

The Return to Soft Dollar Pegging in East Asia Mitigating Conflicted Virtue

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July 2004

Abstract

Before the 1997-98 crisis, the East Asian economies—except for Japan—informally pegged their currencies to the dollar. These soft pegs made them vulnerable to a depreciating yen thereby aggravating the crisis. To limit future misalignments, the IMF wants East Asian currencies to float freely. Alternatively, authors have proposed increasing the weight of the yen in East Asian currency baskets. However, dollar pegs are entirely rational from the perspective of each Asian country—both to facilitate hedging by merchants and banks against exchange risk, and to help central banks anchor their domestic price levels. Post-crisis, as the East Asian economies transform themselves from being dollar debtors into dollar creditors, they face “conflicted virtue”: pressure to appreciate their currencies that could lead to a deflationary spiral. Rather than undervaluing their currencies to promote exports as is commonly alleged, East Asian governments are trapped into returning to—and then maintaining—soft dollar pegs.

Keywords: *Exchange Rates, Business Cycles, East Asian Dollar Standard*

JEL: F3, F31, F32, F33

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I. Introduction

The 1997-98 crisis triggered an extensive debate about what proper exchange rate policy should be in East Asia. Before 1997, all the East Asian countries—with the important exception of Japan—informally pegged to the dollar at both high and low frequencies of observation. See Figure 1. But then opinions diverge as to whether this soft dollar pegging aggravated the crisis, and whether or not it should be abandoned in the future.

The IMF's position is that these soft dollar pegs accentuated moral hazard in poorly regulated domestic banks. In the absence of immediate foreign exchange risk, they over-borrowed by accepting foreign currency deposits at lower interest rates in order to make higher-yield loans in their domestic currencies. Post-crisis the IMF has warned of "*an important danger [...] in slipping back into de facto pegging of exchange rates against the US dollar*" (Mussa et al. 2000: p. 33). For emerging markets open to international capital flows, Fischer (2001, pp. 5-10) has argued that soft pegs are not sustainable. Fischer sees movement towards a bipolar world where a few emerging markets such as Hong Kong adopt hard pegs, while all the others move toward greater exchange rate flexibility. However, for curbing moral hazard in banks, floating the exchange rate may not be the correct policy response. McKinnon and Pill (1999) suggest that the differential between domestic and foreign interest rates might actually widen under a volatile float—thus aggravating the temptation to overborrow.

A further literature has focused on Chinese and Japanese exchange rate strategies as the origin of the Asian crisis. Fernald, Edison and Loungani (1999) scrutinized the impact of the 1994 yuan depreciation on China's East Asian neighbouring countries and concluded that it was not important. Kwan (2001) and McKinnon and Schnabl (2003a) focused on the role of the Japanese yen. They argue that, from mid 1995 to mid 1998, the depreciation of the Japanese yen eroded the international competitiveness of its smaller neighbouring countries, which kept pegging to the dollar. Combined with the undue build up of their foreign currency liabilities (mainly in dollars), their declining international competitiveness raised fears that these debts could not be serviced—thus provoking a currency attack—first in Thailand, with the contagion then spreading to Indonesia, Korea, Malaysia, and Philippines.

Inadvertent but competitive devaluations among the crisis currencies, including the Japanese yen, aggravated the economic downturn in the whole East Asian region. Glick and Rose (1999) have argued that, beyond macroeconomic and financial factors, intra-regional trade

links have been crucial for the spread of the currency crisis as neighbouring countries depreciated. Corsetti et. al. (2000) make a similar argument by focusing on cost-competitiveness of the East Asian tigers in third markets such as the US or Japan. Fortunately, China mitigated the great crisis in the neighbouring economies by refusing to depreciate in 1997-98 along with the others—despite plenty of foreign advice to be more “flexible”.

Instead of uni-polar dollar pegging, Williamson (2000) and Kawai (2002) contend that a higher weight of the Japanese yen in the East Asian currency baskets would mitigate a loss of competitiveness in times of yen depreciation. Arguing that different yen or dollar weights in the currency baskets of the highly integrated East Asian economies could still cause competitive imbalances, Ogawa and Ito (2002) have stressed the need for a simultaneous move to the same (higher) yen weights in the currency baskets.

Despite this heavy criticism by eminent economists backed up by the institutional wisdom of the International Monetary Fund, East Asian central banks have largely returned to the pre-1997 pattern of soft dollar pegging—albeit with some significant differences—as we shall show empirically. One rationale for this collective dollar pegging is provided by Dooley, Folkerts-Landau and Garber (2003, 2004), henceforth DFG. DFG argue that the East Asian economies are deliberately undervaluing their currencies in order to stimulate exports and trade surpluses with the United States as a development strategy. However, we (MCS) shall employ the new concept of “conflicted virtue”² to show that the naturally high-saving East Asian economies have been trapped into running trade surpluses as the counterpart of American trade deficits. The low-saving US, at the centre the world dollar standard, is exploiting its virtually unlimited international line of credit and forcing other countries into current-account surpluses.

II. The Post-Crisis Return to High-Frequency Pegging

The evidence in favour of the East Asian return to exchange rate stabilization against the dollar in the new millennium has two facets. The first is the weight that the smaller East Asian economies give to the dollar compared to other major currencies, such as the yen or euro, in their “currency baskets”, i.e., in directing their foreign exchange interventions. The second is

² How the problem of conflicted virtue arises because of dollar dominance is discussed in greater depth in R. McKinnon, *Exchange Rates under the East Asian Dollar Standard: Living with Conflicted Virtue* forthcoming in 2005 for the MIT Press.

the volatility in their dollar exchange rates now compared to before the 1997-98 crisis. Let us discuss each in turn.

A. The Composition of Currency Baskets

Before the 1997-98 crisis, the East Asian currencies were *de jure* pegged to baskets of major currencies, but typically the weights assigned to various currencies in the official basket were not announced. Instead, they had *de facto* or “soft” pegs to the dollar as Figure 1 shows. Although many East Asian countries such as Korea, Thailand and the Philippines have officially shifted towards (more) flexible exchange rates after the crisis, most East Asian countries seem to have returned to high weights of the dollar in their exchange rate strategies.

[Figure 1 about here]

Using an econometric technique proposed by Frankel and Wei (1994), McKinnon and Schnabl (2004) use an “outside” currency—the Swiss franc—as a numéraire for measuring exchange rate volatility of any East Asian country (except Japan) to detect the composition of their currency baskets, i.e., the relative weights used for the dollar, yen, and euro in guiding their foreign exchange interventions. (Any other outside currency, such as the pound sterling, could serve equally well as numéraire.) For example, if changes in the Korean won against the Swiss franc are largely explained by the changes of the US dollar against the Swiss franc, the US dollar would have a weight close to one (100%) in the Korean currency basket: the Korean won can be assumed to be virtually pegged to the US dollar. Alternatively, if movements in the won against the Swiss franc are largely explained by movements in the yen against the Swiss franc, then the yen would get a weight close to one in Korea’s currency basket. Similarly, with the euro³.

For daily exchange rate observations from January 1990 to May 2004, Figure 2 plots 130-day rolling regressions for each East Asian country’s exchange rate against the Swiss franc on the dollar’s exchange rate against the Swiss franc. Except in the 1997-98 crisis period when the pegged exchange rate regime fell apart, the regression coefficients for their dollar exchange rates are close to one before and after the crisis. The major post 1998 exception is Indonesia whose exchange rate remains erratic.

³ German mark before January 1999.

[Figure 2 about here]

Thus, in the new millennium, the dollar retains its predominant weight in East Asian currency baskets—with China's, Hong Kong's, and now Malaysia's currencies absolutely fixed to the dollar. This is not to deny that the yen is now accorded some small weight in these currency baskets—a weight which, post-crisis, has become significant (although much less than the dollar's weight) in the cases of Korea, Singapore, and Thailand. The euro does not enter with any significant weight before or after the crisis.⁴

B. Exchange Rate Volatility against the Dollar

However, knowing the weighting of dollar and yen in the East Asian exchange rate strategies is not the whole story on exchange rate volatility. In principle, the dollar could get the highest relative weight (as per Frankel and Wei 1994) in the currency basket without the absolute day-to-day volatility of any one East Asian currency against the dollar returning to its pre-crisis level. In complementary tests, we measure volatility as the percentage daily change of the national currency against the dollar (log first differences) from January 1990 through May 2004. We have two standards for assessing this volatility.

First, we compare volatility in the dollar exchange rates of the smaller East Asian economies to that of the Japanese yen⁵, the euro (German mark) and the Swiss franc—the latter two are widely regarded as floating freely against the dollar. Figure 3 shows that, in the non-crisis periods, the daily volatilities in the dollar exchange rates of these more developed industrial economies are an order of magnitude higher than those of the smaller East Asian countries. Not only is the daily exchange volatility of these industrial countries very high, but it does not change significantly over time. In contrast, the volatility of the East Asian currencies is generally much lower—but with greater variability over time, with the crisis periods showing up very starkly.

[Figure 3 about here]

⁴ For a more detailed econometric analysis of the evolution of these basket weights before and after the 1997-98 crisis, see McKinnon and Schnabl (2004).

Second, we compare exchange volatilities pre-crisis and post-crisis: Table 1 reports the standard deviations of daily exchange rate fluctuations against the dollar. In the pre-crisis period (before 1 June 1997), the standard deviations of the day-to-day exchange rate volatility against the dollar of all East Asian currencies are much smaller than the standard deviations of the so-called free floaters (Japan, Euroland, and Switzerland). The standard deviations of the hard pegs (China and Hong Kong) are close to zero during and after the crisis. For Indonesia, Korea, Malaysia, Philippines and Thailand, the standard deviations in Table 1 increase massively during the crisis period (1 June 1997 to 31 December 1998) —with the non-crisis economies of Singapore and Taiwan increasing somewhat less.

After the crisis to May 2004, the standard deviations of all affected countries have declined again (Table 1). Except for Malaysia which fixed firmly to the dollar at the end of 1998, dollar exchange rate volatility of the crisis economies for the whole post-crisis period (1999-2004) is slightly larger than before the crisis. However, most recently in 2003/2004 (the right hand column in Table 1), East Asian countries have more or less returned to the pre-crisis level of dollar pegging at high (daily) frequencies of observation.

[Table 1 about here]

With the benefit of hindsight, the post-crisis return to high-frequency dollar pegging is hardly surprising. But could this clandestine return to high-frequency pegging augur an eventual return to low-frequency pegging as well? Learning from the vulnerability to yen/dollar depreciation, many East Asian countries seem to be allowing more dollar exchange rate variability at lower frequencies in the post-crisis period as shown by Hernández and Montiel (2003). Indeed Figure 1 shows more dollar exchange rate drift after than before the crisis on a month-to-month basis. For Indonesia, Korea, Philippines, Singapore, Taiwan and Thailand monthly exchange fluctuations are greater than before—although those for China, Hong Kong, and Malaysia remain (close to) zero.

Table 2 compares the standard deviations of monthly percentage exchange rate fluctuations against the dollar in the pre-crisis and post-crisis periods. We observe that for all East Asian countries—except the hard peg countries China, Hong Kong and Malaysia—the monthly ex-

⁵ Hillebrand and Schnabl (2003) show that exchange rate volatility of the Japanese yen against the dollar has recently declined.

change rate variability against the dollar is still somewhat higher post-crisis than in the pre-crisis period. In part, this could be due the fact that all appreciated together against the dollar after their “over-shooting” depreciations of early 1998.

[Table 2 about here]

There is an alternative way to measure exchange rate smoothing at low frequencies in the post-crisis era. Suppose we use fluctuations in the more purely floating euro-dollar exchange rate as the benchmark for measuring general market pressure for or against the dollar. We assume that the European Central Bank—behaving as a free floater—leaves the euro-dollar rate to market forces. We partition the data into two sub-periods: 1999-2001 (Figure 4) when the dollar appreciated generally against the euro, and 2002 up to April 2004 (Figure 5) when the dollar generally depreciated against the euro.

[Figure 4 and Figure 5 about here]

Figure 4 plots the cumulative depreciation of the euro and all East Asian currencies for the period of dollar appreciation. All East Asian currencies, except the Philippine peso but including the Japanese yen, depreciated less than the euro against the dollar. Since the beginning of 2002, when the dollar started depreciating, the picture is reversed: Figure 5 shows that all East Asian currencies appreciated considerably less against the dollar than did the euro.

In resisting this exchange market pressure for currency appreciation, each East Asian central bank intervened heavily to buy dollars—as reflected in the rise of official foreign reserves shown in Figure 6. Official foreign reserves in East Asian countries have increased surprisingly fast in China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Taiwan, and particularly Japan.

[Figure 6 about here]

In the East Asian economies including those previously in crisis, foreign exchange reserves have risen far above their pre-crisis levels. In contrast, the official foreign exchange reserves of the benchmark free floaters, Germany and the United States itself, hardly changed. Only Singapore, which “hides” most of its overseas assets in its Government Investment Corpora-

tion, has kept foreign reserves close to the pre-crisis level. Far beyond simply rebuilding their pre-crisis levels of exchange reserves, East Asian governments have evidently been intervening massively to prevent their exchange rates from appreciating.

III. The Rationale for Dollar Pegging – Original Sin and Conflicted Virtue

The rationale for dollar pegging, as observed in section 2, does not primarily arise because of strong trade ties between East Asia and the United States. As outlined by McKinnon and Schnabl (2003a) the US accounts for only about one fifth to one quarter of overall exports of the smaller East Asian economies—and for much less of their imports. More important is the widespread use of the dollar as the invoice currency for most of East Asian trade even though Japanese trade in the region is as large as that of the United States.

Take Korea for example. About 87% of Korean exports, and 81% of Korean imports, are invoiced in dollars (McKinnon and Schnabl 2004). True, about 12% of Korean imports are invoiced in yen—but only those from Japan. And only about half of Japan's overall exports are invoiced in yen, while three quarters of her imports are invoiced in dollars. Outside of Japan, when any other pair of East Asian countries trade, that trade is virtually all denominated in dollars. Thus one can say that East Asia is on a dollar standard—as is much of the world outside of Europe.

This currency asymmetry extends to the financial markets. The dollar is the dominant inter-bank currency for clearing international payments and denominating short-term capital flows—and is the principal official intervention and reserve currency for governments (McKinnon 2004). And using a common international money, sometimes called a key currency, in international markets for goods and finance greatly facilitates commerce—particularly within the increasingly integrated East Asian economy.

If, in addition, the key currency is itself stable valued in terms of its purchasing power over tradable goods and services—as the US dollar was in the 1950s and 60s, and has become once more from the mid 1990s into the new millennium—then governments in the peripheral countries are induced to peg them to the key currency in order to better anchor their own price levels. Ideally, the centre country should have no exchange rate objectives of its own, and thus can follow an independent monetary policy more purely focused on stabilizing its own price level. In East Asia, having most of these increasingly integrated economies more or less peg

to the dollar greatly widens the effective dollar area—thus enhancing the anchoring effect of any one of them pegging to the dollar.

In summary, the benign face of the East Asian dollar standard arises out of the dollar's microeconomic role in facilitating international commerce on the one hand, and its macroeconomic role as nominal anchor for national price levels on the other. Both increase incentives for Asian governments to peg to the dollar.

However, this dollar dominance also has a more malign aspect that, paradoxically, also induces governments in peripheral countries to peg to the dollar. Domestic financial markets, particularly bond markets, may remain underdeveloped in part because financial instruments denominated in domestic currencies are not used (usable) in international transactions. Dollar dominance creates unhedgeable foreign exchange risks in countries whose *private* sector is a significant net debtor *or* a significant net creditor internationally.

Before 1997-98, Indonesia, Korea, Malaysia, Philippines, and Malaysia all ran with substantial current account deficits—see Table 3—that had cumulated into large (mainly dollar) net debts at the time of the great crisis. Subsequently, these five “crisis” economies have (been forced to) run current-account surpluses and are rapidly transforming themselves into creditors—particularly in their net liquid dollar asset positions. In parallel, Table 3 also shows the chronic international creditors—Japan, Singapore, Taiwan, and China (a special case discussed more fully below)—running current account surpluses from 1990 to 2003. So all the East Asian countries are now net, or close to being net, international creditors in dollars. For countries on the dollar's periphery, consider the problems facing debtors and creditors in turn.

[Table 3 about here]

A. Debtor Countries with Original Sin

In their original formulation Eichengreen and Hausmann (1999) call “original sin” a situation in which the domestic currency cannot be used to borrow abroad (international original sin) or to borrow long-term, even domestically (domestic original sin). Due to incomplete and fragile financial markets domestic investors face a maturity mismatch—long-term projects are fi-

nanced by short-term loans—or a currency mismatch—projects that generate domestic currency are financed with dollars.⁶

According to Eichengreen and Hausmann, these mismatches are not primarily because banks and enterprises are not prudent enough to hedge the foreign exchange risk of their exposures. Instead, less developed countries whose liabilities are denominated in foreign currency are unable to hedge because a typical foreign investor won't accept claims denominated in their domestic currencies.

Eichengreen, Hausmann and Panizza (2003a) show empirically that original sin is pervasive in most emerging markets and developing countries which are normally international net debtors. Even for countries with a sustained record of stable domestic prices, their ability to borrow internationally in domestic currency is very limited. Instead, global investors typically denominate their claims in very few major international currencies—now dominated by the dollar and the euro.

Original sin renders monetary authorities less willing to let the exchange rate move both at low and at high frequencies. At low frequencies, Eichengreen, Hausmann and Panizza (2003a) argue that dollar liabilities enhance macroeconomic instability by increasing the credit risk for national balance sheets. With debt denominated in foreign currency, exchange rate fluctuations strongly affect the servicing cost of this debt in terms of domestic currency. Sharp depreciations can force indebted enterprises and financial institutions into default, with considerable risk for the viability of the whole domestic financial system.

In addition, McKinnon and Schnabl (2004) argue that original sin also affects exchange rate stabilization in emerging markets at high frequencies. As domestic capital markets are shallow and incomplete an active forward market in foreign exchange against the dollar—or any other currency—is absent in most developing countries and emerging markets. Forward transacting by risk-averse traders wanting to hedge their open positions in foreign exchange are difficult even when the private sector may not be a net debtor.

Potential market makers such as banks cannot easily cover transactions involving selling the domestic currency forward for, say, dollars because a convenient array of interest-bearing domestic bonds liquid at different terms to maturity is unavailable for foreigners to hold.⁷ But

⁶ The determinants of original sin are investigated by Eichengreen, Hausmann and Panizza (2003b).

⁷ In contrast, forward exchange transacting between any two industrial countries can thrive because each has a well developed domestic bond market denominated in its domestic currency. Long-term forward markets, with a well defined forward premium equal to the interest differential between the two national bond markets at each term to maturity, can thrive at much lower cost.

the problem becomes more acute if the economy is a net debtor. Because economies with uncovered net short-term dollar debts typically have high risk premia in their domestic currency interest rates—as with Indonesia, Korea, Malaysia, Philippines and Thailand before the 1997-98 crisis (McKinnon and Pill 1999)—individual owners of dollar liabilities see the cost of forward cover, i.e., the premium on buying dollars forward with the domestic currency, to be too high. Thus they typically don't hedge.

This induces the government to provide an informal hedge by keeping the exchange rate stable to offset the non-existent private market in forward exchange. If short-term exchange rate fluctuations are low, private banks and enterprises can then repay their short-term foreign currency debts, which are largely denominated in dollars, with minimal exchange rate risk. Thus, if a country's financial markets are condemned by original sin, its regulatory authorities are induced to undertake high frequency exchange rate pegging in order to mitigate payments risk—and are induced to hold official exchange reserves that offset at least part of the private sector's net international indebtedness.

B. Creditor Countries with Conflicted Virtue

The original sin argument is all well-and-good for explaining the pervasive “fear of floating” in the less developed East Asian debtor countries before the 1997-98 crisis—and in developing countries more generally (Calvo and Reinhart 2002). But, post-crisis when all East Asian countries ran current-account surpluses and joined the creditor club (Table 3), why has exchange rate stabilization against the dollar persisted? Even the highly industrialized economy of Japan, which has sustained a current account surplus since the early 1980s and has built up an immense international investment position in US dollars, increased its efforts to stabilize the yen against the dollar in the new millennium (Hillebrand and Schnabl 2003).

What is the motivation for exchange rate stabilization in the East Asian creditor countries? In the Euroland, most private claims on foreigners are denominated in euros. In contrast, East Asian countries hold dollars as the financial counterpart of their cumulative current account surpluses and net inflows of foreign direct investment. Due to underdeveloped financial markets or residual capital controls, private or public investors in most East Asian economies find it more attractive to invest in dollar assets than in claims on foreigners denominated in their home currencies. Even Japan, which has a more highly developed capital market, has built up the lion's share of its international assets in US dollars.

Putting it the other way around, foreigners—among whom Americans are now dominant—are disinclined to build up debts denominated in “minor” Asian currencies as the counterpart of the huge U.S. current account deficit (Table 3). (Some US firms are more willing to issue bonds in euros in the now highly developed euro bond markets. But Euroland is not such a big net creditor relative to its GNP as are the Asian countries collectively.)

There is two-way causation between private portfolio preferences for dollars and government exchange rate policies. Once an Asian government sees its private sector accumulating dollar assets (dollar debts in the case of debtor economies), then it becomes more anxious to stabilize its exchange rate against the dollar. And when neighbouring countries that are close trading partners are also stabilizing their dollar exchange rates, this enhances the attractiveness of holding dollar assets within in any one country. So dollar dominance prevails in financing the large U.S. current deficit, smaller current deficits in Latin America (another dollar zone) and elsewhere. The upshot is that the main foreign exchange risk associated with this enormous transfer of capital is shifted to the largely Asian creditor countries.

Any international creditor country that can not *lend* in its own currency cumulates a currency mismatch that we call the syndrome of *conflicted virtue*⁸, which is the mirror image of the concept of original sin in debtor economies. Countries that are “virtuous” by having a high saving rate (most unlike the United States!) tend to run surpluses in the current account of their international balance of payments, i.e., lend to foreigners. With the passage of time, two things happen. First, as the *stock* of dollar claims cumulates,⁹ domestic holders of dollar assets worry more about a self-sustaining run into the domestic currency forcing an appreciation. Second, foreigners start complaining that the country’s ongoing *flow* of trade surpluses is unfair and the result of having an undervalued currency.

Of course, both interact. The greater the foreign mercantilist pressure for appreciation of the domestic currency, the greater the concern of the domestic private holders of dollar assets. This induces them to convert dollars into domestic currency. As runs into the domestic currency out of dollars begin, the government is “conflicted” because an appreciation would dampen exports and, if repeated, could set in train serious deflation ending with a zero interest

⁸ After one of McKinnon’s seminars on Japan’s problems, Marcio Garcia of the Pontifical Catholic University in Rio de Janeiro suggested that this creditor syndrome be called “constructed virtue”. We changed his terminology somewhat to “conflicted virtue” because it connotes more of a dilemma or impasse.

⁹ For empirical estimates of the stocks of these liquid dollar claims see Goyal and McKinnon (2003) for the case of Japan, and McKinnon and Schnabl (2003b) for the case of China.

liquidity trap. But foreigners may threaten trade sanctions if the creditor country in question does not allow its currency to appreciate. Whence the syndrome of conflicted virtue.

Notice that conflicted virtue would not arise in international creditor countries whose money is internationally accepted. Britain was the world's dominant creditor country in the 19th century with huge net capital outflows. But sterling was used to denominate most British claims on foreigners—sometimes with gold clauses. Similarly, for two and half decades after World War II, the US had large trade surpluses and was the world's biggest creditor; but its claims on foreigners were mainly in dollars.

However, the East Asian economies are historically unusual in being international creditor economies whose currencies are relatively little used. In Japan, current account surpluses have persisted since the early 1980s. Taiwan and Singapore exhibit current account surpluses since the late 1980s. China's export surpluses, although not as large relative to its GNP, have persisted since 1994. Since 1998, all East Asian countries have run current account surpluses reflecting their “virtuously” high saving rates—resulting in high net capital exports (Table 3).

For Japan, with the longest modern history of current account surpluses, the resulting build-up of international assets—largely dollars—is plotted in Figure 7. Japan's net international investment position, as reported by the Japanese Ministry of Finance, has increased since the early 1980s—reaching a new record high of 1.5 trillion dollars in the year 2003.

Although China's build-up of liquid dollar claims has a much shorter history than Japan's, it was, and is being, accelerated by large inflow of foreign direct investment (FDI)—a relatively illiquid long-term liability. McKinnon and Schnabl (2003b) estimate China's liquid foreign assets to be more than 500 billions of dollars by 2003. Including all the smaller economies as well, the cumulative joint current account surplus of all East Asian countries since 1990 (Table 3) amounts to more than 2.55 trillion dollars.

[Figure 7 about here]

Potential balance sheet losses from the dollar fluctuating against the domestic currency increase as these dollar claims accumulate. Should the domestic currency appreciate, unhedged individual or institutional holders of such large dollar assets are increasingly at risk.

For example, Japanese insurance companies, whose liabilities to annuity holders are in yen but with a substantial share of their assets in dollars, could be bankrupted should the yen appreciate against the dollar. The reduction in the yen value of their dollar assets could wipe out

their net worth. Although all domestic holders of dollar assets like their higher yields compared to those on yen assets, they would suffer capital losses if the domestic currency appreciated. Thus, as the economy's overall dollar assets accumulate, their holders become more fearful of a run out of dollars into the domestic currency followed by appreciation.

In China, the natural currency habitat of domestic nationals is their home currency. Household consumption expenditures, wages, and claims on financial intermediaries such as banks (deposits) and insurance companies (annuities) are mainly in yuan. Chinese firms and households will hold dollar assets only if there is a substantial business convenience in doing so, or the interest rate on dollar assets is higher. The primary downside risk is for the yuan to appreciate against the dollar, and thus reduce the yuan value of their dollar assets. Depending on how sensitive domestic holders of dollar assets are to this risk, periodic runs from dollars into yuan could occur just on rumours of appreciation (McKinnon and Schnabl 2003b).

Should the domestic currency actually appreciate when the world price level measured in dollars is itself quite stable, each East Asian government worries about the sudden loss of mercantile competitiveness of its exporters followed by a domestic deflationary spiral—as experienced by Japan from the mid 1980s through the 1990s from the erratically appreciating yen (McKinnon and Ohno 1997).

C. Implications for Interest Rates: The Negative Risk Premium

Governments in creditor economies with conflicted virtue may cut domestic (short-term) interest rates to forestall or slow the conversion of privately held dollar assets into domestic currency. Insofar as people believe that low short-term rates would persist, domestic long-term interest rates would also be bid down. Can a new portfolio equilibrium be found where, at any given exchange rate, *private* domestic nationals are willing to finance the ongoing current account surplus by building up liquid dollar claims on foreigners rather than needing the government to accumulate official exchange reserves?

Japan has the longest experience with current account surpluses, and associated build up of dollar claims, from the early 1980s into the new millennium. The upper panel of Figure 8 shows that interest rates on long-term (10-year) Japanese government bonds (JGBs) have average about 3 to 4 percentage points less than those on long-term US treasuries; and the lower panel shows more volatile short-term money market rates with Japanese rates, on average, also being substantially lower than American.

[Figure 8 about here]

To account for the sustained interest differential between yen and dollar assets, we postulate an augmented interest parity relationship:

$$i = i^* + \Delta s^e + \varphi \quad (1)$$

where i is the (endogenously determined) Japanese long-term nominal interest rate, i^* is the (exogenously given) US long-term nominal interest rate, s is the yen price of one dollar, Δs^e is expected depreciation of the yen, and φ is the risk premium on yen assets. The interest differential, $i - i^*$, from the 70s to the mid 90s was driven primarily by the negative Δs^e term when the erratically appreciating yen peaked out in April 1995 (McKinnon and Ohno 1997). Since the mid-90s, $\Delta s^e \approx 0$ and the interest differential has been driven primarily by the φ term, which is also negative (Goyal and McKinnon 2003).

φ is the excess yield on dollar assets that a Japanese investor demands for bearing foreign exchange risk. For a private Japanese financial institution holding net dollar assets, fluctuations in the yen-dollar exchange rate result in fluctuations in the yen value of the net dollar assets, and hence of the net worth of the financial institution. From its perspective, the dollar asset is the risky asset because its liabilities are denominated in yen. So, φ captures the excess yield, over and above expectations of ongoing yen appreciation, on the dollar asset to induce the domestic financial institution to hold it.

It follows that φ is negative for a creditor country such as Japan with private-sector assets denominated in foreign currency. Conversely, φ is positive for a debtor country whose private sector debts are denominated in foreign currency. The size of φ depends on the country's net foreign currency position *and* on the expected variance in its exchange rate against the dominant foreign money. With a credibly fixed exchange rate, φ approaches zero. However, for "normal" fluctuations in the yen/dollar exchange rate and if interest rates on yen assets are sufficiently below those on dollar assets, then the Japanese private sector—banks, insurance companies, trust funds, and so on—can still be persuaded to fund Japan's ongoing current account surpluses by building up their stocks of higher yield dollar assets.

But there are limits on how negative this risk premium on yen assets, and on how wide the associated interest differential, can become. When American interest rates fall to abnormally low levels, with short rates at just 1 to 1.5% in 2003 and 2004, and Japanese interest rates were bounded from below by zero¹⁰ (lower panel of Figure 8), the spread simply was not big enough. Then the Japanese private sector refused to keep acquiring enough dollar assets, which they saw to be riskier, to cover Japan's ongoing current account surplus. Indeed, private agents in Japan started dishoarding previously accumulated dollar assets in order to acquire near zero-yield yen assets! In 2003, the Bank of Japan intervened massively in the foreign exchange markets so that official reserves rose by 201.33 billion dollars while Japan's current-account surplus was just 136.4 billion dollars (Table 4). In effect, the Japanese government "over funded" Japan's current account surplus in 2003—although not in earlier years.¹¹

[Table 4 about here]

The problem of governments over funding of their current account surpluses—conflicted virtue in an extreme form—has been common in East Asia in recent years. Table 4 shows the same phenomenon in Taiwan (2002 and 2003), Korea (2002 and 2003), Malaysia (almost in 2003), and China (2001, 2002, and 2003)¹². For East Asia as a whole, official reserve accumulation in 2003 was 434 billion dollars while the current account surplus was "just" 255 billion dollars. But apart from the extreme case of over funding in 2003, East Asian governments have been trapped into unduly heavy reserve accumulation for several years because of the reluctance of their private sectors to accumulate nearly enough dollar assets, or to lend in their national currencies to foreigners, to fully cover their current account surpluses.

Figure 9 shows how short-term interest rates in nine East Asian countries (other than Japan) have also fallen sharply in the new millennium relative to the 1990s. (Unlike Japan's, their long-term bond markets are too underdeveloped to get meaningful interest-rate quota-

¹⁰ The astute reader will note that the story of how foreign exchange risk associated with conflicted virtue creates a negative risk premium on yen assets is also an explanation of why Japan has fallen into a zero interest liquidity trap—the macro economic implications of which are spelled out in Goyal and McKinnon (2003) and McKinnon (forthcoming).

¹¹ Hillebrand and Schnabl (2003) analyse the impact of Japanese foreign exchange intervention on the yen/dollar exchange rate.

tions.) By the standards of less developed countries, their central banks have allowed short rates to fall to unusually low levels in an attempt to stem upward pressure on their currencies and excess accumulation of official reserves.

[Figure 9 about here]

True, ultra low American interest rates in 2002-2004 make it difficult to establish an actually negative risk premium in the Japanese mode—but domestic interest rates in Hong Kong and Singapore are near zero, and those in Taiwan and Thailand are about at the (low) American level, while China, Korea, and Malaysia are just a percentage point or two above American rates. (Philippines and Indonesia are outliers with an apparently significant positive risk premium.) Combined with actual—or the threat of—exchange rate appreciation since the 1997-98 crisis, this compression of short-term interest rates toward zero prevents their central banks from cutting interest rates sufficiently to offset the conversion of dollar- into domestic-currency assets. Thus private finance for their current account surpluses dried up, and international financial intermediation remained heavily dependent on official reserve accumulation.

The imperfect solution is for each East Asian government to keep its dollar exchange rate as stable as it can. This then reduces risk seen by unhedged dollar creditors *within* the economy in question. Whence the resort to the “soft” or informal pegging dollar we observe in non-crisis periods—and which was documented above. To be sure, some governments would like to give full assurance that the domestic exchange rate is never going to change. But not even China dares to commit itself to an absolutely fixed dollar exchange rate when its neighbours, who are close trading partners, have not done so. The spillover effects from other countries changing their exchange rates are just too great for any country to risk becoming completely inflexible in responding to either an appreciation or a depreciation by a neighbouring country.¹³ So short of adopting a full-fledged system of regional dollar parities, a difficult exercise in collective action although a potentially great public good for East Asia, soft pegging is the result.

¹² In China, conflicted virtue has been rendered more acute by heavy inflows of foreign direct investment (McKinnon and Schnabl 2003b)

¹³ Think of what happened to Argentina in the late 1990s when Brazil and Chile allowed large depreciations of their currencies.

IV. The Sustainability of the Dollar Standard

The large collective trade surplus of the East Asian countries with the United States, matched by the huge East Asian net capital exports to the US, has become a stylized fact. But noting this fact says nothing about causality or sustainability. Do the East Asian governments acquire dollar bonds in a conscious effort to keep their exchange rates undervalued to promote exports and development? Or, is the huge current account deficit of the United States, reflecting low American saving and an unlimited line of credit with the rest of the world, forcing more and more countries—but particularly those in East Asia—to run with current account surpluses leading to conflicted virtue?

A. The DFG Approach

Dooley, Folkerts-Landau and Garber (2003, 2004) argue that the causality is running from East Asian trade surpluses—and their governments' mercantilist policies—to the US trade deficit. But their argument has deeper historical roots. Under the world dollar standard since 1945, DFG see the world divided into a centre (the United States) and its periphery. For the 1950s and 1960s when exchange rates were more or less fixed under the Bretton Woods agreement, they argue that the important periphery was Western Europe and Japan.

In order to recover more quickly from the ravages of the war, these countries (implicitly) cooperated to keep their currencies undervalued in order to promote high export growth in manufactures, and investment in higher tech industrial export activities. (In the 1950s and 1960s, less developed countries were then mainly producers and exporters of primary products or embarking on import-substituting industrialization. As such they were not a mercantile threat to the centre country.) The “cost” to the European countries was the rapid build up of low-yield, if highly liquid, dollar assets.

But this cost, if any, may have been small or nonexistent. Despres, Kindleberger and Salant (1966) put forward what they called the “minority view” that the United States, with its more highly developed long-term capital market, was simply providing financial intermediation services to the Europeans by lending long in illiquid forms, including foreign direct investment, while borrowing back short in more liquid forms as Europeans built up dollar bank accounts and official foreign exchange reserves.¹⁴ In the 1950s and 1960s, the U.S. had a current account surplus. This intermediation argument still holds in a more limited way today for

countries with less developed domestic financial markets, such as China. The United States is an important source of foreign direct investment into China financed in large measure by China's huge buildup of more liquid dollar claims on the United States. The difference is that now, of course, the United States with its large current-account deficit is no longer a net lender to developing countries

In the new millennium, DFG suggest that European countries have matured from being “peripheral” into having their own fully developed financial markets—particularly with the advent of the euro. In our terminology, European countries are now redeemed from original sin for those that are debtors, and from conflicted virtue for those that are creditors. Therefore, they are quite willing to allow their currencies—principally the euro—to float relatively freely against the dollar without any inordinate build up of dollar exchange reserves. DFG label these relatively free floaters, including Canada and Australia, “capital-account” countries.

However, DFG now identify a new periphery of the United States of what they call “trade-account” countries: mainly our high-growth East Asian economies. DFG claim that these trade-account countries intervene heavily in the foreign exchanges to keep their currencies undervalued to stimulate export expansion into the American market with a consequent stimulus to investment in these export activities. (As befits the centre country in the world dollar standard, the United States best have no independent exchange rate objective.)

The East Asian countries are willing to bear the opportunity cost, in the form of a huge build up of low yield dollar reserves, of their trade surpluses for this “development” objective. At the same time, the American government's own borrowing constraints on financing wars, cutting taxes, and so on, has been greatly softened because of the large (incidental) foreign capital inflow as embodied in large US current account deficits. Because both sides see themselves benefiting from this arrangement despite mercantilist conflicts in particular industries, DFG see the East Asian countries' large trade surpluses and “undervalued” exchange rates to be sustainable “indefinitely”.

B. The MCS Approach

In contrast to DFG, McKinnon and Schnabl (MCS) hypothesize that the relatively high-saving East Asian countries are collectively being forced into running current account sur-

¹⁴ For a more up-to-date assessment of Despres, Kindleberger and Salant (1966) see Bisignano (2004).

pluses with the relatively low-saving United States. Because of the asymmetrical nature of the world dollar standard, the US alone has a virtually unlimited *dollar* line of credit with the rest of the world (McKinnon 2004). With low American household saving and large deficits of the US federal government, the United States is drawing on this dollar line of credit with a vengeance: America's current account deficit is now close to 5 percent of GNP in 2003-2004. But this American saving-investment imbalance is not due to "mercantilist" governments in East Asia undervaluing their exchange rates. The East Asian countries are covering a considerable part (about half), but by no means all, of the US current account deficit (Figure 10).

Why then are East Asian governments intervening so heavily (Figure 6) to keep their currencies from appreciating if it is not to generate a trade surplus? MCS argue that they are trapped by conflicted virtue. A sharp appreciation by any one East Asian country would:

1. Impose capital losses on the domestic holders of dollar assets and make them even more reluctant to finance future current account surpluses.
2. Cause an immediate loss of mercantile competitiveness to East Asian neighbours with whom they are all closely integrated in trade and compete in third markets.
3. Risk a macroeconomic slowdown followed by deflation, the more so if the appreciation is repeated.

However, undergirding the willingness of East Asian countries to maintain their dollar pegs is the presumption that purchasing power of the dollar will remain fairly stable through time. Although American fiscal policy seems to be out of control, these countries presume that Federal Reserve Chairman Alan Greenspan will continue using America's monetary policy to stabilize the US price level as in the 1990s into the new millennium. So MCS see exchange rate policy as an important adjunct of monetary policy. On the dollar's periphery, an appreciating currency is a recipe for ongoing deflation with a potential liquidity trap for interest rates—as Japan experienced with its forced appreciations from the mid 1980s to the mid 1990s (Goyal and McKinnon 2003, Schnabl and Baur 2002).

But monetary cum exchange rate policy cannot predictably influence a country's *net* trade balance, which is all about saving and investment propensities at home relative to those abroad. Thus we part company with DFG's claim that the currencies of the East Asian countries are now "undervalued" in the new millennium, and also disagree with their claim that the currencies of the Western European countries and Japan were undervalued in the 1950s and 1960s. Putting aside Balassa-Samuelson effects associated with rapidly growing economies, price inflation in Europe and Japan in the 1950s and 1960s was about the same as in the United

States. By this criterion, the Bretton Woods exchange rates were more or less right as long as the American price level remained stable—which it was until the very end of the 1960s. Similarly, price inflation in most East Asian countries today is about the same as it is in the United States: their “soft” dollar pegs are not obviously misaligned. But with conflicted virtue, how much their currencies would appreciate if floated has no well-defined upper bound.

When DFG link “undervalued” currencies to trade surpluses, they (like most economists) probably have something like the textbook elasticities model of the balance of trade in their minds. This intuitively appealing model predicts that an appreciation will slow a country’s exports while stimulating its imports so as to reduce its trade surplus. However, the elasticities model only applies to an economy that is *insular*: its foreign trade is a fringe activity, it is closed to international investment flows, and setting the exchange rate is separable from monetary policy. Otherwise, for a fully *open* economy, McKinnon and Ohno (1997, Chs. 6 and 7), show that an appreciation could cause a sufficient slump in domestic investment and output that imports fall more than exports so that the net trade balance improves. They conclude that the effect of an exchange rate change on the net trade balance is ambiguous.

However, MCS agree with DFG that the present dollar based regime with large East Asian trade surpluses and huge trade US deficits is sustainable, or at least is not on the verge of an imminent breakdown. After all, something like this regime has been around since early 1980s when Japan was the dominant external creditor of the United States. But DFG believe it to be a product of export mercantilism in peripheral countries, whereas MCS see them as being trapped by improvident US saving behaviour.

V. Conclusion

The collective macroeconomic consequences of all East Asian governments opting individually to peg to the dollar, if only softly, enlarges the effective zone of stable dollar prices far beyond its country’s direct trade with the United States. Thus each national central bank can lean more heavily on its own stable dollar exchange rate to anchor its domestic price level—which in turn helps its neighbours, with whom it is closely connected in trade, to stabilize their own. A virtuous circle for a change!

During the 1980s up to the Asian crisis of 1997-98, most East Asian countries could pin down their (wholesale) price levels by anchoring their currencies to the dollar (McKinnon and Schnabl 2004). Only the wholesale price indices of Indonesia and the Philippines—which allowed their currencies to depreciate continually but in a controlled fashion—rose signifi-

cantly. This common dollar anchor was more robust because all East Asian countries except Japan were on it. International commodity arbitrage within the whole of East Asia, and not just with the United States, helped pin down the price level of any one participating country.

In the 1990s and earlier, the need for a nominal anchor in East Asia reflected the concern of the smaller countries with the ever present threat of inflation. (Japan, of course, had been mired in a deflationary spiral for more than a decade and only seems to be recovering in 2004.) In the new millennium, however, the increasing need is for a common monetary anchor against the threat of *deflation*. As the East Asian economies build up their liquid dollar balances in transforming themselves from being dollar debtors into dollar creditors (the counterpart of huge American trade deficits), the threat of forced appreciation followed by deflation has become more acute, i.e., the problem of conflicted virtue.

Here again collective (dollar) exchange rate stability in East Asia is a public good. As long as all the now more highly integrated East Asian economies stand firm against foreign pressure to appreciate, it is easier for any one country to avoid appreciating. However, if a major country loses control and allows its currency to appreciate, this could set in train a new East Asian currency crisis with a round of contagious appreciations—as private holders of dollar assets in other East Asian countries become more nervous. Fortunately, China has been very steady in keeping its exchange rate fixed against the dollar, but Japan less so.

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Table 1: Standard Deviations of Daily Exchange Rate Fluctuations against the Dollar

	Pre-crisis	Crisis	Post-crisis	2003/2004
Chinese yuan	0.03	0.01	0.00	0.00
Hong Kong dollar	0.02	0.03	0.03	0.05
Indonesian rupiah	0.17	4.43	1.11	0.43
Korean won	0.22	2.35	0.43	0.43
Malaysian ringgit	0.25	1.53	0.00	0.00
Philippine peso	0.37	1.31	0.51	0.25
Singapore dollar	0.20	0.75	0.27	0.29
New Taiwan dollar	0.19	0.50	0.21	0.20
Thai baht	0.21	1.55	0.38	0.27
Japanese yen	0.67	1.00	0.64	0.57
euro (Deutsche mark)	0.60	0.58	0.64	0.64
Swiss franc	0.69	0.66	0.66	0.70

Data source: Datastream. Percent changes. Pre-crisis = 1 February 1994 – 30 May 1997, crisis = 1 June 1997 – 31 December 1998, post-crisis = 1 January 1999 – 17 May 2004, 2003/2004 = 1 January 2003 – 17 May 2004.

Table 2: Standard Deviations of Monthly Exchange Rate Fluctuations against the Dollar

	Pre-crisis	Crisis	Post-crisis
Chinese yuan	0.25	0.03	0.00
Hong Kong dollar	0.08	0.07	0.11
Indonesian rupiah	0.26	26.54	5.16
Korean won	1.01	11.53	1.92
Malaysian ringgit	1.06	6.69	0.00
Philippine peso	1.19	5.25	1.67
Singapore dollar	0.76	2.88	1.18
New Taiwan dollar	1.01	2.63	1.35
Thai baht	0.43	8.88	1.60
Japanese yen	3.66	3.64	2.39
euro (Deutsche mark)	2.20	2.33	2.58
Swiss franc	2.62	2.60	2.54

Data source: IMF: IFS. Percent Changes. Pre-crisis = February 1994 – May 1997, crisis = June 1997 – December 1998, post-crisis = January 1999 – May 2004.

Table 3: East Asian Current Accounts in Comparison to the US, 1990-2003

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Percent of GDP														
Japan	1.45	1.96	2.97	3.02	2.72	2.10	1.40	2.25	3.02	2.57	2.52	2.11	2.83	3.2
Singapore	8.45	11.32	11.87	7.24	16.17	17.67	15.16	15.58	22.59	18.60	14.48	19.00	21.50	30.9
Taiwan	6.96	7.11	4.14	3.14	2.66	2.07	3.91	2.43	1.29	2.78	2.86	6.36	9.09	10.0
Indonesia	-2.61	-3.32	-2.00	-1.33	-1.58	-3.18	-3.37	-2.27	4.29	4.13	5.32	4.88	4.52	3.9
Korea	-0.79	-2.82	-1.25	0.29	-0.96	-1.74	-4.42	-1.71	12.73	6.03	2.65	1.93	1.28	2.0
Malaysia	-1.97	-8.51	-3.67	-4.46	-6.06	-9.71	-4.43	-5.92	13.19	15.92	9.41	8.28	7.58	11.1
Philippines	-6.08	-2.28	-1.89	-5.55	-4.60	-2.67	-4.77	-5.28	2.37	9.48	8.24	1.84	5.38	2.1
Thailand	-8.53	-7.71	-5.66	-5.09	-5.60	-8.07	-8.07	-2.00	12.73	10.13	7.60	5.40	6.05	5.6
China	3.13	3.32	1.36	-1.94	1.28	0.23	0.88	4.09	3.30	2.11	1.90	1.46	2.86	2.1
Hong Kong									1.53	6.40	4.28	6.11	8.50	11.0
United States	-1.36	0.06	-0.76	-1.23	-1.66	-1.42	-1.50	-1.54	-2.34	-3.14	-4.19	-3.90	-4.59	-4.9
Billions of US Dollars														
Total East Asia	54.51	73.75	117.48	117.80	132.85	93.83	44.17	129.37	244.51	231.69	213.68	179.14	238.88	255.19
Total US	-78.96	3.69	-48.03	-81.95	-117.71	-105.19	-117.16	-127.68	-204.67	-290.87	-411.46	-393.74	-480.86	-541.80

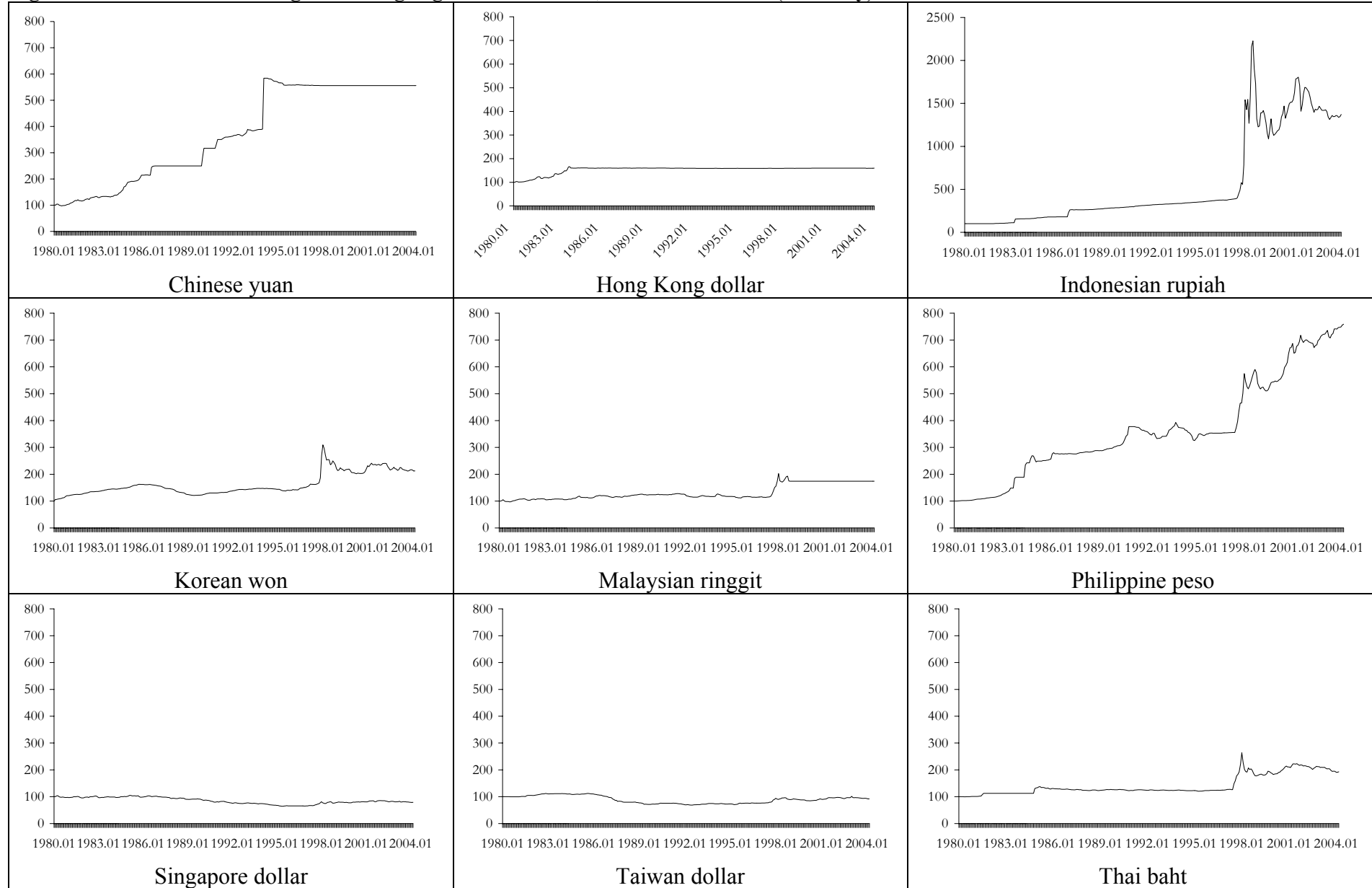
Source: IMF: IFS.

Table 4: East Asian Current Accounts (CA) and Changes in Official Foreign Reserves (RC), 1990-2003 (Billions of Dollars)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Japan	CA	44.08	68.20	112.57	131.64	130.26	111.04	65.79	96.81	118.75	114.60	119.66	87.80	112.45	136.40
	RC	-8.51	-7.73	0.13	26.83	26.43	57.30	34.89	0.53	-4.65	74.49	69.50	40.52	63.73	201.33
Singapore	CA	3.12	4.88	5.91	4.21	11.40	14.80	13.98	14.91	18.54	15.18	13.28	16.14	18.70	28.20
	RC	7.40	6.40	5.73	8.41	9.82	10.46	8.14	-5.61	3.53	1.89	3.38	-4.83	6.52	13.61
Taiwan	CA	10.92	12.47	8.55	7.04	6.50	5.47	10.92	7.05	3.44	7.99	8.85	17.89	25.63	28.60
	RC	-0.78	9.96	-0.10	1.27	8.88	-2.14	-2.27	-4.54	6.84	15.86	0.54	15.47	39.45	44.98
Indonesia	CA	-2.99	-4.26	-2.78	-2.11	-2.79	-6.43	-7.66	-4.89	4.10	5.79	7.99	6.90	7.82	7.85
	RC	2.00	1.80	1.03	0.81	0.83	1.49	4.51	-1.73	6.31	3.84	2.04	-1.23	3.71	3.99
Korea	CA	-2.00	-8.32	-3.94	0.99	-3.87	-8.51	-23.01	-8.17	40.36	24.48	12.24	8.24	6.09	12.30
	RC	-0.52	-1.15	3.33	3.06	5.33	6.90	1.31	-13.53	32.25	21.74	22.15	6.63	18.32	33.70
Malaysia	CA	-0.87	-4.18	-2.17	-2.99	-4.52	-8.64	-4.46	-5.94	9.53	12.60	8.49	7.29	7.19	11.45
	RC	1.93	1.09	6.36	10.03	-1.93	-1.94	3.21	-6.14	4.72	4.94	-1.05	0.96	3.70	10.19
Philippines	CA	-2.70	-1.03	-1.00	-3.02	-2.95	-1.98	-3.95	-4.35	1.55	7.22	6.26	1.32	4.20	1.69
	RC	-0.50	2.32	1.10	0.26	1.32	0.37	3.67	-2.76	1.95	4.00	-0.17	0.37	-0.30	0.32
Thailand	CA	-7.28	-7.57	-6.30	-6.36	-8.09	-13.55	-14.69	-3.02	14.24	12.43	9.31	6.22	7.65	8.02
	RC	3.79	4.04	2.73	4.07	4.81	6.58	1.73	-11.50	2.74	5.37	-1.87	0.42	5.69	2.92
China	CA	12.00	13.27	6.40	-11.61	6.91	1.62	7.24	36.96	31.47	21.12	20.52	17.40	35.42	31.45
	RC	11.57	14.07	-23.22	1.76	30.42	21.96	31.45	34.86	5.07	9.72	10.90	46.59	74.24	116.84
Hong Kong	CA									2.53	10.28	7.08	9.94	13.72	17.43
	RC		4.24	6.37	7.81	6.27	6.15	8.41	29.00	-3.20	6.63	11.31	3.61	0.74	6.46
East Asia	CA	56.04	74.49	115.54	124.99	136.25	92.99	45.09	133.00	241.15	229.78	216.53	181.71	248.38	255.19
	RC	16.38	35.04	3.46	64.30	92.18	107.11	95.05	18.59	55.57	148.48	116.73	108.50	215.79	434.34

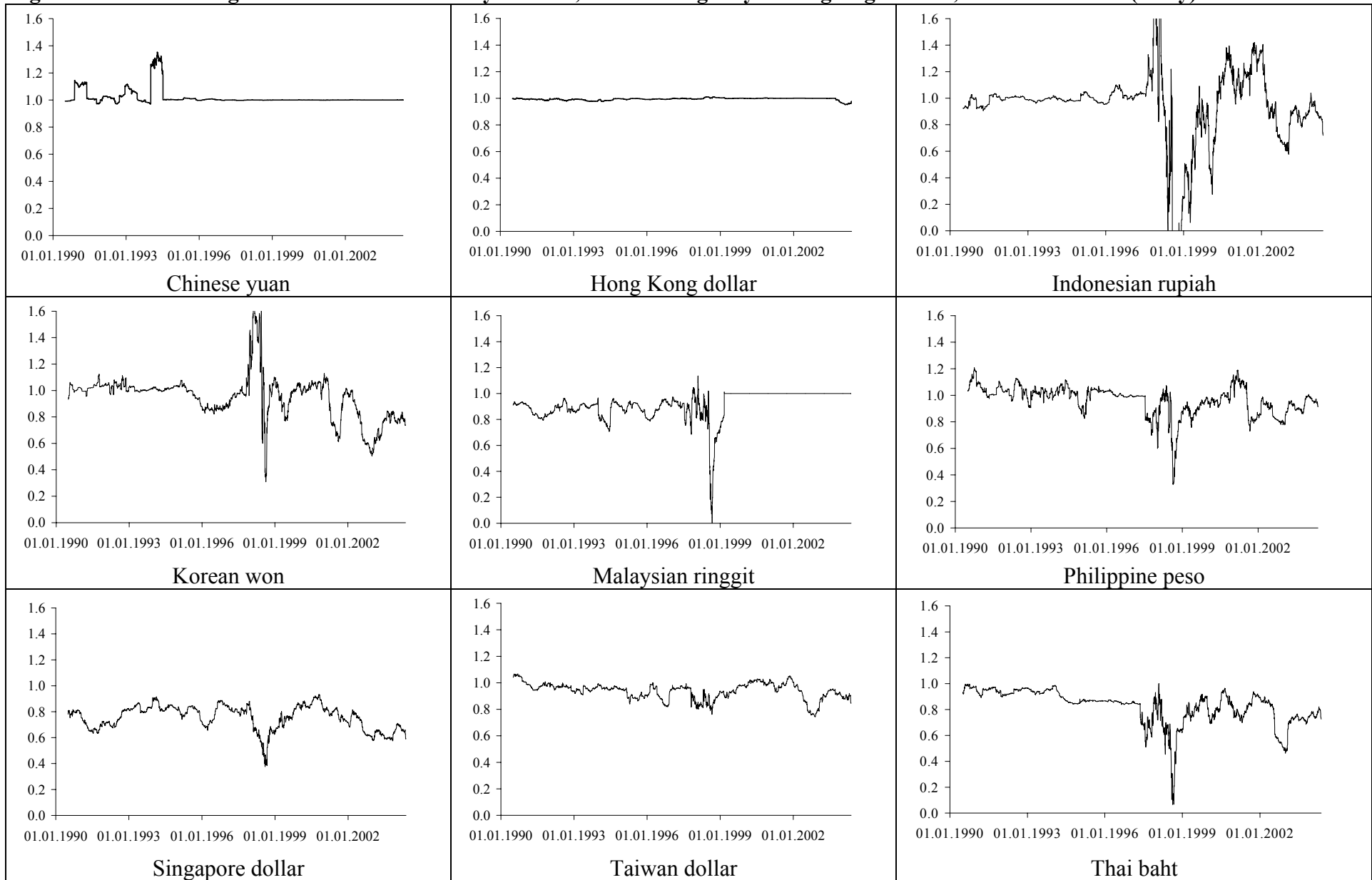
Source: IMF: IFS, Central Bank of China. East Asia does not include Hong Kong from 1990 to 1997.

Figure 1: East Asian Exchange Rate Pegs against the Dollar, 1980:01-2004:04 (Monthly)



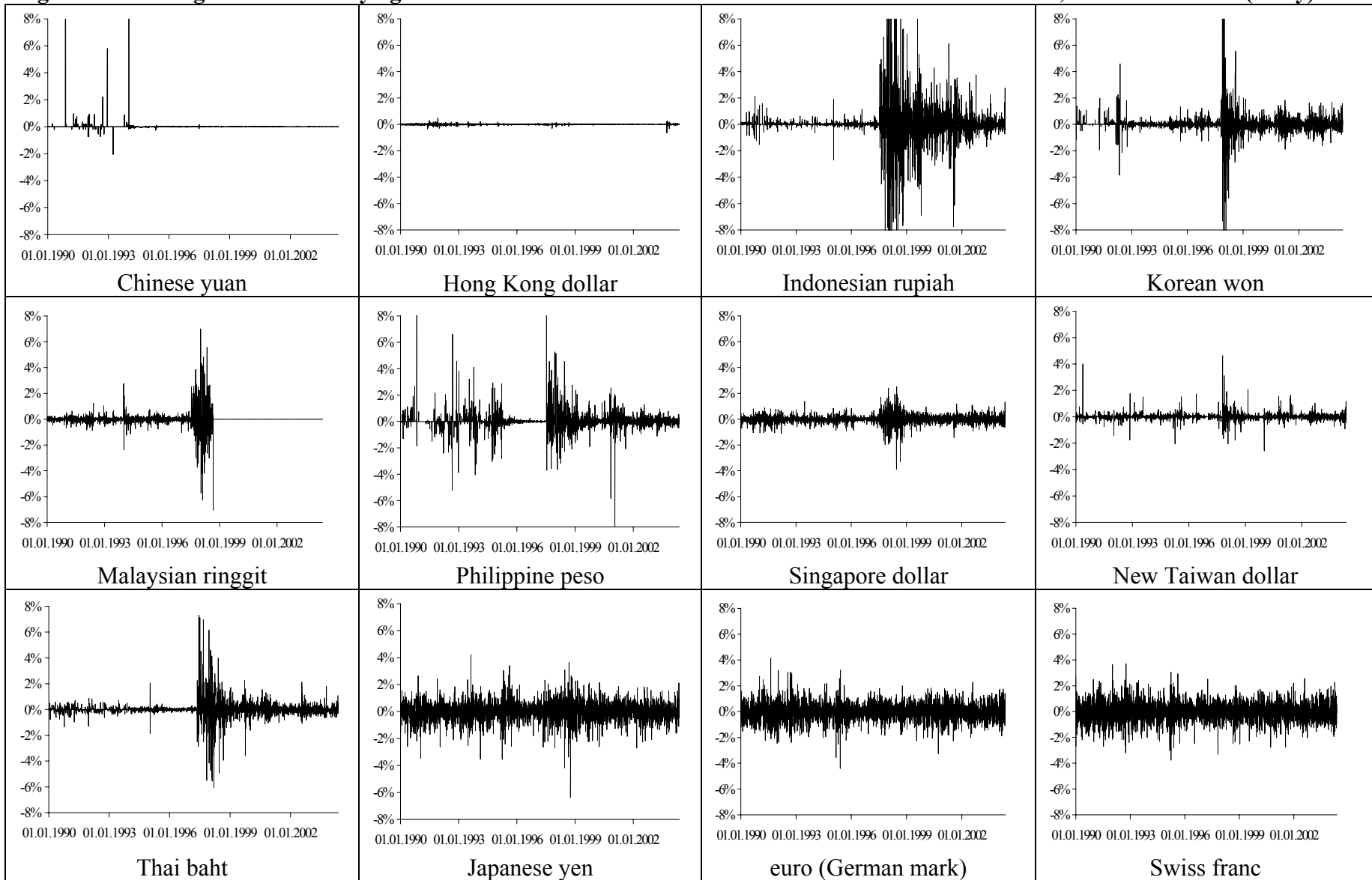
Source: IMF: IFS, Central Bank of China. Index 1980.01=100. Note different scale for Indonesia.

Figure 2: Dollar's Weight in East Asian Currency Baskets, 130-Trading-Day Rolling Regressions, 1990:01-2004:05 (Daily)



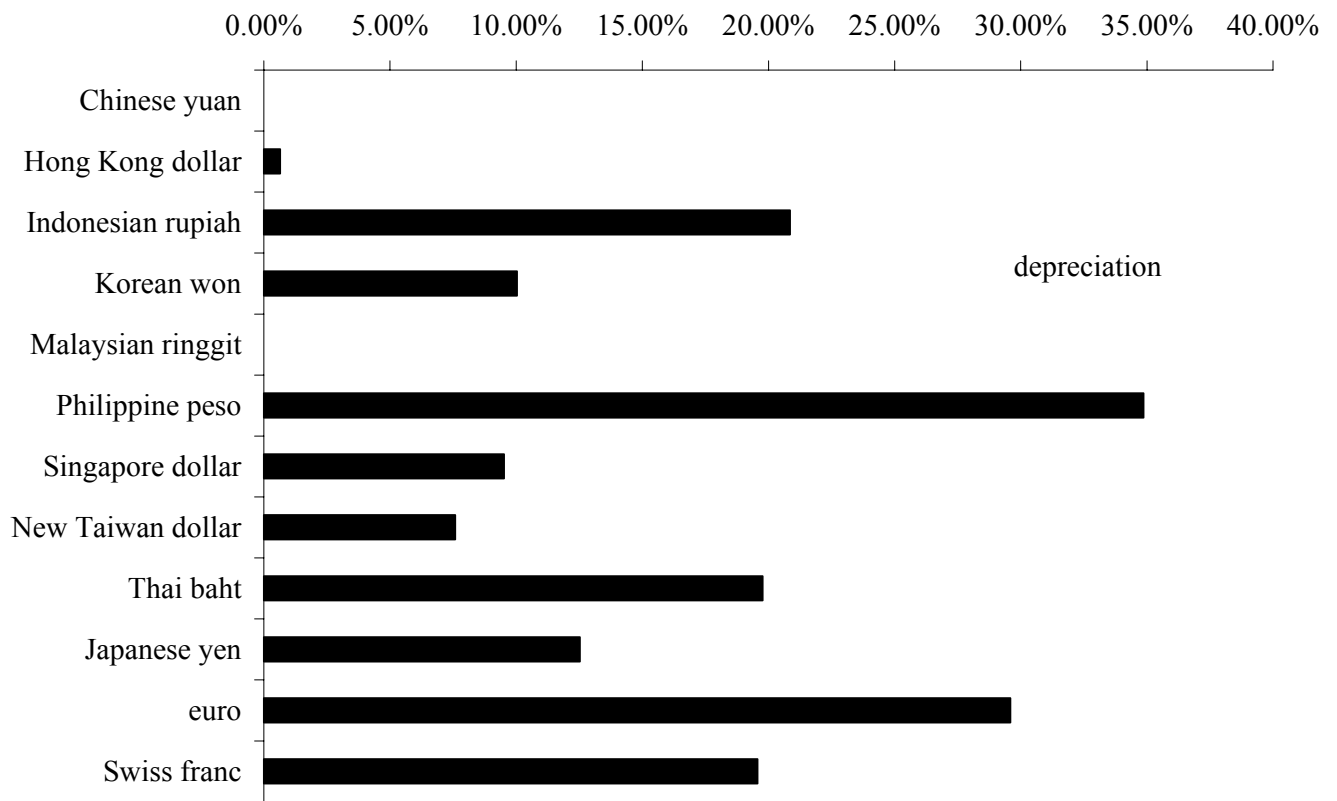
Source: Datastream. 1 corresponds to 100%. Note: A value close to unity shows strong dollar pegging.

Figure 3: Exchange Rate Volatility against the US Dollar of Selected Crisis and Non-Crisis Currencies, 1990:01-2004:05 (Daily)



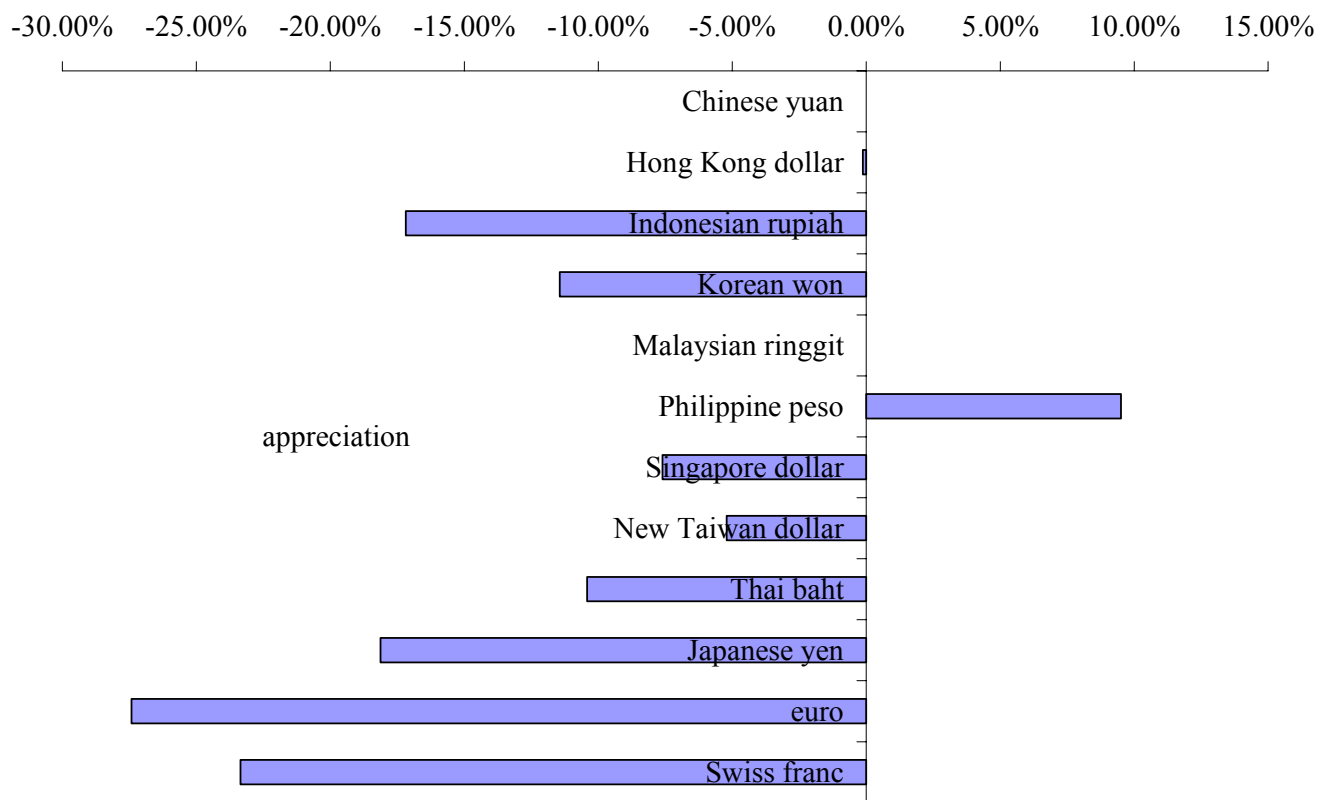
Source: Datastream. Volatility is daily percentage changes against the dollar.

Figure 4: Exchange Rate Changes against the US Dollar, 1999:01-2001:12 (Percent)



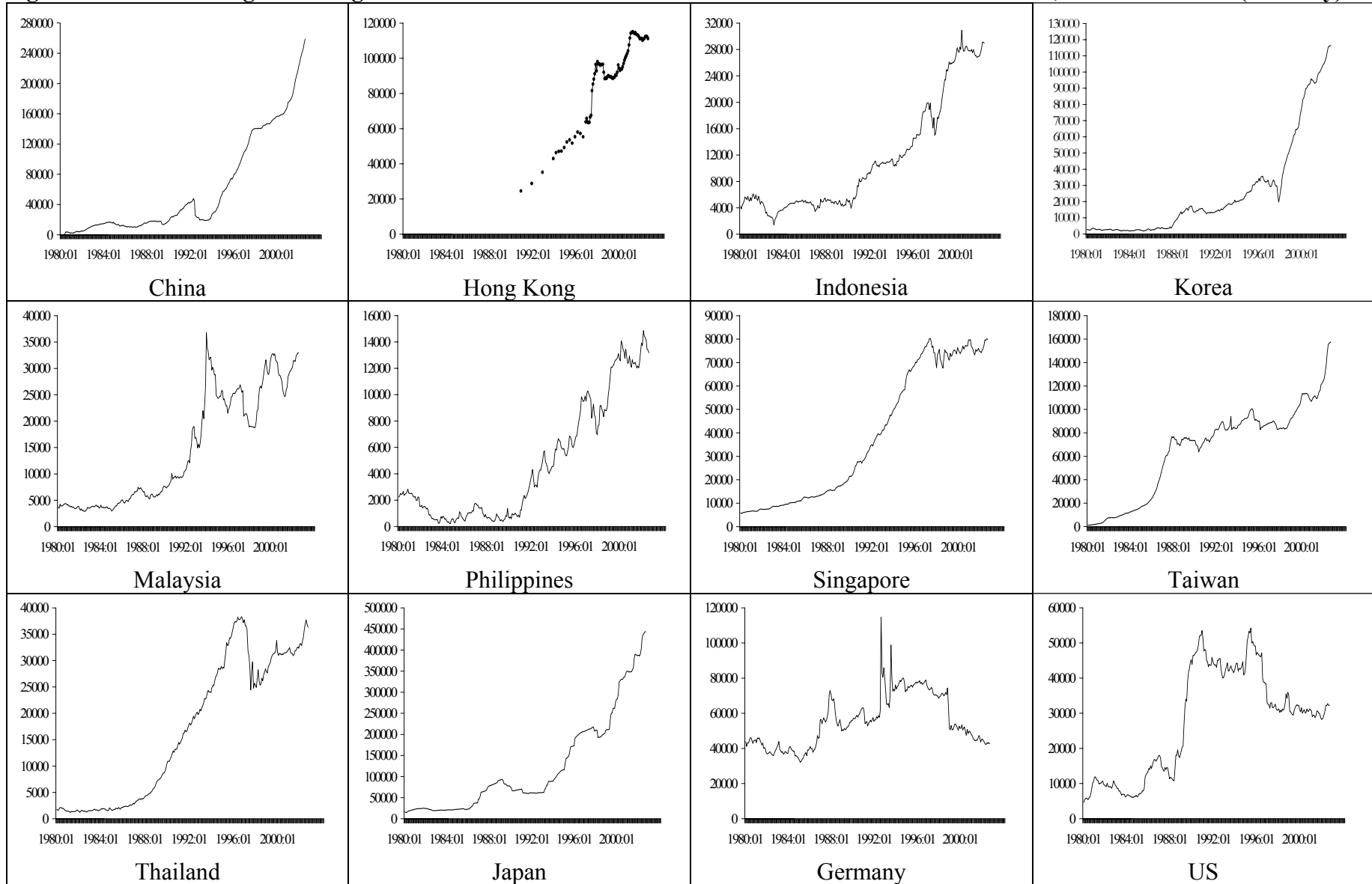
Source: IMF: IFS.

Figure 5: Exchange Rate Changes against the US Dollar, 2002:01-2004:04 (Percent)



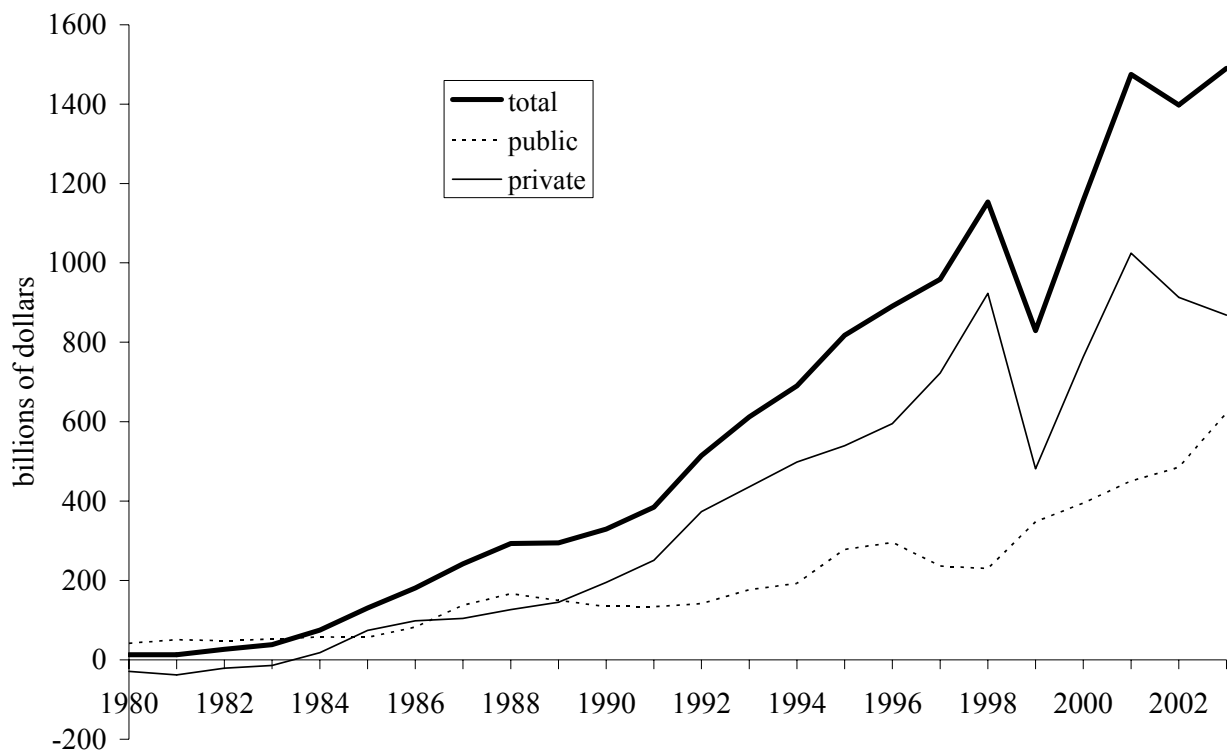
Source: IMF: IFS.

Figure 6: Official Foreign Exchange Reserves of Crisis and Non-Crisis Countries in Millions of Dollars, 1980:01-2004:04 (Monthly)



Source: IMF: IFS. Million dollars. Note different scales on the y-axis.

Figure 7: Net International Investment Position of Japan, 1980 - 2003 (Billions of Dollars)



Source: Japan: Ministry of Finance.

Figure 8: Interest Rates in the US and Japan, 1980:01-2004:03 (Percent per Annum)

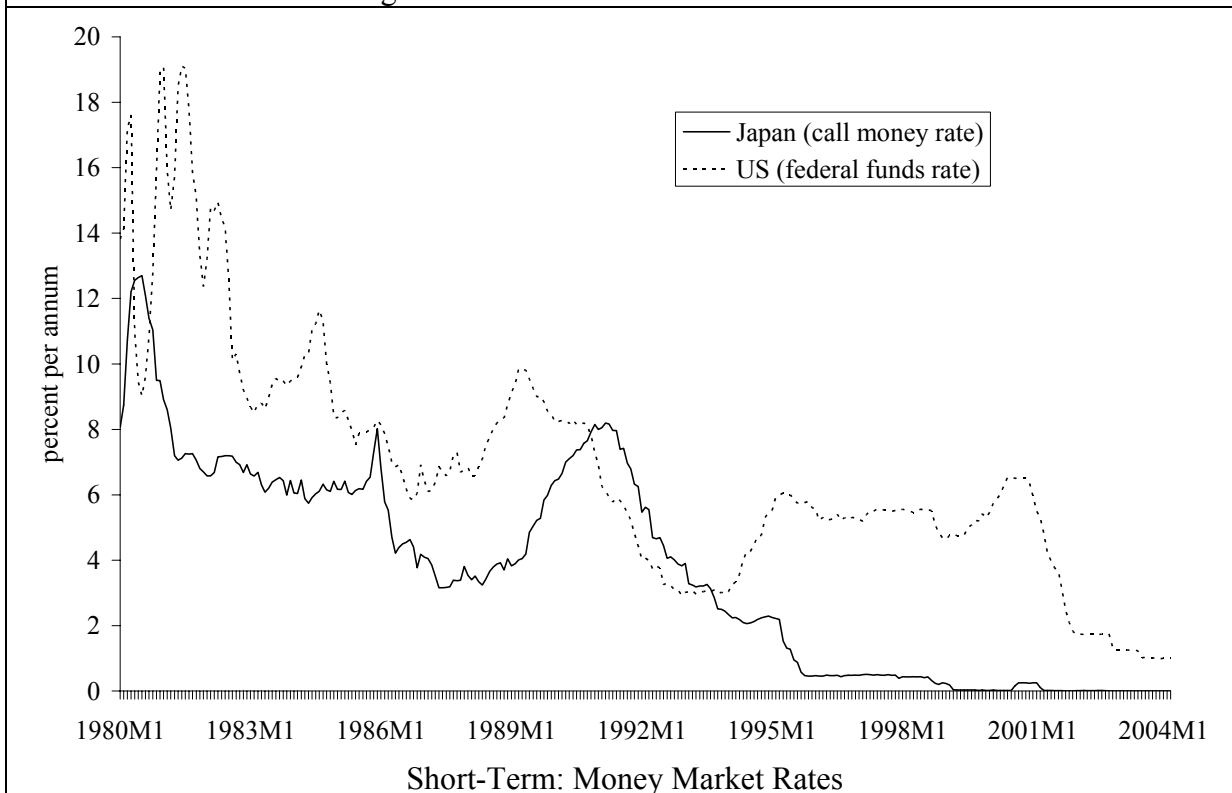
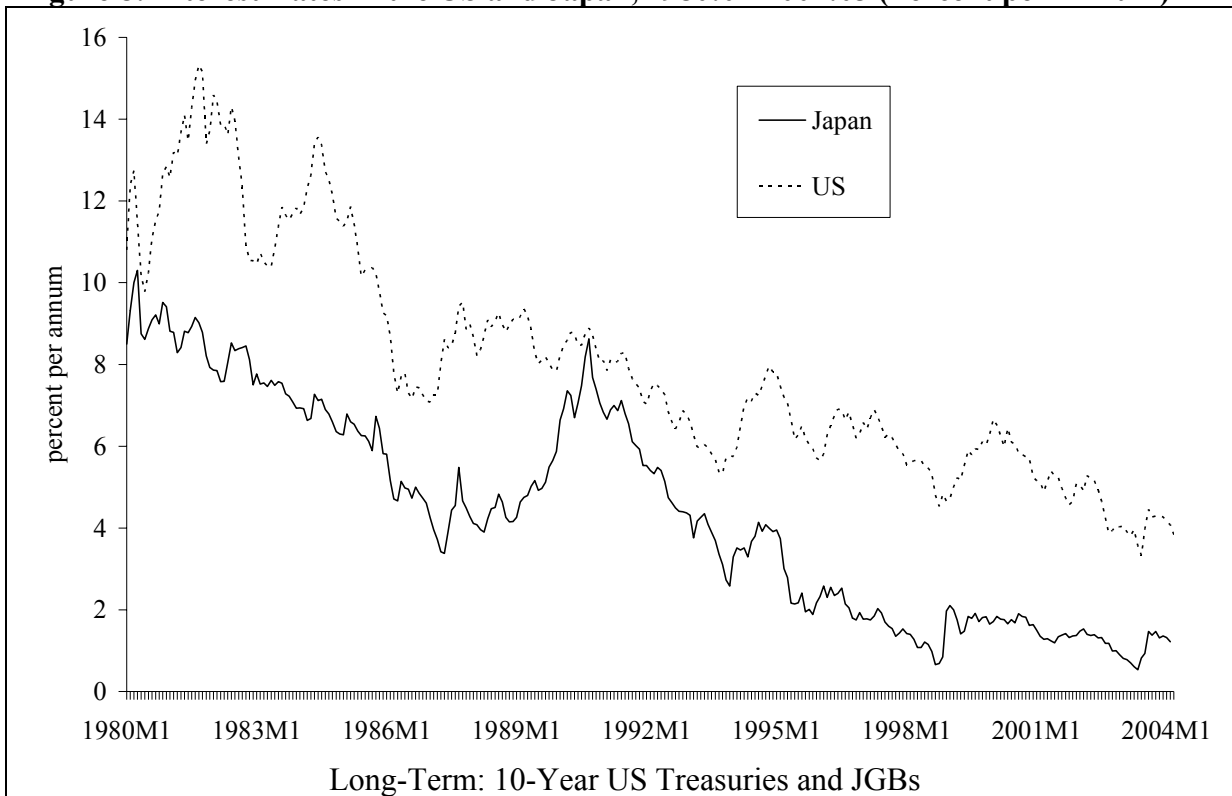
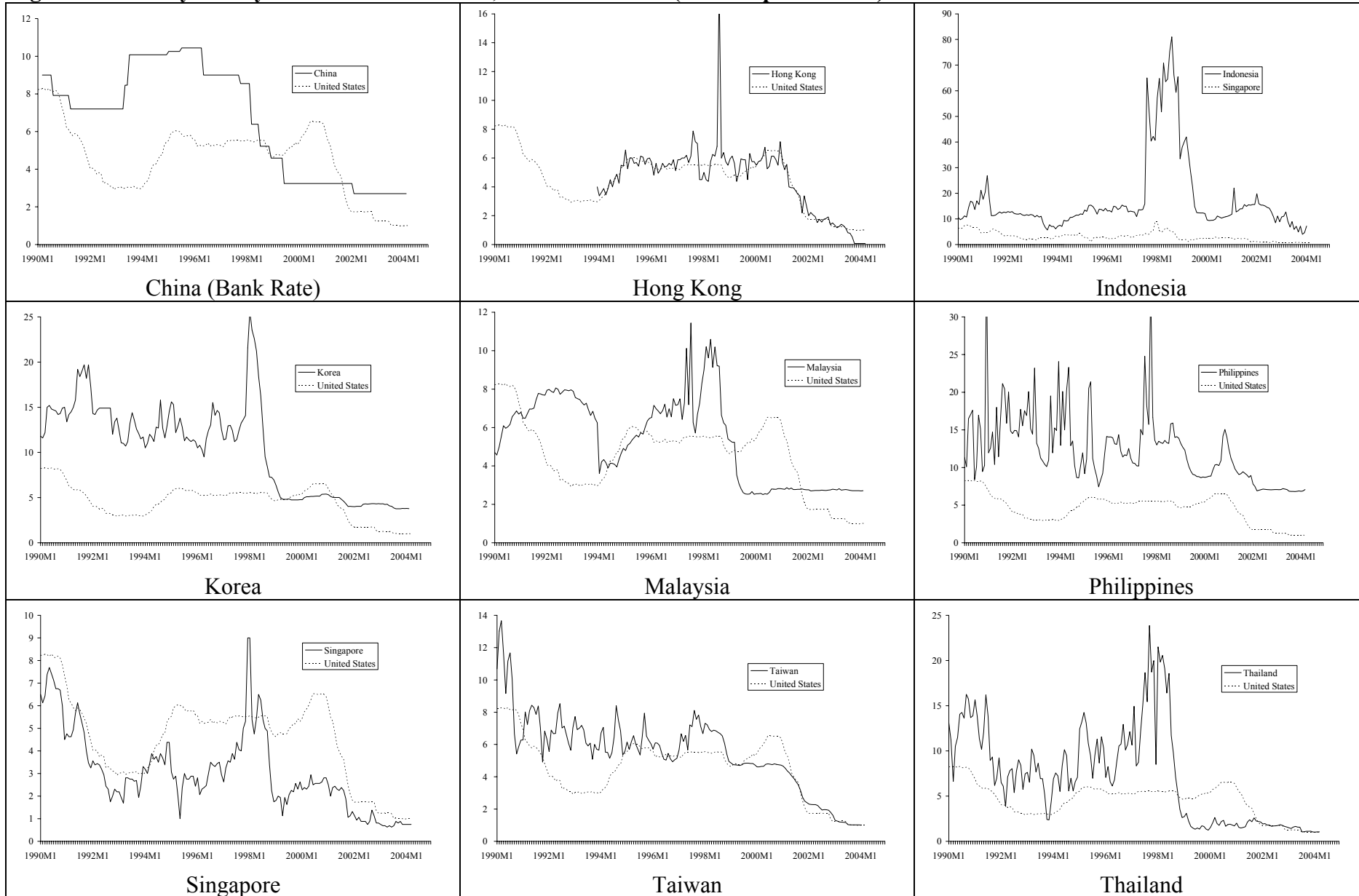
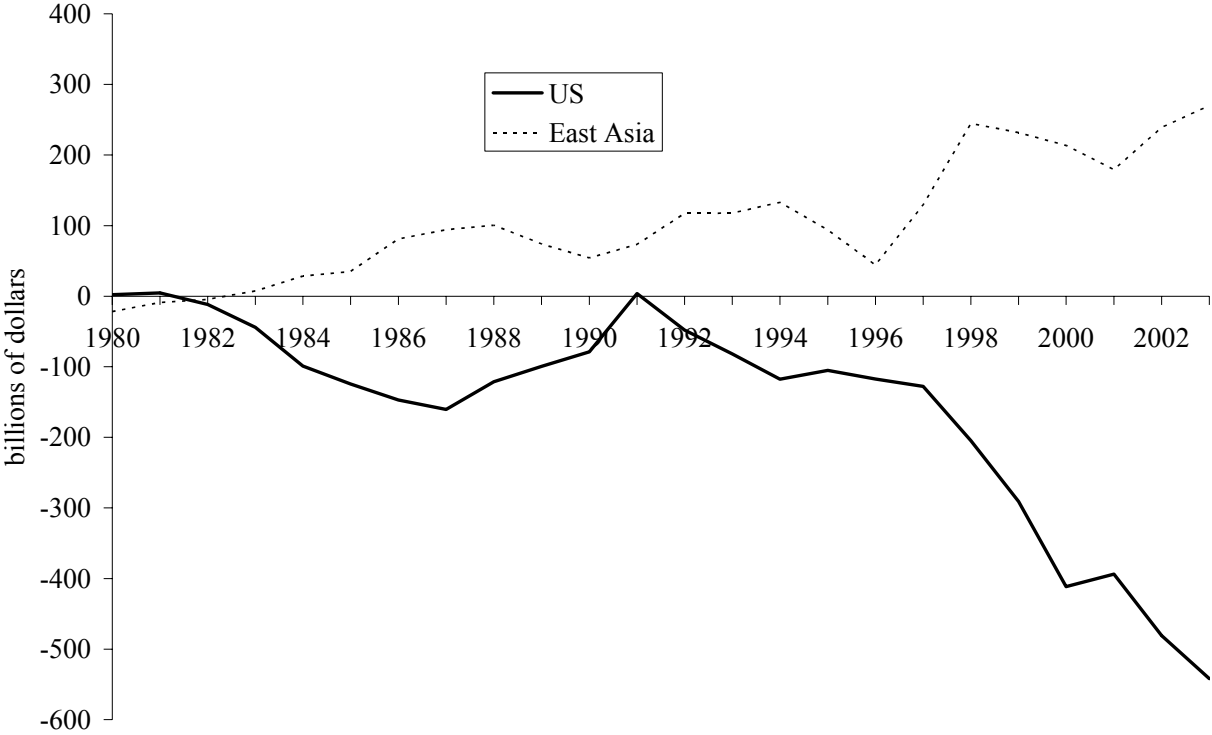


Figure 9: Monthly Money Market Interest Rates, 1990:01-2004:01 (Percent per Annum)



Source: IMF: IFS. Note different scales.

Figure 10: US and Cumulative East Asian Current Accounts, 1980-2003 (Billions of US Dollars)



Source: IMF: IFS.