novel insights and empirical analyses that add to our understanding of the many complex issues involved. In this article, we attempt to



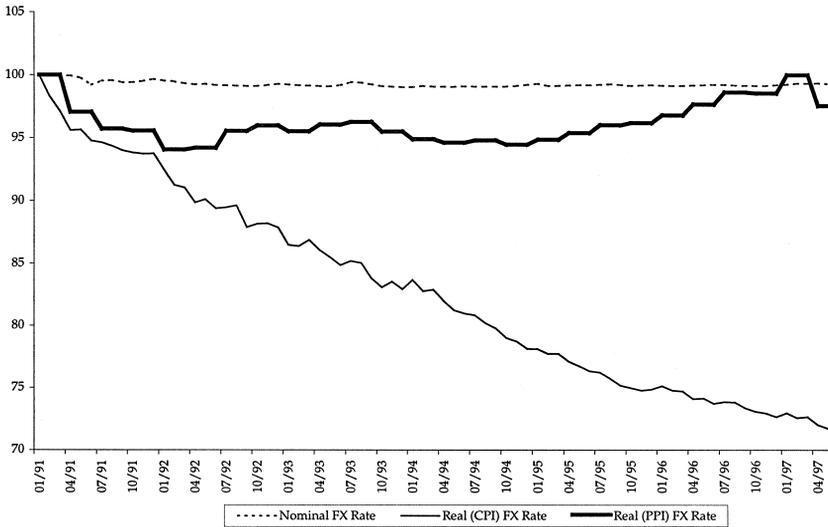


Fig. 2. Nominal and real exchange rate, Hong Kong.

gain a perspective by making sense of the growing scholarly research on this topic. The reading of the literature uncovers several unanswered questions in our minds and thus, we hope to provide not only an understanding of the extant literature but also a research agenda for scholars in the field to take up in their research endeavors.

## 2. Characterizing the crisis

The two most visible defining characteristics of a country that experiences a financial crisis are a large drop in the value of its currency and a large drop in its traded equity prices (Fig. 1). In fact, the event that appears to have triggered the

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Fig. 1. Nominal exchange rates and stock indices. This figure plots the variation in the exchange rate and the stock indices (in local currency) of five crisis countries (Indonesia, Malaysia, Philippines, South Korea, Thailand) and three non-crisis countries (Hong Kong, Singapore, Taiwan) assuming a base level of 100 on January 1, 1997. The left axis is for the exchange rate and the right axis is for the stock index (note that the exchange rate scale for Indonesia is different from that of the rest of the countries). The three vertical lines represent three significant events: (a) July 2, 1997, when Bank of Thailand announced a managed float; (b) November 17, 1997, when South Korea abandoned its defense of the won; and (c) February 16, 1997, when reports emerged that IMF had threatened to withdraw support. *Source:* Datastream.

crisis in East Asia was the announcement on July 2, 1997 that the Thai baht would be allowed to float, effectively devaluing the baht by about 20%. Philippines, Malaysia, Indonesia and South Korea abandoned the defense of the currency soon thereafter. By January of 1998, currencies of all of these countries had suffered a tremendous decline.<sup>2</sup> Even Taiwan and Singapore devalued their currency in what is termed as *competitive* devaluation.<sup>3</sup> Hong Kong is the only country in East Asia that successfully defended its currency against speculative attacks and has maintained its parity with the U.S. dollar. The stock markets in all these countries in Asia plunged as the currency crisis engulfed most of East Asian countries.<sup>4</sup> One of the biggest challenges facing scholars studying the East Asian financial crisis is to explain this contagion in which crisis emanating from one country soon swept across all countries in the region.

Currency crises are usually (but not always) preceded by a gradual deterioration in economic fundamentals, such as a significant expansion in money supply, or some other significant events in the economy. In the Thai case, for instance, several finance companies failed immediately prior to the baht devaluation. In fact, Kaminsky and Reinhart (1998) systematically analyze the links between banking and currency crisis and document that problems in the banking sector typically precede a currency crisis.

What are the indicators in the economy that can suggest that a currency crisis may be brewing? Kaminsky et al. (1998), in surveying the literature and based on their own empirical analysis, conclude that two of the most important variables that have proven particularly useful in anticipating currency crises are the level of international reserves and the real exchange rate.

It is easy to see why depleting international reserves indicate balance of payment problems that can lead to currency crisis. The problem, of course, is that accurate information about the level of international reserves is usually available

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<sup>2</sup> See the appendix in Kho and Stulz (2000) for a chronology of various relevant news announcements.

<sup>3</sup> The idea behind competitive devaluation is that exports of countries, whose currencies undergo a devaluation to world markets, become more competitive compared to the exports of countries whose currencies do not undergo a devaluation to the same extent. This then puts pressure on countries with stable currencies to devalue in order to make their exports competitive in the world markets. This argument requires that prices in local currencies be sticky; otherwise, exporters could just as well alter their prices to make their products more or less competitive. Most of the articles in the literature fail to discuss this simple, but obvious, point. To what extent is the assumption of sticky prices, especially in midst of a big financial crisis, tenable is not obvious to us, even though the received view in the literature appears to take it for granted.

<sup>4</sup> Chander and Patro (2000) document that country fund prices are less sensitive than the local indices to sharp falls in currency prices, resulting in substantial country fund premiums during the crises.

only with a long lag. Indeed, in the Mexican peso crisis in 1994, the position of the international reserves was a guarded secret of the central bank; the Mexican peso crashed immediately when the market learned that the reserves had fallen to precariously low levels.<sup>5</sup>

Given that timely information about international reserves may not be easily available, an alternative is to examine the behavior of inflation differentials or equivalently the behavior of real exchange rates. The reason is that a large difference in inflation rates, if it were caused by expansionary monetary policy in the country, together with managed exchange rates would generally lead to a significant loss in international reserves. One needs to be careful, however, in using an appropriate measure of inflation in computing the real exchange rate if one is to infer that a large rise in the real exchange rate implies a loss of international reserves. It is the attempt by the central bank to keep nominal exchange rates away from the equilibrium exchange rate by intervening in the market that leads to loss of international reserves. Since the equilibrium exchange rate is defined by the ratio of the price levels of *traded* goods, the appropriate inflation measures must compute price level changes of a basket of goods that contains largely traded goods.<sup>6</sup>

To see this more clearly, look at the real exchange for Hong Kong in Fig. 2. The real exchange rate calculated using the consumer price index (CPI) shows a consistently rising real exchange rate. However, real exchange rate calculated using PPIs, which are heavily weighted towards traded goods, suggests no appreciable rise and consequently no significant loss in international reserves. For Hong Kong, the prices of non-traded goods increased much more rapidly compared to the prices of traded goods.

Contrast this with the behavior of the real exchange rate in case of the Mexican peso in Fig. 3. The real exchange rate appears to have increased before the devaluation at the end of 1994 regardless of whether we use CPIs or WPIs to calculate the price levels. This suggests that there must not be a significant difference in inflation rates between traded and non-traded goods for Mexico.<sup>7</sup>

Using the CPI to calculate the real exchange rate can thus be misleading. However, with the exception of Chinn (1998), most of the scholars attempt to

<sup>5</sup> See Edwards (1997).

<sup>6</sup> See Chowdhry and Titman (1999) for elaboration of this point.

<sup>7</sup> More generally, if price levels for two indices, such as the CPI and the WPI, and the relative weights each index places on traded and non-traded goods are available, it is simple to infer the inflation in traded goods alone. Formally, if

$$\pi_1 = \theta_1 \pi_T + (1 - \theta_1) \pi_{NT},$$

$$\pi_2 = \theta_2 \pi_T + (1 - \theta_2) \pi_{NT},$$

where  $\pi_1$  and  $\pi_2$  represent inflation calculation using the two indices,  $\theta_1$  [or  $(1 - \theta_1)$ ] and  $\theta_2$  [or  $(1 - \theta_2)$ ] represent the weights on traded [or non-traded] goods inflation  $\pi_T$  [or  $\pi_{NT}$ ], then the two equations above can be used to infer  $\pi_T$  in calculating the real exchange rate change.

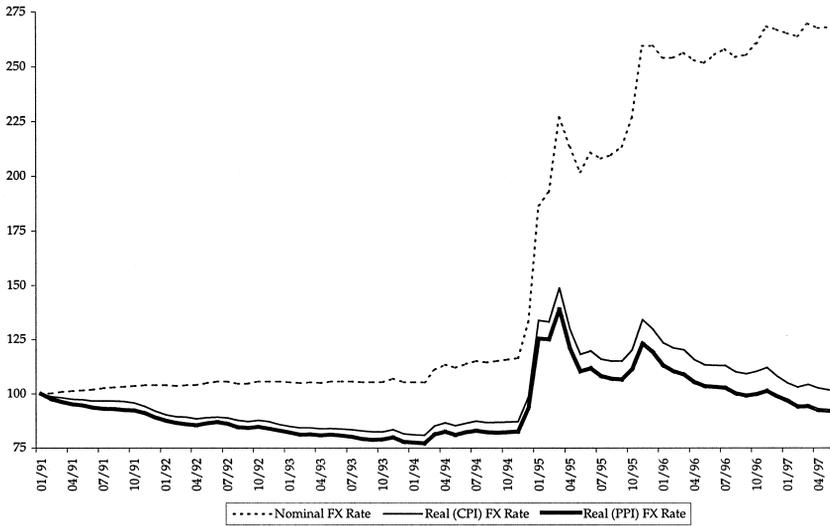


Fig. 3. Nominal and real exchange rate, Mexico.

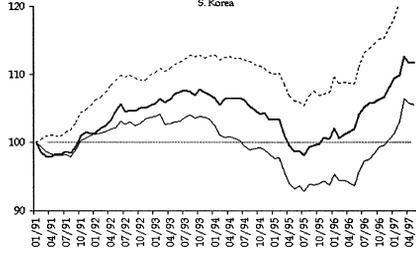
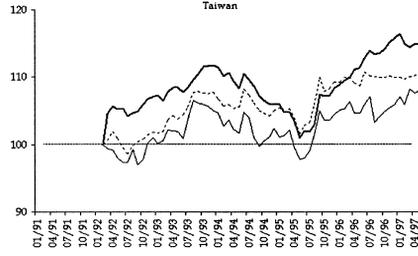
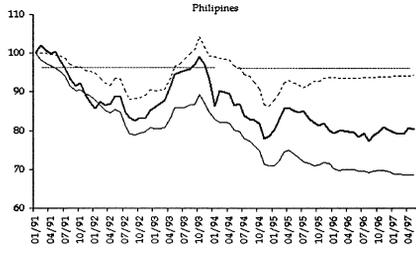
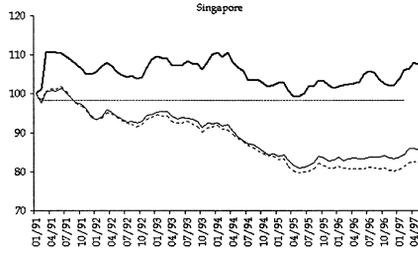
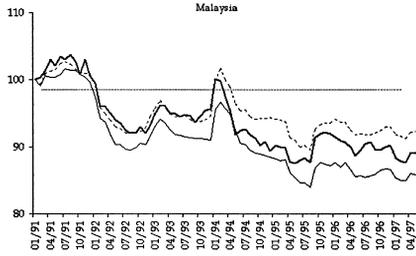
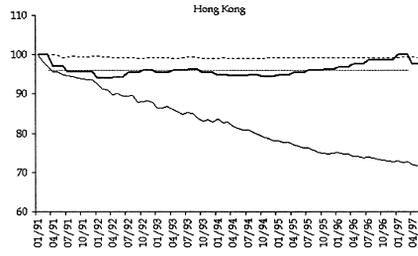
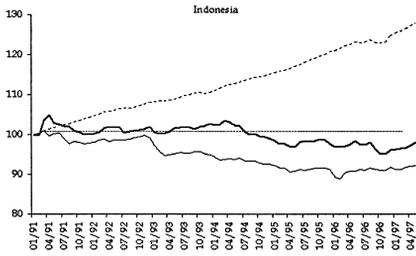
account for real exchange rate appreciation due to factors such as productivity increases by calculating the deviation from trend. Chinn (1998) points out that this is likely to result in conclusions that are incorrect and misleading.

Fig. 4 plots nominal and real exchange rates using both CPI and WPI (or PPI) as the price indices, with 1991 first quarter as the base. On the eve of the crisis in July 1997, the real exchange rate using the WPI or the PPI as the relevant index suggests possible balance of payments problems for only Malaysia, Philippines and Thailand. For Indonesia, South Korea, Hong Kong, Singapore and Taiwan, the real exchange rate on the eve of the 1997 crisis does not suggest any balance of payments problems. It appears that real exchange rate would have had a very limited success in predicting the impending currency crisis.

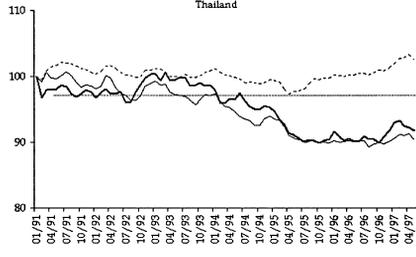
Other variables that appear to indicate impending financial (banking and/or currency) crises relate to the level of debt and lending activity in the economy (as measured by domestic credit or M2) and the level of *external* short-term debt, as a

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Fig. 4. Real exchange rates. This figure plots the variation in the real exchange rates and the stock indices of five crisis countries (Indonesia, Malaysia, Philippines, South Korea, Thailand) and three non-crisis countries (Hong Kong, Singapore, Taiwan) assuming a base level of 100 on January 1, 1997. The dashed line is the nominal exchange rate, light solid line is real exchange rate using CPI, and the dark solid line is the real exchange rate using the PPI. *Source:* Datastream.



----- Nominal Exchange Rate  
 \_\_\_\_\_ Real Exchange Rate (CPI)  
 \_\_\_\_\_ Real Exchange Rate (PPI)



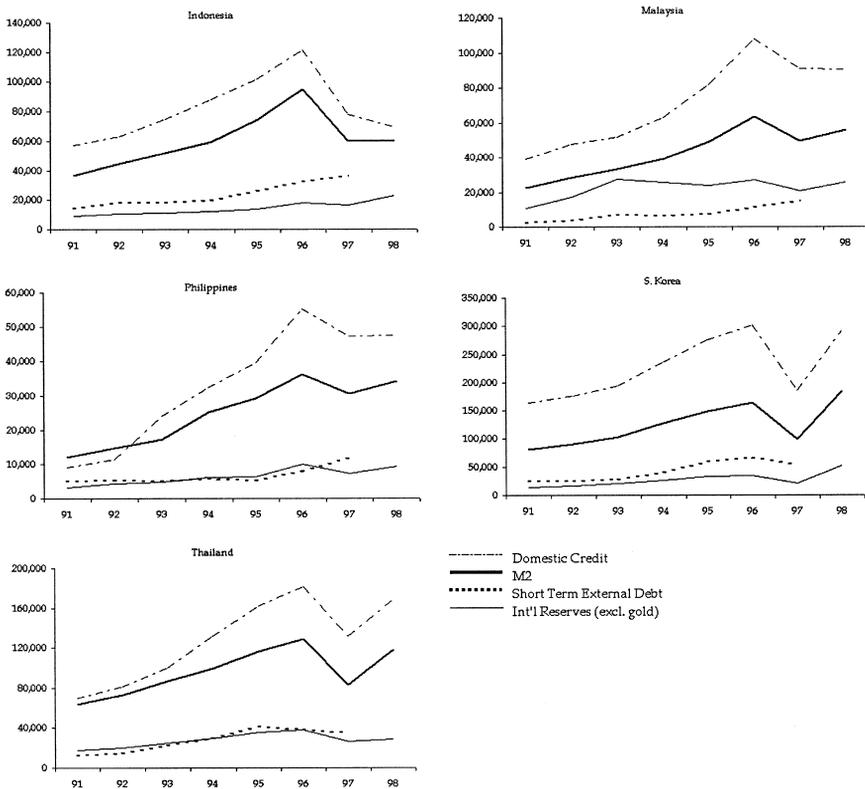


Fig. 5. Money, debt and reserves. All figures in millions of U.S. dollars. All data, except short-term debt, are from IFS. Short-term debt is from World Bank (data for 1998 not available).

fraction of international reserves.<sup>8</sup> The intuition is that a run, either by foreign lenders or because of capital flight by local investors, can leave the economy vulnerable if it does not possess sufficient international reserves to cushion sudden outflows of funds. Fig. 5 shows a sharp increase in measures of domestic credit and M2 in many of the crisis countries in Asia prior to the crisis. Fig. 5 also shows that the level of short-term external debt exceeded the level of international reserves in Indonesia, the Philippines and Thailand. This has led several scholars to blame short-term *debt flows* for the crisis in East Asia.<sup>9</sup> Many take a further leap (without documenting any evidence and without making a persuasive argument) by stating that short-term *capital flows* (debt *and* equity) were responsible for the meltdown we witnessed in East Asia.

<sup>8</sup> See Furman and Stiglitz (1998), Kaminsky et al. (1998) and Rodrik and Velasco (1999).  
<sup>9</sup> Furman and Stiglitz (1998), Radelet and Sachs (1998) etc.

It is one thing to *characterize* a crisis ex post and quite another to develop an early warning model that does a reasonable job of predicting crises ex ante. Several scholars have made attempts to build empirical models that would predict crises in advance,<sup>10</sup> but their out-of-sample performance in predicting the Asian crisis, argue Berg and Pattillo (1999), is largely negative. Furman and Stiglitz (1998) note that even the model of Kaminsky et al. (1998), which is somewhat successful in predicting the Asian Crisis, is biased towards predicting a crisis when none occurred (a false alarm); this is, in fact, confirmed in Berg and Pattillo (1999).

### 3. Theoretical explanations of the causes of the crisis

We now review various theoretical explanations that have been offered to explain the crisis in East Asia, the empirical implications that follow from these explanations, the evidence and the policy implications. In our reading of the literature, we find that, in general, theoretical explanations and policy implications are plentiful but relatively little attention is paid to the empirical implications of the theories and actual empirical tests are rare as of now.<sup>11</sup> In general, the various explanations that have been discussed in the literature can be classified into four broad categories, with several scholars emphasizing more than one of these as being important in explaining the severity of the crisis.

(1) *Fundamentals*: These explanations are variations of the classic, often termed as “first-generation” models, following the seminal papers by Krugman (1979) and Flood and Garber (1984). In these models, the local governments pursue fiscal and monetary policies that are inconsistent with fixed exchange rates, leading to balance of payments problems and depleting reserves. At some point, speculators realize that the central bank will not be able to maintain exchange rate parity and this leads to a speculative attack on the currency.

(2) *Second-generation models*: These are variations of the Obstfeld (1984) model. These models are characterized by a tension between the willingness of the government to depreciate and, at the same time, the desire to maintain a fixed exchange rate. The government may want to depreciate because of either high levels of domestic debt or because of the need for expansionary monetary policy due to high unemployment. It may also feel the need to maintain a fixed exchange rate (for facilitating international trade or as a guard against inflation or as a sort of national pride). When speculators realize that it has become costly to maintain the parity, they attack as soon as they think the attack will succeed.

In both the first- and the second-generation models, the crisis is ultimately the result of flawed government policies, with the speculators merely forcing govern-

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<sup>10</sup> Frankel and Rose (1996), Sachs et al. (1996), and Kaminsky et al. (1998).

<sup>11</sup> The article by Kho and Stulz (2000) is an exception.

ment's hand. However, these models are essentially models of *currency* crisis. The theoretical arguments advanced for the East Asian crisis go beyond the standard currency crisis models and involve other institutions (namely, banks and other financial intermediaries) and other variables (namely, asset prices and corporate borrowing) to explain the crisis.

(3) *Moral hazard*: At the heart of these models are structural distortions caused by implicit guarantees to financial institutions such as banks. These implicit guarantees come either from local treasury or from international organizations such as the IMF and they take the form of assuring depositors (and in some cases, equityholders) of banks that they will bail out should the financial institution fail. This provides adverse incentives to financial institutions to make loans that are imprudent. This bids up prices of risky assets beyond their fundamental values, leading to an “asset bubble” in the economy. As potential losses from these loans start to accumulate, at some point, investors realize the infeasibility of *all* implicit guarantees being honored and the asset bubble bursts, bringing down the value of assets in the economy.

(4) *Self-fulfilling run on liquidity*: These models emphasize the role of short-term *debt* flows with fixed contractual repayment values that are *not fully* insured. These short-term debt inflows are transformed by local banks into long-term illiquid loans, i.e., the local banks perform the classical maturity transformation. This mismatch of maturity and liquidity between deposits and loans creates a possibility of a run described in the seminal paper by Diamond and Dybvig (1983). A loss of confidence, possibly irrational, on the part of short-term debt holders causes them to withdraw their funds en masse, causing the local banks to fail and the level of intermediation in economy to fall drastically. This leads to real contraction in the economy<sup>12</sup>, causing asset prices and currency values to plummet.

There is a widespread consensus among scholars that the “generation” models, by themselves, with emphasis only on fundamentals, such as current account deficits, inflation, real exchange rate appreciation, etc., or on policy inconsistencies, cannot explain the recent financial crises in Asia and Latin America. The empirical evidence is, in fact, consistent with this view; (as discussed in Section 2) the out-of-sample performance of most models attempting to predict the crisis is largely negative. Thus, most scholars adopt elements of either the moral hazard explanation or the self-fulfilling run explanation in explaining the East Asian crisis. This makes the role of banks and financial institutions central in almost all plausible explanations advanced so far. This gives rise to a cross-sectional prediction that the depth of the crisis is likely to be larger for countries where banking supervision and regulation were weaker. Tornell (1999) purports to find evidence consistent with this prediction. The August 21–27, 1999 issue of *The*

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<sup>12</sup> See Bernanke (1983).

*Economist* (on p. 17) speculates that “Singapore and the Philippines were spared disaster partly because they prevented their banks from getting into trouble.”

The most notable, and perhaps the most comprehensive, analysis incorporating elements of both fundamentals and structural distortions caused by moral hazard is provided in Corsetti et al. (1998). Krugman (1998) emphasizes moral hazard problems as the main explanation. Kane (2000) also relies on moral hazard with a somewhat different notion of a “silent” run by investors to explain the timing of the crisis and the contagion. Chang and Velasco (1998), Furman and Stiglitz (1998) and Radelet and Sachs (1998) emphasize the run on liquidity as the major explanation of the crisis in East Asia. Caballero and Krishnamurthy (1999) assume that there is an *exogenous* fall in international liquidity, but go on to explore how inefficiencies in collateral aggregation exacerbate the allocation of resources and adversely affect financial intermediation and real activity in the economy.

### 3.1. Moral hazard

There are several dimensions to the explanations that emphasize moral hazard as the central explanation for the crisis.

Krugman (1998) illustrates how financial intermediaries who receive implicit guarantees will *rationally* choose investments that are “too” risky. In addition, argue Corsetti et al. (1998) and Kane (2000), there was often political pressure on domestic financial institutions to direct credit to *local* favored firms and/or industries. Implicit guarantees also provided adverse incentives to international lenders to lend without implementing adequate supervisory, control and risk management systems in place. What were the implications of such distortionary investments? One, there was “overinvestment” caused by “excessive lending” as many projects with negative net present value were financed and undertaken. Two, prices of local assets rose beyond their true economic value leading to “overvaluation” of asset prices. These overinvestment and overvaluation may have given the appearance of spectacular economic growth in many economies in the region before the crisis.

What then triggered the crisis? As the size of the guarantees, caused by mounting losses accumulated by financial intermediaries lending to unprofitable projects, grew, it became clear to investors in the market that all guarantees cannot, or will not, in fact, be honored. This caused a downward spiral in asset and currency prices.

What can explain the timing of the crisis in several countries in the region almost simultaneously (i.e., the appearance of the contagion)? If the implicit guarantees were from an international institution such as the IMF, then the simultaneity of the crisis is a consistent implication of these explanations. The empirical evidence in Kho and Stulz (2000), however, is not very promising in this regard; they document that the bailouts by the IMF were not fully anticipated and

that the IMF actions do not appear to have significant systemic effects. If the implicit guarantees were from local authorities, then the simultaneity of the crisis is even more difficult to explain with the above explanation, which would require that aggregate guarantees cross the threshold value simultaneously in all countries in the region. Absent was a fundamental shock (which most scholars agree was not present) that would have affected the profitability of projects in all crisis countries, explaining the need for further analysis of the contagion.

A question that arises with explanations suggesting overinvestment and overvaluation caused by moral hazard is if the market is aware of these distortions and if that gets reflected in market prices somehow. The problem with looking at stock prices alone is that they are the sum of the negative effects of imprudent investment decisions and the option value of the implicit guarantees. It is difficult to disentangle these two opposing effects. Fixed exchange rate regimes further cloud transparency in the economy by making another publicly observable asset price, the exchange rate, uninformative. Future research can focus on understanding what public signals in the market can reflect the information about distorted investment policies and the size of the growing liabilities of the guaranteeing institution.

### *3.2. Self-fulfilling run on liquidity*

Scholars, who emphasize a self-fulfilling run by short-term debt holders sharply reversing debt flows into the crisis countries, point to two empirical characteristics of the crisis that support their view. One, the crisis appears to have been largely unexpected, and, two, the variable short-term debt flows/international reserves explain the cross-sectional variation in the severity of the crisis remarkably well (Furman and Stiglitz, 1998; Rodrik and Velasco, 1999). The remarkable rebound of asset prices in most of the countries in the region (see Fig. 1) in just a year or so after the crisis lends further support to their view, as it will be implausible to argue that the problems related to inefficiencies in the banking industries in these countries were resolved in such a short period of time. Radelet and Sachs (1998) point to the rebound of the Mexican asset prices after the tequila crisis of 1994 as a support for the self-fulfilling run explanations of such crises.

One might be tempted to argue that perhaps both elements, moral hazard and self-fulfilling run, were present in the East Asian financial crisis. Such equivocation, however, is not particularly insightful and helpful in this case because the policy implications arising from the two views are diametrically opposite. If one believes the moral hazard story, the prescription will call for removing implicit guarantees that lead to adverse incentives. If, however, these crises were caused by a run by short-term debt holders, then the presence of a deposit insurance type scheme is required to calm the nerves of panic-prone short-term depositors (see Diamond and Dybvig, 1983). This, of course, makes the lessons learned from the debate on reform of deposit insurance in the aftermath of the savings and loans

crisis in the U.S. useful in this context as well.<sup>13</sup> It appears to us that a judicious mix might entail having *fully insured* short-term depositors — to prevent a self-fulfilling run — and *uninsured* long-term investors (who should not be bailed out ex post either) — to provide incentives for them to put in place sound risk management and control systems<sup>14</sup> that curb the problems caused by moral hazard.

#### 4. Flows of equity capital and its implications

The authors of numerous articles (e.g., Corsetti et al., 1998; Furman and Stiglitz, 1998; Radelet and Sachs, 1998; Ito, 1999; Rodrik and Velasco, 1999) have taken the view that short-term capital flows — both debt as well as equity flows — can increase financial fragility and be destabilizing. What is remarkable to us is that none of the theoretical arguments that were built around implications of short-term debt flows applies to equity flows. Furthermore, there is no persuasive empirical evidence in support of this position either; Edwards (1999) casts serious doubts on the oft-cited evidence from the benefits of controls instituted in Chile.

Two of the most voiced concerns over equity flows (other than direct foreign investment flows) are that, one, these equity flows merely cause an increase in prices of existing assets without any corresponding increase in real activity and, two, these equity flows can reverse easily, leaving the real economy in shambles when that happens. First, it is worth noting that these two concerns contradict each other. If, in fact, equity flows do not lead to any increased real activity in the economy, their absence cannot have significant real consequences when these flows get reversed. Second, it should not matter for real activity whether or not the flows are in the form of direct investment or in the form of portfolio investment. This is because when stock prices of existing assets rise as a result of equity flows, this would spur real economic activity as more and more companies would want to issue securities (IPOs and secondary offers) to take advantage of falling cost of equity capital.<sup>15</sup> There appears to be considerable evidence in the finance literature (see for instance Fama, 1990) documenting a positive association between stock price rises and real activity. In fact, many of the authors who voice the first concern also note that moral hazard problems led to increasing asset prices and increased real activity (although not necessarily of the right kind), thus acknowl-

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<sup>13</sup> See references on Nouriel Roubini's website on the deposit insurance reform debate, <http://www.stern.nyu.edu/~nroubini/asia/AsiaHomepage.htm#DEPINS>. Also, the Federal Reserve Bank of Minneapolis has the following website: <http://woodrow.mpls.frb.fed.us/sylloge/TBTF/index.html>.

<sup>14</sup> See Ho et al. (2000) who argue that properly modeled value at risk measures would significantly increase the amount of capital needed to meet the revised Basle requirements.

<sup>15</sup> See Lucas and McDonald (1990) and Choe et al. (1993).

Table 1

Five Asian economies<sup>a</sup>: external financing, e = estimate, f = forecast. Source: IIF, “Capital Flows to Emerging Market Economies”, April, 1999.

	1995	1996	1997	1998e	1999f
Current account balance	-40.6	-54.8	-26.1	-69.2	44.6
External financing, net	83.0	99.0	28.3	-4.2	7.8
Private flows, net	80.4	102.3	0.2	-27.6	0.3
Equity investment, net	15.3	18.6	4.4	13.7	18.5
Direct equity, net	4.2	4.7	5.9	9.5	12.5
Portfolio equity, net	11.0	13.9	-1.5	4.3	6.0
Private creditors, net	65.1	83.7	-4.2	-41.3	-18.2
Commercial banks, net	53.2	62.7	-21.2	-36.1	-16.0
Non-banks, net	12.0	21.0	17.1	-5.3	-2.3
Official flows, net	2.6	-3.3	28.1	23.4	7.6
International financial institutions	-0.3	-2.0	22.4	19.3	-1.7
Bilateral creditors	3.0	-1.3	5.7	4.1	9.3
Resident lending/other, net <sup>b</sup>	-28.3	-27.3	-33.7	-22.9	-21.0
Reserves excluding gold (- = increase)	-14.1	-16.9	31.5	-42.1	-31.4

<sup>a</sup> Indonesia, Malaysia, Philippines, South Korea, Thailand.

<sup>b</sup> Including resident net lending, monetary gold, and errors and omissions.

edging the positive link between stock prices and real activity. The concern about the economy being left in shambles when equity capital flows reverse perhaps stems from the intuition that investment in real capital may be relatively irreversible. However, with irreversible investment, the economy is also less likely to build a large investment in the first place when asset prices are rising.<sup>16</sup>

Empirically, we do observe a positive association between price changes and international equity capital flows. In fact, the sensitivity of these flows to price changes appears to be quite high (see Table 1); this has led many observers to label international flows as “hot money”. Brennan and Cao (1997) develop a formal model in which foreign investors are relatively less informed than local investors about fundamentals. A negative signal about the fundamentals thus causes foreign investors to revise their estimate of expected returns downward much more than local investors whose prior information was much more precise. This causes foreign investors to sell local assets to local investors, leading to a net outflow of equity capital.<sup>17</sup> Even though the presence of less informed foreign

<sup>16</sup> See Pindyck (1988, 1991) and Bertola and Caballero (1994).

<sup>17</sup> This argument is described informally in Furman and Stiglitz (1998). Brennan and Aranda (1999) show that there will be a net debt outflow as well and that debt flows will be even more volatile than equity flows. The empirical evidence in Table 1 is, in fact, consistent with this argument.

investors may cause equity capital flows to be “fickle”, it does not, however, follow that it should result in large swings in *prices* as critics of “hot money” (e.g., Furman and Stiglitz, 1998) seem to imply. This is because with a large fraction of traders being uninformed, a large sell (or buy) order conveys relatively less information about fundamentals and thus, prices set by rational agents should react less to this order flow information.<sup>18</sup>

Our view, therefore, is that there is no persuasive theory and scant empirical evidence to suggest that equity capital flows — “hot money” — cause pernicious effects on the economy. Policy implications suggesting measures to curb equity flows can therefore be considered to be ill founded and premature, at best.

## 5. Concluding remarks

The East Asian crisis of 1998 was remarkable in that it came soon after public pronouncements of the efficacy of the economic models of the Asian tigers. It is no exaggeration to say that the crisis caught everyone unawares with rare warning signals from academic quarters. The aftermath of the crisis has not only led to correction in structural deficiencies of the Asian economies but has also led to correction in the academic literature analyzing the defects in the Asian model.

Whatever may be the final explanation for the immediate reasons for the crisis, there appears to be wide consensus that the crisis reflected some institutional inefficiencies in the Asian economies. Excessive and politically motivated lending, lax banking supervision, inadequate apparatus for handling bankruptcy are just some of the features that highlight what was wrong with these economies. The reforms initiated under the aegis of World Bank, IMF and the foreign investors were intended not only to stem the contagion but also to improve the efficiency of the real and financial sectors of the economy. Although most of the central banks seem to have learned the lesson of not pursuing misguided monetary policies, there are still significant obstacles in the way of cleaning up the banking systems and freeing the capital markets from (implicit) controls. IMF has come in for some criticism for the implicit guarantees it provided to the international lenders, causing the moral hazard problem. The idea of “bailing in” the private creditors seems to be in vogue.<sup>19</sup> Others have expressed a need for some contingent financing facility in times of crisis to stem the flight by private creditors.

There is a general agreement about the need for greater transparency in accounting systems at both the corporate and the country levels. International accounting standards are being developed by the International Accounting Standards Committee. The current capital adequacy norms are seen as too lax (for

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<sup>18</sup> This intuition can be verified with a simple Kyle (1985) type framework.

<sup>19</sup> Ecuador defaulted on its Brady bonds in October, 1999. Foreign creditors suspect IMF of complicity, as a way of “teaching” them that their loans are not guaranteed.

instance, the riskiness of a loan is measured by whether it is made to a country inside or outside the OECD) although the Basle Committee is trying to update these standards. The governments, however, need to clean up the root causes of banking messes by recapitalizing good banks, forcing the closure of underperforming banks, and generally changing the banking culture. The foreign investors would also welcome fuller and timely information about the level of international reserves of the country,<sup>20</sup> the extent of forward transactions undertaken by the central banks, and the levels of short-term debt in the economy.

One crucial facet of the crisis seems to have been not given adequate attention by the researchers. The crisis was characterized by huge outflows of *both* the debt capital and equity capital. Models built around the debt flight do not explain the concurrent flight of equity capital. Informational differences between foreign and domestic appear to be important factors in explaining the flows (both the inflows and the outflows) of equity capital. These equity flows cannot explain the large swings in prices, however. We need to understand the effects of equity capital flows better before we can seriously entertain the advice offered by many, most notably Paul Krugman, that suggests capital controls as the least painful way of saving the country from crisis-like situations. Controls on capital not only discourage foreign investors from investing in the country, but also encourage capital flight by domestic investors.

We hope that the collection of articles in this issue would provide a new impetus to research by not only revealing new insights but also setting a challenging future research agenda.

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<sup>20</sup> The Finance Minister of Mexico has promised to publish the information about the level of international reserves on the Internet. See <http://www.inegi.gob.mx/economia/ingles/fieconomia.html>.

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