

HONG KONG INSTITUTE FOR MONETARY RESEARCH

Central Banks and Capital Flows

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Chapter 1. Executive Summary

Capital flows were at the heart of the Asian Crisis of 1997-8. The inflows were too large before the crisis, and the reversals were hugely damaging. Now, ten years after the crisis and with international capital flows greater than before and likely to increase significantly, we still don't have a clear analytical framework, or a practical operational set of policy guidance, on how to handle these flows. The usual economic tools – the Mundell-Fleming model, uncovered interest parity and the Impossible Trinity – are analytically unhelpful and focus on the wrong issues.

Large inflows will appreciate the exchange rate and are quite likely to cause asset price pressures. These capital flows reflect an on-going structural disequilibrium: the emerging countries have intrinsically better profit opportunities, as they move to the technological frontier. During the decades that they will take to get to the frontier, foreign capital will be attracted by the higher returns and the prospect of currency appreciation. In this environment, the exchange rate will be poorly anchored by fundamentals, and the resultant wide swings may well trigger sharp capital reversals, which in turn threaten stability in the financial system. Thus “twin crises” seem a real possibility.

There is a range of possible policy responses, although none of them seems to provide an easy, complete or fool-proof answer. “Sand in the wheels”, hedging, fiscal surpluses, intervention using foreign exchange reserves, domestic taxes, taxes on inflows (unremunerated reserve requirements), better bankruptcy arrangements, and stronger prudential measures may make some contribution, but each will be limited by institutional constraints and administrative capabilities.

Nevertheless, this is the world in which the emerging countries find themselves, and to turn their backs on global financial integration is not the answer. This paper attempts to set out the problems and to provide a tentative and partial exploration of how these imperfect policy responses might be used to smooth the impact of global capital.

Chapter 2. Introduction

This paper addresses the challenges faced by East Asian emerging countries as their financial markets become more integrated with international markets. Chapter 3 tries to clear the analytical decks of the unhelpful framework which has focused on the wrong issues. Chapter 4 puts these issues to empirical test: do we see the predictions of the Impossible Trinity in practice? The short answer is “no”. Chapter 5 identifies the real issues, including how monetary policy works in a small internationally-integrated economy; how the return-to-capital will be intrinsically higher in emerging countries than in mature economies; and how these imbalances impinge on the macro-economy (particularly on the exchange rate). Chapter 6 identifies the down-side of this: unanchored exchange rates lead to capital reversals and twin crises – the collapse of both the exchange rate and the financial sector. Chapter 7 explores what policy might do in attempting to prevent this, and what might be done to ameliorate a crisis if it starts to unfold. Chapter 8 concludes.

Chapter 3. Capital Flows, Monetary Policy and the Impossible Trinity

For forty years the lode-stone of both the academic and policy debate on the links between capital flows and monetary policy has been the Mundell-Fleming model. Its policy messages are strong and unambiguous. There are two critical (and by implication binary) choices. The first is the choice of capital controls or not (integration with world financial markets or not). The second is exchange rate regime.

At the time of Bretton Woods, the first choice was routinely settled in terms of controls, so independent autonomous monetary policy was feasible. As the developed world became more financially integrated and the support for controls was undermined and whittled away (breaking down irrevocably in 1971), the locus of attention shifted to a dichotomy of exchange rate regimes: an immutable fix (like a currency board) or a pure clean free float with no intervention.¹ Central bankers who believed in this model might have had good reasons to favour the floating regime: if the rate was fixed they were impotent and presumably out of a job.² A floating rate meant that they were back in a job. Even if foreign capital was perfectly mobile, they could shift domestic interest rates and be effective over the cycle through the Dornbusch (1976) “overshooting” mechanism: higher domestic

interest rates push up the exchange rate until portfolio equilibrium is reached, where the interest differential is exactly balanced by expectations of subsequent mean-reverting depreciation. Both covered and uncovered interest parity hold, and autonomous monetary policy is feasible and potent.

The ubiquitous short-hand for this viewpoint is the “Impossible Trinity”: countries can choose among the elements of the policy regime: fixed exchange rate; open capital markets; and monetary policy autonomy, but cannot have fixed exchange rate, open capital markets and monetary policy autonomy.³

From the policy viewpoint, an important element of the Impossible Trinity message was that *resistance is futile*: any attempt to force the exchange rate away from its market-determined path would fail, and attempts to impose capital controls would, at best, succeed only temporarily and at great cost to the efficient operation of financial markets. For the balance of payments to be in equilibrium, uncovered interest parity (UIP) had to hold. Expectations of exchange rate change have to exactly equal the interest differential: if not, capital will flow until UIP holds.

¹ By implication of the terminology (“pure”, “clean”, “free” as opposed to “dirty” floating), most economists favoured the float.

² Although it might be noted that national central banks have survived the European Union.

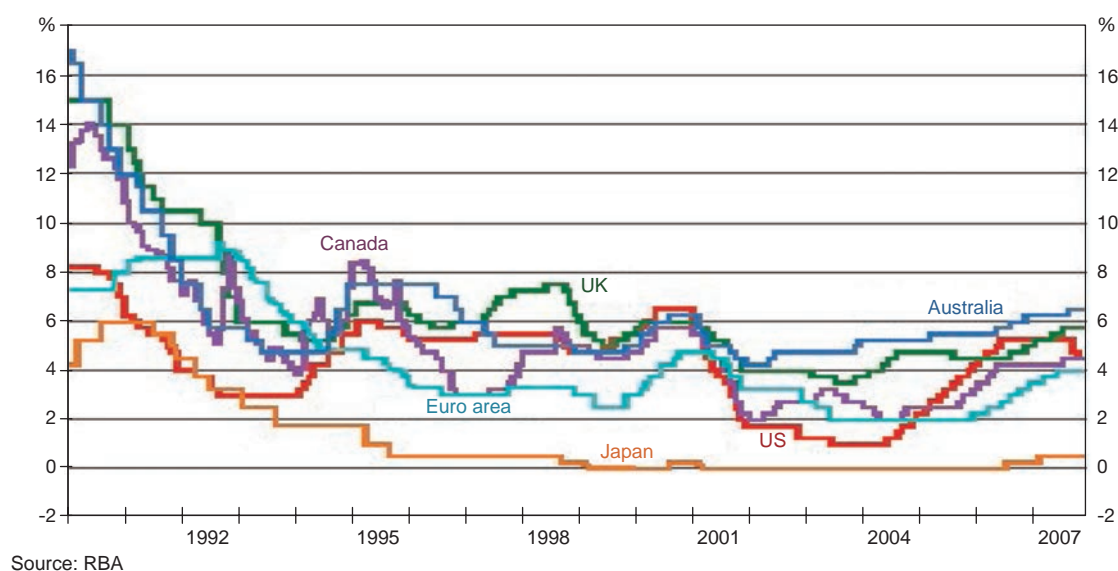
³ “. . . the choice of appropriate exchange rate regime, which, for economies with access to international capital markets, increasingly means a move away from the middle ground of pegged but adjustable fixed exchange rates towards the two corner regimes of either flexible exchange rates or a fixed exchange rate supported, if necessary, by a commitment to give up altogether an independent monetary policy.” Lawrence H. Summers (2000), p. 8.

“Fundamentally, countries could face a conflict of macroeconomic objectives if they attempt to both target a specific exchange rate or band and, at the same time, maintain control over their domestic monetary policy.” IMF Global Financial Stability Report Sept 2007 p. 85. The IMF was no doubt influenced by its long history of analytical advocacy of the so-called monetary approach to the balance of payments.

Meanwhile, back in the real world, major countries, highly integrated into world financial markets, experienced decade-long periods with substantially different interest rates (US and Japan had an average differential of more than 300 basis points – the US rate was three times the Japanese rate – for most of the past fifteen years). It's true

that these countries had floating rates, but there was no sign of the Dornbusch portfolio equilibrating process at work. It would have required a once-off step “overshooting” depreciation of the yen followed by a steady appreciation. Instead, the cross rate has fluctuated between 90 and 150, with three wide cycles over this period.

Figure 3.1 Major Countries' Policy Interest Rates



Just as inconvenient for this view, the “yen-carry trade” seems to have been outstandingly profitable, refuting UIP. A Japanese investor who invested 100 yen at the Japanese official policy rate at the start of 1990 would, by April 2007, have 124 yen.⁴ If she⁵ had exchanged it into Australian dollars and invested at the corresponding official rate in Australia, by April 2007 her investment, converted back to yen would have been 265 yen, a return nearly seven-fold the home alternative. This has varied with the exchange rate cycle (the 9 percent fall in the value of the investment in the single month of October 1998 might have made her anxious).

But if she sat it out, it has been a good long-term bet (some would say a sure bet). If uncovered interest parity held even roughly, it should not have been possible to maintain the yen carry trade so consistently over this long period. To make matters worse, if this view is correct, then the relevant “world interest rate” for the supply of capital should be the *lowest* rate available from any substantial country (e.g. Japan) and the Japanese interest differential should be quickly extinguished by a massive outflow. Certainly, there has been outflow, but it has been of trivial size compared with overall flows, and clearly not enough to prevent Japan

⁴ If this seems a poor return, it was at least better than investing in Japanese equities, whose value halved over this period. Real estate did even worse.

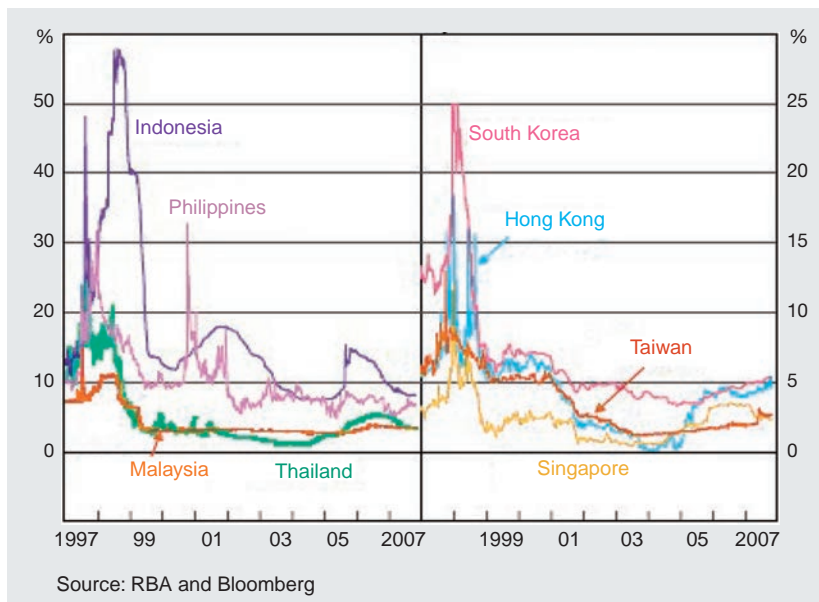
⁵ Japanese men sensibly put their savings in the hands of their wives or mothers.

from maintaining, over more than a decade, a monetary policy stance fundamentally different from international rates.

More relevant to this paper, the countries of East Asia have by and large been able to set policy interest rates where they wanted them, both before the crisis (where the exchange rate regimes were semi-fixed, and interest rates were routinely higher

than world rates) and since (where the regimes are usually classified as “managed float”). As the corollary to this, large capital inflows have not equalized interest rates, even for countries with relatively small financial sectors. In Thailand foreign savings equivalent to 9 percent of GDP in the single year of 1996 were insufficient to bring interest rates into line with foreign rates. (Hausmann (1999) p.146)

Figure 3.2 Asian Short-term Interest Rates



The impossible trinity was based on:

- The strong assumption that if there was any interest differential, foreign capital would flood in (“under perfect capital mobility, the slightest interest differential provokes infinite capital flows” Dornbusch et al. (2002) p.297). This required two separate elements, First, that there are no policy-imposed restrictions (this is what is conventionally thought of as “capital controls” (“Capital is perfectly mobile internationally when investors can purchase assets in any country they chose, quickly, with low transaction costs and in unlimited amounts.” (Dornbusch et al. (2002) p.294).

Second, that investors regarded domestic and foreign assets as perfect substitutes. These are both heroic assumptions, particularly the latter. They would require well-developed institutional connections, full information (often about countries with very different systems and stage of development), similar tax and legal regimes, similar risk appetites and, above all, where the assets were in different currency denominations, a very clear view about the future path of exchange rates. Now, with the experience of thirty years of generalized floating and high international capital mobility, these assumptions look so heroic that we might

pause to ask ourselves why they were thought to be relevant to the real world. Partly, because the model was developed in the time of largely fixed rates, when economists thought floating exchange rates would be much better behaved than they turned out to be.⁶ For many years into the floating period, people still talked of uncovered interest parity as if it might help to explain exchange rate behaviour. We now know (see Engel (1995) and Burnside et al. (2006)) that, not only does it not give any guidance on exchange rate movements, but the sign is *usually wrong*: investors usually make a good profit when they invest in high-interest rate currencies because in addition to the higher interest rate, they usually get an appreciating exchange rate. Nor could perfect substitutability be resurrected by the development of sophisticated hedging tools. While any individual investor could get rid of their own exchange rate exposure by hedging, any country that receives net capital flows leaves some investors (either domestic or foreign) with a currency exposure.

International financial markets became more integrated in the sense that foreigners invested readily, but none of them would have regarded one of the central assumptions – that assets were perfect substitutes, even when denominated in different currencies – as even remotely true or a useful reflection of the market reality. While forward cover was

sold and priced on the basis of the interest differential, no one regarded the forward rate as a good predictor of the future movement of the exchange rate (not, at least, since Meese and Rogoff (1983)). Despite these persistent profitable interest differentials, capital flows have not arbitrated away the differences. After fifteen years of pathetically low returns on yen-denominated investments, Japanese investors still have less than 20 percent of their bond-holdings, and less than 10 percent of their equity holdings, in the form of foreign assets.⁷

- This model posits a very direct connection between capital inflows and looser monetary policy, because the then-current paradigm was the credit multiplier process, whereby a rise in foreign exchange reserves added to base money, which was multiplied up automatically into credit growth. With financial deregulation, this model is no longer relevant, and it is feasible, within limits, for the authorities to maintain the policy interest rate in the face of capital inflows.⁸

Perhaps it shouldn't have come as much of a surprise that capital didn't flow smoothly to arbitrage away all differences of returns: after all, the Feldstein-Horioka Paradox had grappled with the real-economy obverse of this issue: the puzzle of why saving and investments tended to go together, country-by-country (Feldstein and Horioka (1980)). If high-savings countries kept their

⁶ Harry Johnson, leading proponent of floating rates, promised that: "A freely flexible exchange rate would tend to remain constant so long as underlying economic conditions (including government policies) remain constant; random deviations from the equilibrium level would be limited by the activities of private speculators" (Johnson (1972))

⁷ IMF World Economic Outlook 2005 Chapter 3

⁸ "Much of the discussion of sterilized intervention in Asia suffers from anachronism, since it applies measures consistent with quantity targeting to assess the behaviour of central banks with interest-rate operating targets." Ho and McCauley (2007)

money at home and invested it there, it seems highly likely that funds were not seeking out the highest-return investment opportunities, wherever they were located.

To argue that the Impossible Trinity and UIP are unhelpful in explaining capital flows is not to deny any connection between domestic interest rates and capital flows, nor to deny that capital flows cause serious policy problems. We return to this in Chapter 5. First, let's search for the Impossible Trinity in practice.

Chapter 4. Did the Impossible Trinity Constrain Monetary Policy?

We can divide the issues up in the following way:

- Were countries, in practice, able to maintain higher interest rates than the world average?
- Did this cause loss of monetary control via capital inflows?
- What was the impact on the central bank's core objective, price stability?

We noted above that, in the case of Japan vis-à-vis the US, there is no evidence of any inability to set interest rates at the desired levels, even where this results in a significant international differential, maintained for decades. Casual observation would strongly suggest that this has been true, also, for the emerging countries of East Asia: see Figure 3.2.⁹

Did capital flows cause any loss of control over money supply? We can test this against the pre-deregulation common target – base money – as well as broader measures of money. The base money comparison has special resonance for the Impossible Trinity, because this is the channel through which attempts at policy differentials would be frustrated. Table 4.1 shows growth in two versions of “money” compared with growth in foreign exchange reserves. Figure 4.1 presents another view of these data. With the possible exception of India, there doesn't appear to be any

close link between additions to foreign exchange reserves (NFA) and base money.

Why is this linkage so weak? First, the process of sterilization seems to have been quite effective. In practice it is relatively easy for central banks to sterilize excess base money, as banks have no alternative use for it, if they are already supplying all the loans that are demanded at the going policy-based interest rate. In any case, where the interest rate is the policy instrument, there can be a lot of slippage between base money and credit (which is the money variable that impinges directly on economic activity). If the authorities have set the interest rate structure, this will determine the rate of credit expansion, and excess base money may not have much effect on credit growth: it remains as unintended excess reserves in the banks' balance sheets (c.f. Japan 2001-2004 and Indonesia in 2005-6).

We can also examine whether the authorities were able to maintain their policy interest rates in the face of large build-up in foreign exchange reserves. Ho and McCauley (2007) conclude that: “Central banks with explicit short-term interest rate operating targets or official rate corridors (for example, in India, Indonesia, Korea, Malaysia, the Philippines and Thailand) were able to manage money market liquidity such that the relevant interest rates did not fall and stay below their announced targets, notwithstanding bouts of foreign exchange purchases”.¹⁰

⁹ Nevertheless, there have been occasions when capital flows have frustrated the setting of monetary policy. In Australia in 1983, in the face of strong upward pressure on the then-fixed exchange rate, tighter interest rates (appropriate for the domestic economy) attracted such large inflow that sterilization was difficult, perhaps impossible. The elements which frustrated policy in this case were the strong expectation that the exchange rate could only move in one direction, inadequate sterilization capacity (bond tenders were still in their infancy) and money targets were in place, so the failure of full sterilization was, very prominently, a failure of policy.

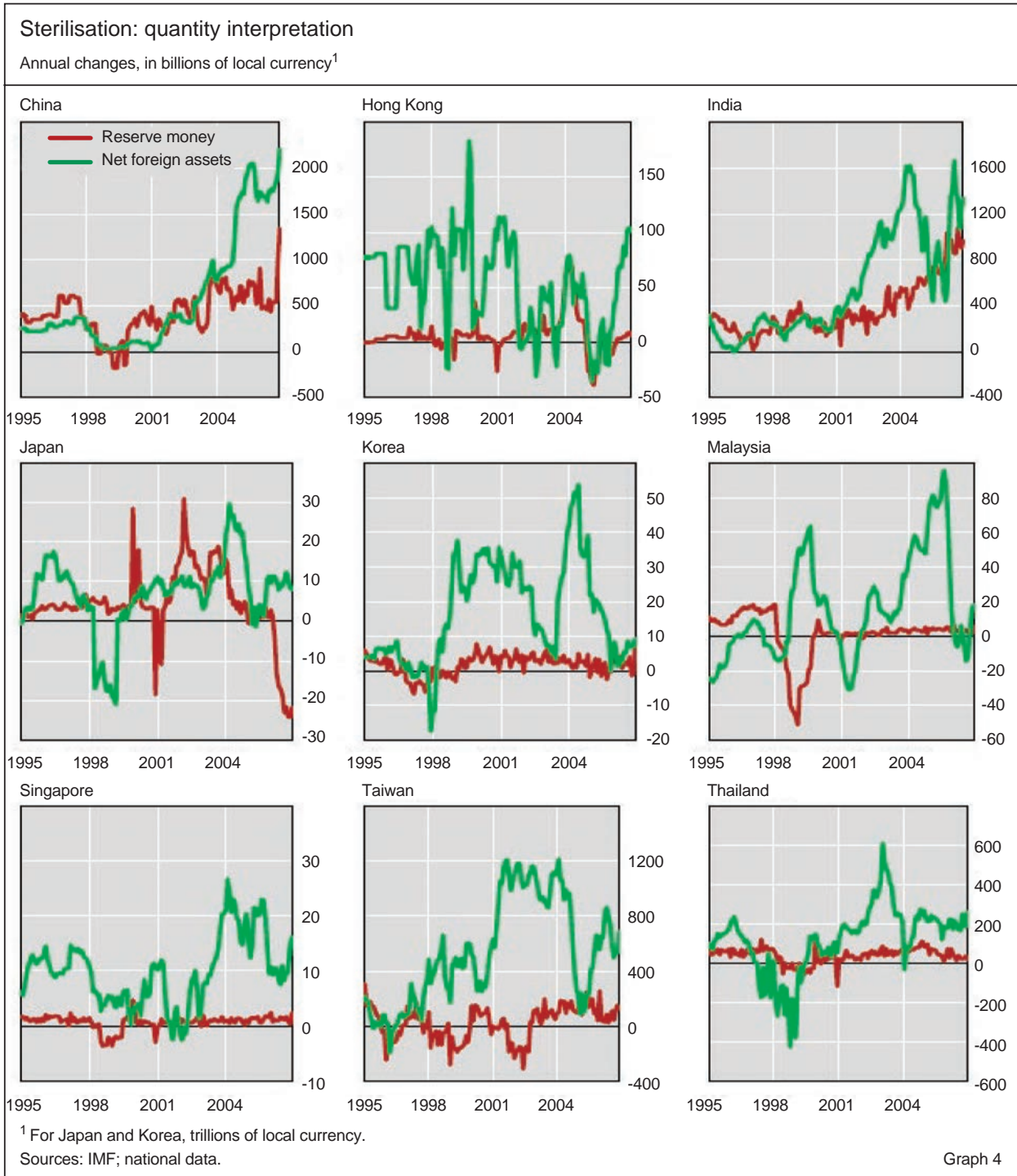
¹⁰ Ho and McCauley emphasize that their results may reflect the particular period under analysis.

Table 4.1 Change in Foreign Reserves, Money Supply (M2) and Reserve Money (y-o-y, %)

	1999	2000	2001	2002	2003	2004	2005	2006
Indonesia								
Change in Foreign Reserves	16.4	7.8	4.4	13.7	12.9	0.0	5.2	24.0
Change in M2	11.9	15.6	13.0	4.7	8.1	8.2	16.3	14.9
Change in Reserve Money	38.8	24.3	15.9	0.9	12.8	1.7	31.0	28.5
Malaysia								
Change in Foreign Reserves	19.7	7.4	4.2	13.0	31.4	50.3	6.0	17.6
Change in M2	13.7	5.2	2.2	5.8	11.1	26.1	15.6	17.1
Change in Reserve Money	26.3	9.4	3.3	6.4	6.9	10.0	5.1	10.6
Philippines								
Change in Foreign Reserves	43.1	1.4	2.9	1.1	2.4	3.9	21.4	25.7
Change in M2	19.3	4.8	6.9	21.0	4.2	10.2	10.3	21.4
Change in Reserve Money	20.6	6.8	3.5	12.8	5.5	9.8	9.3	61.0
Thailand								
Change in Foreign Reserves	18.2	6.0	1.1	17.6	8.0	18.5	4.2	28.8
Change in M2	2.1	3.7	4.2	2.6	4.9	5.4	8.2	6.0
Change in Reserve Money	28.5	18.6	5.7	13.6	11.9	12.4	5.1	2.2
Korea, Rep. of								
Change in Foreign Reserves	42.4	29.9	6.9	18.1	28.0	28.2	5.7	13.6
Change in M2	5.1	5.2	8.1	14.0	3.0	6.3	7.0	12.5
Change in Reserve Money	37.6	0.9	16.3	15.7	7.3	4.8	11.5	19.9
China, People's Rep. of								
Change in Foreign Reserves	5.7	6.7	28.1	35.0	40.2	50.6	33.7	30.1
Change in M2	14.7	15.4	14.4	16.9	19.6	14.5	16.7	16.9
Change in Reserve Money	7.3	8.5	9.2	13.3	17.1	11.4	9.3	20.8
India								
Change in Foreign Reserves	19.5	16.0	21.0	47.5	46.2	28.0	4.2	29.4
Change in M2	17.1	15.2	14.3	16.8	13.0	16.7	15.6	21.6
Change in Reserve Money	11.4	7.7	10.2	9.3	13.8	16.3	14.9	18.5

Source: International Financial Statistics (IMF)

Figure 4.1 Foreign Exchange Reserves and Base Money



It is possible that the authorities might have preferred higher interest rates and might possibly have trimmed their setting in the hope of discouraging some of the excessive capital inflow.

But if they did trim their policy instrument, it doesn't seem to have done any harm in terms of achieving their final objective – low inflation. So far this century, despite very large capital inflows, inflation

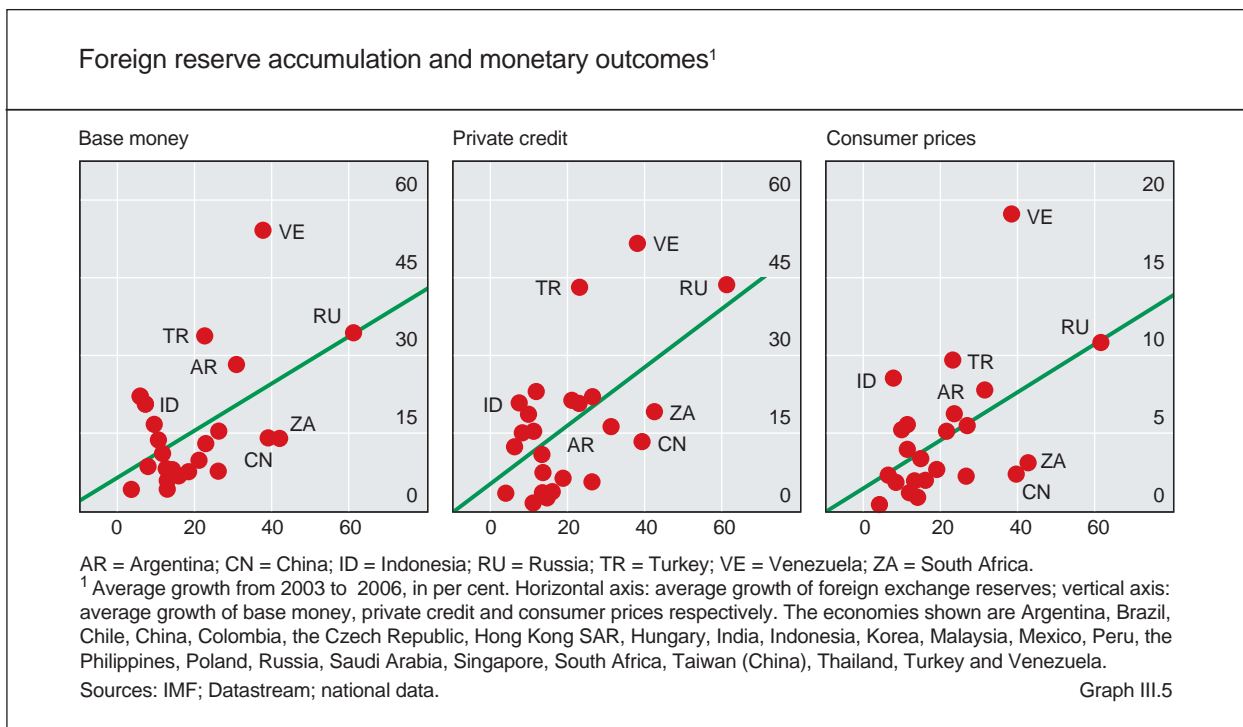
has by-and-large been contained (although China may represent an unfinished story). Ho and McCauley (2007) conclude: “All in all, Asia during the period under consideration did not provide evidence for the well-known argument that large-scale reserve accumulation would be inflationary. The top reserve accumulators, be it in absolute terms (China and Japan) or in relative to GDP terms (Singapore, Malaysia, Taiwan and China), did not experience notably larger rises in inflation over the period 2002-2006 compared to economies that accumulated little reserves.

More strikingly, there is in fact an inverse relationship between reserve accumulation and average inflation performance in Asia over the same period. The top reserve accumulators all had relatively low inflation or even deflation. In contrast, two economies that saw the least reserve accumulation (Indonesia and the Philippines), given currency weakness through

2005, were the ones that over-shot inflation targets and experienced the highest inflation in the region. This inverse relationship is even more evident if one juxtaposes the inflation rate in 2001 (i.e. the initial condition) with the subsequent degree of reserve accumulation.”

The BIS 2007 Annual Report, using a wider range of countries, claims to see some relationships between, on the one hand, growth of foreign exchange reserves and, on the other, base money, credit and inflation (see Figure 4.2). These look to be pretty tenuous relationships with little explanatory power. The IMF, stuck as usual in a decades-old paradigm, still wants to test the Impossible Trinity in terms of the relationship between base money and credit growth (see IMF World Economic Outlook, October 2007).

Figure 4.2 Foreign Exchange Reserve Accumulation and Money



Chapter 5. What are the Real Problems?

If the problems identified by the Impossible Trinity seem greatly exaggerated, there clearly are serious policy issues raised by capital inflows. The practical problems from capital flows facing central bankers might be grouped in the following way:

- While capital inflows don't prevent countries from setting their policy interest rate according to the needs of their domestic economy, nor do these flows flood their money markets with excessive liquidity, nor prevent the achievement of CPI inflation targets, inflows *do* create a channel by which asset prices can be bid up over the course of the cycle.
- There is, more fundamentally, also a *structural* issue involving interest rates: successful emerging economies have a degree of dynamism that requires them to have, over time, higher interest rates than the mature economies (their Wicksellian "natural rate" will tend to be higher). As well, their exchange rates will tend to appreciate structurally over time as they move towards the technological production frontier. The combination of structurally higher interest rates and trend appreciation gives foreigners an attractive potential return, and the resultant capital inflow puts additional upward pressure on the exchange rate. Policy-makers may find the appreciation inconvenient as it damages what may be the most dynamic part of the economy – the tradable sector. As well, the exchange rate is not anchored by any clear "fundamentals", which opens up the possibility that, from time to time, the market will regard the rate as "over-valued", and sell the currency. Herd behaviour results in overshooting in both directions.
- This environment of an unanchored exchange rate combines with the intrinsic volatility and

flighty nature of emerging-country foreign capital inflows to create the potential for "sudden stops" of foreign capital flows. The capital flight is very likely to damage the financial sector ("twin crises").

- Policy-makers have a limited armoury of effective weapons to handle this. Higher interest rates don't often help against such outflows, and foreign exchange market intervention is an uncertain tool.
- To the extent that these problems encourage countries to hold large foreign exchange reserves, this creates a series of problems in the management of central bank balance sheets.

This is a formidable array of problems. Let's set them out in more detail and provide some real-world examples.

5.1 Macroeconomics: How Monetary Policy Works in a Small Well-Integrated Economy

Three decades ago, in a less-integrated world, monetary policy worked by constraining the cyclical upswing and its accompanying asset price pressure, either with higher interest rates or credit controls, which impinged mostly on interest-sensitive expenditures such as investment and asset prices. Nowadays, for a small economy with a floating exchange rate and well-integrated into international financial markets, when the monetary authorities raise the short-term policy interest rate in response to inflation-threatening excess demand, borrowers are able to move out along the yield curve and obtain funds at rates which reflect the availability of foreign funding. Essentially, the higher domestic short-term interest rates encourage borrowers to tap overseas sources of

funds (usually indirectly through financial intermediaries) to obtain their financing at rates which don't fully reflect the rise in the domestic short-term policy rate.¹¹ Tighter monetary policy induces extra capital inflow, *funding* the cyclical upswing, at the same time that it is being *constrained* through higher interest rates. This new exchange-rate channel restrains the inflationary impact by providing additional supplies of appreciation-cheapened goods and services via the enlarged current account deficit. Monetary policy is working through the exchange rate as well as through the interest rate, and the former channel may be more powerful than the latter. Monetary policy is still effective, but it works differently. Excess demand is spilled overseas rather than restrained.¹²

It does, however, leave open the possibility (in fact the likelihood) that pressures on *asset prices* will be funded by capital inflow, not offset much by the extra supply of cheap foreign goods and services (physical assets might be thought of as a non-traded good). This asset price inflation is accommodated by the stance of domestic monetary policy, which is targeted at CPI prices rather than asset prices. Central banks remain uncomfortable with this asset price inflation as it is distortionary while underway, exacerbates the cycle and is disruptive when the asset bubble eventually bursts. This was certainly the case in a number of East Asian countries in the years leading up to the Crisis. This does present a dilemma for

policy: the authorities could raise interest rates, but they refrain from this (or do it only in moderation) not principally because their actions will be frustrated by extra capital inflows, but because they don't believe they can effectively control asset prices and don't want to be blamed for pricking the bubble when the asset prices eventually fall. They have, moreover, judged themselves to be unable to do more than, at most, lean against the wind, ready to pick up the pieces when the asset bubble bursts. This is unsatisfactory, but represents the imperfect current "state of the art".

5.2 Macro-Economics: Structural Interest Differentials

Emerging countries are likely to be high-growth, high productivity, high profit economies, as they move towards the best-practice production frontier.¹³ Of course this will be a jerky "punctuated evolution", with diversions and setbacks caused by poor domestic policies, inefficiencies and shocks. There is, however, enough inherent dynamism and profitability in this transition to the frontier that the equilibrium interest rate in these economies will, on average, be higher than in mature countries, because the return on physical capital is higher. One way of expressing this idea is to say that the Wicksellian "natural" interest rate for emerging countries is likely to be higher than in mature economies (Figure 5.1 suggests some empirical basis for this view). These emerging countries will attract foreign capital at those

¹¹ The borrowers may not feel constrained by the currency risk, as high interest rate countries tend to appreciate most of the time, and this will reduce the costs of their borrowing

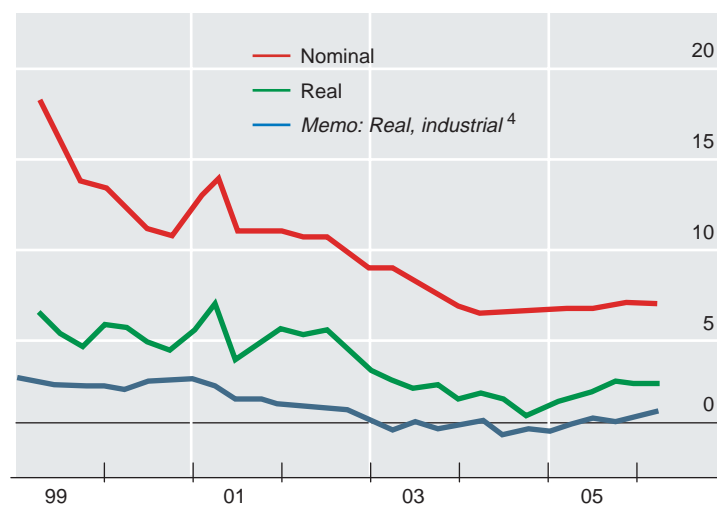
¹² There is a philosophical issue involved here. It was usually the *intention* of policy, in the pre-integration regime, to restrain the excessive demand because there was a presumption that it was excess, as well as excessive. It often consisted of investment booms and asset bubbles. Are we getting an optimal (or more optimal) outcome by allowing these "excessive" upswings to run their course?

¹³ Lipschitz et al. (2002) illustrate this point by calculating physical capital per worker in Eastern Europe which, on average, is one-third of the German level. On the bold assumption of the same Cobb-Douglas production function, raising this to the German level would require net investment equal to nearly five times GDP. Even with a combination of domestic and substantial foreign-funded investment, it will take decades to bring the capital stock up to German levels.

moments in the business cycle when investors feel confident about the risks (economic and political) of investing in countries about which they know little. This will happen, whatever the domestic policy interest setting: if the authorities try to keep interest rates low, the inflows will come into real assets or equities. So the key point in thinking about interest rates is not that they have to be the *same* as international rates (as implied by the Impossible Trinity), but they *will be higher* over the

medium term and policy has to work around and adapt to this. This is a structural issue, not a cyclical one, so the exchange rate implications of the higher interest rate can't be sorted out using the Dornbusch overshooting mechanism. Nor is the exchange rate regime a relevant issue: if the country keeps a fixed rate, the real exchange rate appreciation comes about through faster domestic inflation (e.g. Hong Kong, at least over its medium-term history).

Figure 5.1 Interest Rates, Emerging and Mature Economies



BIS Annual Report 2006 Chapter IV

Inflows will not only be encouraged by these structurally higher interest rates, but will be further encouraged by the prospect of structural exchange rate gains (c.f. Japan, which appreciated from 360 yen/dollar to 100 in the early 1970s). This might be explained in terms of the Balassa/Samuelsion theorem (differential productivity performance in the tradable vis-à-vis the non-traded sectors), or may simply reflect the high overall productivity as capital/labour ratios rise and the country moves towards the best-practice production frontier. During this journey, interest rates need to be higher, and the real exchange rate has the prospect of appreciation. This is an attractive intrinsic environment for capital inflows (for another

description of this same process, see Lipschitz et al. (2002)).

5.3 Macro-Economics: What is the Analytical Model For the Exchange Rate?

The cyclical pressures on the exchange rate (as it acts as the main channel for monetary policy) combine with the structural influences, to produce an exchange rate which has a strong tendency towards appreciation, and has no clear anchor in the “fundamentals”. The cyclical path of the exchange rate might possibly be explained in terms of the Dornbusch (1976) over-shooting model

(although it is hard to identify this process in the real world), just as some cyclical movements may be explicable in terms of the world commodity-price cycle (see Gruen and Kortian (1996)).

Economic analysis, however, has little to say about the path of the exchange rate during the decades-long journey to the technological frontier. It might be possible to envisage the exchange rate on a steady trajectory towards the long-term equilibrium, when the economy has reached the technological frontier. But at any point on this path, this exchange rate will be too low for portfolio equilibrium, as the investors have the prospect of higher interest returns and exchange rate appreciation. Suppose the rate appreciated enough to fully anticipate the end-point of the structural appreciation (some decades ahead): the investor still has the advantage of the higher interest rate in the meantime. So nothing short of a once-off appreciation *beyond* this long-term equilibrium, followed by a steady depreciation (rather like a very drawn out version of the Dornbusch over-shooting process) would maintain portfolio equilibrium.

We observe that this inflow is not equilibrated by price arbitrage: the foreign and domestic interest rates do not merge together. So there must be other forces at work constraining the inflow. One common approach is to explain the interest differential as a “risk premium”. This might mechanically satisfy some portfolio balance constraint, but is analytically unhelpful unless some explanation can be offered for the risk premium and how it changes over time.

Is there a structural analogue of the cyclical Dornbusch overshooting mechanism? If the exchange rate appreciates and remains above its longer-term equilibrium until some random shock creates the risk of a short-term fall, the prospect of even a small fall *in the near future* outweighs the interest differential. This would have to be a very random, tenuous and unstructured equilibrium path because a longer-term investor would not be deterred by this short-term depreciation risk. Investors with a short-term horizon, however, might want to cut their exposure. We might expect to see not only swings in the exchange rate of the recipient country, but in the capital-supplying country as well. This fits well with the experience of Japan during the yen-carry period: an undervalued exchange rate (note substantial current account surplus, and a real rate which is lower than in the 1990s) punctuated by sudden sharp appreciation whenever the outflows are in question (October 1998, August 2007) with very large swings (with a range of 80-150 yen/dollar).

This fits with the idea of “sudden stops”. Some simply call this “time-varying risk premium” and leave it at that. The more honest approach is that taken by Krugman (2006), who calls this a Wyle E. Coyote process: “a moment when investors realize that the dollar’s value doesn’t make sense and that value plunges.”¹⁴ This puts the sophistication of the analysis on the right level: that of a comic book. The “search for yield” lasts while-ever asset prices are rising and the boom is strong. The most plausible explanation of the Asian contagion in 1997 was Morris Goldstein’s “wake up call”:

¹⁴ Krugman provides the explanation: “For those not familiar with the classics: there were often scenes in Road Runner cartoons in which the ever-frustrated Wile E. Coyote would run off a cliff, take several steps on thin air, then look down – and only after realizing that there was nothing under him would he plunge.” There are other inventive explanations, often brave attempts to maintain the rigour of the portfolio balance approach: McKinnon and Pill (1996) see the inflows reversing at that moment when foreign investors realize that the implicit guarantees to banks have been fully used up.

nothing more substantive than a reminder that there was an issue. More often than not, the trigger for outflow is an external policy event rather than domestic (see Feruci et al. (2004)).¹⁵ Perhaps an insight is gained by remembering that the foreign investors usually know very little about the specifics of their investment or even the country they have invested in. The arrival of a small amount of new information can add hugely to their stock of knowledge, and lead to an abrupt change of view.

The markets themselves embody self-exacerbating processes. They use similar risk models, which signal the same decision-point for all investors. Credit rating agencies set their ratings by looking in the rear vision mirror, and when they downgrade as things turn bad, investors (often driven by rating-specific mandates) are forced to sell. Herding (“if others are getting out, what do they know that I don’t?”) or “correlated errors” cause the investors to cut their investments at the same time, often into “crowded markets” where others are doing the same thing, with large impact on prices. A fall in the exchange rate is supposed to create the expectation of a subsequent rise (“mean reversion”), but when the exchange rate is unanchored, it can fall very greatly without encouraging new inflows (c.f. the Asian Crisis). Eventually, however, the fall ends and the underlying interest differential asserts itself again, setting off a new exchange rate cycle.¹⁶

This creates the possibility – in fact the likelihood – of broad swings in the value of the currency, perhaps following the cycle. This is not an issue of short-term volatility of the exchange rate (the usual subject of economic analysis, and market risk-analysis as well), but of sustained departures from the equilibrium exchange rate: misalignment rather than volatility.

It’s hardly surprising that policy-makers find this world – an overly-appreciated exchange rate with a tendency to sudden gyrations – uncomfortable and unattractive. In most cases in East Asia since the crisis, with flexible exchange rates in place, the policy concern has not been that capital flows threaten price stability, but rather that the inflows sets in train this appreciation/instability of the exchange rate.

The appreciated exchange rate undermines international competitiveness, at the cost of slower growth in the tradable sector, often the most dynamic sector of the economy (for argument in favour of under-valued rates and further references see Rodrik (2007)).¹⁷

The more the appreciation, the larger the fall when the reassessment comes. Add on some overshooting in the opposite direction, spill-over into inflation and self-reinforcing capital flight (examined in the next chapter) and the stage is set for a crisis.

¹⁵ ‘The main finding is that push factors are important in explaining banking flows and bond spreads. In the case of the latter, the model suggests that two thirds of the compression in EME bond spreads in the period between October 2002 and earlier this year was explained by push factors alone, and in particular the fall in US short-term rates in 2001. This implies a need for caution by EMEs in borrowing too heavily during times of a benign external financing environment, as a reversal in credit conditions is more often than not beyond the control of the borrower. Feruci et al. (2004).

¹⁶ The yen carry trade seems to illustrate these swings. Most of the time, the interest differential attracts flows to the country with the high interest rate, and pushes up its exchange rate. Every so often, those taking advantage of the uncovered carry get worried about their exchange exposure, and when enough of them do, this risk is realized in the form of a sudden appreciation of the low-interest-rate country. This appreciation, however, restores the incentive for the carry-trade: the interest differential is attractive and there no longer seems to be an immediate prospect of future exchange loss. So the flow starts again and the recipient country’s exchange rate appreciates once more.

¹⁷ Emerging countries are not the only ones reluctant to see their exchange rates appreciate: ECB Chairman Trichet called the appreciation of the Euro in 2004 “brutal”.

With the exchange rate subject to this sort of random influence, policy-makers face the difficult task of distinguishing between this randomness and the on-going and continuous changes in the equilibrium, with the danger that they may try to resist the latter as well as the former. Uncomfortable though it is, the authorities in the emerging countries have to accept the need for some appreciation. A capital inflow *should* put upward pressure on the exchange rate, because this is the mechanism through which the real counterpart of the financial capital inflow – the transfer of resources – takes place: the appreciation encourages imports and discourages exports¹⁸. This is true whether the capital flow is long-term structural, or cyclical. In both cases the movement of the exchange rate is part and parcel of the adjustment process and policy should not resist it. Its unwelcome nature is, however, understandable: even if the authorities acknowledge that this sequence – with appreciated exchange rate and current account deficit – is the necessary channel for the capital inflow to operate, they no doubt recall that both these same elements – appreciation and CAD – were identified as being central causes of the Asian Crisis and often blamed for the problems (see, for example, Feldstein (2000)). Misguided though such criticism might have been, it was important in undermining confidence. Policy-makers are understandably reluctant to leave themselves and their countries open to a repeat performance.

We might note in passing how the Impossible Trinity led to a focus on the wrong issue after the crisis. The exchange rate *regime*: specifically on the need for “corner solutions” (the rate should either be immutably fixed or a pure free float). The middle ground of managed rates was out of bounds. Over time opinion has softened and fuzzed (see Fischer (2002)) and now focuses, more narrowly and

sensibly, on the dangers of a fixed-but-changeable peg. In the meantime, however, attention was distracted from the possibility – indeed the likelihood – that at times the unanchored exchange rate will be significantly away from its equilibrium value and for long enough to do damage. In the fixed/free float dichotomy, policy-makers have no need to think about some notion of the “right” level of the exchange rate. But if the middle ground of partially-managed rates turns out to be the practical reality, then policy-makers need some framework which has a place for the exchange rate in their policy consideration.

Of course it is not easy to operationalize such a framework, and many will see this as a distraction from the single-objective approach to monetary policy. But for countries that are not yet ready to let their shallow and immature foreign exchange market handle the price discovery (i.e. they retain a “fear of floating: see Calvo and Reinhart (2002)), there is a vital need to have some fairly specific working notion of what is the “right” exchange rate (if only in terms of a range), and how this might change over the cycle and structurally over the medium term. They also need some notion of how to reconcile the possibly-conflicting signals which the foreign exchange market may be giving to their price stability objectives.

We will return to this issue, below, when we discuss policy measures. For the moment it is enough to observe that exchange rates in emerging countries are not well anchored by widely-accepted stable views about the “fundamentals” or a long track-record which would establish the parameters of a mean-reverting process, and while memories of the huge movements during the 1997 crisis remain, exchange rates will be vulnerable not just to short-term volatility, but possibly dramatic shifts of opinion.

¹⁸ Keynes (1929) wrote about this issue as the “transfer” process.

Chapter 6. Flighty Volatile Capital: Sudden Stops and Twin Crises

If a flexible exchange rate is not well anchored by expectations and a well-established history of mean reversion around some longer-term trend, “sudden-stop” capital reversals are a constant danger. As capital leaves in response to a disturbance or change in confidence, it drives down the exchange rate, causing a vicious cycle as more capital leaves in response to the falling exchange rate.

When these investors flee, they are not easily replaced by other foreigners: these investors in emerging countries are on the frontiers of fund-management, not the mainstream. Few other foreigners can be persuaded to invest by a modest fall in the exchange rate because the exchange rate is not well anchored and there isn’t a general perception of what the “right” rate is.¹⁹ Capital inflow in emerging economies is binary: it’s either on or off.

Such sudden outflows require a huge and painful adjustment process. When the capital flow is inelastic in response to a lower exchange rate, the adjustment has to take place largely in terms of *income falls* which, through reduced imports, are the only path by which the current account can be quickly brought into equilibrium with the now-reduced foreign funding. The exchange rate cannot produce a quick response by “switching”, so the equilibrium has to be achieved by painful “adjusting”: reducing absorption.

To illustrate the point, let’s compare Australia and Thailand during the Asian crisis. The fall in the Australian dollar was not, of course, as great as in Thailand, but it was nevertheless very substantial – close to 30 percent. The relationship between this exchange rate fall and capital flows was, however, quite different, for reasons we will explore in a moment. But first, let’s look at the data. Figure 6.1 shows the huge turnaround in capital flows in Thailand (amounting to over 20 percent of GDP, from a deficit of 8 percent in 1996 to a surplus of nearly 13 percent in 1998. This contrasts with Australia (shown in Figure 6.2). At least in this annual data, there is no sign of *any reversal of capital at all* in the case of Australia, despite the significant fall in the exchange rate: the inflow was actually larger in 1998 than the previous average.²⁰ Thus for Australia the fall in the exchange rate was a threat to inflation (which in the event came to be seen as a tolerable threat, as the pass-through was much slower/smaller than had previously been thought), but not to capital flows. Relaxed about the threat to price stability, the Australian central bank was prepared to let the exchange rate fall without raising interest rates in its defence.²¹ The result was that the real economy was largely unaffected (if anything, stimulated by the lower exchange rate). The Thais, on the other hand, were forced to raise interest rates in an economy already put in free-fall by the need to trim the current account to the available (hugely reduced) foreign funding. Clearly there is a different relationship between exchange rate weakness and capital flows

¹⁹ I have described it (Grenville (2004)) as like trying to sell discount tickets outside a theatre which is already ablaze, with the patrons streaming out.

²⁰ It is worth noting that there was no discernable outflow in the earlier exchange rate “crisis” in Australia – the “Banana republic” episode of 1986, when the exchange rate fell 35 percent without any capital outflow, despite the relative novelty of the exchange rate regime, which had floated only eighteen months earlier.

²¹ The central bank had the added advantage that it could be seen “to be doing something”, in the form of foreign exchange market intervention.

Figure 6.1 Thailand: Capital Flows

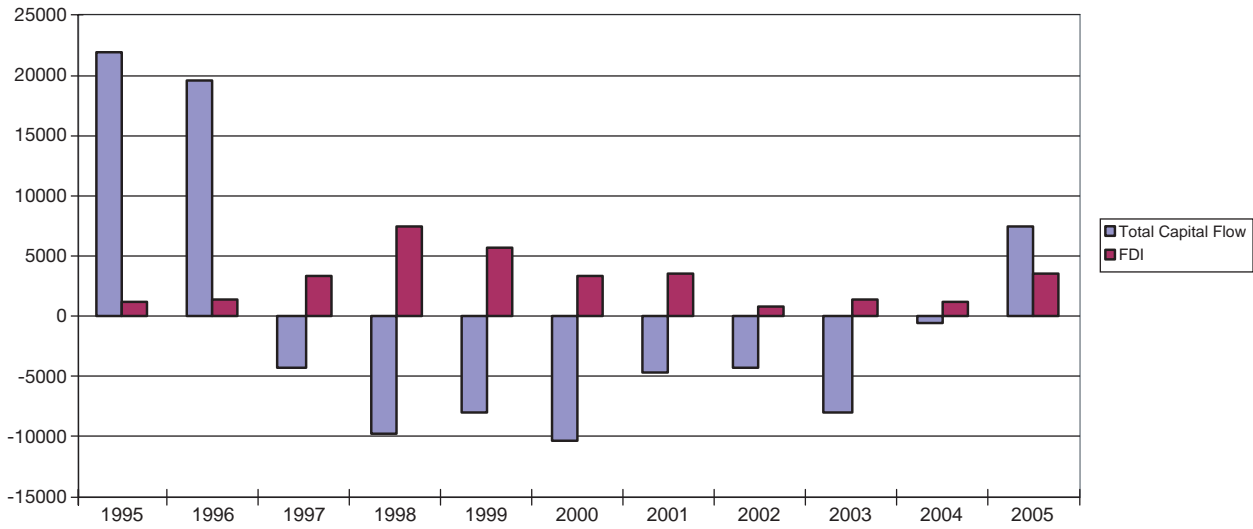
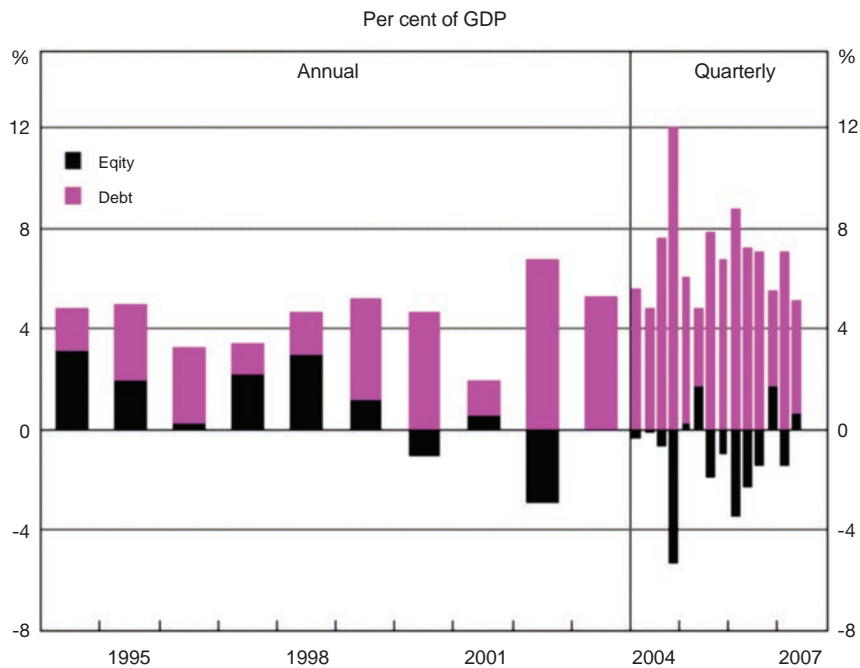


Figure 6.2 Australia: Capital Flows



Sources: ABS; RBA.

Others countries provide similar comparisons. Cabellero et al. (2004) argue that the different behavior of Chile, compared with Australia, was not caused by different views on the inflation danger (the pass-through in both countries is similar), but rather was aimed at pre-empting capital outflow which would be much more likely to happen (fewer opportunities to diversify risk through derivatives), and do more damage when it did (commercial balance sheets are quite exposed to exchange-rate risk).^{22 23} Hausmann (1999) compares Mexico and Australia: in Mexico's case it is not clear whether the interest rate increase was a response to the inflation threat or designed to encourage capital to stay, but the capital flow behaviour in the two cases is clearly quite different.

This difference between Mexico, Chile, and Thailand, on the one hand, and Australia (and similar countries) on the other is the central policy issue: what is it that makes investors prepared to hold their positions^{24 25} in the case of Australia, but not with the other countries? It is not that everyone has somehow covered their currency exposures in the case of Australia but not in the case of Thailand: Australia has had a long history of current account deficits and this cumulated inflow means that someone (in Australia's case, foreigners) is holding a very substantial currency exposure. Caballero et al. identify the difference as "country trust", as distinct from "currency trust":

"Currency-trust describes the degree of confidence foreign investors have in holding assets denominated in the currency of the particular country. It indicates that investors believe currency movements will not be used to expropriate their investment but also that the central bank has enough control over the currency that random shocks are unlikely to lead to perverse exchange rate dynamics. In this way currency-trust is seen to be related to the concept of inflation credibility. Country-trust describes the degree of confidence foreign investors have more generally in the country, incorporating the commitment of the country to repay debts, corporate governance, the financial system and the economic stability of the country. Importantly, country-trust means that there is no need for highly specialized knowledge to invest in the country (for example about government and institutions)." (Caballero et al. 2004)

Others would describe this differently, with different characteristics. They might talk in terms of institutions and the environment of law and governance. Others would emphasize that the disparities in size between the financial markets of the emerging countries and those of the mature countries which are the source of the disruptive flows are a central issue (see Volcker (1999), Richards (2002) and Runchana Pongsaparn (2007)).

²² "In Chile there was widespread fear of a capital flow reversal. Net capital outflows could lead to a balance of payments crisis that would turn out to be much more costly than the contraction brought about by high interest rates. Contractionary monetary policy was seen as a way of reducing the need for external financing (by reducing domestic absorption) and the extent of the capital flow reversal (by sending a pragmatic signal to investors)." Cabellero et al. (2004).

²³ See also Ortiz's (2000) discussion comparing Australia and Mexico. He identifies different inflation pass-through as an important issue.

²⁴ Or, if they don't, other investors take their place (and their exposure).

²⁵ The USA provides a more recent example of stable capital flows. Foreigners' purchase of mortgage-backed securities funded almost one third of the US capital inflow in 2006. When risk-ratings were re-assessed starting in mid-2007, foreigners sold these assets but stayed in dollar-denominated assets. (IMF Managing Director's speech Oct 2007)

Still others will argue that at each stage of the exchange rate fall in Australia, foreign investors thought that the rate had fallen enough and there was no expectation of further fall.²⁶

However it is described, the policy problem is that reputation and institutions²⁷ cannot be built quickly or easily. The prescription is simply unattainable in the short or even medium term.²⁸ While embarking on this journey towards deep and resilient financial markets, policy-makers have to put in place strategies to cope with the journey. We turn, now, to that issue.

²⁶ Krugman makes the point this way: “But nobody who looks at the terrible experiences of Mexico in 1995 or Thailand in 1997 can remain a cheerful advocate of exchange rate flexibility. It seems that there is a double standard on these things: when a Western country lets its currency drop, the market in effect says “Good, that’s over” and money flows in. But when a Mexico or Thailand does the same, the market in effect says “Oh my God, they have no credibility” and launches a massive speculative attack.” (Paul Krugman “Latin America’s Swansong” at <http://web.mit.edu/krugman/www/swansong.html>)

²⁷ In the Douglass North (1990) sense of rules and norms which govern relationships between market participants.

²⁸ Much of the discussion after the Asian crisis was like a variant on the old Irish joke about asking the way to Dublin: “If I wanted to go there, I wouldn’t want to be setting out from here”.

Chapter 7. How Should Policy Respond?

We start from the presumption that capital flows, like trade flows, are beneficial to a country and that policy should facilitate these. In particular there should be an acceptance that an appreciated exchange rate that is part and parcel of the absorbing the capital flows and bringing about the transfer of real goods and services. But where there are significant interest differentials, there is a likelihood of excessive inflows as countries become more financial integrated, and these flows are likely to be volatile. A country may not be able to absorb, in a beneficial way, all the foreign capital that it attracts.

7.1 Before the Crisis: Prevention

The two broad approaches here are to try to limit the inflow, and to prevent the exchange rate from overshooting in its appreciation.

It would be possible to discourage the inflow by introducing various types of “sand in the wheels”: unstable politics, arbitrary administrative or judicial decisions, poorly functioning institutions, obscure information and random market processes resulting in wide and unpredictable fluctuations in the exchange rate. It goes without saying that policy should be aimed at *removing* such imperfections, not using them as a policy instrument to solve a problem of excessive inflows. This kind of “sand in the wheels” is simply inefficient and denies the emerging country the benefit of the cheaper capital available overseas.

We noted, in Chapter 5.3 above, that exchange rate uncertainty and volatility will be one way of discouraging inflows. While this sort of disruption is widely accepted as the main explanation of time-varying risk, but seems sub-optimal.²⁹

There is another price-based mechanism at work. The foreign investment bids up the price of domestic assets (not just equities, but debt and property). This achieves portfolio equilibrium for the foreigners as the yield on the assets is driven down towards the foreign interest rate. There are, however, two disadvantages for the recipient country. First, as asset prices rise, an asset bubble is likely. Second, domestic investment is encouraged by the asset price increase (Tobin’s “q” operates), so the stance of monetary policy is undermined.

Is there nothing better available in the policy armoury, to restrain excessive inflows? If we see the problem in terms of a price differential between the return on capital at home and abroad, policy might aim to ration the inflow while at the same time ensuring that the recipient country gets the full benefit of the fact that capital is available more cheaply in the world market: this is, after all, the usual benefit of globalization. If rationing is needed (and this is an issue of absorptive capacity), then a tax on inflows seems worth exploring, as it does the job and gives the benefit of the price differential to the home country (although, as usual, capacity to administer such a tax is an issue). So the first

²⁹ It might be noted in passing that inducing volatility or uncertainty into market prices is sometimes put forward as a desirable thing. This example from the IMF comes very close to advocating an overvalued exchange rate in order to create downside risk: Policymakers should continue to be pragmatic and allow for greater exchange rate flexibility in order to create two-way risk in the foreign currency markets and promote a rebalancing of growth where necessary, limiting any intervention to efforts to reduce volatility and ensure that market conditions remain orderly.” IMF Regional Outlook Asia Oct 2006.

This seems perverse: reducing the uncertainty in exchange rate movements would reduce the risk premium, and if this results in too much inflow, it would be better to discourage this through some form of tax (with the revenue benefits) rather than through artificially inflating the risk premium.

measure might be to ensure that the foreign investment is fully taxed in the recipient country. International tax treaties aimed at avoiding double taxation tend to shift taxation out of the recipient country (where at most there is a smaller withholding tax), perhaps to some tax haven.³⁰ This may be hard to change, but would at least ensure that taxation wasn't a distortion working in the wrong direction for macro-economic stability. A comprehensive capital gains tax would seem to have the same virtue. While a rigorously-enforced capital-gains tax may not prevent an asset bubble from forming, it may constrain it and the revenue will help clean up the damage when it bursts.

One preemptive response to excessive surges of foreign capital might be inflow controls – Chilean-style unremunerated reserve requirements (URR).³¹ Mainstream discussion of these still has the flavour that, just as “real men don't eat quiche”, serious countries don't have URR controls. This seems puzzling, as objective assessments show them to have been modestly successful over the policy horizon³² and they seem closely tailored to the requirement to discourage the least-useful and most disruptive form of inflow – short term funds. The negative consensus surrounding URR has been unhelpful to their effective use. Financial markets, carrying the Impossible Trinity baggage, were universally critical when Thailand attempted to introduce URR in December 2006, triggering outflows. If the URR is a legitimate policy response,

it needs more *in principle* support from the IMF (and some technical help in implementation might have helped, as well). To the extent that these are often thought to be effective only for relatively short periods of time (until markets find easy ways to by-pass them), these measures might be thought of as being relevant to surges and the cyclical issues (i.e. trying to get more of the impact of monetary policy back to the interest rate instrument) rather than the structural issue.

To the extent that the inflows are coming through the domestic financial system, there seem many opportunities for stronger prudential controls, driven by the by-now-well-established fact that prudential problems in the downswing of the cycle were largely created during the upswing.³³ Policy should be bold enough not only to recognize the incipient problems, but to act on them. There is a good case for prudential regulations preventing or greatly limiting the role which the core financial institutions (banks) can play in intermediating the foreign inflows. So one answer to the second leg of “twin crises” – the collapse of the banking system – may be to prevent the banks (and their subsidiaries) from acting as intermediaries for the inflow, and have their customers' whole-of-balance-sheet exposures subject to detailed prudential scrutiny and proper reserving practices. As often happens, doctrinal or philosophical views get in the way of good policy. In this case, there is a commonly-voiced argument that prudential

³⁰ A casual observation of the implementation of dual tax agreements would suggest that these have been written by the investing countries rather than the capital-receiving countries.

³¹ Because many commentators hold negative views about these, they may conveniently forget that many other countries used this sort of capital control before Chile did: Australia in the 1970s had “Variable Deposit Requirements” that were so powerful in their effect that they had to be abandoned.

³² The IMF IEO (2004) concludes that URR temporarily allows domestic interest rates to be higher, that there is no significant effect on exchange rate; that the volume of capital inflow is reduced although this effect diminishes over time; and that the composition of capital inflows towards longer maturities.

³³ Tight loan-to-valuation ratios, cyclically variable provisioning requirements and limitations on the accepted value of security seem sensible measures. See Borio and Lowe (2003).

measures should not be used for macro-economic purposes, but this misunderstands the nature of the problems: it *is* a prudential problem which *also* happens to have macro-economic implication.

In the aftermath of the Asian crisis, there was a strong suggestion that the crisis could have been avoided or greatly mitigated if only domestic borrowers had hedged their foreign exchange exposure before the crisis.³⁴ To evaluate this, we need to separate the three different channels that come into play in a crisis. First, the exchange rate falls and this is a threat to inflation (which might lead the central bank to raise interest rates at a time when the economy is already weak). Second, the capital outflow requires an adjustment in the current account position so that it fits with the new (reduced) availability of external funding. Third, the exchange rate fall administers a balance sheet loss to anyone with a currency exposure (which was so damaging to domestic corporates in the Asian crisis). With this three-fold distinction in mind, we can evaluate the effect of hedging. While hedging can shift the exposure around, the exchange rate vulnerability remains: if there is large capital inflow, then someone – either domestic or foreign – has taken on a currency mismatch. If hedging shifts the exposure from one resident to another, there would seem to be little macro-effect. If the exposure is shifted to foreigners, this shifts the *balance sheet* exposure to them and softens the effect of the crisis on domestic corporates. This may mitigate the crisis, but the remaining two effects – exchange rate fall and the need for current account adjustment – remain, and could even be more severe. Foreigners will attempt to cut their exposure when the currency comes under threat, pushing the exchange rate down and creating the

same pressure on inflation and the same need for current account adjustment in response to capital reversal.

A closely-related debate goes under the catchy title of “original sin” (Eichengreen et al. (2005)) which puts the currency denomination of foreign debt as the central issue. Hausmann (1999) explains the difference between Mexico and Australia (both big foreign borrowers, but one fragile and the other not) in terms of the ability of Australia to borrow in its own currency, while Mexico (having “original sin”) had to borrow in dollars, leaving its borrowers vulnerable to an exchange rate depreciation. This raises the same issues as discussed in the previous paragraph. Unless it can be shown that foreign investors are more stable holders of currency exposure than domestic borrowers, the vulnerabilities remain, whoever has the exposure.³⁵

Our analysis questions the conventional wisdom of encouraging countries to shift the exchange risk to foreigners, thus ridding themselves of “original sin”. Certainly, this shifts the *balance sheet* damage of a depreciation to foreigners. But the country and its investors pay a significant premium for this risk shifting. Just as a Japanese investor would have been much better off by investing in Australian dollars, an Australian borrower would have been significantly better off borrowing in yen over this period. Shifting the currency risk to foreigners gives them the benefit of the difference between the low international rates and the high domestic rates. Why is this universally regarded as good policy?

The one policy prescription which seems to achieve wide support in theory if not in practice is to respond to excessive capital inflow by shifting the

³⁴ For a recent example, see IMF (2007): “these countries had accumulated large unhedged foreign exchange liabilities, as domestic interest rates were higher than international rates and very tightly managed fixed exchange rates had conveyed a false impression of no exchange rate risk.”

³⁵ On these issues, see also Goldstein and Turner (2004).

budget in the direction of surplus. This prescription seems to rely on the Mundell-Fleming IS/LM framework: a budget surplus will shift the IS to the left, lowering interest rates and discouraging capital inflows. This seems to fail on two levels. First, the IS/LM framework no longer captures the way monetary policy operates. The authorities set the short-term interest rate and have no reason to change this in the face of a large budget surplus and a leftward shift of the IS. Longer-term interest rates are set by the Wicksellian natural rate, which doesn't change. Even if interest rates *did* fall, the capital flows facing the countries of East Asia seem to be fairly interest-inelastic, as they are now dominated by FDI (including direct purchase of assets such as infrastructure) and portfolio flows into equities. If this is the right framework, then the extra savings from the budget will shift the saving/investment balance and, *pari passu*, the current account towards surplus. If the same quantity of capital inflow has to be brought into equilibrium with a smaller current account deficit, this would seem to put *upward* pressure on the exchange rate, the exact opposite of the desired result.³⁶

“The bigger they are, the harder they fall”. Can the authorities help by foreign exchange market

intervention to prevent the exchange rate from rising too much in the pre-crisis period? This is where they need some operational notion of what is the “right” exchange rate. Probably the least-palatable message that comes out of this discussion is that the authorities should be ready to allow the exchange rate to appreciate. They need to resist opposing the on-going underlying structural appreciation and the appreciation which is the normal part of monetary policy during the upswing of the cycle. If they can identify any further overshooting, there is a fair chance that intervention will, at least, do no harm and will turn out to be profitable for the central bank. Topping and tailing the cyclical overshooting of the exchange rate seems not only possible, but desirable. This is not a doctrinal issue: simply one of operational capacity. Whether or not it changes the path of the exchange rate much, it gets policy to focus on the right issue – has the exchange rate overshoot. The justifiable concerns that the exchange rate may overshoot would suggest some variant on the Williamson band-basket-crawl (BBC) (see Williamson (2000)).³⁷ This has, in a fairly mechanical form, some of the characteristics of the Singapore exchange rate approach, which permits quite aggressive and determined intervention, but

³⁶ Sometimes this argument is confused with the idea that the capital flow has *caused* excess demand and thus a fiscal surplus will fix the problem. Of course in a simple Keynesian sense a fiscal surplus reduces demand. But in the context of capital flows, we need a clearer specification of the problem. A capital flow matched by a current account deficit adds as much to supply as to demand, so does not cause excess demand. The inconvenient aspect of the inflow is the upward pressure on the exchange rate needed to bring about the real transfer, in the form of a current account deficit, and a fiscal surplus would not seem to help here unless it lowers interest rates and this discourages inflows.

³⁷ Even recent IMF analysis still hankers after the simple world of the Impossible Trinity. Here is an example from the support material for the 2006 Singapore Annual meeting: “In fact, in the “impossible trinity” view, an economy can have only two of the following: an independent monetary policy, a fixed exchange rate, and capital account openness. In the textbook version, a monetary loosening to support GDP growth, for example, would trigger incipient capital outflows that would put downward pressure on the exchange rate peg and lead to an unsustainable drawdown of official reserves. Something has got to give.

Capital controls do not offer a durable way out of the dilemma. A margin for policy maneuver can perhaps be reconstituted by recognizing that capital account openness is not an all-or-nothing proposition: capital flows can be managed through capital controls. While attractive as a tactical solution, this approach has limitations in practice. Capital controls may provide temporary “breathing space” for the pursuit of domestic policy objectives but their long-term effectiveness is questionable in sophisticated global financial systems. More importantly, barriers to capital mobility entail costs in terms of a less efficient allocation of international savings and the foregone benefits of the diversification provided by unencumbered trade in assets.” IMF background paper for the Singapore annual meeting 2006.

normally only when the exchange rate has moved significantly away from what is seen as the medium-term equilibrium.³⁸

Of course any intervention has to be kept consistent with the monetary stance but, as we noted in Chapter 4, this is less difficult in practice than the Impossible Trinity implies.³⁹ The threat to the stance of monetary policy is more likely to come from a reluctance to keep interest rates at the proper level, rather than any use of intervention in the foreign exchange market.

7.2 Managing a Crisis

So much for prevention. When this fails and the “sudden stop” is impending or has begun, central banks have three possible responses: raising interest rates, foreign exchange market intervention, and capital controls.

Sometimes higher interest rates help retain fleeing capital, but not often, and never when the exchange rate fall is accompanied by a financial crisis (Goldfarjn and Gupta (1999)). During the Asian crisis, the reversals in Thailand and Indonesia were dramatic, and could not be countered by any realistically-acceptable rise in interest rates. At an intuitive level, the central problem is that the prospect of an imminent depreciation will always outweigh the investors’ higher running return. We shouldn’t have had to learn the lesson in 1997: in 1992 the UK was unable to defend the sterling peg

because the market knew that an interest rate defence was too politically painful to be maintained, and in the same year Sweden tried 500 percent interest rates to defend the Krona, ultimately unsuccessfully.

There is very little support for foreign exchange intervention in the academic literature, and it takes a brave (some would say foolhardy) central bank to stand against a serious bout of capital outflow. Nevertheless, this is what reserves are for, and if the authorities are not ready to use their reserves, then why bother to have them in the first place? Intervention has (at least) two aims:

- First, in the hope of discouraging capital outflow by supporting the exchange rate.
- Second, to finance a continuation of the current account position, so as to avoid a forced turn-around which, in turn would force a sharp contraction in GDP.

While in practice these two aims will be inexorably interwoven, they should be judged separately. Even if the intervention has no effect on the path of the exchange rate, intervention might be well justified by the extra time it buys for the absorption adjustment process to take place.

Why does intervention get such a bad (academic) press? Once again it is tempting to put some of the blame on the strong presumption that many

³⁸ It does not imply, of course, that BBC would necessarily use the exchange rate as the instrument of monetary policy to target inflation, as Singapore does. Australian intervention practices also have some of these characteristics, in that substantial intervention takes place, but only if the exchange rate has departed significantly from what the RBA judges to be a sensible level. Whether or not a formally defined band is best (neither Singapore nor Australia have such bands) and whether this is made public are purely operational issues. A publicly announced band may help to anchor the exchange rate, but will also constrain the flexibility of the authorities in responding to shocks.

³⁹ The common text-book distinction between “sterilized” and “unsterilised” intervention reflects a confusion of operational practice. Any competent monetary authority will routinely sterilise an intervention through its daily liquidity management operations (otherwise system liquidity would be unbalanced). The substantive distinction should be between intervention which is supported by a change in monetary policy and one which is not. Obviously supported intervention has a greater likelihood of influencing the path of the exchange rate, but the support may not be consistent with domestic monetary objectives.

analysts have that the market provides the right answer. Perhaps a stronger reason is that history provides plenty of examples of futile defences of unsustainable exchange rates. The test is not to lump together all the attempted defences and try to distil a single answer on whether intervention “works”, but to identify *the circumstances* in which it could work, and test these. This, however, is not easy: we can’t know the counterfactual path of the exchange rate and there is an intractable identification problem in that we can’t distinguish between the policy reaction (intervene when the exchange rate is falling) and policy failure (the exchange rate is falling despite intervention).

What we know is that some central banks have consistently made a handsome profit over time by attempting to “lop the peaks and fill the troughs” (see Andrew and Broadbent (2004)). Whether they succeeded in lopping and filling is impossible to prove, but their profits suggest, at least, that private arbitrageurs are “leaving money on the table”. The experience of Singapore during the crisis suggests that a well-functioning economy can protect itself against depreciation over-shooting through intervention. The key, in this and other successes, is for the authorities to allow the exchange rate to move a significant distance *before* attempting a determined well-resourced defence (and even then being prepared to shift the defensive lines rather than be overwhelmed)⁴⁰. This takes a high degree of expertise and experience, backed by good administrative arrangements: not every country will be able to emulate Singapore’s success.

Whatever the arguments about the effectiveness of intervention in influencing the path of the

exchange rate, there will still be a case for using reserves to smooth the absorption adjustment in a crisis, and in Chapter 7.3 below we will return to the issue of what is a sensible level of reserves to hold for this purpose.

The academic literature is similarly unenthusiastic about capital controls, although after to the Asian Crisis there seemed more support for inflow controls of the Chilean type, mentioned above. It’s hard to find any support at all for *outflow* controls, and again this may reflect the power-realities that the loudest voices come from the creditor countries. Despite the frequently heard assertions of the sanctity of debt,⁴¹ it’s equally hard to see the philosophical objection: every country has its *domestic* bankruptcy rules which are invoked, in extremis, to sort out the relative rights of debtors and creditors when the debtor is insolvent. The subtlety here is that there are both private debtors and debtor countries, so the essence of the issue is how to keep it confined to the parties immediately involved. These “consenting adults” made an agreement, and when it falls apart, the effects should ideally be confined to them. Rapid recognition of bankruptcies in 1997 would have fundamentally altered the way the Asian Crisis played out, especially in Indonesia. Private debtors would not have been in a position to buy foreign currency to stave off their creditors (and by so doing, drive down the exchange rate): their balance sheets (and their cheque books) would have been in the hands of a bankruptcy administrator who, in due course, would have negotiated a settlement with the creditors.

⁴⁰ The practical dilemma for policy makers is this. If they intervene quickly, investors may interpret this to mean that the adjustment process has been staved off only temporarily and will withdraw their funds. If the authorities stay out of the market while the adjustment occurs (or at least in the first major phase of the adjustment there may be a better chance that investors will think, at every moment in time, that the adjustment is already complete and will not withdraw their funds. The counter argument, of course, is that the authorities need to get in early with their intervention to avoid a downward momentum building up.

⁴¹ Most prominently from the Institute for International Finance, the mature country bankers’ lobby group.

Given the undoubted success of the Korean standstill on bank debt at the end of 1997 and the importance of this in restoring stability and confidence, it might be thought that this would become part of the normal policy armoury. Not so. It is treated as a unique occurrence in unusual circumstances. It would have been impossible, it is said, to do deals with all the widespread creditors in the other cases. This is clearly wrong: it could be done in the same way that domestic bankruptcy administrators work, by an administrator simply announcing that the business is insolvent and creditors should come forward to register their claims, which will be dealt with in good order. This would, however, require some international endorsement to avoid individual creditors jumping the queue, and, as we have seen, it has not been possible to get international endorsement of orderly debt resolution even in the far simpler sub-case of sovereign debt restructuring.

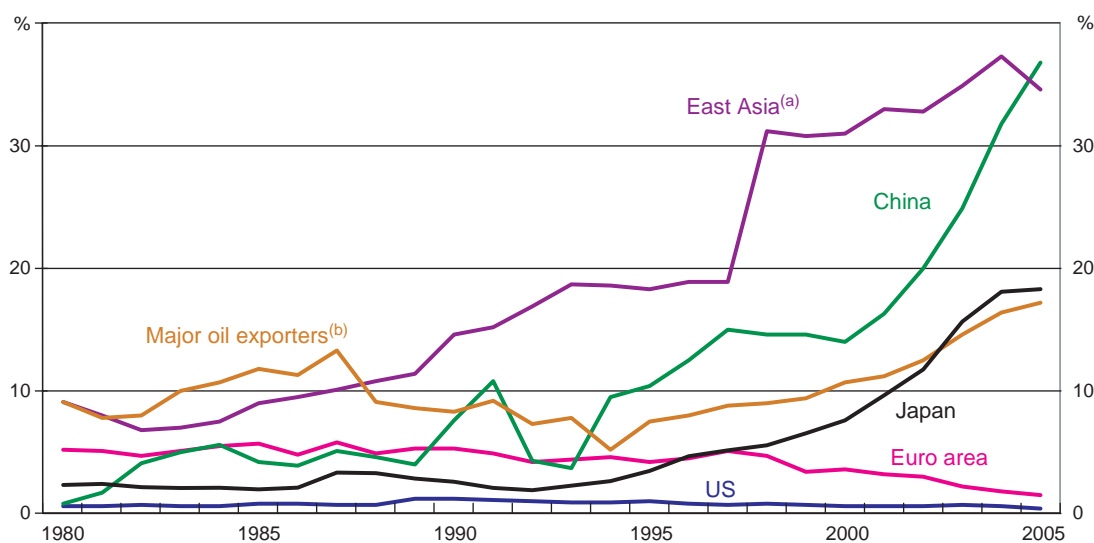
There is one further policy measure, related to foreign exchange intervention, which gets little discussion but seems to have been effective in Brazil in 1999 (see Bevilaqua and Azevedo (2005)). Rather than use its foreign exchange reserves to sell into the market, the government can issue debt

denominated in dollars (either new budget financing or rolling over existing debt). This provides the dollar-denominated assets which the market can use to provide currency cover for those who otherwise would have bought dollars in the foreign exchange market. Of course the government is taking on currency risk, so should try to follow the Brazilian example: only do this if the currency has overshot and is likely to appreciate.

7.3 Managing the Central Bank Balance Sheet

In their broad order of magnitude, the capital inflows into East Asia in the past five years have been around the same as in the first half of the 1990s, but their absorption has been fundamentally different. In the 1990s, for better or for worse, there were corresponding current account deficits, so the capital flows were, in fact, transferred in terms of real goods and services. In contrast, and perhaps reflecting the trauma of the Asian Crisis, these countries have run current account surpluses for the past decade, so the net inflows have, roughly speaking, gone straight into official foreign exchange reserves.

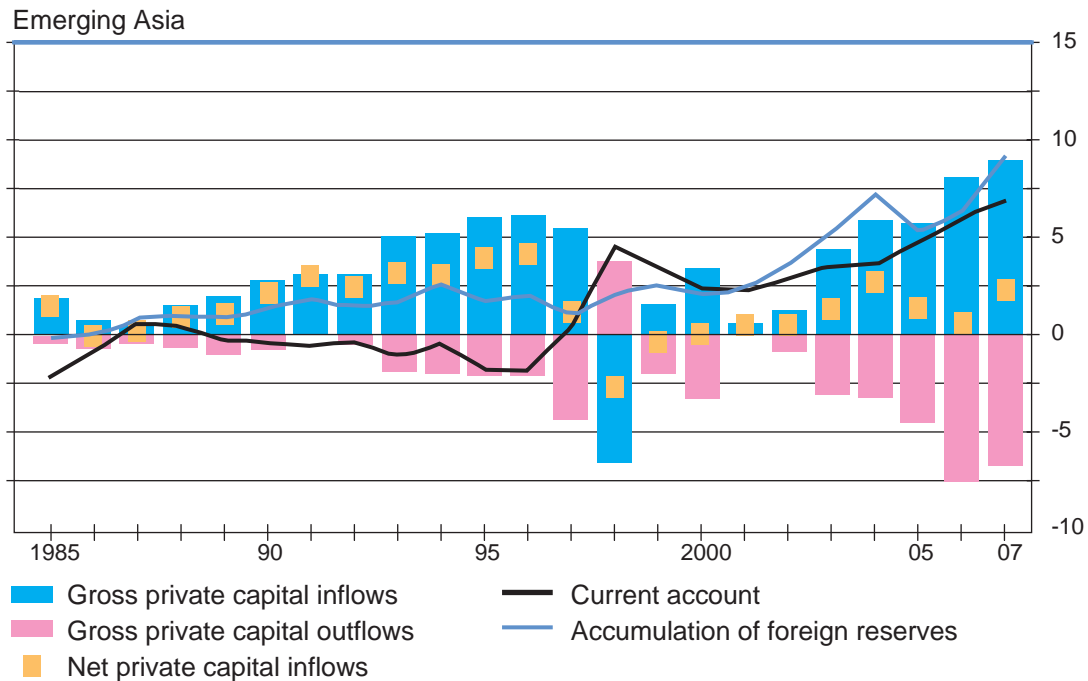
Figure 7.1 Reserve Assets, Percent of GDP



Notes: (a) Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, South Korea, Thailand and Vietnam.
(b) Algeria, Iran, Kuwait, Mexico, Nigeria, Norway, Russia, Saudi Arabia, the United Arab Emirates and Venezuela.

Sources: RBA, IMF, IFS, WEO; World Bank, WDI

Figure 7.2 Capital Flows and Reserves



WEO October 2007

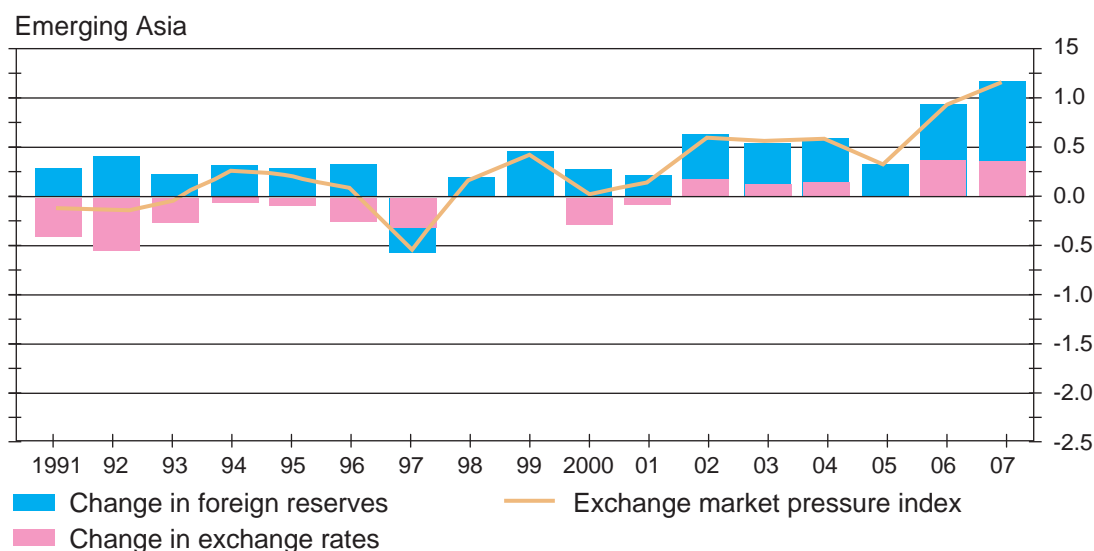
Large capital inflows which lead to intervention, increases in foreign exchange reserves, and sterilization present two problems for the management of a central bank's balance sheet. First, the central bank has a foreign exchange exposure, often very large, which threatens its capital position in the event of appreciation. Second, the earnings on these foreign exchange assets are often less than the cost of issuing the sterilization instrument, putting the central bank's profit and loss at risk.⁴²

Despite these two potential-cost factors, reserve holding may represent proper policy choices: even where the central bank makes losses, the country

as a whole may make offsetting gains. Alternatively, the investments may be thought of as a sensible self-insurance policy against flighty foreign capital which, like all insurance premia, cannot be judged without assessing risks which did not eventuate. When we consider that the cost of the crisis in Indonesia is reflected in a level of income which is around one third lower than it would have been without the crisis, and that this is an on-going loss (it was not a "V" shaped recession), if reserves were able to avoid or mitigate such a crisis, the return on reserve-holding would be very high. But no central bank wants to go, cap in hand, to the government for a recapitalization if either of these factors puts its solvency in question.⁴³

⁴² Of course if uncovered interest parity held, the higher interest rate paid would be compensated by valuation gains on the appreciating foreign assets. If, on the other hand, the emerging countries have intrinsically higher interest rates (as suggested here), then there will usually be a holding cost reflecting this differential.

⁴³ The issues are made more complex by the accounting rules, which may in some cases bring favourable valuation changes into the profit and loss account (when, e.g. the foreign exchange reserves are 'churned' in market transactions), to be distributed to the government as dividends, but so creating hostage to fortune when negative valuation changes occur.

Figure 7.3 Exchange Market Pressure Index

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Rodrik (2006) sets out the cost of foreign exchange reserve holding for emerging countries as a whole, putting it at around 1 percent of GDP. He sees this as a self-insurance policy worth taking. Table 7.1 illustrates the magnitudes of these two problems for a number of East Asian countries. The on-going cost of financing reserve holdings are often negative (in the sense that domestic interest rates in 2006 were lower than foreign) and where this is not the case, the costs seems quite modest (smaller than Rodrik's estimates). Ho and McCauley (2007) confirm this view.

The risk of valuation losses in the event of an appreciation seems more substantial.⁴⁴ The hypothetical possibility that might focus the mind on the broad order of magnitudes is to imagine a 20 percent appreciation of the yuan, impinging on foreign exchange reserves equal to half of GDP: an accounting loss for the central bank equal to 10 percent of GDP: see Table 7.1 for a more detailed calculation covering other countries as well.

Table 7.1 The Cost of Foreign Exchange Reserve Holding in 2006

	Cost of Funding the Reserves, Billion USD (As a Percentage of GDP) ⁴⁵	Cost of a 20% appreciation, Billion USD (As a Percent of GDP) ⁴⁶
Indonesia	2.967 (0.815%)	8.221 (2.257%)
Malaysia	-1.150 (0.772%)	16.426 (11.029%)
Philippines	0.087 (0.074%)	4.005 (3.407%)
Thailand	-0.138 (0.067%)	13.058 (6.329%)
Korea, Rep. of	-0.934 (0.105%)	47.776 (5.379%)
China, People's Rep. of	-27.648 (1.045%)	213.698 (8.080%)
India	2.640 (0.302%)	34.148 (3.909%)

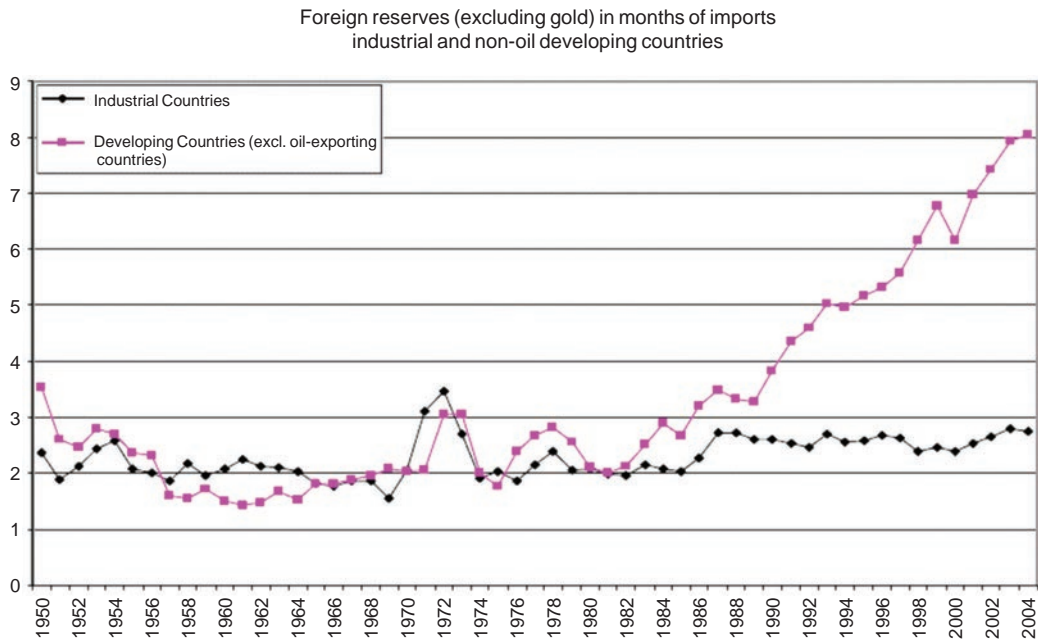
Source: International Financial Statistics (IMF); Bloomberg; World Economic Outlook Database.

⁴⁴ The US dollar value of the reserves is unchanged, so can finance the same sized current account deficit.

⁴⁵ Total Reserves*(Yield of 3-Month Domestic Treasury Bill – Average Yield of US Treasury 1-5 Years)

⁴⁶ Total Reserves*0.2

Figure 7.4 Foreign Exchange Reserves

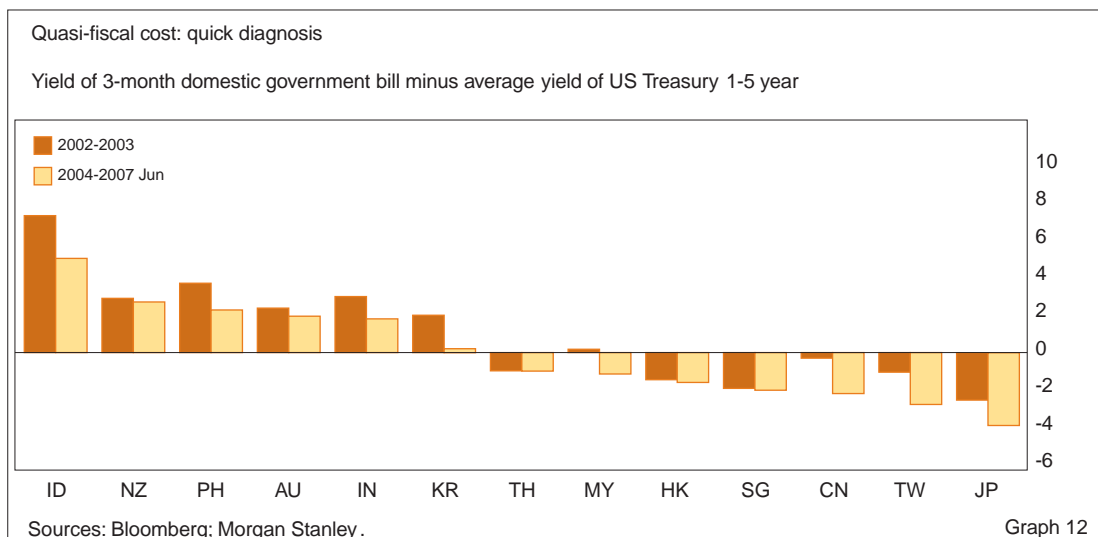


Source: Rodrik (2006)

In one sense, these capitalization and profit issues are accounting problems which could be handled by some inventive inter-governmental accounting – by the addition of some government bonds to the central bank balance sheet. Perhaps the more

important policy issue is whether these foreign exchange exposures are in the nation’s interests, and whether the investment in often-low-return assets is sensible.

Figure 7.5 Quasi-fiscal Cost of Reserves



Source: Ho and McCauley 2007

Graph 12

One often-heard suggestion is the Guidotti Rule (Greenspan 1999), which proposes that emerging countries should hold foreign exchange reserves equal to the debt falling due over the next year. If this is interpreted as the *longer-term* debt falling due over the next year, it might make some sense as insurance against difficulty in rolling over the long-term debt (and this may be the issue for Latin America). But if the reserves are being held against the short-term debt liabilities (which would be the case in East Asia), it raises the issue of why the short term debt was a good idea in the first place. The Guidotti rule is, however, a reminder that the old rules of thumb connecting recommended reserve holdings with imports are not relevant in a world where the shock comes to the capital account.

A more fruitful argument is found in Jeanne and Ranciere (2006), who note the role of reserves in avoiding the dramatic fall in absorption which was forced on the crisis countries of Asia as they turned their current account deficits into surpluses in order to meet the funding constraint. They note that, in a large sample of “sudden stops”, the average output loss was 4.5 percent of GDP in the first year and 2.2 in the second. Their model requires input of parameters covering risk factors and other unknowns and has little interaction between the level of reserves and the likelihood of a sudden stop, but seems to be the basis of a sensible approach to assessing reserve levels.

One response, becoming increasingly in favour, is to pass any excess over and above the needs of foreign-exchange market intervention, to a separate body to manage the assets (a sovereign wealth fund), assessing the foreign exposure and the funding costs.

Chapter 8. Conclusion

The Impossible Trinity embodied an implicit threat and an implicit promise. The threat was that the only viable exchange rate regime was a pure free float, and the promise was that if countries had a free float, it would be well behaved. The Trinity was wrong in both senses: its *threat* was greatly exaggerated, and its *promise* was unfulfilled.

Experience has shown that a country *could* have a managed exchange rate (substantially short of a pure free float), open capital markets and an independent monetary policy. Equally, a floating exchange rate did not always enable a country to pursue monetary policy without regard to the way the outside world impinged on them.

The linkages between the three elements are much less mechanical than the Trinity implies. This creates policy flexibility not envisaged while at the same time making the overall environment less predictable and less well-behaved. Specifically, the outcome is that the exchange rate is poorly anchored for many emerging countries, making sudden reversal of capital flow more likely, which entails painful macro-economic adjustment and puts prudential stability at serious risk.

This is certainly not to make the case for a fixed exchange rate (which would seem a very difficult regime to maintain in a world of integrated financial markets), or for the dogged defence of any particular rate, or resisting the structural appreciation which inevitably goes with the journey to the technological frontier. Of course it is never good policy to defend the wrong price (whether an exchange rate or any other price). Part of the damaging legacy of the Impossible Trinity was its notion that once the choice was made between free float and immutably fixed, the exchange rate would look after itself. Policy-makers should be looking at the exchange rate and asking

themselves if it represents the current proper equilibrium, or is significantly misaligned. Foreign exchange intervention is a second “arm” of monetary policy which, while feeble and uncertain in operation, should be in the armoury. Ensuring that this is consistent with the principal arm of monetary policy – the interest rate – is a challenge, but one that is better faced with a more complex and nuanced view of the inter-relationships than is provided by the Impossible Trinity.

The other unhelpful legacy of the Impossible Trinity was the idea that *resistance is futile*. Eclectic, diverse and wide-ranging responses to the challenges posed by large and volatile capital flows are needed and feasible. Intervention is only one of the possibilities explored here. “Sand in the wheels”, hedging, fiscal surpluses, domestic taxes, taxes on inflows (unremunerated reserve requirements), better bankruptcy arrangements, and stronger prudential measures may make some contribution, although each will be limited by institutional constraints and administrative capabilities.

All this does, however, leave a huge policy issue largely unaddressed in this discussion. It might be possible to explain the build up of emerging economies’ foreign exchange reserves in terms of self-insurance against volatile capital flows. But when they amount to more than one third of GDP for the countries taken together, and for China, to more than half of GDP, is it sensible policy for this to continue? A current account surplus of over ten percent of GDP and growing suggests unsustainability, and the size of the potential valuation losses is a reminder that, seen in terms of self-insurance, the premium may turn out to be high. One often-proffered answer to upward pressure on the exchange rate – to tighten fiscal policy – seems inappropriate for China, with its

existing huge saving surplus.⁴⁷ Whether the answer is found in further freeing of capital outflow (which might involve significant public participation, as is the case in Singapore), or stimulus to domestic consumption, or more significant appreciation of the currency, remains in the realm of future policy challenges.

This paper leaves the policy-maker with unanswered operational questions. Just what is the right level of foreign exchange reserves for self-insurance in a world of unanchored exchange rates and volatile capital flows? Once that level of reached, what then? Allowing the exchange rate to rise has to be part of the answer, but how far? Can the International Monetary Fund's renewed interest in exchange rate surveillance fill the gap, based on macro-balance, equilibrium REERs and sustainability calculations? Can this be linked into the supposedly-deeply embedded relationships of saving and investment, using this as a basis for a view about the appropriate current account balance? If this can be used to identify the appropriate current account position, how can policy keep capital flows at around this same size? One thing seems clear: with capital flowing "uphill", the dynamic economies of East Asia recording current account surpluses, and foreign exchange reserves over-flowing the coffers, the current conjuncture isn't sustainable and increasing globalization will put further pressure on these imbalances over time.

⁴⁷ And, for that matter, much of the rest of East Asia.

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