

Rethinking vulnerability to currency crises: Comments on Athukorala and Warr

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Abstract

This paper re-examines Athukorala and Warr's *ex post* investigation of several Asian countries' vulnerability to balance of payments crises. It argues that their focus on 'mobile capital' is flawed in two important aspects. It also questions their ideas about exchange rate 'overvaluation', and argues that their case that this is a meaningful indicator of vulnerability is unconvincing. The finding that rapid finance sector growth seems to have been a precursor to crisis is followed up with a discussion of the policy implications, which was largely absent from the original article. The paper goes on to question the logic of the authors' finding that the crises were not caused by irrational private sector behaviour. Finally, it suggests that government policy often implicitly assumes the prevalence of such behaviour, and that vulnerability to crises results from policy that prevents continuous adjustment of the real exchange rate to changing circumstances.

Key Words: real exchange rate, capital flows, vulnerability, balance of payments crisis, exchange rate risk, capital adequacy, moral hazard

JEL Classification: E58, F32, F41, G28, O11, O24, O57

INTRODUCTION

In 'Vulnerability to a Currency Crisis: Lessons from the Asian Experience' (Athukorala and Warr 2002, hereafter A&W) the authors seek to evaluate two competing theories of causes of the crises in several Asian countries in 1997-98. The first of these is that they were caused by irrational market behaviour: the private sector speculated against the currencies in question in the absence of any actual change in economic circumstances. For brevity I shall refer to this as 'sunspot behaviour'. They argue that there is no policy solution in this case, other than the imposition of capital controls (p. 34). The second is the vulnerability theory, according to which the crises occurred because of deterioration in macroeconomic conditions as a result of policy errors (p. 34). By implication, if these errors can be identified, they can be avoided in the future, thus reducing the likelihood of future crises (pp. 37-8). The authors seek to choose between these theories by comparing the experiences of five Asian countries that had a currency crisis in 1997-98 with those of five that did not.

Investigating vulnerability

The essence of a currency crisis is an attack on a currency in the expectation of a devaluation of the fixed (but adjustable) nominal exchange rate. To investigate the vulnerability of countries to such attacks, the authors focus on three indicators of difficulties governments might face in defending the current fixed rate.

1 *Low reserves relative to the possible size of the capital outflow (p. 38), identified as the stock of 'mobile capital' at risk from exchange rate depreciation.* This stock is argued to consist of short-term liabilities to foreigners denominated in foreign currency (short-term borrowing from foreign banks, trade credit from foreign entities, and bank deposits of non-residents) plus liquid assets of foreigners (foreign portfolio investment) (p. 41). The basic idea is that if reserves are low, the central bank will not be able to satisfy the demands of all of those who wish to unburden themselves of exchange rate risk, and so it will be forced to devalue (p. 39).

2 *Rapid growth of the finance sector relative to GDP.* This serves as a proxy for financial sector fragility, which might make governments reluctant to raise interest rates. In the absence of this concern, raising interest rates would tend to strengthen both the capital account and the current account, thus increasing the feasibility of maintaining the current exchange rate. If loans to the private sector grow significantly more rapidly than GDP, the presumption is that lending institutions have been paying inadequate attention to the risk of defaults, resulting in poor quality loan portfolios (p. 42).

3 *Inability to reduce non-tradables prices in order to shift to a new equilibrium real exchange rate without changing the nominal exchange rate.* The authors' argument is that if the real exchange rate—the ratio of tradables to non-tradables prices—has appreciated significantly beyond its equilibrium value, 'the required real depreciation [to get back to equilibrium] may be too large' (p. 39). In other words, presumably, it may take too long to reduce non-tradables prices sufficiently to get back to equilibrium, and the central bank will run out of reserves in the meantime and be forced to devalue.¹

Some preliminary observations

Mobile capital

The first of the authors' vulnerability indicators (the ratio of reserves to 'mobile capital') appears to be doubly misconceived. First, the authors' view as to who is at risk from a possible devaluation is seriously flawed. Their list is very short, consisting of entities that have borrowed short-term offshore and foreign entities that have engaged in portfolio investment. In fact, those at risk include *all* entities that have borrowed at *any maturity* in foreign currency, whether *domestically or overseas* (except when there is a natural hedge), together with *all* entities that own firms producing *non-tradables*, or shares in such firms.

The domestic currency value of all foreign currency denominated debt increases with depreciation, by the same proportion, regardless of maturity. Thus the holders of short-term and long-term foreign currency liabilities are equally at risk. To imagine that long-term borrowers do not regard themselves as being at risk is to imagine that the expected depreciation will be very quickly reversed. For them not try to hedge their risk when there is a widespread perception of an imminent depreciation would be akin to investors in Enron or the 'dot.com' companies holding on to their shares as they began to decline in value in recent times. This is the reason why price movements in spot markets and forward markets are highly correlated: today's price is a better predictor of tomorrow's price than yesterday's, since it reflects more recent information. To look at it differently, if the perception were widespread that the depreciation would be short lived, those who had short-term foreign currency borrowings would have no trouble rolling them over; if they cannot, this is a clear indication that the market expects the depreciation to be sustained. The fallacy that a short term to maturity of foreign borrowing constitutes

¹ Note that, except in the short run, item 2 is the same as item 3. Raising interest rates requires contractionary monetary policy, the effect of which is to reduce the price of non-tradables.

a problem not faced by long-term borrowers appears frequently in the literature (e.g. Hill 1999: 8–9; Fischer 1998: para. 13).

Moreover, the risk is the same regardless of whether the entity is domestic or foreign, and regardless of whether the source of funds is domestic or foreign. In regard to the latter, many firms in Indonesia, for example, borrowed from domestic banks but in foreign currency; clearly, they were at risk from depreciation of the currency. On the other hand, however, some foreign currency borrowing has a natural hedge. In particular, borrowing in the form of trade credit is naturally hedged if the underlying trade transaction is denominated in the same currency. Thus an exporter that receives a prepayment in foreign currency for a shipment of goods is protected against depreciation—indeed, he can be expected to gain from it. Likewise, an importer who has received goods on credit in foreign currency has at least some protection by virtue of the fact that the domestic prices of these goods can be expected to increase, if not by the full amount of the depreciation.

If there is a depreciation, the relative price of non-tradables will fall, and the value of the firms producing non-tradables will fall accordingly. It follows that the owners of such firms are at risk from a depreciation, whether they are foreign or local, and whether they are merely portfolio investors (minority shareholders) or sole or controlling owners: citizenship is irrelevant, and the size of the shareholding is irrelevant. All portfolio investors will therefore have an incentive to sell their shares in such firms and convert the proceeds to foreign currency. It will not be practicable for sole or controlling shareholders to do this within a short time-frame, of course, but they still have an incentive to hedge their risk—which they can do, to some extent at least, by borrowing local currency and converting it into foreign currency assets (Fane 2000: 77). On the other hand, those that own shares in tradables producers stand to gain from depreciation; foreign portfolio investors in such firms would be acting irrationally if they were to sell on the basis of such an expectation.

The second misconception is reflected in the authors' implicit assumption that the only entities to act in response to a perceived incipient devaluation of the currency will be those who would be harmed by such a devaluation:

A currency crisis occurs when market participants ... *seek to escape* assets dominated in that currency. ... Because investors try to avoid ... *capital losses*, they exit [when depreciation is expected] (p. 36, emphasis added).²

In such circumstances the entities wanting to buy foreign exchange from the central bank are not just those seeking to hedge their exchange rate risk exposure. The analysis needs to take account also of those who see the opportunity for a speculative gain.

As the authors themselves note, '[w]hen capital flows are reversed, holders of liquid domestic liabilities (*sic*) may also try to convert them into foreign exchange' (p. 41). (The subsequent text suggests that they are referring here to other entities' liabilities, such as bank deposits, which are more appropriately described as *assets* of the holders.) But they argue against including bank deposits (other than those of non-residents) in their measure of 'mobile capital', on the grounds that 'conversion of money balances into foreign currency is not an option to (or considered by) the majority of such asset holders' (p. 41). The basis of this assertion is unclear. In Indonesia, for example, all the large banks accept deposits in rupiah and dollars, and a customer concerned about a possible devaluation only needs to fill in a simple form to instruct the bank to shift funds from one type of deposit to the other.

Even this ignores a more fundamental issue, however, which is that the ability to undertake speculative activity does not require the speculator to hold a stock of any particular type of asset beforehand. On the contrary, much speculation is financed by new loans *brought into existence at the time speculation is undertaken*. This point can be illustrated by reference to the famous attack on the British pound in 1992 led by George Soros (Krugman 2000: 121-3). Soros was not at risk from a depreciation of the pound, but he formed a strong view that depreciation was likely, and decided to arbitrage between the current price of dollars and the expected future price of dollars—in other words, to speculate against the pound.

The likelihood of depreciation had little, if anything, to do with the accumulation of foreign debt in the UK. It was based on the observation that when the UK joined the European exchange rate mechanism, it did so at an exchange rate that did not properly reflect the level of prices and the rate of inflation in the UK relative to the rest of Europe. Soros judged that UK prices were too high and that the Bank of

² Real assets, of course, are not denominated in any particular currency. What happens to their value in response to a devaluation depends on what they produce, as just noted.

England would not be willing to implement sufficiently contractionary monetary policy so as to bring them back into line with those in Europe. He quietly arranged large credit lines that allowed him to borrow heavily in pounds, which he then used to purchase dollars. In other words, he used exactly the same technique as could be expected to be used by majority owners of firms producing non-tradables—not to hedge existing exchange rate risk in this case, but in order to go long in dollars in order to profit from the expected depreciation of the pound.

A similar process was at work in both Thailand before the baht was floated in July 1997, and in Indonesia after the rupiah was ‘floated’ in August 1997.³ In both countries the owners of financial institutions were able to persuade the respective central banks to lend heavily to them, on the pretext that such loans were essential if their institutions were to be saved from collapse. They then used the proceeds of these loans to purchase foreign currency (indirectly, from the same central banks).

The lesson from episodes such as these is that any vulnerability indicator that relies on measures of stocks of various financial securities in existence prior to an observed currency crisis is bound to be defective, because it cannot take into account speculative activity financed by borrowing that is undertaken in the course of betting against the currency.

For all these reasons it is difficult to interpret the authors’ indicator of the adequacy of reserves. Their measure of the stock of mobile capital omits items that should be included while including others that should be omitted. More importantly, however, they ignore the role of those speculators who cannot be identified in advance, and who finance their activity by taking out new loans at the same time they begin their speculative attacks.

Real exchange rate movements

In relation to pre-crisis real exchange rate movements there are also two serious concerns. First, the authors present no evidence to demonstrate that real exchange rates just prior to the crisis, or at any other time, were at anything other than equilibrium levels. Their assumption is that observed movements leading up to the crisis were movements away from equilibrium—that the earlier values were ‘right’ and the pre-crisis end points ‘wrong’ (i.e. overvalued). But it is equally possible that

³ Despite Indonesia’s announced intention to float the rupiah, in fact the central bank soon became heavily engaged in supporting it in both the money market and the foreign exchange market (McLeod 1998: 38–9).

the reverse is true, or that the movements were simply from one equilibrium to another, given that economic conditions had changed in the interim. As Fane (2000: 73) puts it: "RER overvaluation" is more often used than defined'.

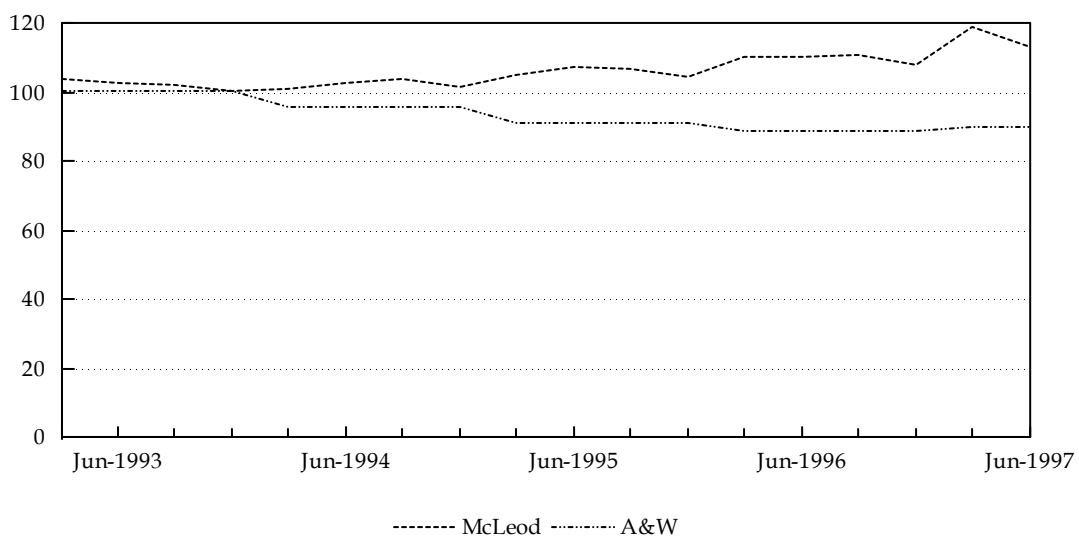
Second, it is possible to obtain quite different pictures of real exchange rate movements simply by changing the manner in which the real exchange rate is measured. The authors' preferred measure is

$$RER = E.P^*/P,$$

Where E is the nominal exchange rate, P^* is an index of foreign wholesale prices, and P is the domestic consumer price index. But by definition, the real exchange rate is the ratio of tradables prices to non-tradables prices as faced by producers, so the authors' measure is simply a proxy for this (p. 42).

An alternative approach is to use the tradables prices that are observable in the country in question (Fane 2000: 72). Tradables and non-tradables prices can be obtained from the national income accounts, provided we are willing to categorise each sector of the economy as producing either tradables or non-tradables. I have undertaken this exercise for Indonesia, classifying three sectors as tradables and the remainder as non-tradables; the tradables sector includes agriculture, forestry and fisheries; mining and quarrying; and manufacturing. The real exchange rate measured on this basis shows a quite different pattern of movement from that computed by the authors (figure 1). Specifically, the real exchange rate is shown to *depreciate* (by 13%), not appreciate (by 11%, according to A&W table 3), in the 3 ½ years prior to the crisis.

Figure 1 Real Exchange Rate for Indonesia
Dec-1993=100



Empirical results

The authors' broad findings are as follows (p. 50):

1 The ratio of foreign exchange reserves to 'mobile capital' declined significantly prior to the crisis in the crisis countries, but not in the non-crisis countries.

2 There was a lending boom prior to the crisis in all crisis countries, but not in the non-crisis countries.⁴

3 The crisis countries had significant *real exchange rate appreciations* prior to the crisis, as did *three* of the non-crisis countries (p. 50, emphasis added). Note, however, that this result is presented elsewhere as 'all the five crisis countries were characterised by ... *overvalued exchange rates*', while only *two* of the non-crisis countries were so characterised (p. 51, emphasis added).⁵

Authors' conclusions and policy implications

The authors' main conclusion is that the crises were not caused by irrational market behaviour, but by 'unstable deteriorations in macroeconomic conditions' (p. 52). Although this conclusion may be correct, I have some doubt as to whether all of the evidence they present actually points in this direction. I have already mentioned my concerns about the way real exchange rates have been measured. This concern aside, the way the authors' real exchange rate data have been interpreted is also open to question: it is possible to find virtually anything one wants to find in these data. In particular, quite different pictures can be obtained, depending on which period is chosen as the starting point. For example, table 1 takes the year 1992 (five years before the crisis began) as the arbitrary starting point, and ranks countries by their real exchange rates (as measured by A&W) just prior to the crisis. It can be seen that, although the crisis countries on average had experienced larger appreciations, there is considerable overlap in the 1997 rankings, and there is very little difference between the bottom six. (The lowest ranking country, the Philippines, was also the least affected by crisis of the 'crisis-5.)

⁴ The authors also assert that 'the level ... [of] the credit to GDP ratio was uniformly lower in the non-crisis countries' (p. 48). In fact there was considerable overlap (p. 47). In any case this is irrelevant, since their argument in relation to vulnerability relies on an increase in this ratio, not on its level.

⁵ China seems to have been discounted in this 'head count' by virtue of the distorting effect of its large devaluation in 1994 (p. 50).

Table 1 Real Exchange Rates (1992 = 100)

<i>Crisis</i>	<i>Non-crisis</i>	1992	1993	1994	1995	1996	1997
	Taiwan	100	102	98	100	108	117
	India	100	111	104	100	102	98
Korea		100	98	92	86	88	93
	Sri Lanka	100	99	94	94	89	88
	Singapore	100	97	89	76	84	84
Malaysia		100	97	94	88	86	84
Thailand		100	96	90	86	84	83
	China	100	91	109	91	85	83
Indonesia		100	92	87	84	82	82
Philippines		100	94	92	85	86	80

For all these reasons it is hard to see that this part of their analysis provides any substantive support for their conclusion.

In relation to their first vulnerability indicator—the ratio of reserves to ‘mobile capital’—I have already discussed my reservations about the logic behind this indicator and the way ‘mobile capital’ has been measured. But there are other concerns as well. Suppose we express this indicator as

$$Z_1 = Z_a/Z_b, \text{ where}$$

$Z_a = \text{reserves/GDP}$, $Z_b = \text{mobile capital/GDP}$, and GDP serves as a scaling factor.

Suppose further that we rank the countries according to these measures, and find a close correlation between Z_a and the occurrence of crisis but no such correlation with Z_b . This would imply that the observed correlation between Z_1 and the occurrence of crisis was spurious, and it would cast doubt on the authors’ finding that irrational market behaviour was not a cause of the crises—while at the same time demonstrating that their contention that there is no policy solution to guard against such behaviour other than capital controls is incorrect.

If governments are confident that sunspot behaviour is in fact common, the seemingly obvious policy response (other than capital controls) is to hold international reserves, and to use them to intervene in the market at times when the private sector is buying (or selling) foreign exchange ‘irrationally’. Indeed, I would argue that it is precisely the belief that markets ‘get it wrong’ when it comes to the exchange rate that explains the widespread practice of governments intervening in the market for foreign exchange in order to keep nominal exchange rates constant.

This is seen as undesirable, causing resources to flow one way and then back again later in wasteful fashion. In this way of thinking, because the government understands that sunspots in fact have no economic implications, it follows that it is better to delegate the job of setting the nominal exchange rate to the government, and to achieve this end by buying and selling foreign exchange as appropriate. (To put the argument in reverse, if the government believed in the good sense of the private sector, it would leave the exchange rate to be determined in the market without intervention by itself, on the assumption that any changes would reflect changes in underlying economic circumstances.) The smaller the amount of reserves held on average relative to the size of the economy, the less the chance of ensuring that this sunspot behaviour does not lead to the central bank being forced to devalue.

In short, it is possible that the authors' results in relation to reserves relative to 'mobile capital' are actually hiding the genuinely important variable—the absolute level of reserves (scaled to the size of the economy)—and that they have too readily written off the possibility that sunspot behaviour may have helped to cause the crises.

It is disappointing that the authors have very little to say about the implications of their findings for policy, despite having argued that '[a]ccepting one [of the contending theories as to causation] has implications for the choices of policies for preventing and/or managing future crises' (p. 34). Taken at face value, their results seem to support the view that the opening of capital accounts was an important contributor to the crises. Indeed, most commentators would probably agree that China escaped the crisis because its capital account was closed to debt flows (if not to FDI) (Song 1998: 106). Nevertheless, they are not disposed to attribute too much of the blame for the crises to open capital accounts, and seek to justify this position by referring to their findings in respect of the other two indicators of vulnerability (p. 52). Readers are left with the impression that liberalisation of the capital account is still good policy provided that it is supported by other policy adjustments, but no detail is provided as to what these might be.

The authors' most persuasive finding is that there was something of a pre-crisis credit boom in each of the crisis countries, and it would have seemed useful to offer some guidance to policy makers in relation to this aspect. There would appear to be two main reasons why the financial sector might grow rapidly. First, if the government's policies in the past had the effect of repressing the financial sector, then a relaxation of those policies would result in rapid expansion as financial firms exploited the new freedom to provide services for which the demand had been

repressed. The case of Indonesia certainly fits this description (McLeod 1999). Second, rapid finance sector growth may also be attributed to the existence of a serious moral hazard problem. This will arise if there is a perception of a government guarantee of the liabilities of financial enterprises, if the prudential regulations do not require them to have sufficiently large amounts of capital relative to their risk assets (or if these regulations are not enforced), and if the procedures for dealing with banks that become insolvent do not threaten significant losses for depositors. Put simply, in these circumstances the government guarantee is equivalent to a subsidy to this particular mechanism for transferring funds from savers to investors.

With these comments in mind, presumably the first best policy implications of the authors' findings do not include the re-imposition of policies that repressed the financial sector in the past. Rather, what is required is action to deal effectively with the moral hazard problem. In this regard, Fane (2000: 127–30) advocates a large increase in the minimum acceptable capital adequacy ratio to apply to banks in developing countries to ensure the owners have significant sums at risk, while McLeod (2003) advocates a set of procedures to be followed by the authorities when banks get into trouble that have the effect of ensuring that losses in excess of owners' equity will be borne by banks' depositors and other creditors, not by the government (as agent of the general public). Another way of ameliorating the moral hazard problem is to adopt a policy of openness towards foreign banks (Fane 1998: 302). Competition from foreign banks will reduce the scope for growth of domestic banks, and thus help to restrain them from overreaching themselves. At the same time, host country governments will come under little or no pressure to bail out foreign banks if they get into trouble.

The authors' findings in relation to real exchange rates are not persuasive, for reasons discussed above, so there are no obvious policy implications here. It is interesting to note, however, that observed movements in real exchange rates may result from increased capital inflow (p. 39). To the extent that the authors are correct in interpreting the appreciation of the real exchange rate as a movement away from sustainable equilibrium, and to the extent that the observed decline in the ratio of reserves to 'mobile capital' is a proxy for an increase in the level of capital inflow, we are again led to the conclusion that open capital accounts were a significant contributor to vulnerability to currency crisis. Recall, however, that the authors decline to put too much blame on capital account liberalisation for the crises, on the grounds that capital inflow was not the only such contributor (p. 52). But one of the other contributors, according to them, was appreciation of the real exchange rate,

which also seems to have been at least in part the result of capital inflow! It is a pity that the authors did not confront these issues more directly – uncomfortable as they may be for economists who feel ‘in their bones’ that controls on capital flows are not the best policy that can be devised, given the benefits of international flows of capital to areas where the best investment returns can be obtained.

RETHINKING VULNERABILITY: POLICY MAKERS’ ATTITUDES TO SUNSPOTS

Whether or not there is actually some component of sunspot behaviour in the private sector’s actions seems inherently impossible to know. More to the point, however, is that even if this *is* the case, it still does not necessarily follow that the appropriate response by the government is to try to override the private sector in determining relative prices. To do so is to push the economy away from what the private sector believes is equilibrium, and thus to invite speculative behaviour – which can be very destabilising.

This can be characterised as a trade-off between Type I and Type II errors. The Type I error is to allow movement of the real exchange rate to a new, ‘wrong’ equilibrium when the movement is being driven by a sunspot. The cost of this error is the cost of moving resources in one direction and then back again. The Type II error is to hold the real exchange rate constant on the incorrect assumption that the private sector’s desire to adjust the real exchange rate is driven by a sunspot rather than a genuine change in economic circumstances. The cost of this error is the potential cost of a balance of payments crisis. In my view, the costs of Type I errors are likely to be much smaller. There may well be considerable volatility in nominal exchange rates in the short run, but firms making decisions about the allocation of productive resources are much more likely to be guided by what they see as established trends than by such fluctuations, which are really of interest only to currency traders and finance journalists.

The policy implication of this way of thinking is that governments should allow *real* exchange rates to be market determined. This will be possible if the *nominal* exchange rate is genuinely market determined – that is, if it is truly permitted to float without any intervention by the central bank in either the foreign exchange market or the money market. It will also be possible if the authorities opt for a fixed nominal exchange rate and refrain from sterilising the monetary impact of balance of payments disequilibria – as would be the case under a pure currency board system.

Thus an alternative way of thinking about this topic is to argue that vulnerability to a currency crisis actually depends on the government’s attitude to incipient or actual movements in the real exchange rate. In fact, most governments do not think in

terms of having targets for the real exchange rate, but it is common for them to be committed to both a fixed nominal exchange rate, and to a more or less fixed level of non-tradables prices (or to a more or less fixed domestic price level).⁶ Commitment to a fixed nominal exchange rate and stable non-tradables prices means that there is an implicit commitment to a fixed real exchange rate. *It is this commitment that is actually the cause of balance of payments or currency crises.*

The example of Thailand

The case of the depreciation of the pound in 1992 has already been mentioned. In the present context, consider also the case of Thailand, where the Asian crisis began, not in 1997 but in 1996. At this time, things began to go wrong for Thailand (Warr 1998: 55, 59–60; Jackson 1999: 8; Nidhiprabha 1999: 68–72). First, international prices for some of its main exports declined. Second, it became increasingly obvious that there had been too much investment in several important sectors of the economy, with the result that the rest of the world became increasingly reluctant to lend to the country. The deterioration of both the current account and the capital account implied the need for a depreciation of the real exchange rate, but the Thai authorities did not want to give up their peg to the US dollar, nor did they want to tighten up on monetary policy in order to push down the price of non-tradables. In other words, they deliberately tried to hold the economy away from its new equilibrium real exchange rate. A charitable interpretation of this policy would be that they expected the negative shocks soon to be reversed; the more plausible interpretation is that they were unwilling to undertake the necessary policy adjustments because of the political opprobrium this would involve (MacIntyre 2003: 58–69).

Although it is possible to hold the economy away from its equilibrium in the short run, over a longer period it is not. The Bank of Thailand managed to hide the fact that its international reserves had almost all been lost by entering into forward contracts to supply foreign exchange (Nidhiprabha 1999: 71; Krugman 2000: 92). At the same time, not only did it fail to tighten up on monetary conditions, but it actually went in the other direction as a consequence of loans it was making to troubled financial institutions (Fane and McLeod 1999: 398). For the time being these transactions satisfied the desires of those who wished to hedge their exchange rate risks, but the steady injection of base money into the economy played into the hands of those who wanted to speculate against the currency. The negative shocks failed to

⁶ In Indonesia's slightly more complicated case, the government's commitments amounted to much the same thing: a fixed rate of nominal depreciation, and a targeted rate of inflation.

reverse themselves, and reality caught up with the central bank in mid 1997, when it found itself obliged to float the baht and thus allow it to depreciate to a level the markets thought realistic.

The example of Indonesia

Now consider the case of Indonesia, where most observers (including myself) assumed that the steady increase in Bank Indonesia's international reserves reflected a strong balance of payments and, therefore, the absence of any reason for a depreciation. Just as was the case in Thailand, however, Indonesia's authorities had been attempting to hold the economy away from its equilibrium. The difference was that in this case, Indonesia's external circumstances were still highly favourable, and getting to equilibrium required appreciation, not depreciation. But the government was committed to a steady rate of nominal depreciation and to a low rate of inflation—in other words, to a relatively fixed real exchange rate (McLeod 1997a: 33). In order to achieve both of these objectives in circumstances in which the balance of payments was in surplus, the central bank needed to purchase the excess supply of foreign currency (to prevent nominal appreciation) and simultaneously to sterilise the monetary impact of these purchases by borrowing from the private sector (to hold down inflation) (McLeod 1997b: 5).⁷

Again, however, it proved impossible to hold the real exchange rate away from its equilibrium indefinitely. The central bank's policies during this period implied that it was going increasingly long in dollars—building up its foreign exchange reserves and financing this by rupiah-denominated borrowing from the private sector. This was mirrored in the consolidated balance sheet for the private sector as a whole, which was going correspondingly *short* in dollars—building up its foreign exchange borrowings and investing the proceeds in rupiah-denominated liabilities of the central bank. Moreover, so far as investment in real assets was concerned, the central bank's policies also encouraged a heavy focus on non-tradables: as long as the expectation was for real exchange rate appreciation, investment in non-tradables appeared more attractive than in tradables.

The longer this process continued, the greater the exchange rate risk exposure of the private sector. As exposures of the entities concerned became larger relative to their equity, the likelihood that some of them would get cold feet and begin to wind back

⁷ A similar process had occurred earlier in Thailand (Warr 1998: 51-2).

this exposure became greater.⁸ In the absence of the float of the baht in July 1997 the exposure of Indonesia's private sector to exchange rate risk presumably would have continued to increase for some time, but eventually there would have been some trigger that would have been strong enough to induce a rush for the exits—a self-fulfilling panic that would force the authorities to devalue, or to float the rupiah and allow it to depreciate. If not the float of the baht, it might well have been an attack by the hedge funds, as was to occur in Hong Kong in October 1997 (Krugman 2000: 126–9), or unexpected illness of Indonesia's dominant president, Soeharto, as was to occur in December 1997.

This Indonesian example, in which a moderately high level of capital inflow plays an important role, bears some resemblance to the authors' focus on the stock of 'mobile capital' relative to reserves. One difference is the recognition here that the problem is related to capital inflow *in aggregate* (or, more precisely, that part of it that finances investment in non-tradables production), not just short-term debt and foreign portfolio investment. Another is the emphasis on the central bank's attempts to prevent appreciation of the real exchange rate, which led it to increase the level of its reserves rapidly.

A&W would perhaps have supported the central bank in trying to oppose this appreciation, since this would have made Indonesia less vulnerable to a currency crisis according to both their first and third measures of vulnerability. Having said that, however, it must be pointed out that Warr (1998: 52) is well aware that such policy involves continuous disequilibrium, because it prevents either the exchange rate or the interest rate adjustment required to move to a new equilibrium. Unfortunately, however, A&W do not say what their preferred policy response is in these circumstances.

CONCLUSIONS

This paper has argued that the authors' approaches of looking at the stock of 'mobile capital' relative to foreign exchange reserves, and at movements in the real exchange rate, are not particularly helpful or meaningful in describing the vulnerability of various economies to balance of payments crises. It has suggested that governments often make exchange rate policy on the assumption of irrational private sector behaviour, and that this itself is a key explanation for payments crises, because it

⁸ Likewise, Fane (2000: 78) argues that 'the volatility of portfolio and other capital flows is greatly magnified by the ... central bank practice of tightening or easing monetary policy in an attempt to sterilise the effects of capital flows on the money supply'.

encourages the private sector to speculate against the monetary authority. The paper accepts that prior rapid growth of the financial sector appears to have been associated with payments crises, and suggests that this is consistent with the view expressed elsewhere that there is often a serious moral hazard problem stemming from implicit government guarantees of financial institutions. From this it is argued that what is required is a set of policies capable of tackling this moral hazard problem, such as: significant increases in minimum capital adequacy standards; rules that ensure that bank losses in excess of shareholders' equity are borne by depositors and other creditors; and strong encouragement for foreign banks to compete on equal terms with domestic banks.

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