

Setting Monetary Policy in East Asia: Goals, Developments and Institutions

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1. Introduction

The Asian crisis represented a watershed in monetary policy-making in east Asia. Suddenly gone, in many cases, was the guiding principle of stability of the currency against the US dollar. Suddenly gone, in some cases, was the senior management of the central bank itself. New goals, and new means to achieve them, were needed. In a number of Asian central banks, new leaders faced the challenge of setting new goals.

Four years after the onset of the crisis it is possible to characterise the objectives that have been embraced and the institutions that have developed to elaborate and attain these objectives. What follows, therefore, reviews the broad menu of objectives considered, and poses the question of whether a predominant emphasis on price stability can be reconciled with attention to asset prices or exchange rates. Then follows a sketch of the various choices made by the monetary authorities and how these are related to structural differences across economies. The institutions of monetary policy-making have evolved, but not always in smooth parallel. Section 2 discusses five appropriate objectives of monetary policy. Section 3 sketches the change in objectives since the crisis. Section 4 focuses on institutional developments. Section 5 briefly summarises the key points.

2. The Appropriate Objectives of Monetary Policy

Monetary authorities bear the responsibility for achieving certain objectives. Macroeconomic goals can include long-term growth or employment. Increasingly in recent years, central bank goals have, either in practice or law, focused on 'price stability', in some cases even going as far as setting numerical inflation targets to be attained over specific time horizons. Other objectives also assumed by central banks in east Asia are assuring financial stability, exchange-rate stability, somehow defined, and attempting to maintain positive real interest rates for depositors. A central bank may also embrace the principle of freedom for international capital flows, although this principle may constrain the bank in achieving its other objectives. I now focus on each of these in turn and look at, in increasing depth in the next two sections, how they have fared in east Asia.

1. The author has benefited from discussions with Palle Andersen, Claudio Borio, Ben Fung, Stefan Gerlach, David Gruen, George Pickering, Amando Tetangco and Shinichi Yoshikuni and from the assistance of Angelika Donaubaauer and Les Skoczylas but responsibility for any errors or bad judgement remains his own. The views expressed are those of the author and not necessarily those of the Bank for International Settlements.

2.1 Goals

2.1.1 *Price stability*

Price stability, defined qualitatively or operationalised as a range for the inflation rate, has gained wide acceptance as an appropriate goal of monetary policy. Explicit inflation targeting, which can be defined as including a publicly announced, specific range of acceptable inflation rates, a horizon for achieving this target range and regular reporting, has been characterised as constrained discretion. It has the great advantage, in my view, of framing the public discussion of monetary policy in terms of an outcome that the public demonstrably cares about and can understand. It permits the use of an intermediate target, if a sensible one is available, but frames a discussion of ignoring it (or even abandoning it), if necessary.

Guy Debelle's following contribution to this conference makes 'The Case for Inflation Targeting in East Asia' (this volume). Amato, Gerlach and Hawkins (2001) have recently surveyed institutional arrangements and challenges faced by emerging market and transition economies, including Korea and Thailand.

Relieved of the need for balance, let me echo below some reservations that my colleagues at the Bank for International Settlements have lodged regarding an exclusive focus on inflation and neglect of asset prices. Bill White, present at the creation of inflation targeting at the Bank of Canada, has joined the questioning, so no innate hostility to inflation targeting is involved.

2.1.2 *Financial stability*

Financial stability is an objective of monetary policy as well. Indeed, this was the first rationale for, and goal of, the Federal Reserve. Its leaders even denied that it should be held responsible for price fluctuations well into the 1920s. While this view now seems quaint, some proponents of inflation targeting focus as single-mindedly on price stability and, implicitly or explicitly, hold that it is a necessary and sufficient condition for financial stability.

Price stability, however, does not appear to be a sufficient condition for financial stability. In particular, asset price inflation and associated excessive credit growth can occur against the backdrop of stable prices. The risk of asset price inflation and excessive credit growth, indeed, might even be heightened by falling or low inflation. Conversely, the effect of asset inflation and excessive credit growth may be to reduce inflation, including via exchange rate appreciation associated with capital inflows.

To some observers, the solution is that the central bank must have the discretion to depart from the inflation-targeting framework itself, responding to threats to financial stability in a manner that cannot be readily explained in terms of meeting the inflation target.² Others argue that an apparent departure from actions required

2. Kindleberger (1995).

by inflation stabilisation – in particular, a tightening in the face of asset price inflation – can be justified in terms of avoiding the deflationary consequences of a later collapse.³ Others suggest using the full scope of a tolerable inflation range, by, for example, aiming at price increases in the lower end of the target corridor in the face of asset price inflation and associated rapid credit growth.⁴ Others adopt a Tinbergian position, and argue for policies other than interest rate movements to address the problem of credit cycles: disclosure of credit exposures to inflated asset prices; higher capital requirements for particular assets or across the board during asset price inflation; variable loan-to-value ratios; and other policies.⁵

2.1.3 Exchange-rate stability

Usually portrayed as an alternative to inflation targeting is stabilisation of the exchange rate (real or nominal). This can be argued for on the grounds of an optimal currency area, the criteria for which, by construction, ensure that the imported interest rate policy is appropriate for the economy adopting the fixed exchange rate. The policy of fixing the exchange rate can alternatively be thought of as adopting a monetary standard that has long-term predictability even if the associated interest rates are often cyclically inappropriate. One appeal is that this policy is simple to execute and does not require a deep understanding of the linkages between interest rates, inflation and growth.

In practice, the contrast usually drawn between assigning the monetary authority to achieving price stability and managing the exchange rate is harder to sustain as the economy under consideration is more open. The more open an economy, the greater will be the effect of the exchange rate relative to the interest rate in setting monetary conditions. At the extreme of hyper-openness, the monetary authority may well choose to devote monetary policy first and foremost to some rate or path for the exchange rate, *as a means of achieving price stability*.

2.1.4 Capital account openness

Capital account openness is a policy choice that may be adopted for various other reasons but that then puts a constraint on monetary policy. In particular, according to the so-called ‘impossible trinity’ view, an economy can only have two of the following: independent monetary policy, a fixed exchange rate and capital account openness.

Yi Gang and Tang Xian (2001) have argued a variant of this view. They hold that the impossible trinity is better viewed as a constrained sum in which fractions are possible. That is, an independent monetary policy (1) might be combined with semi-fixity of the exchange rate (1/2) and a halfway open capital account (1/2).

3. Kent and Lowe (1997).

4. Crockett (2001, p 17).

5. BIS (2001, pp 123–141); Borio, Furfine and Lowe (2001); McCauley, Ruud and Iacono (1999, pp 289–326).

Whether one agrees with this characterisation or not, one must agree that capital account openness should not be viewed as an all-or-nothing proposition. The Mundell-Flemming model, after all, conceived of capital flows as largely money-market flows, or at most money-market and bond-market flows.

An important development in the world economy in the late 1990s was the shift of international capital flows from the fixed income market, both money and bond flows, to the equity market, including both portfolio equity flows and direct investment. Equity-dominated capital flows can overturn standard Mundell-Flemming results. That is, a decline in policy interest rates can raise expected corporate earnings, possibly in conjunction with a decline in the longer-term interest rates presumably used as the basis for discounting those earnings. This can lead equity prices to rise and attract foreign investors with extrapolative expectations to buy more equities. These equity inflows, under the hypothesis of equity domination of capital flows, can overwhelm the money-market effects of lower interest rates on the currency and lead to a rise in the currency. Attempts to explain the US dollar's strength in the first half of 2001 along these lines run up against the shift from equity to bond inflows into the US during this period. The yen's strength after the March 2001 change in policy, and episodes of the US dollar/won exchange rate, however, can be more plausibly read in this manner.

The increased importance of equity flows has increased the effective scope of a capital account policy of semi-openness. In particular, in this era a capital account can be open to equity flows, both portfolio and direct investment, but closed to money and bond flows, or only some kind of money flows. Such a policy allows the international redistribution of risk through trade in the most risky assets, while limiting international influence on the money market.

2.1.5 Positive real interest rate on deposits?

In parts of east Asia, it appears that monetary policy is constrained by a perceived need to maintain positive real interest rates on household deposits. During boom years, of course, this constraint did not bind. Since the crisis, however, as economies have flown into the 'headwinds' of corporate and bank balance sheet restructuring, this consideration may have kept interest rates higher than they might have been otherwise. The view that real deposit yields must at all times over the business cycle be positive may derive from the arguments against financial repression of a generation ago. But these arguments targeted the chronic, not episodic, maintenance of negative real interest rates.

The application of a secular argument to each point in a cycle may be questioned. Elsewhere, in the face of fairly mild headwinds, at least by the recent standards of east Asia, the Federal Reserve pushed interbank rates down to zero in real terms. This implied significantly negative real deposit rates for all but the largest deposits. Structural differences, however, may allow the Federal Reserve to more easily adopt such a policy than its counterparts in east Asia. For one, bank deposits are a much smaller share of household deposits in the United States, and the institutions of

collective investment in stocks and bonds are much more developed. For another, the United States is a net debtor to the rest of the world in short-term dollar instruments, so the net income effect of lower short-term interest rates is positive.

2.2 Goals and instruments

Tinbergen's genius was to win a Nobel Prize for the insight that you can't hit two birds with one stone. The question arises whether to seek only price stability or exchange-rate stability, however defined, or whether to try to seek to achieve some measure of another goal, given the primary emphasis. There are two approaches to this question.

One approach is to attempt to use the range of targeted outcomes to accommodate other goals. This was mentioned above in the context of attention to asset price inflation in an inflation-targeting regime. A similar, within the margins, attention to the exchange rate might be paid in the same regime. (Similarly, there might be room within an exchange-rate targeting regime for interest-rate stabilisation or even some limited interest rate policy.)

Another approach is to look for another instrument. Again, this was mentioned above in the context of assigning prudential measures a role in limiting the potential damage of asset price inflation. Another instrument, or following Dooley, a quarter of an instrument,⁶ is the currency composition of the government's (or the central bank's) balance sheet. If monetary policy is assigned to stabilising prices, changes in the balance of domestic and foreign currency assets or liabilities on the official balance sheet can be used to affect the exchange rate in some fashion. Changes in the composition could include not only sterilised intervention but also changes in debt management.

Another instrument available in some economies is variation in employer contributions to a mandatory provident fund. A cut in the employer's contribution lowers the cost of labour in domestic and foreign currency. The Singaporean authorities used this incomes-policy instrument in the mid 1980s and during the Asian crisis (MAS 2001a) to lower the real exchange rate as measured by relative unit labour costs without requiring a depreciation of the nominal exchange rate. This then allows the nominal exchange rate to be assigned to price stability (see below). Mandatory provident funds in Malaysia and, more recently, in Hong Kong might be similarly used (although the recent proposal in Malaysia to cut the employee contribution is more akin to fiscal policy).

3. Recent Choice of Objectives in East Asia

This section analyses the choices of objectives for monetary policy in east Asia since the crisis. Broadly, the goal of monetary policy in the region has moved towards price stability. The exception, of course, is Malaysia, which has, for the time being, joined Hong Kong SAR (Special Administrative Region) in embracing a

6. In his presentation in Seoul (Dooley, Dornbusch and Park 2001).

fixed exchange rate against the US dollar. The Chinese authorities took a smaller step in the same direction by reducing the already very limited volatility of the renminbi against the US dollar in the course of the crisis, a policy that has since been reversed only partially.

3.1 Price stability

At writing there are six or seven central banks in east Asia that have set for themselves the objective of price stability. In addition, two central banks seek to use the control over interest rates afforded by capital controls to stabilise prices in the context of a fixed exchange rate. The following paragraphs consider central banks generally oriented toward price stability; explicit inflation targeters, or central banks moving in that direction; and fixed exchange rate countries with a large measure of freedom in setting interest rates.⁷

Among the central banks with a general orientation to price stability one can argue, and indeed the Monetary Authority of Singapore (MAS 2001a, p 15; Khor 2000, p 110) has argued, that it has long aimed at price stability, albeit without, until recently, publicly articulating their strategy. In March 2001, the Bank of Japan adopted the goal of an end to deflation and promised to maintain large excess reserves in the banking system until such time as deflation ended. The monetary authority of Taiwan, China⁸ sets an M2 target 'to allow the economy to make full use of its production capacity without jeopardising price stability' (CBC 2000, p 35), where the latter apparently means a core inflation rate of 1 per cent.⁹

Explicit inflation targeting is relatively new in east Asia. The Bank of Korea introduced explicit inflation targeting in the context of the reforms adopted with the support of the IMF in 1998. The Bank of Thailand published its first quarterly *Inflation Report* in July 2000. Indonesia set its second annual inflation target in January of 2001. The Philippines is in the process of adopting inflation targeting.

Capital controls allow for independent setting of interest rates in China and Malaysia. The authorities in China expressed their concern at the deflation that resulted from maintaining China's exchange rate during the Asian crisis as they lowered 1-year deposit rates to 2.25 per cent in 1999. In Malaysia, 'the basic thrust of monetary policy was...to support economic recovery and facilitate structural reforms, while preserving price stability' (Bank Negara Malaysia 2000, p 85) and interest rates were brought down to 3 per cent. In 2000, 'interest rates remained low but were judiciously managed to balance the need to support economic growth,

7. Schaechter, Stone and Zelmer (2000), published in December 2000, does not focus on any inflation targeters in east Asia.

8. Henceforward 'the CBC' of 'Taiwan'.

9. Core inflation is defined as consumer prices excluding fresh fruits and vegetables, fish and shellfish and energy (CBC 2000, p 21).

preserve price stability and sustain the nation's level of savings' (Bank Negara Malaysia 2001, p 85).

3.1.1 Singapore: price stability and the exchange rate

Above, Singapore was included among central banks aiming at price stability, but conventional classification would leave Singapore out of this group and instead place it among the economies pursuing a stable exchange rate. On this view, the basic strategy of monetary policy in east Asia would line up rather neatly along the lines of economic openness. The relatively closed economies, with export to GDP ratios ranging from 10 per cent in Japan up to 50–60 per cent in the Philippines or Thailand focus on price stability, while the very open economies of Malaysia, Hong Kong and Singapore focus on the exchange rate. On this view the outlier is China, which by regional standards is not so open. There, however, discussion of more flexible interest rates and exchange rates in the lead-up to WTO admission may suggest a monetary policy regime in transition. Of course, China and Malaysia employ capital controls to allow a combination of fixed exchange rate and domestic interest rate setting.

At the level of strategy, however, Singapore belongs among those central banks aiming for price stability. One can model a Taylor rule for Singapore in which the nominal effective exchange rate moves in response to deviations of inflation away from its target and of output from its trend. Box A reports two empirical efforts along these lines. That foreign exchange market economists in Singapore (rather than, say, a policy economist in Hong Kong) have estimated these Taylor rules means that the Singaporean authorities have succeeded in communicating their strategy to market participants. Thus, the exchange rate is a policy variable analogous to the short-term interest rate elsewhere. If one insists that the monetary strategy in Singapore is exchange-rate stabilisation, then one has to argue that the monetary strategy of the United States is interest-rate stabilisation. Singapore poses a challenge to the concept of 'an international system of hard pegs and relatively free floats', in which the central banks with freely floating currencies target inflation; it has not joined 'the observed movement away from intermediate arrangements' (Eichengreen 2001, p 17).

Box A: A Taylor Rule for Singapore with the Nominal Effective Exchange Rate as Operating Target

At least two sets of market analysts conceive of the Monetary Authority of Singapore following a Taylor Rule, but of a form quite different from the original formulation. The standard Taylor rule relates the policy interest rate, the overnight target for the federal funds rate, to deviations of expected inflation from target inflation and deviation of output from trend output. In this variant on the Taylor rule, however, the MAS operating target is the change in the nominal effective exchange rate (NEER)¹, not the short-term policy interest rate.

In particular, Simon Flint of Bank of America's Currency Strategy Group argued in 1999 that 'Singapore uses its FX rate as the US Federal Reserve uses the Fed Funds Rate'.² Similarly, Bhanu Baweja and Paul Schymyck at IDEAGlobal Economic Research in Singapore find the MAS 'set the NEER in period t as a function of the expected deviation of inflation and the output gap from their target levels'.³

Flint estimates the following equation on quarterly data:

$$NEER_t - NEER_{t-1} = a + b[I_t] + c[(Y_{t-1} - Y^*_{t-1})] \quad (1)$$

where $NEER$ is the nominal effective exchange rate, I_t is core inflation, Y_t is real quarterly GDP and Y^* is potential output, estimated as growing at 7.8 per cent pre-crisis and 5–5.5 per cent post-crisis.

Baweja and Schymyck estimate the following equation on quarterly data:

$$NEER_t - NEER_{t-1} = a + b[(I_{t-1} - I^*)] + c[(Y_{t+1} - Y^*_{t+1})] \quad (2)$$

Where I_t is taken to be the core rate of inflation on the MAS definition, I^* is taken at the long-term average rate of inflation of 1.5 per cent and Y_{t+1} is realised GDP in the following period and Y^*_{t+1} is computed using the Hodrick-Prescott filter.

Parameter estimates and regression statistics are shown in Table A1.

1. Note that in order for Singapore to have a lower inflation rate than its trading partners, the NEER has shown a trend appreciation. This requires the left hand side variable to be expressed as some sort of change variable. With the NEER indexed at 100 at some point, longer estimation periods would probably benefit from the variable being defined as a percentage change in the index rather than an absolute change.
2. Flint (1999, p 1).
3. Baweja and Schymyck (2001).

Table A1: Two Estimates of a Taylor Rule for Singapore's Nominal Effective Exchange Rate

	Constant	Inflation	Output gap	Adjusted R ²	Standard error	F-statistic	Durbin-Watson statistic	Number of observations
Flint	0.0041 (1.5)	0.79 (3.5)	0.11 (2.0)	0.32	0.012	8.6		36
Baweja and Schymyck	0.65 (3.3)	0.44 (3.3)	0.24 (2.4)	0.31	1.2	9.6	2.2	45

Notes: Flint estimates refer to the period 1990–99; Baweja and Schymyck refer to 1985–96. Figures in parentheses are *t*-statistics.

Sources: Baweja and Schymyck (2001); Flint (1999); author's personal communication with same

The two analyses agree qualitatively that point estimates of the parameter on inflation are larger than those for the output gap but the authors' interpretations of this finding vary in an interesting manner. Baweja and Schymyck follow the standard approach by suggesting that 'The estimates...indicate a stronger policy response to inflation deviations as compared with output gap deviations'. In particular, the authors note, if inflation is 1 per cent over target, a 0.44 per cent appreciation in the NEER is engineered. For the output gap, a 1 per cent excess of output over potential would lead to an appreciation of the NEER by 0.24 per cent. By contrast, Flint holds that 'It would be wrong to conclude from the coefficients above that I was far more influential than Y. It is chiefly that Y has been far more volatile than I (with a standard deviation of 3.6% versus 0.9%)'. In other words, it may be more interesting to ask whether the central bank moves its policy variable more or less for a one standard deviation overshoot of inflation or growth, rather than a 1 per cent overshoot. In industrial countries, inflation and growth vary more similarly over the cycle, so this issue does not arise with the same force.

3.1.2 *The choice between a general orientation to price stability and explicit inflation targeting*

Why have some economies chosen explicitly to target inflation while others have not? Gerlach (1999) examined data on 22 OECD countries and found that a previous lack of independence of the central bank, heavy dependence on commodity exports and a relatively closed economy all favoured the adoption of explicit inflation targeting. For central banks that previously did not enjoy independence, explicit inflation targeting was interpreted as a sort of substitute: a government gives a clear mandate and allows the central bank to choose the means of achieving it. In economies dependent on commodity exports, wide swings in the terms of trade render an exchange-rate goal hard to attain and thereby make a regime of inflation targeting more attractive. In highly open economies, central banks are less tempted to ease to give a temporary boost to the economy because any consequent exchange rate depreciation would strongly affect domestic prices. Thus, with openness itself disciplining monetary policy, there is less advantage to targeting inflation.¹⁰

In the light of these findings for most of the OECD, any historical lack of central bank independence in east Asia would seem to argue for the broad advantage of explicit inflation targeting (see below). With regard to export composition, however, only Indonesia remains heavily dependent on commodity exports in east Asia today. The openness of a number of east Asian economies would make their adoption of explicit inflation targeting unusual in light of the experience in most of the OECD. Sweden, with a ratio of exports to GDP of 32 per cent, was the most open economy among explicit inflation targeters in Gerlach's sample, although Iceland and Norway at 35 per cent and 39 per cent, respectively, have since adopted this policy.¹¹ The adoption of explicit inflation targeting by the relatively closed economies, at least on a regional comparison, of Korea and Thailand accords with the choices of most of the OECD, although Thailand is more open than any industrial country that has adopted explicit inflation targeting.

One can ask the converse of Gerlach's question: why do some central banks that embrace price stability as a goal abstain from explicit inflation targeting? Baltensperger, Fischer and Jordan (2001) argue that central banks that enjoy considerable latitude to set or to define their goal (said to enjoy 'goal independence') are likely to eschew inflation targeting. Such central banks, the argument goes, are likely to view inflation targeting as a restriction on their ability to act flexibly to promote preferred economic outcomes and so not only the Swiss National Bank but

10. Note that Gerlach's paper, owing to data limitations, confined itself to the choice of explicit inflation targeting versus all other choices. Thus, dependence on commodity exports and a relatively closed economy may argue for a domestic price stability goal in general, rather than explicit inflation targeting *per se*.

11. Gerlach's analysis had to exclude these two countries to obtain sensible results. Given their dependence on commodity exports, Gerlach suggested that perhaps they would do better to adopt explicit inflation targeting, which they subsequently did.

also the ECB, the Federal Reserve and the Bank of Japan have abstained from explicit, full-fledged or single-minded inflation targeting.¹²

The association of inflation targeting and commodity exports poses an important question for east Asian economies: Has their integration into the world electronics business made them, in effect, commodity exporters? As this business suffers its worst downturn since the mid 1980s, the extreme amplitude and frequency of the technology cycle, as compared to that of other manufactured goods, is evident. Unlike the mid 1980s, electronic goods bulk very large in the exports of east Asian countries (Table 1). Are price or volume swings in this business so extreme (Table 2) that the electronics cycle should be understood as a fundamental force driving exchange rates, much as the traditional commodity cycles drive the Canadian and Australian dollars?¹³ Or, in some east Asian economies at least, is the value added in labour-intensive electronics manufacturing relatively immune to the price swings in the business while exchange-rate stability might actually attract investment from multinational corporations? A finding that an economy's exports are heavily exposed to a highly cyclic industry with idiosyncratic cycles might, on Gerlach's evidence, argue for inflation targeting.

Table 1: High-tech Exports of Asian Economies

	Share of economy's total exports to OECD countries									Percentage change in US imports during year to:	
	Per cent									Jun 2000	Feb 2001
	CN	HK	ID	KR	MY	PH	SG	TH	TW		
Computers ^(a)	6	7	2	13	19	22	54	16	28	8	-6
Telecommunications ^(b)	7	4	5	6	15	6	5	7	4	43	1
Components ^(c)	8	18	2	23	24	33	17	11	17	22	-2
Total	20	30	9	41	58	60	77	34	50	19	0

(a) SITC division 75: office machines and automatic data processing machines.

(b) SITC division 76: telecommunications and sound recording and reproducing apparatus and equipment.

(c) SITC division 77: electrical machinery, apparatus and appliances not elsewhere specified and electrical parts thereof.

Note: See Appendix C for a listing of country codes.

Source: BIS (2001, p 43)

12. Cargill and Ito (2001) argue that the last has fallen into an 'independence trap', in which it resists the (in their view, correct and efficacious) policy of inflation targeting only because of the seeming limitation on newly-won independence.

13. Given the shares in Table 1 and the openness of the east Asian economies, the estimates in the last column of Table 2 seem, if anything, low.

Table 2: Effect of Slowing Electronic Demand

	Value-added share of electronics Per cent	Effect on GDP of a 20 per cent reduction in electronics exports %
ID	20	-0.4
KR	50	-1.2
MY	35	-2.0
PH	20	-0.7
TH	25	-0.4

Source: Asian Development Bank (2001, p 23)

3.1.3 Inflation targeters' choices

The three Asian central banks that are explicitly targeting inflation have defined inflation in various ways and have set target ranges of varying widths (Table 3). All three exclude volatile or unpredictable elements, with Indonesia excluding the effect not only of government price hikes but also government incomes policies, while the elements excluded from the Korean and Thai consumer prices are variations on the more familiar food and energy themes.

Most of the target ranges have, in the event, been undershot or achieved. After experiencing lower than target inflation for the first three years of its inflation targeting, the Bank of Korea this year has cited inflation running above its 2001 target (resulting from depreciation of the won, higher oil prices and rises in public-sector tariffs) in lowering interest rates only 50 basis points thus far this year. The central bank has attempted to anchor expectations across the cycle to lessen the impact of one year's inflation outside the target range. In setting its target in 2000 of $2.5\% \pm 1\%$, 'it also established a mid-term inflation target of 2.5 per cent to maintain consistency in monetary policy and suppress inflationary expectations' (Bank of Korea 2001a, p 1). Strongly affected by political developments (Alamsyah *et al* 2000, p 237), the depreciation of the rupiah led to an overshoot of Bank Indonesia's first target in 2000. Thai inflation came in at the low end of the wide target range.

In all three cases, the shift to inflation targeting has been accompanied by increasingly explicit communication with the financial markets and parliament. In Indonesia, 'We have to announce the result of the Board monthly meeting. [Interest rates resulting from SBI auctions are announced weekly.] We have to provide a quarterly report to the parliament, which basically is a sort of inflation report, and we have to submit the annual report and announce the target of inflation to the public at the beginning of every year' (Iljas 2000). Nowadays the Bank of Korea announces

Table 3: Inflation Targeting in East Asia: Concepts, Targets and Outcomes
Per cent

Concept targeted	1998		1999		2000		2001
	Target	Actual	Target	Actual	Target	Actual	Target
ID							
Consumer price inflation excluding the effect of government price and incomes policy	na		na		3–5	5.93	4–6
KR							
Headline inflation, 1998–99; since then, consumer prices excluding petroleum and agricultural products other than cereals	9±1	6.9	3±1	0.8	2.5±1 ^(a)	1.8	3±1
TH							
Consumer price inflation excluding raw food and energy prices	na		na		0–3.5	0.7	0–3.5

(a) 2.5 per cent also announced as a medium and long-term target.

Note: See Appendix C for a listing of country codes.

Sources: Bank Indonesia (2001); Bank of Korea (2001b); Bank of Thailand (2000e, 2000f, 2001a, 2001b)

its policy rate just after its monthly meeting and the governor and other senior officials spend quite a bit of time in parliamentary testimony.

3.1.4 US and Asian interest rates

Before turning to a discussion of exchange rates, it is useful to compare interest rate movements in east Asia with those in the United States (Table 4). One test of monetary independence is whether east Asian economies did not match the Federal Reserve in its recent cycle of tightening and loosening, especially the tightening phase. China, Indonesia, Malaysia and Thailand did not even share the qualitative up-down pattern of the Federal Reserve's tightening and easing phases. Only the Philippines matched or more than matched the Federal Reserve, and political events exaggerated the seeming response. Korea, Singapore and Taiwan showed a very muted cycle compared to the United States. Even Hong Kong, while resembling US rates, did not match them. On this evidence, east Asia's monetary policy is not a trans-Pacific import.

Table 4: Changes in Policy Rates in the US and Asia

Percentage points

	US	CN	HK ^(a)	ID	KR	JP	MY	PH	SG ^(a)	TW	TH
Tightening phase	Up	Down	Up	Down	Up	Up	Down	Up	Up	Up	Down
May 99–Nov 00 ^(b)	1.75	1.53	0.52	12.00	0.50	0.25	0.20	5.00	1.00	0.25	0.25
Easing phase	Down	None	Down	Up	Down	Down	None	Down	Down	Down	Up
Dec 00–Jul 01 ^(c)	2.75	–	2.24	2.23	0.50	0.25	–	4.50	0.61	1.23	1.00
<i>Memo: nominal effective exchange rate</i>											
May 99–Nov 00	6.91	3.57	5.07	–13.90	1.26	17.30	3.72	–21.20	1.11	2.67	–12.70
Dec 00–Jul 01 ^(c)	4.57	4.20	4.56	–9.90	–1.56	–9.78	6.04	–2.11	0.55	0.35	2.25

(a) Three-month HIBOR/DIBOR, not a policy rate.

(b) The US Federal Reserve first raised the Federal Funds target rate in June 1999 and tightened in five further steps through to May 2000. The period used here is longer, reflecting the Federal Reserve's 'tightening bias' into November.

(c) Data as of 9 July.

Note: See Appendix C for a listing of country codes.

Sources: BIS calculations; national sources

3.2 Exchange rates

Discussion of post-crisis exchange rate policy in east Asia has given rise to controversy and misapprehension. The exceptions are China, Hong Kong and Malaysia, which have adopted widely acknowledged fixed-rate or quasi-fixed-rate regimes. Elsewhere, it has been claimed that the behaviour of exchange rates in east Asia has reverted to pre-crisis norms. The data do not support such claims (see Appendix A). A harder question is how to characterise the foreign exchange market intervention of east Asian economies, that is, going beyond the one-size-fits-all designation of a managed or dirty float.

3.2.1 China, Hong Kong and Malaysia

These three economies aligned their exchange rates more closely to the US dollar in 1999–2000 than they did in 1995–1996. Starting from very similar spot rate volatility against the dollar in the earlier period, the Chinese renminbi and Hong Kong dollar both became more stable (Table 5). Ironically, even though the policy commitment to dollar exchange rate stability was stronger in Hong Kong, the renminbi showed less movement against the dollar in the latter period. The volatility of the Malaysian ringgit against the US dollar, for its part, fell from a not inconsiderable level around 3 per cent to 0.

Against the background of widening of interest rate differentials in favour of the US dollar in the course of the Federal Reserve's last tightening cycle, the isolation of the Chinese and Malaysian money markets came under stress. The Chinese authorities allowed domestic banks to offer higher rates on US dollar and other foreign-currency accounts (McCauley and Mo 2000), and for a time China's official reserves grew very slowly notwithstanding reported surpluses on the current and direct investment accounts. Malaysia's reserves declined for much of 2000, albeit they remained at comfortable levels, again notwithstanding a wide current account surplus.

The conventional wisdom with regard to currency board systems is that, at best, interest rates can fall to match those obtaining in the base currency. In general, owing to lower creditworthiness or residual concern about the possibility of a breakdown in the peg, interest rates in the pegged economy offer a premium over those in the base currency. Developments in Hong Kong in 2000, however, did some puzzling damage to this view as money market rates there fell substantially below US dollar LIBOR. The 1-month HIBOR fell below LIBOR by over 100 basis points at times, and 1-year HIBOR (a very liquid node in the Hong Kong money and foreign exchange market) by as much as 40 basis points. Most commentary ascribes these relatively low interest rates to weak loan demand and/or the strength of capital inflows.¹⁴ Implicitly, these interpretations require a shortage of speculators (or nimble hedgers), that is, of corporations willing to switch US dollar debt into

14. Capital inflows were cited by the Hong Kong Monetary Authority (2001, p 42), in particular funds flowed strongly into China-related share offerings.

Table 5: Exchange Rate Volatility – 1995–1996 and 1999–2000
Annualised standard deviation of daily per cent changes

	Volatility against US dollar		Nominal effective exchange-rate volatility	
	1995–1996	1999–2000	1995–1996	1999–2000
AU	7.25	11.45	8.90	10.47
CN	0.42	0.06	3.83	3.69
HK	0.41	0.14	4.81	4.90
ID	2.66	23.40	6.56	23.60
KR	3.94	6.58	5.89	8.17
MY	2.83	0.00	4.91	4.48
NZ	6.86	13.16	5.68	10.78
PH	3.93	8.26	6.03	8.86
SG	3.90	4.13	5.27	5.67
TW	3.80	3.56	5.05	7.26
TH	1.77	7.92	4.57	8.52
BE	9.67	11.78	3.52	2.61
CA	4.98	6.36	5.30	6.69
CH	12.10	11.19	6.86	4.09
DE	10.01	11.78	5.10	3.90
FR	8.45	11.78	3.73	3.54
IT	8.91	11.78	9.20	3.14
JP	11.08	11.39	9.79	11.62
NL	9.97	11.78	4.05	2.97
SE	8.38	10.73	7.07	5.40
GB	6.77	8.15	5.53	7.21
US	na	na	5.15	5.40
XM	na	11.78	na	8.39

Note: See Appendix C for a listing of country codes.

Sources: BIS; Bloomberg

Hong Kong dollar debt, or of money-managers prepared to switch from large Hong Kong dollar deposits to US dollar deposits. At least one market economist discerned another influence, namely, that the Hong Kong authorities used degrees of freedom in the composition of the official balance sheet (purchases of US dollars on the strong side) to sustain lower Hong Kong dollar interest rates (Condon and Chan 2000; Condon 2000). It would not be hard to find a motive: while the US economy was threatening to overheat, the Hong Kong economy was gripped by deflation.

3.2.2 The Singapore dollar

As noted above, the authorities have guided the Singapore dollar's effective exchange rate as a means of keeping prices stable. Singapore's policy continuity is underscored by the observation that neither its bilateral nor its effective exchange rate volatility has changed substantially since the crisis. Recently, however, the MAS has outlined its approach to the public in a way that marks a break with the past. On 27 July 2000, a senior official at a media briefing on the release of the MAS *Annual Report* reported that the MAS had taken a 'neutral stance' toward the trade-weighted Singapore dollar in the previous year. In view of labour market tightening and higher world commodity prices the 'MAS is, therefore, prepared to allow a gradual and modest appreciation of the Sing dollar on a trade-weighted basis in the coming year'. This stance was re-affirmed in the *Monetary Policy Statement* in February 2001 (MAS 2001b). Market participants were left to infer the current target nominal effective exchange rate (the 'centre') and the margin of tolerance around it (the 'width of the band') from the behaviour of the exchange rate and perceived interventions, but they learned its slope, in qualitative terms at least, and that the market rate was in the upper half of the band. Under the circumstances, market participants might interpret gradual to mean something like 1–2 per cent per annum.¹⁵ In July 2001, market participants were surprised that the MAS openly switched to a neutral stance (i.e., a stable nominal effective exchange rate going forward), citing labour market softening, weaker global price pressures and the implications of collapsing non-oil domestic exports. The MAS also published its nominal effective exchange rate and characterised the market exchange rate *vis-à-vis* its target band (MAS Economics Department 2001, p ii), allowing market participants to make more progress on inferring the official basket weights and target band (Patterson, Chong and Eschweiler 2001).

3.2.3 The NT dollar

Falling between the economies experiencing lower or higher exchange-rate volatility is Taiwan. The New Taiwan dollar's bilateral US dollar volatility remained the same but its effective-exchange-rate volatility increased. This was in part a consequence of the greater US dollar volatility of its neighbours' currencies. There is evidence, however, of a change in policy in 2001 (see below).

3.2.4 The rupiah, won, peso and baht

Calvo and Reinhart (2000, p 27) claim: 'Indeed, once financial markets settled and capital flowed back into Asia, their currencies are fluctuating much the way they did prior to the crisis—that is to say, they are not fluctuating at all'. Similarly, McKinnon (2000) concludes that the east Asian dollar standard enjoyed a resurrection after the crisis and Ogawa (2001, p 32) looks at the baht, won and Singapore dollar

15. Baweja and Schymyck (2001) find 2.5 per cent as the trend (their estimated constant times 4).

and concludes that ‘some of the East Asian currencies have returned to de facto pegging of the home currencies to the U.S. dollar since late 1998’. By contrast, the MAS Economics Department (2000) measures exchange rate volatility against the dollar and concludes that ‘the declaration that there [is] greater flexibility in the three currencies [(namely, rupiah, won and baht) is] not “merely words but also deeds”’ (p 14). The data through end 2000 weigh in favour of the central bank economists in Southeast Asia, showing distinctly higher volatility for the currencies of Indonesia, Korea, the Philippines and Thailand. The higher volatility of these currencies holds whether the exchange rate is measured against the US dollar or in effective terms. Note, however, that the increase in effective-exchange-rate volatility is smaller than the increase in US dollar exchange-rate volatility. (See Appendix A for a more extensive treatment of the relationship between McKinnon’s conclusion and evidence.)

It is not safe, however, to conclude from this observation that policy is more accepting of exchange rate volatility. Neither Australia nor New Zealand has changed its exchange rate policy, and yet both of their exchange rates were more volatile in the latter period. Moreover, it could be, for instance in Indonesia, that the economy as a whole was more volatile in the latter period and thus any rise in foreign exchange volatility might simply reflect the underlying economy rather than policy. An approach that considers both exchange rate and interest rate volatility is required.

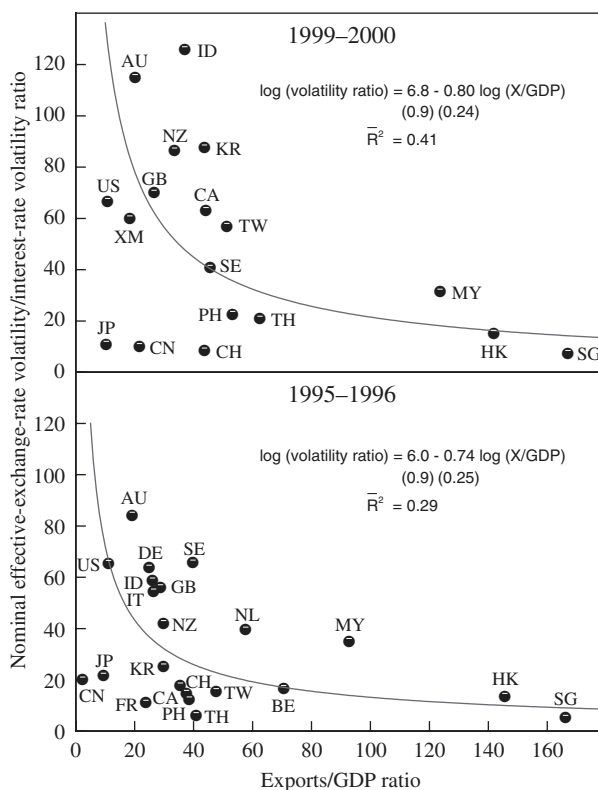
3.2.5 *The balance of interest rate and exchange rate volatility*

A more telling measure juxtaposes exchange-rate volatility and interest-rate volatility.¹⁶ Looking, then, at the ratio of exchange-rate to interest-rate volatility,¹⁷ the impression gained by a simple comparison of exchange-rate volatilities is largely confirmed (Figure 1 shows effective-exchange-rate volatility and Figure 2 shows

16. The present analysis does not follow some studies of the balance between interest- and exchange-rate volatility that include the volatility of foreign exchange reserves. The concept, that pressure on the currency can find expression in some combination of exchange rate intervention and interest rate movements, is sound enough. To measure intervention-related reserve changes, however, requires more than differencing a series in the *International Financial Statistics*. For one thing, variations in the US dollar/euro and US dollar/yen exchange rate introduce changes in reserve levels that are unrelated to intervention. Worse, not just interest receipts, but also draw-downs and repayments of loans, as well as government transactions, can move reserve levels in the absence of intervention. Of course, swap transactions can serve to maintain reserve levels in the presence of intervention.

17. In measuring interest-rate volatility, one faces a choice between two measures, each of which has limitations. One can look at *basis point volatility* or *yield volatility*. The former is constructed as the standard deviation of actual interest rate movements over some period (appropriately annualised); the latter as the standard deviation of percentage movements in interest rates over some period. The problem with basis point volatility is that it treats as the same a 25 basis point interest rate move when interest rates are 20 per cent or 1 per cent, yet interest rates tend, like inflation, to be more variable at higher levels. The problem with looking at interest rate movements in percentage terms, however, is that at very low rates, the same 25 basis points can be a large fraction. Thus, Japan’s short-term interest rates have shown outsized yield volatility in recent years. As in Borio and McCauley (1996), yield volatility serves as the focus here while the oddity of the measure for Japan must be borne in mind; figures based on basis point volatility can be found in Appendix B. One appealing feature in the present context is that exchange-rate volatility is measured in the same units of percentage changes as yield volatility.

Figure 1: Openness and Volatility of Nominal Effective Exchange Rate and Interest Rate



Notes: Interest rates are defined as 1-year household deposit rate for China; 3-month deposit rate for Korea, Singapore and Thailand; 1 and 3-month SBI rate for Indonesia for latter and earlier period respectively; 3-month T-bill rate for the Philippines; 3-month money-market rate for Taiwan and 3-month interbank rate for remaining countries.

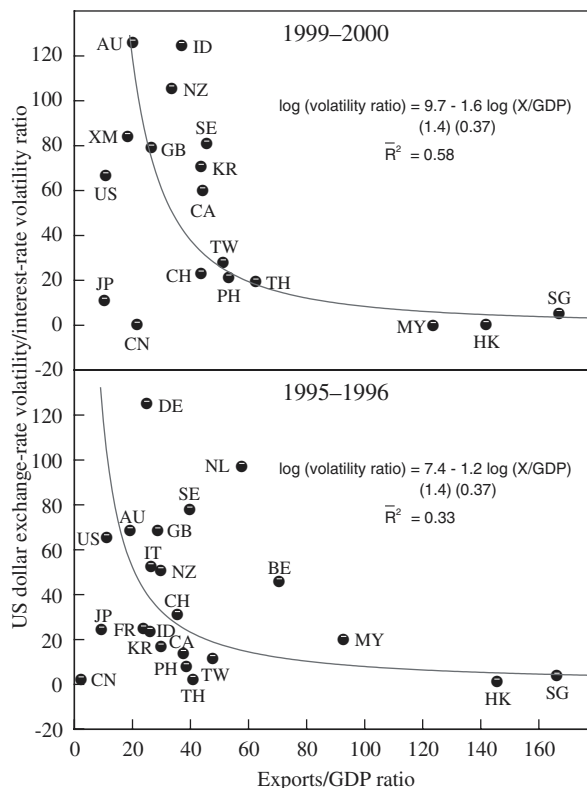
Interest-rate volatility measured as annualised standard deviation of daily percentage change in yield. Figures in parentheses are standard errors. Data for China and Japan are excluded from the plotted regressions.

See Appendix C for a listing of country codes.

bilateral exchange rate volatility against the US dollar). That is, exchange rates have become more volatile not only absolutely but also in relation to interest rates in Indonesia, Korea, the Philippines, Taiwan and Thailand. In addition, exchange-rate volatility has risen relative to interest-rate volatility marginally in Singapore and substantially in Taiwan.

What should be made of the observation that the relative volatility of the exchange rate for many emerging east Asian economies remains below that of many industrial economies? One answer is openness. With greater openness the exchange rate's effect on prices and activity increases in relation to that of interest rates. Indeed, the

Figure 2: Openness and Volatility of US Dollar Exchange Rate and Interest Rate



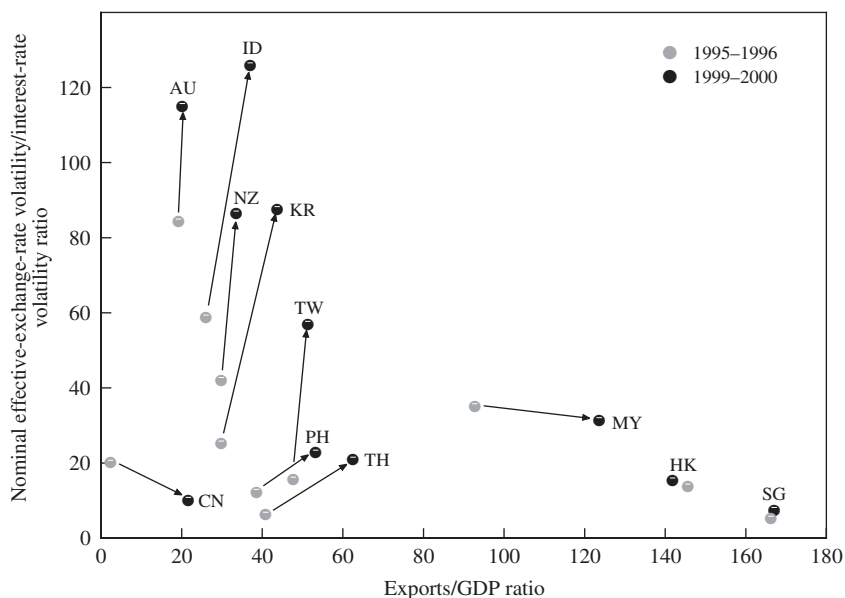
Note: See Figure 1.

more open the economy, the lower relative exchange-rate volatility. Viewed in this light, the similarities among Hong Kong, Malaysia and Singapore are more noticeable than their differences: these three super-open economies have chosen to stabilise their exchange rates in relation to their interest rates.

For the east Asian and Pacific economies, Figure 3 focuses on the change in the relative exchange-rate volatility between 1995-1996 and 1999-2000, using the effective exchange rate measure from Figure 1. The arrows for Indonesia, Korea, the Philippines, Thailand and Taiwan all point in the northeast direction. This indicates that the increase in relative exchange-rate volatility occurred *despite* the very considerable opening of the east Asian economies. (This opening reflects the unbalanced nature of the recovery since the crisis, with exports serving as the leading sector.)

The rise in relative exchange-rate volatility in Australia warns that a policy change need not underlie these observations: the exchange rate simply became more volatile in the latter period. In the case of the larger rise in relative exchange-rate

Figure 3: Ratio of Exchange Rate to Interest Rate Volatility
1995–1996 and 1999–2000



Note: See Figure 1.

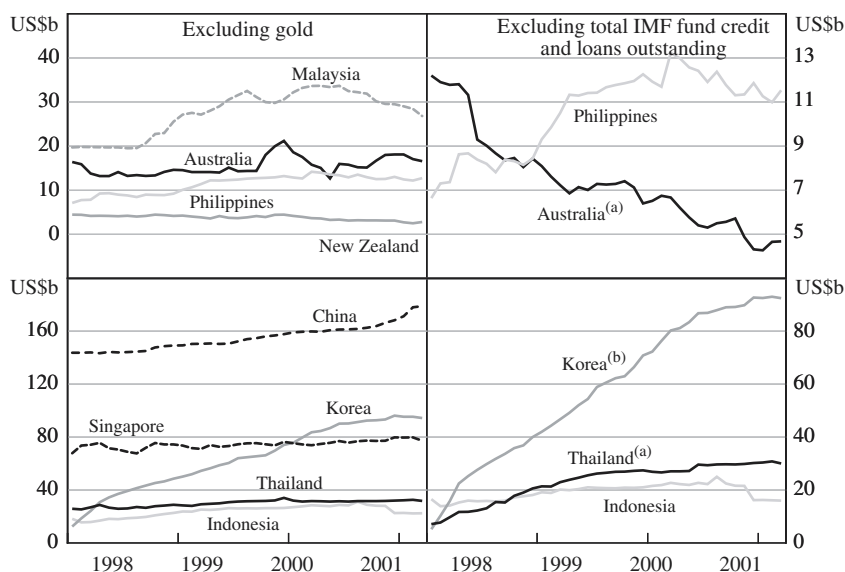
volatility in New Zealand, however, policy probably played a larger role. Adherence to a monetary conditions index setting in the earlier period meant that interest rate policy leaned against movements in the exchange rate. The adoption of the official cash rate regime has been associated with a small dampening of interest-rate volatility in the latter period but a substantial rise (even relative to Australia) in effective-exchange-rate volatility.¹⁸ In any case, it seems fair to conclude that policy-makers in east Asia have generally accepted more variable exchange rates since the crisis.

3.2.6 Styles of foreign exchange market intervention

Above, changes in the currency composition of the central bank's (or government's) balance sheet were characterised as a quarter of an instrument. Given this fractional weight, central banks in east Asia tend to be well-equipped with international reserves (Figure 4). Moreover, the composition of a central bank's balance sheet shows a higher weight on foreign assets, the greater the openness of the respective economy (Figure 5). Given the balance sheet size, central banks of the more open

18. Drew and Plantier (2000) find less interest rate smoothing in New Zealand as compared to Australia. But their measure of interest rates, namely quarterly averages, abstracts from much of the volatility in interest rates as measured here.

Figure 4: Total International Reserve Holdings of Central Bank
US\$ billion



(a) Also excluding net forward positions.

(b) Also excluding deposits in Korean banks.

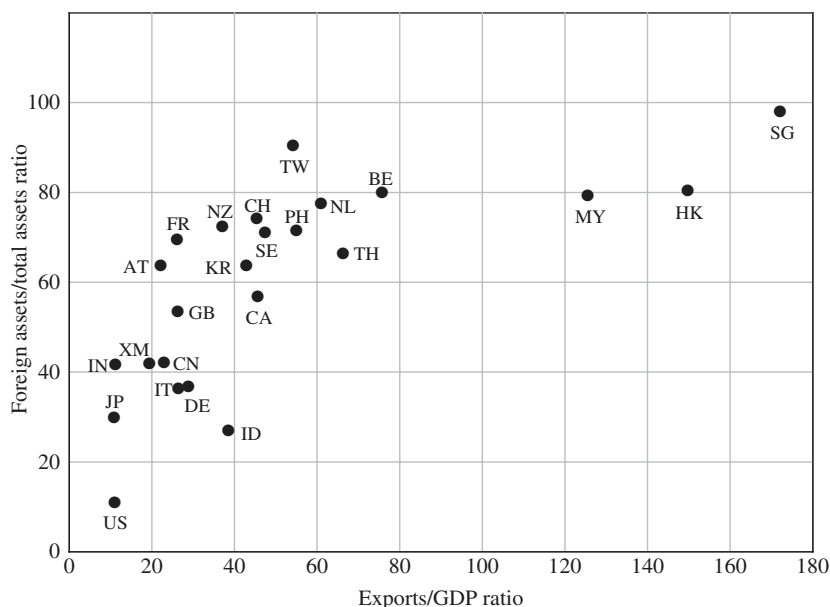
Sources: IMF, *International Financial Statistics*; national data

economies thus have considerable scope to shift their assets toward domestic currency, that is to intervene to support their currencies. In reality, the balance sheet size is not given, and the more open economies have accumulated reserves well in excess of their monetary bases, whereas the relatively closed economies of the United States, Euro area and Japan all have reserves smaller than their monetary bases (Borio and McCauley, forthcoming).¹⁹

At least three archetypal styles of intervention can be distinguished. One approach, associated with the Bank of Canada until 1995 (Stephenson 1995), consists of attempting to reduce daily or weekly volatility. The rationale could be that smaller movements would serve to deflect speculators to other markets where quicker returns are possible, and thus to reduce bandwagon effects. Such a style could see the central bank in the market on different sides within short periods. At the other extreme, a central bank may intervene only at the edges of exchange rate cycles of length not dissimilar to the business cycle and of amplitude of 25–30 per cent. This style of intervention might see a central bank on the same side of the market repeatedly, but lengthy periods would pass before any intervention on the other side

19. One operational result of international reserves in excess of the monetary base, it might be noted, is that the most frequent monetary policy operation in east Asia is to drain bank reserves in some fashion, whereas in the larger, more closed industrial economies the most frequent monetary policy operation injects bank reserves.

Figure 5: Economic Openness and Foreign Asset Holdings of Central Banks



Notes: Data for the individual Euro area countries are for 1998; for all other countries are the latest available.

See Appendix C for a listing of country codes.

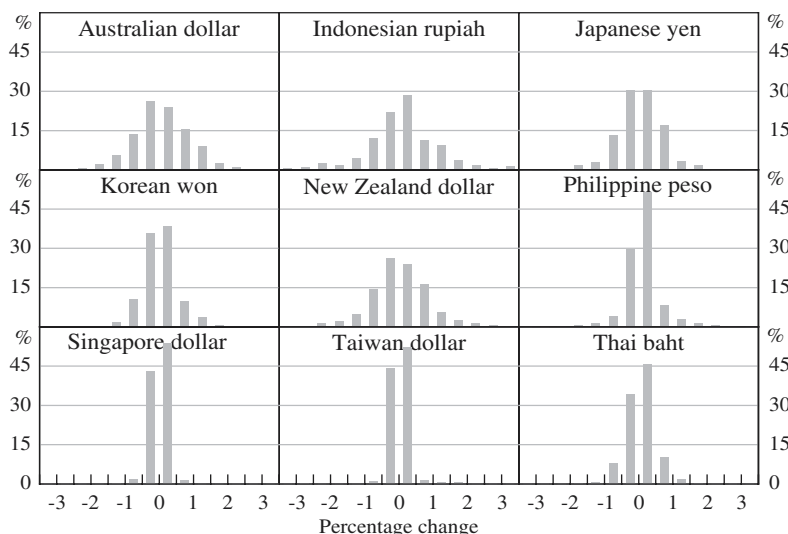
Sources: IMF, *International Financial Statistics*; national data

of the market. This has been the pattern in US dollar/mark–euro markets. In between these two styles is intervention at the edges of a band defined, say, as single-digit percentages away from a centre.

In east Asia and the Pacific, it is easy to identify some economies with these archetypes. Taiwan practices Canadian-style intervention, at times reportedly intervening on both sides of the exchange rate on the same day. As a result, the NT dollar shows few changes of absolute value over $\frac{1}{2}$ per cent (Figure 6). In the past three months, however, several single-day moves of about one NT dollar – roughly 3 per cent – may signal a change in approach. Changes in the Philippine peso exchange rate also fall in a narrow percentage range, although the approach may be less to limit volatility *per se* as to resist sharp downward moves in the peso, on the one side, and to rebuild expensive, borrowed reserves, on the other. Australia has in recent years at least intervened at the perceived extremes of broad swings in the exchange rate.

Korea presents greater difficulty of interpretation. Foreign exchange dealers actually staged a job action some while back to protest what they took to be unwholesome official censoring of daily volatility, suggesting a style akin to that of Taiwan. Korea's panel, however, shows an asymmetry not so evident in the case of

Figure 6: Frequency Distribution of Daily Percentage Changes in US Dollar Exchange Rates
January 2000–July 2001



Notes: All exchange rates expressed as units per US dollar; thus, positive percentage changes denote a depreciation against the US dollar.

Source: BIS

Taiwan, with larger depreciations than appreciations. Dooley *et al* (2001) prescribe an announced rule for intervention that can be interpreted as formalising elements of a policy already in existence. In particular, given a publicly announced intention to increase official reserves, Dooley *et al* would prescribe buying US dollars on minor won strength while refraining from intervention except in the case of very considerable won weakness. Such a policy would produce the asymmetry shown on the figure. Another interpretation, however, is that the Korean authorities were closer to the US dollar/euro style of intervention. That is, they attempted to prevent appreciation above 1100 won to the US dollar, but then let the won depreciate along with the yen to about 1300 before reportedly intervening to support the won. Since, by then, the pass-through of imported goods prices to consumer prices had raised the inflation rate above the target range, this policy could also be interpreted as the use of the government balance sheet (either intervention or debt management or both) to hit the inflation target.

In Thailand, there was a period of reserve building in the wake of the crisis. Then, until recently, the authorities apparently had generally refrained from intervention, though rumours in the press were frequent. When the baht came under pressure in October 1999, the chosen policy was a tightening of the enforcement of the limit on lending baht to banks offshore. As a result, the baht's volatility against the US dollar has been at the high end in east Asia.

3.2.7 Limitations on international capital flows

The experience of Latin America heavily influences the international discussion of monetary policy choices in emerging market economies. As a result, the use of restrictions on international capital flows to square the circle of independence in monetary policy and some control over the exchange rate is generally assumed away. Yet in east Asia, not only has the use of such restrictions not passed from the scene in major economies, but also it could be argued that on balance their use has increased since the Asian crisis.

East Asian authorities put limits on international capital flows in a variety of different ways. These include limitations on non-residents access to domestic currency assets and liabilities, restrictions on resident holdings of foreign-currency bank accounts held with the domestic banking system, required approval for foreign currency borrowing by the corporate sector, and constraints on portfolio flows into equity markets.²⁰ Table 6 profiles east Asian economies on these dimensions and in addition reports whether there is a non-deliverable forward market for the respective currency. In such a market, forward transactions are settled not by an exchange of US dollars against local currency but rather a net dollar payment is made depending on the difference between the agreed rate and the actual, prevailing exchange rate. The existence of such a market indicates the force of the restrictions on non-resident access to the domestic currency through the banking system, although the closeness of the arbitrage between offshore and onshore exchange rates (and thus interest rates) varies.

Particularly noteworthy are the limits on *non-resident access to domestic currency*. Since the crisis, such limits have been adopted not only in Malaysia, but also in Thailand, and more recently in Indonesia. ‘The Bank of Thailand imposed a new measure on 29 January 1998 that baht-denominated credit facilities provided by each financial institution to non-residents where there is no underlying trade or investment activities in Thailand, are subject to a maximum of B50 million [about US\$1 million] per counterparty. On 4 October 1999, the Bank of Thailand clarified that the term “per counterparty” refers to all transactions taken by the head office, branches, representative offices and all affiliated companies of a particular non-resident to be counted as one’ (Bank of Thailand 2000b). ‘Until this year, the IDR [Indonesian rupiah] was one of the freer currencies in the region but... earlier this year, the central bank made offshore to offshore transactions illegal which effectively shut down the offshore deliverable market’ (Leven 2001).²¹ Such restrictions have been tightened in China, the Philippines and Taiwan, and loosened only in Singapore and Korea. These restrictions suggest that the argument that non-resident short-sellers, including speculative accounts, have a role to play in the international financial system has little resonance in the region.

20. Restrictions on foreign direct investment are not discussed.

21. ‘However, there are still no restrictions on spot transactions... Transactions to hedge onshore investments (including portfolio) and trade flows are exempt from this limit providing that supporting documentation is filed with the central bank’ (Leven 2001, p 3).

Table 6: Limits on International Capital Flows in East Asia

	Non-deliverable offshore forward market for domestic currency	Limits on non-resident access to domestic-currency liabilities	Limits on foreign currency deposits in domestic banks	Limits on corporate borrowing in foreign currency	Limits on non-resident equity purchases
CN	Y	Y	N	Y	Y ^(a)
HK	N	N	N	N	N
ID	Y	Y	N	N	N
KR	Y	Y	N	N	N
MY	N	Y	N ^(b)	Y	N
PH	Y	Y	N	Y ^(c)	N
SG	N ^(d)	Y	N	N	N
TH	N	Y	Y	N	N
TW	Y	Y	N	Y ^(e)	Y

(a) Non-residents not allowed to buy A-shares listed in Shanghai and Shenzhen but are allowed to buy B-shares.

(b) Only corporate accounts permitted.

(c) Registration of foreign loans with the Bangko Sentral ng Pilipinas is necessary only in order to obtain foreign exchange from the central bank.

(d) Borrowing of Singapore dollars to buy Singaporean equities, bonds and real estate now permitted; offshore issuers of Singapore dollar bonds without local need for the funds are required to swap the proceeds into foreign currency.

(e) Taiwanese corporations are allowed to borrow foreign currency freely but not to exchange the proceeds for New Taiwan dollars.

Note: See Appendix C for a listing of country codes.

Sources: Leven (2001); national sources.

At the same time, economies that restrict *corporations' borrowing in foreign currency* (and thus to set up speculative long positions in domestic currency) were not persuaded by the experience of the Asian crisis to abandon their constraints. The restrictions take at least two forms. In China, Malaysia and the Philippines, firms must seek approval before borrowing in foreign currency, although there were clearly cases of evasion of this requirement in both China and the Philippines. In Taiwan, firms can borrow freely in foreign currency, but are restricted from converting the proceeds into New Taiwan dollars to fund domestic assets.

If restrictions on non-residents' access to domestic currency are common, domestic depositors in east Asia enjoy remarkable freedom to place their savings in domestic banks in *foreign currency accounts*. Foreign currency banking is common in economies like the Philippines and Indonesia with chronic high inflation by regional standards. In addition, low domestic interest rates resulting from low or no inflation have led to a build-up of foreign currency deposits in economies with

restrictions on the scope of foreign investment, namely China and Taiwan.²² Taiwan's limits on remittances by residents, \$5 million a year for individuals and \$20 million a year for firms, have allowed, at times, rapid shifts from NT dollars to domestic foreign currency accounts. In Thailand, by contrast, individuals or firms cannot open foreign currency accounts without underlying overseas cash flows.

Foreign investors also enjoy considerable freedom across east Asia *to buy and sell equities*. Malaysia abandoned the last of its holding-period based capital gains taxes in the last budget. Taiwan restricts investment from abroad to the larger global 'real money' investors but has enlarged the ambit of qualifying foreign investors in a bid to attract more funds into its NASDAQ-related market. While China prohibits foreign investment in its A-share markets in Shanghai and Shenzhen, valuations are so high that the pressure is from the other side, that is, domestic investors buying into lower-rated B-shares (permitted earlier this year) and into offshore issues of Chinese and China-related firms (not permitted). Foreign portfolio investors' desire at times to hold onto shares but to hedge currency risk results in some of the largest flows in the non-deliverable forward market for the Korean won and New Taiwan dollar.

Three strands of evidence shed light on the effectiveness of limits on non-resident access to local currencies and on domestic corporations borrowing in foreign currency. The general view is that controls on capital outflows 'tend to lose their effectiveness and efficiency over time' and that 'capital inflow controls may for a time be useful in enabling a country to run an independent monetary policy...but their long-term effectiveness to those ends is doubtful' (Fischer 2001). The present evidence cannot test these assertions but rather can indicate whether, at a point in time, the limits seemed to have the intended effect.

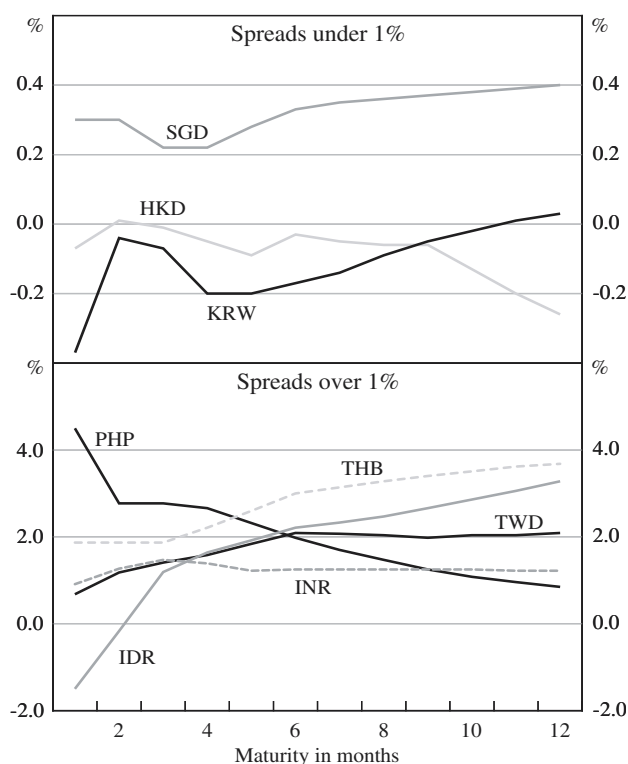
Regarding capital outflows by residents, the considerable gap that opened up during the Federal Reserve's tightening cycle and domestic interest rates in China and Malaysia in the 2–3 per cent range strongly argues for the effectiveness of restrictions on capital flows. This conclusion holds even after acknowledging the substantial capital outflows from both economies, which seems to have abated with the lowering of US dollar money rates this year (Aziz 2001).

Regarding limits on foreign access to domestic currency, one classic indicator for the effectiveness of capital controls is offshore rates above domestic yields. Figure 7, bottom panel, shows that offshore yields on the Philippine peso, New Taiwan dollar and Thai baht were all substantially above their onshore counterparts right across the maturity spectrum, suggesting some success in limiting the access of non-residents to those currencies. Indonesia had not yet banned offshore trading in the rupiah, so there was no consistent sign to the offshore-onshore interest rate differential. It should also be noted that these spreads are quite variable. The top panel shows that Hong Kong dollar differentials are very narrow²³, and the

22. See McCauley and Mo (2000) and Fung and McCauley (2001).

23. The lower rates offshore for the Hong Kong dollar at the 1-year maturity probably reflects credit differences between the average quality of the panel of banks constituting HIBOR and JP Morgan's offshore Hong Kong dollar rate.

Figure 7: Asian Offshore-Onshore Interest Rate Differentials
As of September 1999



Source: Leven (1999)

Singapore spreads, modest. In Korea, since the reforms of April 1999, 'the ability for onshore investors to arbitrage the two markets [onshore deliverable and offshore non-deliverable] keeps offshore interest rates close to onshore levels' (Leven 2001, p 4). Owing to asymmetries in the permitted arbitrage, Korean offshore yields generally trade below onshore yields.

Another piece of evidence on the restrictions on foreign-currency borrowing by the corporate sector can be seen in the relationship between BIS-reporting bank loans extended to non-banks and domestic credit on the eve of the crisis. The economies with restrictions (China, India, Malaysia, Philippines and Taiwan) had an average ratio of offshore-to-onshore credit of just 4.6 per cent, while Australia, Hong Kong, Indonesia, Japan, Korea, Macau SAR, New Zealand, Singapore and Thailand averaged over twice that percentage (Table 7).²⁴ This contrast suggests that the various restrictions on foreign currency borrowing were effective. Since the trauma

24. The measure is not perfect since it does not capture foreign currency lending booked domestically. Such lending was large in Thailand.

Table 7: Credit Booked by Domestic and Offshore Banks in Asia and the Pacific
June 1997

Credit to non-banks located in:	Booked by domestic banks	Booked by offshore banks	Percentage offshore
	US\$bn	US\$bn	
Australia	338.3	22.8	6.7
China	878.8	18.8	2.1
Hong Kong SAR	279.3	25.6	9.2
India	189.0	11.2	5.9
Indonesia	129.4	37.4	28.9
Japan	5 785.4	327.9	5.7
Korea	309.6	26.2	8.5
Macau SAR	17.5	0.7	4.0
Malaysia	124.7	7.4	5.9
New Zealand	67.7	5.2	7.7
Philippines	59.7	5.1	8.5
Singapore	66.2	8.3	12.5
Taiwan	453.4	3.2	0.7
Thailand	201.5	13.3	6.6
Average			8.1
Average of China, India, Malaysia, Philippines, and Taiwan			4.6
Average of others			9.9

Sources: BIS, *BIS Quarterly Review: International Banking and Financial Market Developments*, Table 6B; IMF, *International Financial Statistics*

of the crisis and with much lower domestic interest rates, these restrictions may not be binding today.

4. Central Bank Independence in East Asia

That central banks need clear goals and the ability to use its instruments to achieve them is a widely held view. Some difference of opinion concerns whether central banks should be at liberty to assign themselves goals, or should only have the right and responsibility to pursue goals set by a finance minister or legislature (Debelle and Fischer 1994).

Several dimensions of central bank independence warrant attention. The first is *legal* independence. Studies of central banking found that, among industrial

economies, legal independence was associated with lower inflation. The lack of association between measures of legal independence and inflation elsewhere, however, led to a focus on *behavioural* proxies for independence. Finally, some attention should be paid to *balance sheet* (or possibly income) independence.

4.1 Legal independence

Taking at face value the first study of central bank legal independence and inflation that covered Asia, one confronts an immediate problem. While among industrial economies (Figure 8), legal independence was associated with lower inflation (Grilli, Maciandaro and Tabellini 1991), a broad study of the matter for the rest of the world found no such association (Figure 9). Looking at Asia alone, there is not much association either (Table 8).²⁵ There are several ways to look at this finding. One is to distrust the measures of independence for emerging economies and thus to imagine that better measures would confirm the result found for industrial countries. Another way to look at the lack of a relation is that the measures of independence used for industrial economies were generated in full knowledge of the inflation outcomes to be explained. If the same measures fail in another sample of countries, perhaps they were too fine-tuned ('overfitted') in the first instance.²⁶

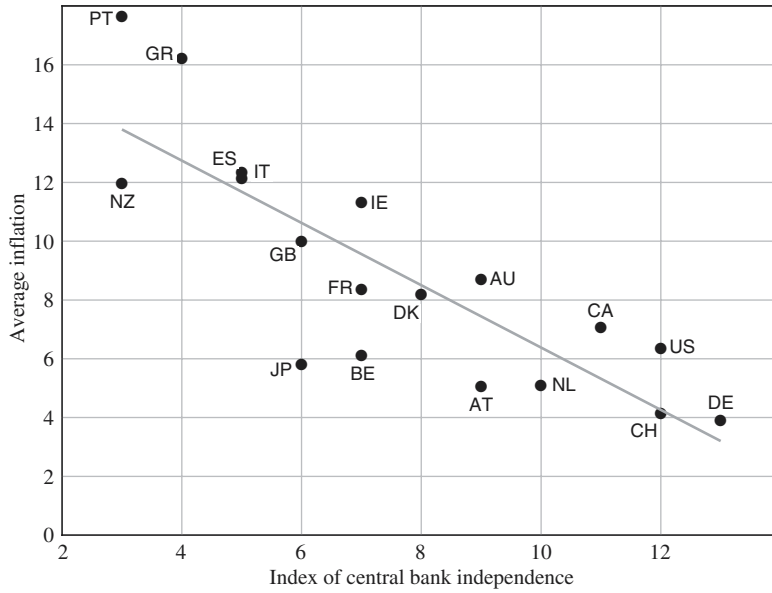
Historically, the legal position of Asian central banks was not strong according to Cukierman (1992). His overall median reading for central bank independence in the 1980s was 0.33, so most of the listed east Asian and Pacific central banks suffered legal independence at less than the median level. It is interesting, however, that 4 of the 6 Asian–Pacific central banks in the 1980s with legal independence below the median on Cukierman's measure have since gained independence, starting with New Zealand. (On the evidence of Table 8 at least, the adoption of explicit inflation targeting is related to past inflation.)

In the wake of the Asian crisis, the Korean and Indonesian central banks gained legal independence. In the case of the Bank of Korea, the 'fully revised Bank of Korea Act of 1997...establish[ed] the neutrality and autonomy of monetary policy, with price stability declared as the sole objective of the Bank of Korea' (Oh 2000, p 190). Similarly, in June 1997 the Japanese Diet passed a new *Bank of Japan Law*, establishing its independence as of April 1998. A new independent Policy Board would set monetary policy in an open manner.

25. Cukierman's measure (1992, pp 373–376) of legal independence includes the aspects of the governor's appointment (term, who appoints, dismissal, restrictions on other jobs), policy formulation (who sets, government involvement, central bank involvement in budget process), clarity of central bank objective(s) and central bank lending policy (limits, decision-making, counterparties, maturity, interest rates, prohibition on direct funding of government).

26. Another is to suspect that openness, which as noted above may tend to lead to lower inflation, needs to be taken into account ('partialed out') in order for the data to line up in a way that permits the interpretation that independence leads to lower inflation.

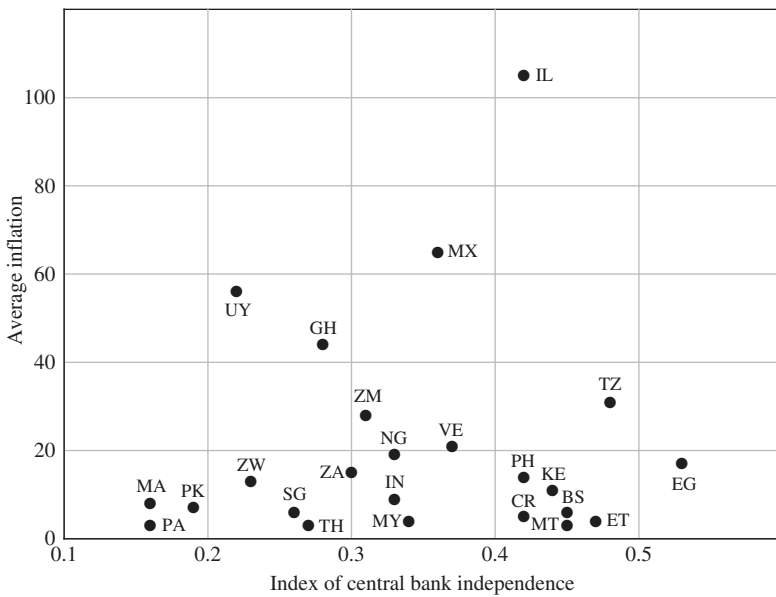
Figure 8: Central Bank Independence and Inflation in the 1980s
Industrial countries



Note: See Appendix C for a listing of country codes.

Source: Grilli *et al* (1991)

Figure 9: Central Bank Independence and Inflation in the 1980s
Selected developing countries



Note: See Appendix C for a listing of country codes.

Source: Cukierman (1992)

Table 8: Legal Independence and Inflation in the 1980s

	Legal independence 1 = maximum	Average yearly inflation %
Philippines	0.42	14
Malaysia	0.34	4
Indonesia	0.32	10
Singapore	0.27	3
New Zealand	0.27	12
Thailand	0.26	6
Korea	0.23	8
Japan	0.16	3

Source: Cukierman (1992, p 381)

The 1999 *Central Bank Act* for Indonesia, replacing 1968 legislation, mandated a single objective for Bank Indonesia to maintain the stability of the value of the rupiah, made Bank Indonesia an independent body and put in place accountability and transparency requirements, to be achieved in part through disclosure. ‘To reduce monetary leakages, Bank Indonesia was prohibited from extending credit to the government and subsidized credit programs were transferred to state-owned institutions appointed by the government...Based on the same law, Bank Indonesia is only allowed to extend loans to banks that are facing short-term liquidity problem (maturity mismatch), and even then, only if certain strict requirements are met’ (Bank Indonesia 2000, p 5). A year later, however, ‘implementation of Act Number 23 of 1999 on Bank Indonesia...has appeared to be not as smooth as expected, particularly with regard to the issue of central bank independence. The problem intensified toward the end of the year following a [government] proposal to amend the Bank Indonesia Act²⁷, even though it had been in place for less than two years. The emergence of this issue also absorbed a good deal of Bank Indonesia’s attention and resources during 2000’ (Bank Indonesia 2000, p viii).

Legislation to grant the Bank of Thailand independence was introduced in the previous Thai parliament but not passed. That left Chapter 3, Section 19 of the *Bank of Thailand Act B.E. 2485*: ‘The Governor and the Deputy-Governor shall be appointed or removed from office by the Crown upon the recommendation of the Cabinet’.

27. Including ‘article 48 regarding the replacement of the members of Bank Indonesia’s Board of Governors’ (Bank Indonesia 2001, p 19).

4.2 Behavioural independence

Perhaps the original approach to the study of central bank power suffered from an excess of legalism and gave too little weight to practice and personalities. In any case, it set off a search for behavioural measures of independence that would capture practice. Cukierman (1992) found that turnover of the head of the central bank correlated better with inflation outcomes than did the legal measures. Of course, this measure is far from perfect. On the one hand, a rubber stamp for the finance ministry may enjoy a long tenure; on the other hand, for example, G William Miller's departure from the Federal Reserve in favour of Paul Volcker almost surely helped lower US inflation. The association of governor turnover and inflation, however, derived its strength from cases in which the turnover was above 0.25 (an average term of less than four years). In Cukierman's Asian-Pacific sample, only two countries come in with turnover above this figure, so perhaps there should be no surprise that there is, if anything, a negative association between governor turnover and inflation (Table 9).²⁸

Table 9: Central Bank Governor Turnover 1950–89 and Inflation in the 1980s

	Average number of governor changes per year	Average yearly inflation %
Philippines	0.13	14
Malaysia	0.13	4
New Zealand	0.15	12
Indonesia	0.20	10
Thailand	0.20	6
Japan	0.20	3
Singapore	0.37	3
Korea	0.43	8

Sources: Cukierman (1992, p 381); Cukierman and Webb (1995, p 418) for Indonesia

Cukierman and Webb (1995) proceeded to define and measure the political vulnerability of central banks. The insight was that it was not simply a short tenure for the governor that might undermine a central bank's pursuit of the long-term goal of low inflation as against today's political expediency. In addition, they argue that if a new national leader can and does change the governor of the central bank shortly after coming into power, this might be particularly prejudicial to price stability. 'Frequent removal from office of the bank's governor following political transitions probably reflects gross political influence, because the governor's term in office is

28. Above the 0.25 threshold, the association has the right sign, with Singapore showing lower turnover and inflation than Korea.

not shielded by law or custom from political changes' (Cukierman and Webb 1995, p 400). They find that the higher the political vulnerability, the higher the inflation.²⁹

Again, the empirical relevance of this work for Asia and the Pacific does not appear all that strong (Table 10). Perhaps, however, the argument should not be dismissed, given the global, if not the regional experience. The record summarised on Table 10 helps puts some recent events in east Asia into perspective. The effort of the Indonesian head of state and the decision by the new Thai government to change governors both had precedents in the respective post-war histories through the 1980s. In the case of the Philippines, the mooted replacement of the governor by a new president would have been quite at variance with the Philippines' post-war record. Cukierman and Webb would suggest at the margin that the tenure of the two governors bode well for lower inflation. Whether the argument can be extended to the recent replacement of the Thai governor is difficult to say. The turnover at the central bank was followed by a raising of interest rates – an action quite at variance with the theoretical presumptions regarding a new government's interest in turnover at the central bank.

29. A window of six months after a political transition was selected to maximise the explanatory power of this variable in regression analysis of inflation across countries.

Table 10: Political Vulnerability of Central Banks in East Asia and the Pacific

		Vulnerability	Number of political transitions	Number of central bank turnovers	Number of central bank turnovers within 6 months of political transition
AU	1950–71	0.333	3	1	1
	1972–89	0.000	3	3	0
CN	1950–71	–	–	–	–
	1972–89	0.500	2	4	1
ID	1950–71	1.000	1	5	1
	1972–89	–	0	0	0
JP	1950–71	0.200	5	4	1
	1972–89	0.222	9	4	2
KR	1950–71	na	0	2	0
	1972–89	0.667	3	6	2
MY	1950–71	0.000	3	0	0
	1972–89	0.000	2	2	0
NZ	1950–71	0.250	4	2	1
	1972–89	0.000	5	4	0
PH	1950–71	0.000	4	3	0
	1972–89	0.000	2	2	0
SG	1950–71	na	0	1	0
	1972–89	na	0	6	0
TH	1950–71	0.250	4	4	1
	1972–89	0.111	9	3	1
TW	1950–71	0.000	3	2	0
	1972–89	0.500	4	2	2

Notes: – denotes not available. ‘Vulnerability is not available when data on either the number of political transitions or the number of central bank turnovers are not available’ (Cukierman and Webb 1995). Indonesia, for 1972–89, appears mislabelled and should be na.

na denotes not applicable. Political vulnerability defined as number of central bank turnovers within 6 months of a political transition divided by the number of political transitions (i.e., the last column divided by the third column).

See Appendix C for a listing of country codes.

Source: Cukierman and Webb (1995, pp 417–419)

4.3 Balance sheet independence

Events during the Asian crisis left a mark on the balance sheets of the central banks of Indonesia, Korea, Malaysia and Thailand. An extreme parallel is offered by the Philippines, where the debt crisis of the 1980s left the central bank insolvent (Cuisia 1992; Zialcita 1993). The 1993 *New Central Bank Act* attempts to prevent a recurrence.

The balance-sheet aftermath of crisis can, at the limit, impair the capital and weaken the income of the central bank, and thereby hurt its credibility in the market place and make it dependent on appropriations. The principle is important even when none of these results follow. For instance, in the case of the run on, and subsequent effective takeover of, Continental Illinois by the Federal Deposit Insurance Corporation in 1984, the Federal Reserve's discount window advance to the bank remained outstanding for years. In the view of some observers, in allowing the discount window advance to remain outstanding for so long, the Federal Reserve was inappropriately lending to the solvency-support agency, the FDIC. Even if the Fed's monetary operations were in no way impaired by this arrangement, the principle of no Federal Reserve funding of the government was arguably frayed.

It is by no means surprising that, in system-wide financial crises, central bank balance sheets in Indonesia, Korea, Malaysia and in effect Thailand took some hits. The hope must be that these hits prove temporary, and generally there are grounds for hope. Last year the Indonesian government took responsibility for losses related to Bank Indonesia loans to insolvent banks during the crisis. In Korea, the central bank has received substantial repayments over the past two years on various crisis-related credits. In Malaysia, a bank recapitalisation fund owned by the central bank has recovered the bulk of the funds advanced to banks.

In the case of Bank Indonesia, three years after the onset of the crisis, the central bank and government were still arguing about the distribution of losses, mostly from funds advanced to Suharto-related banks.³⁰ Bank Indonesia had made discount window advances to insolvent banks in the amount of Rp144.5 trillion (about US\$13 billion at the current exchange rate) in late 1997 and early 1998. These advances had been transferred from Bank Indonesia to the government in return for government bonds, but the government had threatened to withdraw these bonds in view of questions about the circumstances under which these advances had been made and the uses to which the funds had been put. A Parliamentary committee accepted Bank Indonesia's view that the advances had been government policy and that in any case the government was responsible for Bank Indonesia's solvency. Late last year, Bank Indonesia and the government agreed to share this burden approximately $\frac{1}{6}$ – $\frac{5}{6}$. Bank Indonesia transferred notes to the government in the amount of Rp24.5 trillion, the terms of which matched the government bonds. Notwithstanding recording this amount as an extraordinary loss, Bank Indonesia

30. This account relies on Bank Indonesia (2001, pp 16-17). There is also a much smaller issue regarding Bank Indonesia's divestment of its equity stakes in banks and non-bank financial institutions (Bank Indonesia 2001, p 18)

reported a profit in 2000. This resolution did not signal an improvement in relations between the central bank and the government: three days after the agreement was reached, the government proposed amendments to the central bank law to the parliament, as discussed above.

The Bank of Korea has worked half its way out of the balance sheet implications of the crisis. In 1999, 6.2 trillion won was repaid by the Financial Market Stabilisation Fund (Bank of Korea 2001b, p 37). In 2000, Korea First Bank, which had been taken over by the government in the crisis but was successfully divested to a foreign partnership, repaid a 1 trillion won loan. These repayments left 7.4 trillion won aggregate ceiling credits, which, 'following the currency crisis of 1997, ... had come to be used as a means of easing the corporate credit crunch, making it difficult for the central bank's lending system to perform its original inherent function' (Bank of Korea 2001b, p 28).³¹

Acting in pre-emptive fashion, Bank Negara Malaysia in August 1998 set up an agency known as Danamodal to fortify the capital positions of Malaysian banking institutions adversely affected by a weakening economy and falling asset prices. In the event, Danamodal injected 7.6 billion ringgit (US\$2 billion) of cash into 10 banks in exchange for subordinated capital instruments convertible into preferred shares, subordinated debt and ordinary shares. The impact on Bank Negara's balance sheet was minimised by its making a modest equity investment of 3 billion ringgit (less than US\$1 billion) and Danamodal's issuing 11 billion ringgit (US\$3 billion) zero-coupon bonds (Danamodal 2001b). By the end of January 2001, the bulk of the investments actually made had been redeemed by seven of the beneficiary banks, with a number of redemptions related to the consolidation of the Malaysian banking system (Danamodal 2001a). Whether or not Bank Negara's equity investment has at this stage been reduced, the fact that most of Danamodal's investments into banks have been repaid implies that the central bank is more than half-way to undoing the effect of the crisis on its own balance sheet and contingent liabilities.

The Bank of Thailand's monetary policy-making does not necessarily benefit from its management and partial funding of a bank bail out agency, albeit a legally separate one. The Financial Institutions Development Fund (FIDF) was founded in the mid 1980s to permit the Bank of Thailand 'to relax BOT limitation[s] in implementing financial-support measures for rehabilitation and development of the

31. This crisis-related expanded use of the aggregate ceiling credits undid some of the progress made since March 1994, when the Bank of Korea revised its lending facilities. Kim and Kim (1999, p 130) note that 'since the currency crisis in late 1997, the aggregate credit ceiling has been raised twice [and at least once more] owing to the extreme difficulties faced by SMEs in accessing loans from financial institutions because of the severe credit crunch associated with financial sector restructuring. More specifically, the ceiling was raised from 3.6 trillion won to 4.6 trillion won with effect from mid-December 1997 and to 5.6 trillion won with effect from March 1998. Furthermore, no significant progress has been made so far in the area of flexible adjustment of the discount rate in accordance with the movement of market interest rates. Since a considerable share of loans through the discount window are still directed at SMEs, the discount rate has remained at 5 % [3 per cent in 2000]. 'The Bank of Korea increased the Aggregate Credit Ceiling by 2 trillion won (7.6 trillion won to 9.6 trillion won) as of January 2001 to alleviate the funding difficulties of small and medium sized enterprises (SMEs) in the course of restructuring' (Bank of Korea 2001a, pp 4-5).

financial institutions to maintain stability in the system...[In particular, the] FIDF can purchase and lend to illiquid financial institution[s] against many kind[s] of collateral other than required by BOT' and 'can own a stake in a troubled financial institution and take control over the management' (Bank of Thailand 2000a, 2000c, 2000d). It became 'majority creditor to the closed-down financial institutions such as the Bangkok Bank of Commerce...[and] the 56 financial institutions [finance companies] under the supervision of the FRA' (Bank of Thailand 2000g). The fund showed negative equity of 202 billion baht (about US\$4 billion) at end 2000, even though it enjoys a guarantee of the Ministry of Finance on its borrowing. Guarantees, of course, tend to be better budgetary politics than public policy, given the added expense of the market's treatment of guarantees as opposed to 'full faith and credit' debt and the damage to the bond market of splitting government debt (McCauley and Remolona 2000).

Running and funding the FIDF affects the development of the Bank of Thailand's operations as well. The FIDF gets the bulk of its funds through the repurchase market, where the Bank of Thailand does most of its operations. At present, the Bank of Thailand is a counterparty on all transactions in the repo market. The development of a broader market in which private parties transact directly with each other would help widen the effect of Bank of Thailand operations. But the doubtful capacity of the FIDF to fund itself without the Bank of Thailand fronting for it has not promoted this development. So the central bank's involvement with a bank bail-out fund affects the clarity of the country's fiscal accounts and the central bank's mission, and also the development of bond and money markets.

5. Conclusions

Most central banks in east Asia focus on price stability. Given the openness of some east Asian economies, however, this focus entails quite a bit of attention to the exchange rate. In the case of extremely open Singapore, the effective exchange rate serves as an operating target of a monetary policy geared to price stability, in much the same way as the nominal interest rate is managed elsewhere to achieve price stability. The economies hardest hit by the crisis, and not the most open ones by regional standards, have adopted explicit inflation targeting and the Philippines is on the road to joining them. Two of the three economies with fixed exchange rates, China and Malaysia, have effective enough capital controls to permit them an independent interest rate policy. Only Hong Kong can be said to have chosen exchange rate stability and open capital markets over price stability.

Contrary to some readings of the evidence, east Asian economies have not generally fallen back into managing their currencies tightly against the dollar. Comparing the ratio of exchange rate to interest rate volatility before and after the crisis, Indonesia, Korea, the Philippines, Taiwan and Thailand all show much more exchange rate flexibility. This development came against the background of the substantial increase in the openness of economies in the region, which tends to work against exchange rate volatility. There remains in the region a capacity, in terms of reserve levels, and a willingness to use foreign exchange intervention to affect the

exchange rate and several styles of intervention can be discerned. There is also a willingness to use restrictions on financial transactions with non-residents as a means to limit exchange rate volatility. These restrictions seem able to drive a wedge between onshore and offshore interest rates, at least for a time.

Do central banks in east Asia enjoy sufficient independence to be held responsible for achieving their goals? Milestones in central bank independence in the region include 1993 in the Philippines, 1997–1998 in Korea and Japan, and 1999 in Indonesia. Any answer must acknowledge that the east Asian evidence has contributed *very little support* for several propositions linking central bank independence and inflation: more legal independence results in lower inflation; less turnover at the governor level leads to lower inflation; and more job security for governors during political transitions leads to lower inflation. More attention should be paid to the balance-sheet independence of central banks. Here there is clear progress in Indonesia, Korea and Malaysia since the crisis in extinguishing central bank credit extended to banks.

Appendix A: McKinnon and East Asian Foreign Exchange Policies

This appendix reconciles the findings of McKinnon (2000) with the conclusion drawn above regarding exchange rate policies since the Asian crisis. There is a sharp divergence between McKinnon's interpretation of his regression analysis, that east Asia returned after the crisis to pegging against the US dollar, and the above interpretation of bilateral exchange-rate volatility, that in 1999–2000 the Korean won, Philippine peso and Thai baht fluctuated substantially more against the US dollar than they had before the crisis.

It is helpful to distinguish two different features of exchange rate behaviour at the outset. One feature is *bloc membership*, or the behaviour of a currency in the face of movements of major currencies. In particular, when the Deutsche mark/euro moves by 1 per cent against the US dollar, does a given currency move on average in the same direction by a half a per cent or more? In this case of high sensitivity, it may be said to be in the euro bloc. Or does the given currency's dollar exchange rate not show much sensitivity to movements in the euro, in which case it may be said to be in the dollar bloc. Similarly, one can distinguish currencies in the dollar versus the yen bloc by estimating such sensitivities by regression analysis. Such analysis shows that, with episodic exceptions, the Australian dollar has traded in the dollar bloc in its floating period. Indeed, it has often shown a tendency to appreciate against the US dollar when the latter was appreciating against the Deutsche mark/euro and to depreciate against the US dollar when the latter was depreciating (a 'super-dollar' (BIS 1996, p 109)). Work that has analysed currencies as trading in the Deutsche mark/euro, yen and dollar blocs includes Brown (1979), Frankel and Wei (1994), Bénassy-Quéré (1996), McCauley (1997, 1999 (see map on p 102)), Galati (1998), Galati and McCauley (1998) and Galati (2001). The last analyses these sensitivities and shows them to be related to trade patterns, among other factors.

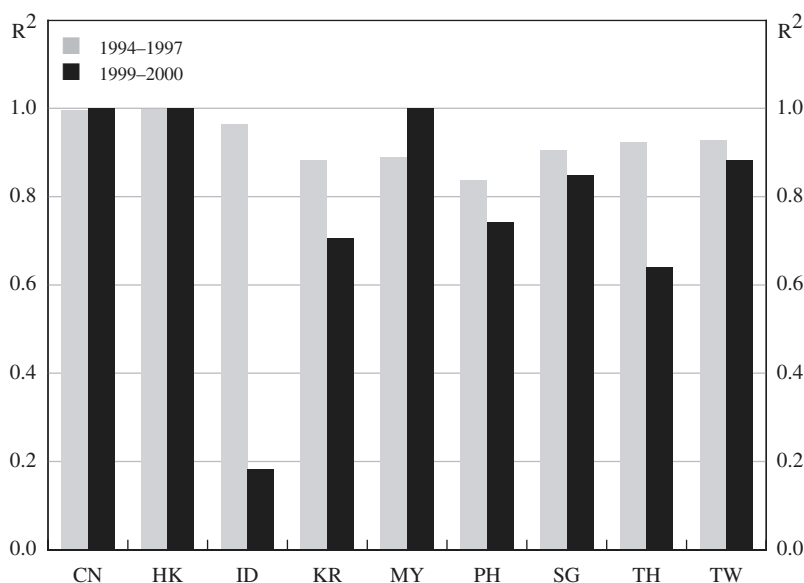
A different concept is *de facto pegging*. A currency could be said to be *de facto* pegged to another if the volatility is below some threshold. In terms of the simple regression analysis just discussed, a *de facto* peg would mean little idiosyncratic movement and thus a very high R-squared. It is important to recognise that currencies can float quite freely and yet belong to a bloc. The Australian dollar (save in episodes) and the Canadian dollar, for example, typically share the US dollar's movements against the euro or the yen but show volatility against the US dollar of 5 per cent or more. If belonging to the dollar bloc is taken to be the same as being pegged to the dollar, then the Canadian and Australian dollars must be considered to be pegged to the US dollar.

With this background, it is easy to reconcile this paper's claim and that of McKinnon. He regresses the percentage change in the exchange rate of regional currencies against the Swiss franc on the percentage change in the exchange rate of the US dollar against the Swiss franc. He finds that the sensitivity (or beta) of the regional currencies returned after the crisis to about unity, much the same value as before the crisis. In other words, both before and after the crisis, regional currencies

tended to move one-for-one with the US dollar against the Swiss franc. From these observations, McKinnon concludes that east Asian currencies have reverted to dollar pegging.³²

This conclusion, however, does not follow. The conclusion that does follow is that these currencies remain in the dollar bloc, or at least that they have not slipped from the dollar bloc into the euro bloc, in which the Swiss franc trades. The evidence that McKinnon reports, and on which he should rely, is the R-squared statistics from his regression. These indicate substantial increases in volatility against the US dollar not only for the Indonesian rupiah, but also for the Korean won and the Thai baht, and some increase in volatility for the Philippine peso and New Taiwan dollar.

Figure A1: McKinnon's Reported R-squared Statistics



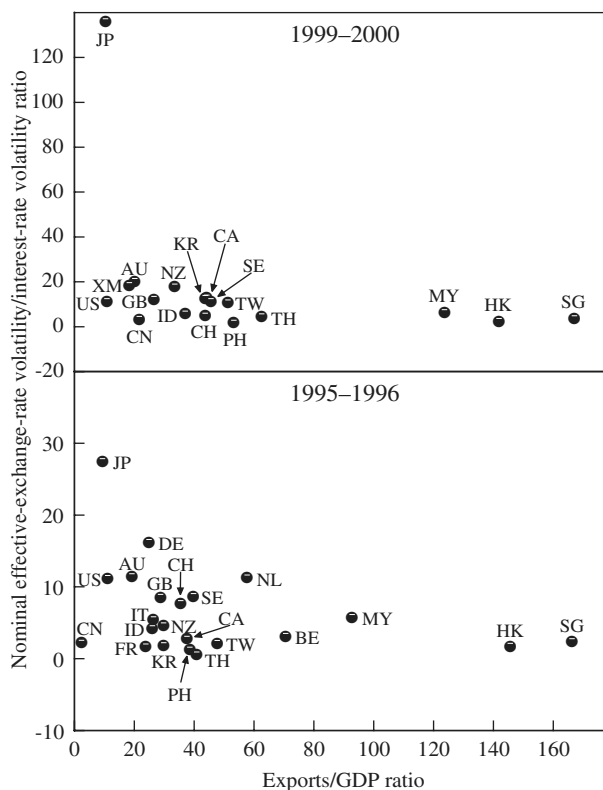
Note: See Appendix C for a listing of country codes.

Even the conclusion that the east Asian currencies remain in the dollar bloc is challenged by the performance of the Korean won starting in November 2000 and extending well into 2001. The Korean won shared well more than half of the yen's movements against the US dollar as the yen dropped from around 110 to the dollar to almost 130 to the dollar. An assessment of the implications of the Korean won at least temporarily joining the yen bloc belongs elsewhere, however.

32. McKinnon notes that during the crisis the sensitivities tended to be near zero. This, however, simply reflected a great deal of idiosyncratic movement by the east Asian currencies during the crisis. (An analogy can be drawn to errors in variables analysis, which points to a lower coefficient. If, for example, the Korean won happened to fall by 10 per cent on a day when the dollar strengthened against the Swiss franc, the sensitivity would be moved toward zero.)

Appendix B: The Balance of Interest-rate and Exchange-rate Volatility Based on Basis Point Volatility

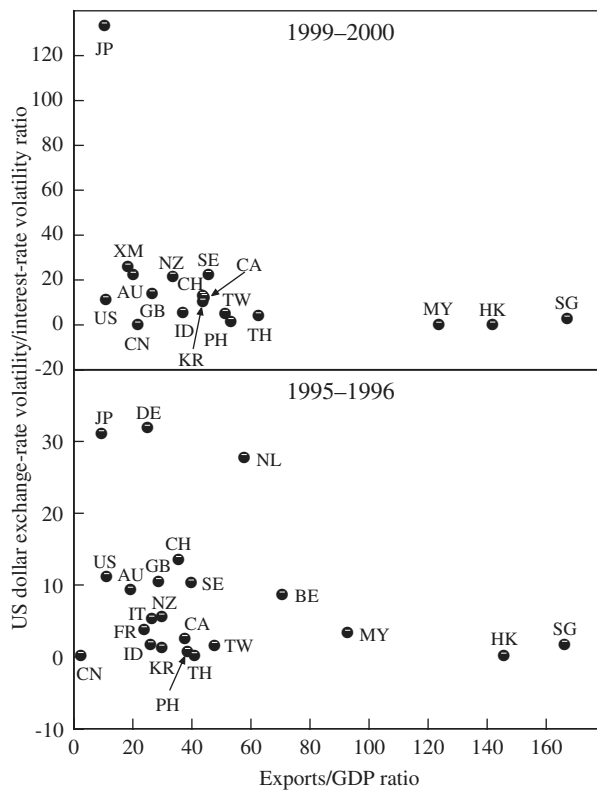
Figure B1: Openness and Volatility of Nominal Effective Exchange Rate and Interest Rate



Notes: Interest rates are defined as 1-year household deposit rate for China; 3-month deposit rate for Korea, Singapore and Thailand; 1 and 3-month SBI rate for Indonesia for latter and earlier period respectively; 3-month T-bill rate for the Philippines; 3-month money-market rate for Taiwan and 3-month interbank rate for remaining countries. Interest-rate volatility measured as annualised standard deviation of actual interest rate movements.

See Appendix C for a listing of country codes.

Figure B2: Openness and Volatility of US Dollar Exchange Rate and Interest Rate



Note: See Figure B1.

Appendix C: Alphabetical List of ISO Country Codes

ISO Code	Country	ISO Code	Country
AT	Austria	KR	Korea
AU	Australia	MA	Morocco
BE	Belgium	MT	Malta
BS	Bahamas	MX	Mexico
CA	Canada	MY	Malaysia
CH	Switzerland	NG	Nigeria
CN	China	NL	Netherlands
CR	Costa Rica	NZ	New Zealand
DE	Germany	PA	Panama
DK	Denmark	PH	Philippines
EG	Egypt	PK	Pakistan
ES	Spain	PT	Portugal
ET	Ethiopia	SE	Sweden
FR	France	SG	Singapore
GB	United Kingdom	TH	Thailand
GH	Ghana	TW	Taiwan
GR	Greece	TZ	Tanzania, United Republic of
HK	Hong Kong	US	United States
ID	Indonesia	UY	Uruguay
IE	Ireland	VE	Venezuela
IL	Israel	XM	Euro area
IN	India	ZA	South Africa
IT	Italy	ZM	Zambia
JP	Japan	ZW	Zimbabwe
KE	Kenya		

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