

Pre-print version

Article in *Emerging Markets Review* (Elsevier), vol. 1, Num. 3, 2000, pp. 229-51

Novelties of Financial Crises in the 1990s and the Search for New Indicators

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This draft: August 2000

Abstract: This paper argues, first, that, despite some similarities, financial crises in the 1990s have featured substantial differences between them: the ERM crisis of 1992-93 was mainly due to stringent monetary policies; the Mexican crisis of 1994-95 was associated to private overconsumption; and the East Asian crises of 1997-99 were basically the result of private overinvestment. Therefore, as crises do not seem to present strong regularities over time, the task of trying to predict them on the basis of past developments is surely deemed to failure. As crises might be simply unpredictable, specialists should refrain from creating and developing predictors and focus instead on simpler early-warning indicators. Second, the paper reviews the main body of literature on leading indicators of crises and it suggests that the bulk of these conventional indicators do not seem to be appropriate to the East Asian episodes. In order to create a new set of early-warning indicators, economists should focus on non-conventional deficiencies, such as those related to financial fragility associated with financial deregulation and with capital inflows, to a declining efficiency of investment, and to a high short-term external debt (especially as a proportion of foreign exchange reserves).

Keywords: financial crisis; ERM; Mexico; Asia; exchange rates; financial policy; foreign debt.

JEL Classification: F30, F32, F33, F43, G15.

1. Introduction

As suggested in many theoretical and empirical studies, financial crises in the 1990s have been preceded by several common features: pegged exchange-rate regimes, rapid financial liberalizations, massive capital inflows, real appreciations of the currency, deteriorating current accounts, and speculative and herding behaviors in international capital markets.

However, these crises were essentially different from each other. After the East Asian episodes of 1997-99, we have now witnessed a crisis due to stringent monetary policies in a context of global deflation (that was arguably the case of the turmoil of the Exchange Rate Mechanism of the European Monetary System in 1992-93), a crisis associated basically with domestic private overconsumption (as in Mexico in 1994-95), and crises provoked mainly by a process of previous private overinvestment (as in the East Asian case).

Moreover, the current literature on indicators of currency crises (especially in emerging markets) does not seem to fit very well with the situation in the East Asian economies prior to their crises. Only one (a high ratio of short-term foreign debt to reserves or a substantial rise of this ratio) of the eight main significant variables identified in the literature was recorded in all the later troubled East Asian economies in the years preceding the onset of the crises in mid-1997. This seems to suggest that the task of predicting crises might be a rather difficult (or even impossible) endeavor. Specialists should focus instead on the more modest goal of developing early-warning indicators in order to prevent (and not to predict) the recurrence of crises.

If financial crises have been heterogeneous and if trying to predict them has not only failed but might be an impossible task, two main tenets of a recent work of a leading specialist (Kaminsky, 1999) can be put into question: that the East Asian crises were not of a new breed and that they were predictable.

This paper is organized in the following way. Section 2 describes the main factors behind those three crises and concludes that they were in fact rather

different. Section 3 presents a very short survey of the literature on indicators of crises and suggests that some considered variables should be retested in a more precise way and that some other new variables should be taken into account. Section 4 summarizes the main arguments of the paper and concludes.

2. Financial Crises in the 1990s: a Brief Review of Stylized Facts

2.1. Financial crises in the post-Bretton Woods period

Financial crises are defined here in a narrow sense. They should include, at least, four main elements: (1) a significant and unwanted depreciation of the currency; (2) a large drop in stockmarket indexes; (3) serious difficulties in the domestic financial system; and (4) a reversal of GDP growth towards much lower positive rates or negative rates.

Since the collapse of the Bretton Woods system in the early 1970s, several financial crises, especially in emerging economies, have erupted in the Southern Cone of Latin America (Argentina, Chile and Uruguay) in 1981-82; in virtually all Latin America, during the debt crisis in 1982-89; in Western Europe, as the ERM of the European Monetary System suffered a turmoil and a breakup in 1992-93; in Mexico, in 1994-95; and in East Asia, in 1997-99.

An important feature was that all post-Bretton Woods crises were preceded by an upsurge in net private capital inflows (Kahler, 1998; UNCTAD, 1998). Capital flows were attracted in all cases by three main factors. First, important interest rate differentials between capital-importing economies and capital-exporting countries.¹ Second, financial market deregulation and capital-account opening. Third, an exchange-rate policy aimed at maintaining stability in the nominal exchange rate.

¹ However, it should be noted that in the Southern Cone, Western Europe (Italy, Spain and the UK) and Mexico, the interest rate differential was related to tight monetary policy in the capital-recipient countries, while, in Latin America in 1982-1989 and in East Asia, it was mainly due to very low international interest rates.

The nature (composition, maturity and borrowers) of those flows was nevertheless different in each case (table 1).

Table 1. Composition, maturity and borrowers in upsurges of capital inflows since the late-1970s

	Composition	Maturity	Borrowers
Southern Cone	Individual bank lending	Short-term	Private
Latin America	Syndicated bank loans	Medium-term	Public
Western Europe	Portfolio investments	Short-term	Private
Mexico	Portfolio investments	Short-term	Private/Public
East Asia	Bank lending	Short-term	Private

Source: Author.

In all cases, massive capital inflows led to two alternative or combined effects in the recipient economies: (a) if not sterilized (causing then an increase in the monetary base, in domestic demand and in inflation), to currency nominal appreciations and to a worsening of the external payments position (e.g. a rise in the current account deficit and in the foreign debt). The change in the real exchange rate towards greater currency appreciation, due also to inflationary pressures, tended to attract even more capital flows; (b) if sterilized (in order to maintain unchanged the monetary supply), central banks had to issue domestic debt, which in turn increased domestic interest rates and the fiscal deficit. Moreover, central banks used the domestic currency obtained by the issue to acquire foreign exchange. The increase in both interest rates and foreign exchange reserves attracted even larger capital flows, as the interest-rate differential tended to rise and as the increase in reserves seemed to assure stability in the nominal exchange rate.

This process seemed to create a virtuous circle of long-lasting increases in capital inflows. However, these inflows normally contributed to an overextension in bank lending, with three adverse consequences: a rapid

increase in asset prices (that is, a bubble in the non-tradable sector); a decline in the quality of assets; and a greater laxity in risk-assessment by domestic banks and other financial institutions. Therefore, large capital inflows were related in all cases (except in the ERM episode) to serious banking crises.

In more general terms, responses by recipient countries to massive capital inflows can be described as follows (Reinhart and Reinhart, 1998):

- *sterilization*: central banks accumulate foreign exchange reserves to avoid some (or all) of the ensuing currency nominal appreciation. They engage also in open market operations (and/or they impose higher reserve requirements in the banking system or they shift government deposits to the central bank) to offset some (or all) of the monetary expansion associated with the higher reserves. Open market operations include the selling of treasury bills or central bank paper. As a result, the predictability of the near-term value of the currency, together with higher interest rates, lead to an increase in the volume of short-term capital inflows. It should be noted that central banks tend to prefer open market operations, as higher reserve requirements increase the burden on the banking sector and provoke some financial disintermediation.
- *exchange-rate policies*: a revaluation of the currency (which is normally rejected because of its adverse effects on exports) to reduce the gap between the nominal exchange rate and the real exchange rate, or, at least, a shift towards higher exchange rate flexibility (e.g., some nominal depreciation to maintain competitiveness, although this measure may lead to higher inflation).
- *fiscal policies*: in order to lower aggregate demand, governments may choose to tighten fiscal policies, but this choice may collide with long-term needs for infrastructure development in low-income countries.
- *capital-account measures*: taxing short-term inflows, improving prudential regulation on cross-border borrowing, or liberalizing capital outflows.

The empirical evidence tends to suggest that developing countries, in order to avoid some of the adverse impacts of maintaining the currency peg, emphasize,

in general, sterilization. Moreover, the comparison of several Latin American economies before the Asian crises² leads to several conclusions: (1) sterilization of capital inflows should avoid the issue of large short-term government debt, especially if denominated in foreign currency (Chile versus Mexico); (2) flexibility in exchange rate policies is better than credibility, even if it provokes a somewhat higher inflation, as pegged currency regimes tend to lead to real appreciation and have moreover a limited usefulness over time to fight inflation (Chile versus Mexico and Argentina); (3) capital controls on short-term capital inflows, at least on a temporary basis, have shown good results (again Chile versus Mexico and Argentina); (4) some fiscal restraint might be necessary (*idem*).

Table 2 summarizes policy responses to large capital inflows in several Latin American economies in 1994 and in Thailand in 1996.

Table 2. Policy responses to large capital inflows in several Latin American economies in 1994 and in Thailand in 1996

	Mexico94	Chile94	Argentina94	Thailand96
Fiscal restraint	NO	YES	NO	YES
Currency revaluation	NO	YES	NO	NO
More Ex. Rate variability	NO	YES	NO	NO
Sterilization	YES	YES	NO	YES
Capital controls	NO	YES	NO	YES
Lib. of capital outflows	YES	YES	NO	YES
More trade liberalization	YES	NO	NO	YES

Source: Reinhart and Reinhart, 1998, table 4.10, p. 122.

The three main episodes of financial crises in the 1990s (the ERM crisis of 1992-93; the Mexican crisis of 1994-95; and the East Asian crises of 1997-99) deserve special attention.

² See Eichengreen and Fishlow (1998), Kahler (1998), and Reinhart and Reinhart (1998).

First, they share important similarities. All were preceded by: (1) a process of rapid financial deregulation and capital-account opening, which, in general, was not matched by an adequate regulation and supervision of the domestic financial system; (2) a policy of exchange-rate peg, aimed at containing inflation and attracting foreign capital; (3) large interest-rate differentials; and (4) an upsurge in net private capital inflows, which contributed to a currency real appreciation and/or an overextension in bank lending.

Second, they have been related, much more than previous episodes, to the growing globalization of the world economy³, especially as regards to the trend towards higher capital mobility (e.g., increase in inflows and vulnerability to sharp reversals).

Third, the ERM and Mexican crises have inspired the so-called second-generation models of currency crises, which, describing the turmoils mainly as self-fulfilling events, prevail in the current theoretical literature (see, for instance, a critical survey of these models in Bustelo, García and Olivié, 1999, part II).

2.2. The ERM crisis (1992-93)

The crisis in 1992-1993 of the ERM of the European Monetary System (EMS) was a new kind of financial turmoil. In contrast with the Latin American episodes of the late-1970s and the 1980s, the European crisis was, to a great extent, a self-fulfilling event.

As Krugman (1997) suggested, “the European countries attacked in 1992 and 1993 did not fit the [first-generation] canonical crisis model at all”. Governments retained access to foreign capital, so they did not have to monetize their public deficits. Therefore, later-troubled economies did not have *a priori*

³ For an analysis of the links between globalization and financial crises, see Kahler (1998), Bustelo, García and Olivié (1999, part III), and Bustelo and Olivié (1999).

limitations on foreign exchange reserves and they did not feature an exceptionally rapid growth of domestic bank credit.

Moreover, they had relatively low and stable inflation rates both before and after the crisis. The ERM crisis was virtually unanticipated by financial markets: for instance, interest differentials against deposits in the later targeted currencies did not begin to widen until August 1992, only one month before the initial breakup of the system.

The results of the ERM crisis are very well known: the exit of the Italian lira and of the British pound from the EMS in September 1992; recurrent speculative attacks against the French franc in late 1992 and in 1993; and several devaluations of the Spanish peseta, the Portuguese escudo and the Irish punt from September 1992 to July 1993. Finally, in early August 1993, the size of currency bands in the ERM was widened from 4.5% (+/- 2.25%) to 30% (+/- 15%), epitomizing the collapse of an entire exchange-rate system (Buiter, Corsetti and Pesenti, 1998).

The crisis reflected the inherent weakness of national anti-inflationary policies based on pegging the exchange rate and the vulnerability of the policy-makers' commitment to nominal exchange-rate stability. It has been explained both as a result of some policy-induced weak fundamentals in the EMS zone since the late 1980s but especially in the aftermath of Germany's reunification in the early 1990s, and as a product of massive speculative attacks against several currencies in the area.

Since 1987, several high-growth and high-inflation economies (such as Italy, Spain and the UK) had pursued tight monetary policies to contain prices' increases, creating large interest-rate differentials with the rest of Western Europe (particularly with Germany) and with the US. This attracted large capital flows, which appreciated the currencies and provoked large current account deficits.

Moreover, in the aftermath of its reunification Germany undertook large fiscal transfers to its Eastern region, which fueled domestic demand, increased the budget deficit and created inflationary pressures (wages had also featured an upward trend, following monetary unification). In order to keep inflation at bay, the Bundesbank, sticking to its traditional tight monetary policy, raised interest rates at a time when other European countries (and also the US and Japan) had to lower their rates to get out of recession. In mid-July 1992, Germany's monetary authorities increased the discount rate from 8% to 8.75%, in a context of declining rates in the US and Japan (average short-term rates in 1992 were 9.4%, 4.1% and 3.4%, respectively). Germany attracted substantial capital flows (especially from the US, as the interest-rate differential surpassed 600 basis points). Large capital inflows appreciated the D-Mark: it reached a historical high rate towards the dollar during the summer of 1992.

The D-Mark appreciation should have provoked in other EMS-member countries either an exchange-rate realignment (a devaluation) or further deflation-oriented policies, both to regain competitiveness. However, policy makers in Italy, the UK, Ireland, Spain and Portugal, confronted both to substantial inflationary pressures and to high unemployment (and pressured to engage in expansionary fiscal policies), decided to maintain the pegs, mainly for fears of the domestic inflation cost of the eventual realignment, while they refused to increase sharply their already high interest rates.

After the first Danish referendum (which rejected the Maastricht treaty) and with uncertain expectations regarding the French consultation, speculative pressures on the lira and the pound increased during the summer of 1992. In early September, Italy decided to increase its discount rate, while the Bank of England opted to accumulate foreign exchange reserves. After the Finnish markka (which had a peg with the Ecu) was floated on 8 September and despite a slight decrease in German interest rates, the sterling and the lira withdrew from the EMS on 16 September, while the peseta was devalued by 5%. Pressures mounted on the franc, the peseta and the escudo. The latter were both devalued again by 6% on 22 November, amidst the floating of the Swedish and, later, the

Norwegian kronas (which also had a peg with the Ecu). In January 1993, the Irish punt was devalued by 10%. Germany reduced interest rates in February, March and April to reduce tensions, but in May both the peseta and the escudo were devalued by another 6.5%. Finally, on 2 August 1993, the size of the currency bands in the EMS widened from 4.5% to 30%, putting an end therefore to the previous system.

In short, the ERM crisis might be explained by the following main factors. First, pegged currencies featured substantial real appreciations following the upwards movement of the D-Mark, due to higher interest rates in Germany in a context of slack growth (and low interest rates) in the US and Japan. Second, relatively loose fiscal policies and tight monetary stances in several European countries before the crisis were counterproductive. Inflationary pressures precluded fiscal stimuli while relatively high domestic interest rates were maintained in order to fight inflation and especially to attract the foreign capital needed to finance the current account deficits. Large capital inflows, spurred also by capital account opening after the Single Act, contributed to currency real appreciations while high interest rates discouraged investment and job creation. When the crisis began in mid-1992, "other European countries pegging to the Mark found themselves obliged to match the tight monetary policy without the fiscal expansion [of Germany]; thus they were pushed into recession" (Krugman, 1997). Third, massive speculative attacks (Eichengreen, Rose and Wyplosz, 1994) were launched against the pound, lira, punt, escudo and peseta, on the ground that, in the aforementioned context, those currencies could have been defended only by a very sharp monetary contraction, which policy makers rejected on domestic political and economic considerations.

The ERM crisis was therefore a result of pegged exchange rates, appreciated currencies, financial liberalization and speculative and herding behaviors in international capital markets. These four features were to be found later also in the Mexican and the East Asian crises.

2.3. The Mexican crisis (1994-95)

Similarly to several European economies in 1992, Mexico was not suffering from particularly adverse conventional deficiencies in fundamentals in the early 1990s (and more precisely in 1994, see Sachs, Tornell and Velasco, 1996b). It featured a low public deficit (only 0.5% of GDP in 1994⁴); a reasonable inflation rate (at least by Mexican standards) of 8% in 1993 and 7% in 1994; and a consistent monetary policy (the growth of M1/GDP was only 1.1% per year in 1992-94).

However, the Mexican economy had also several important weaknesses (Calvo and Mendoza, 1996; Espinosa and Russell, 1996; Palma, 1998):

- political instability, following the Chiapas rebellion in January 1994 and the assassination of presidential candidate Luis Donaldo Colosio in March, in a context of an election year;
- a large current account deficit (6.8% of GDP in 1993; 8% of GDP in 1994, which amounted to 38% of exports), due to an important peso overvaluation and to a decreasing savings rate. According to Palma (1998), the peso appreciated in real terms almost 62% between 1987 and 1994. In the two years preceding the crisis, the currency appreciated, in real terms, 13.1%.⁵ The appreciation was a result of the currency peg, the inflation differential with the US (3 percentage points in the tradable sector in 1990-93), and the large capital inflows that the country received (US\$ 91 billion in 1990-93, many of them with short-term maturities - only 13% was in the form of direct investment in 1993). The private savings rate declined from 26.1% in 1984-90 to 13.8% in 1991-93, while the investment rate increased from 16.5% to 19.5%. As a result, the current account deficit rose from US\$ 14.6 billion in 1991 to US\$ 28.8 billion in 1994;

⁴ Although this figure might be higher (to perhaps 4% of GDP) if funds raised and lent by state and development banks are included. However, Mexico had budget surpluses from 1990 to 1993.

⁵ This appreciation was roughly similar of that of Southeast Asia in the 24 months preceding the 1997 crisis: 17.7% in the Philippines, 15.5% in Thailand, 12.8% in Malaysia, and 12.1% in Indonesia, although much larger than that of South Korea (4.4%), according to Esquivel and Larraín (1999: table 2).

- a substantial short-term private and public foreign indebtedness, mainly dollar-denominated, as a result of the issue of foreign debt instruments by private financial and manufacturing companies and, in 1994, of government dollar-indexed bonds (*tesobonos*). This was the result of the need to finance the external deficit but also of an indiscriminate and premature capital account opening;
- an inadequate regulation and supervision of the domestic financial system, which had been recently liberalized. Liberalization included measures directed to reduce reserve requirements, to increase access to offshore borrowing and to remove restrictions on corporate debt financing and barriers to entry in the financial system. Inadequate oversight provoked excessively risky bank loans (bank credit, as percentage of GDP, doubled between 1990 and 1994) and growing asymmetries in maturity and currency structures between foreign borrowings and domestic loans;
- a high vulnerability to reversals in capital flows, following the aforementioned features and the six-step increase in US Fed funds rates during 1994 (from 3.0% in January to 5.5% in late-November). In fact, net transfer of resources from abroad declined from US\$ 22 billion in 1993 to *minus* US\$ 2 billion in 1995 and to *minus* US\$ 13 billion in 1996, a swing equivalent to 10% of GDP (Palma, 1998).

As a result of speculative selling of the peso, foreign exchange reserves declined from US\$ 29 billion in January 1994 to US\$ 16 billion in April-October and to only US\$ 6 billion in December. Finally, on 22 December, Mexico allowed the peso to float freely. The currency lost 40% of its value between 20 December 1994 and 15 January 1995. A protracted recession followed, as GDP fell 7% in 1995 and as the unemployment rate increased from 4% to 7%.

2.4. The East Asian crises (1997-99)

The East Asian financial crises in 1997-1999 were, to an extent which was difficult to understand afterwards, unanimously unpredicted. Academic specialists on currency crises, financial analysts, debt-rating agencies, and even

the International Monetary Fund (IMF) and the Asian Development Bank (ADB), failed to predict not only the crises but also any kind of major economic or financial disturbance.⁶

In fact, all the later troubled East Asian economies (Indonesia, Malaysia, the Philippines, South Korea, and Thailand, or Asia-5) lacked in 1990-1996 both domestic and foreign *conventional* macroeconomic deficiencies⁷. On the domestic front, they had low public deficits - or even budget surpluses (with balances ranging in 1990-1995 from -1.1% of GDP in Thailand to +3.2% of GDP in Thailand); limited public debts (only Malaysia had a figure of more than 40% of GDP); moderate inflation (except in the Philippines and Indonesia); high savings and investment rates (over 30% of GDP, except in the Philippines); robust GDP growth (8% in 1990-1996 on average in Asia-5); high and apparently sustainable net capital inflows (which amounted to 6% of GDP in 1990-1996 and were seen as *benign* as they financed investment rather than consumption); and low unemployment rates (below 3% in Malaysia, South Korea, and Thailand, around 4% in Indonesia, although 7% in the Philippines). Internationally, interest rates in the US and especially in Japan were low; GDP growth was reasonably high in the advanced economies (except in Japan in 1997); world commodity markets were stable; and world trade growth averaged 6% in 1990-1996. As a conclusion, “none of the [traditional] macroeconomic fundamentals suggested that a crisis of the magnitude that occurred was imminent in Asia” (Glick, 1998: 6).

⁶ The ADB's *Asian Development Outlook 1997 and 1998* noted that “over the near term, prospects for growth look good” while the *IMF Annual Report 1997* even praised the “soundness” of Thailand's and South Korea's macroeconomic policies. Among academic researchers, virtually all failed to predict the crises. However, a praiseworthy exception was Korean economist Park Yung-chul. See Park (1996).

⁷ However, there were important *non-conventional* deficiencies in fundamentals (see below). For statistics on the macroeconomic fundamentals of Asia-5 in 1990-96 see, for instance, ADB (1999), Bustelo (1998), Bustelo, García and Olivié (1999, part I), Corsetti, Pesenti and Roubini (1998), Glick (1998) and World Bank (1998).

Despite this apparently comfortable international and domestic macroeconomic environment, which contrasted, in several aspects, to those of some Western European countries (Spain, Italy, United Kingdom, Ireland, and the Nordic economies) before 1992-1993 and of Mexico before 1994-1995, virtually all Asia-5 economies presented simultaneously several weaknesses. A premature and indiscriminate financial liberalization led to large capital inflows and to a substantial lending boom. As a result, currencies appreciated in real terms, while overinvestment contributed to a fall in capital efficiency. Current account deficits were financed by short-term foreign debt, which rose mainly as a consequence of a rapid financial opening. The domestic financial sector incurred in excessive risk-taking and became more fragile and vulnerable.

The East Asian economies undertook, since the early 1990s, a process of rapid financial liberalization, including both domestic deregulation and capital-account opening (Jomo, 1998; Chowdury, 1999). As regards to domestic deregulation, barriers to entry in the financial sector were eliminated while old and new financial institutions obtained more freedom in their borrowing and lending decisions (these measures increased the number of financial institutions and their range of activities); restrictions on corporate debt financing were lifted; and regulatory controls over interest rates and loans were loosened, in benefit of a more market-based monetary and credit policy. As regards to capital-account opening, virtually all restrictions on cross-border borrowing were eliminated. As financial institutions entered new areas of business and as domestic firms became free to borrow both domestically and abroad, the quality of risk-assessment was reduced, while foreign exposure (to both interest- and exchange-rate risk) increased, due to the liberalization of the capital account, to the interest-rate differentials, and to the pegged currencies (which virtually cancelled the perceived exchange risk). Foreign borrowing in short-term funds denominated in foreign currencies contributed, along with increased competition in the domestic banking sector, to an excessive bank lending on a long-term basis (and in domestic currency). As a result, balance sheets in banks and other financial institutions featured a growing maturity and currency mismatch between liabilities and assets.

In the case of borrowing, obtaining capital from abroad (at low interest rates on a short-term basis) to lend in the domestic market (at high interest rates on a long-term basis) was profitable. This process contributed, besides to the aforementioned maturity mismatch between liabilities and assets, to the accumulation of a substantial short-term foreign debt.

In the case of lending, due to increased competition in the domestic market, most banks tended to direct their loans to the stockmarket and to commercial and residential property, and thus contributed to create an asset bubble in those sectors. For instance, low rental yields in office buildings in central business districts reflected a boom in real estate. Moreover, stock indexes in the property sector rose more than general stock indexes. Banks behave quite rationally, as lending to consumption was not profitable due to high private savings and as loans to manufacturing were affected by declining corporate returns.

Moreover, financial liberalization proceeded in a context of inadequate governmental regulation and prudential supervision (Singh, 1998). Low capital adequacy ratios and high legal lending limits contributed to bank overlending (or to firms' overborrowing), while limited disclosure requirements and inadequate asset classification systems disguised the extent of problems related to non-performing loans.

In short, financial liberalization was a major cause of the subsequent increase in net capital inflows and of the boom in bank credit to the private sector.

High and rising capital inflows (table 3), due to low interest rates in the advanced economies (especially in Japan) and, domestically, to the high-growth and high-yield environment, to the financial opening and to the stability of the nominal exchange rates, led to currency real appreciation. According to Radelet and Sachs (1998: table 10), between December 1990 and March 1997 currencies

appreciated, in real terms, 47% in the Philippines, 28% in Malaysia, 25% both in Indonesia and Thailand and 11% in South Korea.⁸

Table 3. Net private capital inflows (as a percentage of GDP)

	1975-82	1983-91	1992-96
Indonesia	1.1	2.6	4.8
Malaysia	5.1	4.1	10.5
Philippines	5.5	-0.8	4.8
South Korea	5.7	-0.4	3.2
Thailand	4.0	5.7	8.8

Source: IMF.

The rise of the US dollar since the spring of 1995, relative to the Japanese yen (and most European currencies), also contributed to this appreciation, as the Asian countries had a dollar-pegged exchange-rate regime. For instance, as the value of the US dollar increased from 85 yen in June 1995 to 127 yen in April 1997 and to 135 yen in December 1997, Japan increased its competitiveness outside Asia relative to its regional competitors (mainly South Korea, Taiwan, Singapore and Malaysia), while Japanese direct investment in the area and its market for Asian products contracted. Moreover, inflation rates were higher in the Asia-5 countries than in their main trading partners. In 1995-96 average inflation rates surpassed 8% in Indonesia and the Philippines, 5% in Thailand, 4% in South Korea and 3% in Malaysia, while the rise of the consumer price index in the US was only 2.8% (and Japan was featuring deflation).

The real appreciation of Asia-5 currencies contributed to an important slowdown in exports and, subsequently, to an increase in trade deficits and to large current account imbalances, especially in Thailand and Malaysia.

The loss of competitiveness due to currencies' real appreciation, together with the entry of low-cost producers (such as China) in international sectors with

⁸ For the World Bank (1998: table 2.5), currency real appreciation amounted, from June 1995 to June 1997, to 20.0% in the Philippines, 16.1% in Thailand, 14.0% in Indonesia, 9.3% in Malaysia, and only 2.5% in Korea. Other differences in pre-crisis conditions between Southeast Asia and South Korea are outlined in Bustelo (2000).

global excess supply, with a glut in the world's semiconductor market, and with the reduction in import propensities in advanced economies in 1994-1996, provoked a slowdown in exports. The growth rate of total exports decreased markedly in Thailand (from 25.1% in 1995 to -1.3% in 1996), South Korea (from 30.3% to 5.3%) and Malaysia (from 26.0% to 6.7%). However, Indonesia (13.4% and 10.4%) and the Philippines (31.6% and 17.5%) suffered a less important decline.

As a result, current account deficits (as a percentage of GDP or of exports) reached considerable high levels in Malaysia and Thailand, but they were also sizable in the Philippines and South Korea. Only Indonesia had a reasonable current account deficit. According to statistics from the ADB (1999: table 1.2), in 1996 current account deficits (as a proportion of GDP) amounted to 7.9% in Thailand, 5.0% in Malaysia, 4.7% both in the Philippines and South Korea (although Korea's deficit decreased to 2.0% in 1997), and 3.4% in Indonesia.

Financial deregulation and large capital inflows led to a boom in bank credit to the private sector (table 4). The large increase in bank lending contributed to accelerate overinvestment, which was already under way. Investment rates in 1995-1996 surpassed 40% in Malaysia and Thailand and 35% in South Korea.

Table 4. Bank lending to the private sector (as a percentage of GDP)

	1980	1990	1996	Δ90/80	Δ96/90
Indonesia	8	45	55	12	10
Malaysia	33	71	93	37	22
Philippines	31	19	49	38	30
South Korea	36	52	62	16	10
Thailand	9	64	102	53	38

Source: BIS.

Overinvestment, together with important increases in unit labor costs, provoked a decline in capital efficiency in the early 1990s. This decline was shown in three facts: (1) in Asia-5 the average investment rate rose from 1986-1990 to 1991-95 while average GDP growth decreased from around 10% in 1986-1990 to around

8% in 1991-1995. For instance, the ratio between the investment rate and GDP growth increased, from 1990-94 to 1995-96, from 4.14 to 4.72 in Malaysia and from 4.54 to 5.79 in Thailand; (2) the incremental capital output ratio (ICOR) displayed an upwards trend in several important manufacturing sectors. For instance, from 1987-92 to 1993-96, the ICOR increased in Malaysia, Thailand and South Korea, according to Corsetti, Pesenti and Roubini (1998: table 6); and (3) returns on assets in the corporate sector, following estimates from Claessens, Djankov and Lang (1998: table 1), diminished, from 1992 to 1996, 2.6 percentage points in Thailand, 2.1 points in Indonesia, 0.8 points in South Korea and 0.4 points in Malaysia. Only the Philippines featured an increase (2.0 points).

In short, the essential process which led to rising vulnerabilities in East Asia might be summarized as follows:

- financial opening contributed, along with interest rate differentials and the exchange-rate pegs, to substantial net capital inflows (US\$ 220 billion in Asia-5 in 1990-96), most of which were short-term bank loans or portfolio investments;
- high net capital inflows provoked a currency real appreciation, due also to differentials in inflation rates and to the US dollar rise, which led in turn to slowing exports. Exports were also affected by a cyclical overproduction in semiconductors (which damaged mainly South Korea and Malaysia), by the stagnation of the Japanese economy, and by the entry of low-cost producers (there was a shift of regional trade advantages towards China). Slowing exports contributed to an increase of current account deficits, which rose 1 to 2 points of GDP in 1995-96;
- the upsurge in capital inflows, together with financial deregulation, provoked also an overextension in bank lending, which created an asset bubble in the non-tradables sector, a reduction in asset quality, and greater laxity in risk-assessment in borrowing and lending decisions. Overlending also contributed to overinvestment by private manufacturing firms, which, as a result, faced a decline in capital efficiency;

- financial deregulation increased fragilities in the domestic financial sector: excessive risk-taking; high domestic and foreign exposure; inadequate bank sheets; maturity and currency mismatch between borrowing and lending; and high short-term external debt (which was also the case in some manufacturing firms).

However, with insight, a soft landing, through slowing domestic demand and depreciating gradually the currency (with a crawling peg regime), should have been possible. Currency appreciation was smaller than in pre-crisis Mexico (Palma, 1998) and also than in several Latin American economies at that time (Radelet and Sachs, 1998). Exports were still rising in 1996 (except in Thailand) at considerable, although declining, rates. The current account deficit was high only in Malaysia, Thailand and the Philippines, but not in Indonesia and South Korea.

Nevertheless, two main factors contributed to the financial panic which erupted in July 1997, when the Thai baht was allowed to float, triggering a currency meltdown in Asia-5 in the following months. First, an increased financial fragility, due to growing domestic vulnerabilities in banks, non-bank financial institutions and manufacturing firms, combined with an overindebtedness in foreign liabilities (mostly short-term, private, denominated in foreign currencies and unhedged). Second, a slight macroeconomic worsening in 1996 and early 1997, due to slowing exports and declining investment efficiency, which led, for instance, to several important bankruptcies in South Korea in the first half of 1997. Both factors certainly contributed to the sharp reversal in net capital inflows in 1997 and 1998.

As regards to domestic financial fragility, East Asian banks and non-bank financial institutions (NBFIs) began to manage their risk inadequately in the aftermath of financial deregulation. Excessive risk-taking was a result of the real or perceived financial insurance they had from the government (the so-called moral hazard), the entry of NBFIs in new and unknown areas of business, the high foreign exposure of financial institutions (which increased both their

interest-rate and exchange-rate risks), and their widespread practice of collateralized lending. As a result, many banks were undercapitalized: their capital-to-asset ratios were low, especially in South Korea, Thailand, Indonesia, and Malaysia.⁹

Financial liberalization in a context of inadequate governmental regulation and prudential supervision was the main factor explaining this behavior. Indicators of this financial fragility were¹⁰:

- *overlending*: in 1990-1997, the average annual growth rate of real bank credit to the private sector was 18.0% in the Philippines, 17.9% in Indonesia, 17.7% in Thailand, 16.1% in Malaysia and 11.6% in South Korea, while the corresponding rates were much lower in Mexico (5.2%), Brazil (2.3%) or Japan (1.4%), according to Bisignano (1999: table 1). From 1990 to 1996 bank lending to the private sector increased 38 percentage points of GDP in Thailand and 30 points in the Philippines and reached a sizable amount in Thailand (102%) and Malaysia (93%).
- *high foreign exposure*: foreign liabilities of domestic banks as a proportion of GDP rose from 11% in 1993 to 27% in 1996 in Thailand, from 6% to 17% in the Philippines, and from 4% to 9% in South Korea.
- *high real estate exposure*: bank loans directed to the property market were in 1997 in the range of 30-40% of total loans in Thailand and Malaysia.
- *inadequate bank sheets*: in 1997 the rate of non-performing loans was 16% in South Korea, 15% in Thailand, and 11% in Indonesia (by contrast, this rate was only 2% in Singapore).

As regards to the productive sector, East Asian manufacturing firms had in general an easy access to credit. As a result, they were highly leveraged (Claessens, Djankov and Lang, 1998, table 6). Both borrowing respective to

⁹ However, banks' average capital-asset ratios were at the end of 1996 fairly reasonable: they ranged between 6% and 14%, except in the Philippines (15-18%), according to Corsetti, Pesenti and Roubini (1998: table 22).

¹⁰ The following data, unless otherwise stated, are from table 2 in Glick (1998).

investment and debt relative to equity¹¹ were abnormally high. Moreover, they were also confronted to a declining capital efficiency and to a falling profitability of investment.

Both banks and firms were also overindebted in foreign short-term liabilities, while foreign exchange reserves were not matching the debt. Indicators of such indebtedness are: (1) short-term debt as a proportion of total debt (around two-thirds in the Philippines, South Korea and Thailand in June 1997); (2) short-term debt as a proportion of foreign exchange reserves (table 5), which measures the external illiquidity risk; and (3) the ratio of broad money (M2) to foreign exchange reserves (which is a proxy for the potential demand for foreign currency by holders of domestic currency), with figures for mid-1997 surpassing 600% in South Korea and Indonesia and 400% in Thailand, the Philippines and Malaysia.

Table 5. Short-term foreign debt/international reserves (II/1997)

Indonesia	1.70
Malaysia	0.61
Philippines	0.85
South Korea	2.06
Thailand	1.45

Source: ADB.

A slight macroeconomic worsening became apparent in 1996, related especially to a slowdown in export growth and to a deterioration in the current account. The growth of GDP decreased, between 1995 and 1996, from 9.5% to 8.6% in Malaysia, from 8.9% to 7.1% in South Korea and from 8.8% to 5.5% in Thailand, according to data from the IMF (1998: table A6). Moreover, in 1996 and early 1997, the bubble in the real estate sector burst in Thailand and there was also a decrease in stockmarkets' indexes in Thailand and South Korea. According to data from Datastream, between June 1, 1996 and January 1, 1997 the Bangkok

¹¹ Corporate debt-to-equity ratios were, in 1988-96, 3.46 in South Korea, 2.00 in Thailand, 1.95 in Indonesia, 1.12 in the Philippines and 0.90 in Malaysia, while

SET decreased 32% while the Seoul Composite Index fell 36%. For instance, this led, in South Korea, to several bankruptcies in the first half of 1997.

All these financial and macroeconomic vulnerabilities in 1996 and early 1997 contributed, along with changes in investors' confidence, to the speculative attacks on the currencies and the stockmarkets that were launched since June 1997. Moreover, the reversal of capital flows in 1998 and even in 1999 was very substantial. Net private capital inflows to Asia-5 decreased from US\$ 102.3 billion in 1996 to *minus* US\$ 27.6 billion in 1998, a swing of almost US\$ 130 billion. Bank credits dropped almost US\$ 100 billion, while funds from non-bank private creditors decreased more than US\$ 25 billion (table 6).

Table 6. Net private capital flows to Asia-5 (US\$ billion)

	1995	1996	1997	1998	1999f
Equity	15.3	18.6	4.4	13.7	18.5
<i>FDI (1)</i>	<i>4.2</i>	<i>4.7</i>	<i>5.9</i>	<i>9.5</i>	<i>12.5</i>
<i>PI (2)</i>	<i>11.0</i>	<i>13.9</i>	<i>-1.5</i>	<i>4.3</i>	<i>6.0</i>
Private Creditors	65.1	83.7	-4.2	-41.3	-18.2
<i>CB (3)</i>	<i>53.2</i>	<i>62.7</i>	<i>-21.2</i>	<i>-36.1</i>	<i>-16.0</i>
<i>NBPC (4)</i>	<i>12.0</i>	<i>21.0</i>	<i>17.1</i>	<i>-5.3</i>	<i>-2.3</i>
Total	80.4	102.3	0.2	-27.6	0.3

Notes: (1) Foreign direct investment; (2) Portfolio investment; (3) Commercial banks; (4) Non-bank private creditors.

Source: IIF (1999).

2.5. A comparison and some lessons

An interesting prolongation of the previous analyses is to compare the East Asian crises with the ERM and Mexican turmoils.¹²

To begin with, the European battered economies in 1993 featured much lower GDP growth and investment and savings rates than Asia-5 before 1997. They had also much higher unemployment rates. Besides, in the ERM case interest

the corresponding figures for the US and Germany were 1.03 and 1.51 (Claessens, Djankov and Lang, 1998: table 6).

rates in Germany were high, while in 1996-1997 US and Japanese rates were low. Fiscal policies were relatively loose in pre-1993 Europe while East Asia featured virtually balanced budgets. Inflation rates were higher in Western Europe than in East Asia: as a result, monetary policy was tighter in the UK, Italy, Spain, Portugal and Ireland in 1992 than in Malaysia, Thailand or Indonesia in 1996 or than in South Korea in 1997. The European countries did not present dangerous levels of short-term private foreign debt.

Turning now to the common features of the ERM and East Asian crises, these were previous rapid financial liberalizations, pegged exchange rates, substantial real currency appreciation, large current account deficits, and adverse effects from speculative and herding behavior in international capital markets.

In short, the ERM crisis was mainly related to restrictive monetary policy in the European periphery in the late 1980s and in Germany in the early 1990s. By contrast, in low-inflation East Asia, monetary policy was not particularly tight.

Despite some similarities, the East Asian crises were essentially different from the Mexican turmoil three years before. To begin with, Mexico was 1994 in the midst of an exchange rate-based stabilization program, which was the main reason why the nominal exchange rate was stable. Moreover, the government undertook, since the early 1990s, a widespread privatization process, which attracted substantial foreign portfolio investments. Furthermore, a speculative boom in the stockmarket was under way. All these factors, combined with very low interest rates in the US, attracted considerable capital flows to Mexico (which amounted to 10% of GDP in 1993).

If one compares Mexico in 1994 with Thailand in 1996 (Hale, 1998), other differences in the pre-crisis economic environment were the following:

- savings and investment rates: 10% and 25%, respectively, in Mexico, and 35% and 44%, respectively, in Thailand;

¹² Krugman (1997) compares the three crises. Esquivel and Larraín (1999), Hale (1998), Kregel (1998), Ortiz (1998) and Palma (1998) deal only with the

- foreign exchange reserves: as a percentage of the current account deficit, they represented 95% in Mexico and 300% in Thailand;
- composition of foreign capital inflows: mainly portfolio investment in Mexico, and mainly bank loans in Thailand;
- inflation rates: 12.9% in Mexico (1990-93) and 5.5% in Thailand (1994-96);
- external environment: high interest rates in the US in 1994; low interest rates in Japan and other advanced economies in 1996;
- political situation: instability in Mexico; stability in Thailand.

Therefore, the Mexican crisis was associated with overconsumption (as the private savings rate declined) while the East Asian crises were related to overinvestment and overproduction.

Table 7 summarizes the comparison between the three financial crises.

Table 7. A comparison between the ERM, Mexican and East Asian crises

	ERM	MEXICO	ASIA-5
International int. rates	High*	Low	Low
Fiscal policy	Loose	Cautious	Cautious
Monetary policy	Tight	Tight	Cautious
Exchange rate	Pegged	Pegged	Pegged
Real appreciation	Yes	Yes	Yes
Inflation rate	Low	Low	Low
Investment rate	Low	Low	High
Savings rate	Low	Low	High
Current account deficit	High	High	High**
Short-term foreign debt	No	Yes	Yes
Financial liberalization	Yes	Yes	Yes
Financial panic	Yes	Yes	Yes
Political stability	Yes	No	Yes

Notes: *: Germany's rates; **: Except South Korea in 1997 and, to a lesser extent, Indonesia in 1996.

Source: Author.

Mexican and East Asian crises.

Some lessons can be obtained from these developments: (1) financial liberalization (including both deregulation and opening) should be pursued carefully, especially in emerging economies: gradualism, transparency and strong regulation and prudential supervision should be taken fully into account; (2) some kind of Chilean-type capital controls might be useful, as they may help in reducing the proportion of short-term funds in total capital inflows; and (3) a new international financial architecture is needed, in order to lower instability in world financial markets.

3. Are Conventional Indicators Appropriate for the East Asian Crises?

3.1. A short survey of the literature on indicators

The literature on indicators of financial (or currency or balance-of-payments) crises is already very large. The remaining of this section does not attempt to provide a comprehensive survey of the indicators literature but only to present a short summary of its main findings.

Moreover, it is well known that the studies on indicators use different definitions and measures of crises, sample periods and selections of countries, sets of tested variables, and empirical methodologies in order to obtain significant indicators.¹³ Nevertheless, a very simple review might be useful.

According to nine important empirical studies on indicators of financial (or currency) crises published from 1996 to 2000¹⁴, the variables that have most explanatory power (that is, variables tested and found significant) are the following (see also table 8): currency real appreciation (7 out of 9 studies found it significant), high ratio of short-term debt to reserves or high growth of this

¹³ Methodologies range from signals approaches and limited-dependent variable models to severity of crisis methods.

¹⁴ Frankel and Rose (1996), Sachs, Tornell and Velasco (1996a), Kaminsky, Lizondo and Reinhart (1998), Berg and Patillo (1999a and b), Kaminsky (1999), Bussière and Mulder (1999), Wirjanto (1999) and Vlaar (2000).

ratio (5 out of 9), high ratio of broad money (M2) to reserves (5 out of 9), high expansion (and level) of domestic bank credit (4 out of 9), changes in reserves (4 out of 9), slowdown in real GDP growth (3 out of 9), high ratio of current account deficit to GDP (3 out of 9), and deterioration in export performance (3 out of 9).

Table 8. Significant variables in nine empirical studies on indicators of financial crises

	FR 96	ST V96	KLR 98	BP 99a	BP 99b	K 99	BM 99	W 99	V 00
Currency real appreciation	X	X	X	X	X		X		X
Ratio short-term debt/reserves					X	X	X	X	X
Ratio M2/reserves		X	X	X					X
Domestic bank credit	X	X	X					X	
Reserves			X	X	X				X
GDP growth	X		X					X	
Ratio current account/GDP				X	X		X		
Export growth			X	X	X				

Note: FR96: Frankel and Rose (1996); STV96: Sachs, Tornell and Velasco, (1996a); KLR98: Kaminsky, Lizondo and Reinhart, (1998); BP99a: Berg and Patillo, (1999a); BP99b: Berg and Patillo (1999b); K99: Kaminsky (1999); BM99: Bussière and Mulder (1999); W99: Wirjanto, 1999; and V00: Vlaar, 2000.

Source: Author.

In addition, other minor variables have been tested and found significant in some of these studies: high foreign interest rates, high proportion of short-term debt in total foreign debt, increase in the domestic inflation rate, rapid financial liberalization, substantial capital flight, expansion of credit to the public sector, widening of the trade deficit, high growth of M1, increase of the fiscal deficit, and high ratio of imports to exports. All these variables were found relevant in 2 or 1 out of 9 studies.

3.2. The East Asian case and the search for new indicators

If we apply the eight most cited indicators to the East Asian case, the findings are disappointing (see the statistical appendix in Bustelo, 1998 and in Bustelo, García and Olivé, 1999). Real appreciation of the currency was important in

Southeast Asia but not in South Korea. The ratio M2/reserves, albeit high in all Asia-5 in 1996, was not especially disturbing in the preceding years in Malaysia. The level of domestic bank credit was not especially high in the Philippines, Indonesia and South Korea, although the growth of its ratio to GDP in 1990-96 was substantial in the Philippines. Foreign-exchange reserves did not display a substantial reduction in any of the Asia-5 economies (both in absolute terms or expressed as months of imports). The ratio of the current account deficit to GDP was not particularly high in Indonesia in 1996 and in South Korea in 1997. Export growth declined only marginally in Indonesia and the Philippines in 1996 respective to 1995.

Therefore, only the level (or change) of the ratio of short-term debt to reserves seems to be appropriate for all Asia-5 economies. However, it should be noted that this ratio surpassed 1 only in Indonesia, South Korea and Thailand by mid-1997. Nevertheless, the increase of this ratio was substantial in Malaysia and the Philippines from June 1994 to June 1997 (table 9).

Table 9. Ratios of short-term foreign debt to reserves in Asia-5

	June 1990	June 1994	June 1997
Indonesia	2.21	1.73	1.70
Malaysia	0.22	0.25	0.61
Philippines	3.18	0.41	0.85
South Korea	1.06	1.61	2.06
Thailand	0.59	0.99	1.45

Source: BIS and IMF.

The main conclusion of this section can be laid out as follows. Of the eight most cited significant variables cited in the literature on indicators of currency crises, only one (the level or growth of the ratio of short-term debt to reserves) can be retained in the East Asian case. Moreover, mainly all studies in this literature fail to consider other two variables which appear to be important in the East Asian crises: financial liberalization (although Kaminsky, 1999 considers it) and the efficiency of investment. Financial liberalization may lead to financial fragility, especially if deregulation is coupled with inadequate supervision by banks' managers and by monetary authorities and if capital-account opening is

undertaken in a too rapid way. As noted above in the case of the East Asian crises, financial fragilities were observed in indicators such as excessive risk-taking, high domestic and foreign exposure, inadequate bank sheets and overindebtedness in short-term foreign liabilities. Declining efficiency or profitability of investment may reflect a process of overinvestment in manufacturing sectors with excess capacity and in property and stockmarkets.

As a result, it is fair to conclude that: (1) the leading indicators literature is still in its infancy and more rigorous and precise data (especially on financial fragility and investment efficiency) should be explored; and (2) researchers should refrain from creating and developing predictors of crises (after all, financial crises might perfectly be unpredictable) and focus instead on simpler early-warning indicators.

4. Conclusions

The above comparison between the ERM crisis of 1993-1994, the Mexican crisis of 1994-1995 and the East Asian crises of 1997-1999 seems to suggest that the Asian turmoils were rather different than previous episodes, which were also heterogeneous. The ERM crisis was associated mainly with restrictive monetary policies firstly in the European periphery and later in Germany. The Mexican peso crisis was related to overconsumption, that is, to a drop in the private savings rate. On the contrary, in Asia-5 monetary policy was not restrictive before the crises (despite sterilization of capital inflows, simply because inflation rates were low) while overinvestment – rather than overconsumption – was the main issue.

Moreover, the East Asian financial crises were related to non-conventional deficiencies in fundamentals, such as a lending boom associated with high capital inflows and financial deregulation, a declining capital efficiency (as a result of overinvestment), and a large short-term foreign debt (especially as a proportion of foreign exchange reserves). However, the mainstream literature on *predictors* of currency crises highlights, in general, only conventional

deficiencies, such as those related to the behavior of real exchange rates, domestic credit, foreign exchange reserves, GDP growth, and the ratio between M2 and reserves.

After the crises in Asia-5, some researchers have reassessed those indicators. For instance, Radelet and Sachs (1999), Berg and Patillo (1999b), Kaminsky (1999), Bussière and Mulder (1999), Wirjanto (1999) and Vlaar (2000) have underlined the importance of the level (and change) of the ratio of short-term foreign debt to foreign exchange reserves. Jotzo (1999) has suggested two additional indicators: the external debt's currency composition and the soundness of the financial system (measured by the rate of non-performing loans, the reserve requirements and the capital-to-asset ratios). Kaminsky (1999) has pointed out that financial liberalization might be an important indicator to explore. The preceding pages have tried to suggest that, in addition to short-term debt-to-reserves, new indicators should be explored, such as those depicting domestic financial fragility following financial liberalization and as those of a process of declining investment efficiency.

Therefore, specialists should continue to look for other early-warning indicators of currency crises in emerging economies, building certainly on the experience of the 1990s but taking into account that each crisis seems to be substantially different than the preceding one.

Acknowledgements

The author wishes to thank the useful and constructive comments of an anonymous referee to an earlier version of this paper. Responsibility for the views expressed in the paper and for any omission or error remains with the author.

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