Managing foreign debt and liquidity risks in emerging economies: an overview

John Hawkins and Philip Turner

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Introduction*

Recent crises have revealed major shortcomings in the management of foreign debt and liquidity in emerging market economies. Possible responses were discussed by a small group of senior central bankers at the BIS during a two-day meeting in December 1999. Ideas included an integrated approach to managing risks in a broader national balance sheet and reforms to the government's own asset and liability management practices. Another important topic was how far the adequacy of foreign exchange reserves should be judged in relation to short-term foreign debt. Policies towards the private sector's management of liquidity risks also featured. The country papers that follow highlight the main experiences of specific economies. This paper provides an overview of the main issues.

The first section looks at lessons from recent crises on the dangers of excessive foreign debt, particularly if it is short-term. The second section considers official policies to manage foreign debt. It begins by evaluating the idea of "national liquidity", ie comparing the total liquid assets over the whole economy with the total foreign debt, in terms of both conceptual validity and practicality. Drawing on this discussion, the question of how much government debt should be issued domestically and how much externally is then posed. The role of simple guidelines for government debt management and their relationship with reserve management is also discussed.

The third section focuses on the issue of how the "optimal" size of foreign exchange reserves – if this is a useful concept – varies across countries and over time. The so-called "Guidotti rule" is discussed, along with some possible modifications. The final section examines possible policies towards the private sector's external debt. Such policies include prudential rules for banks and other financial institutions, capital controls,

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possible disclosure requirements or regulations for companies, and restrictions on households. Options for developing domestic bond markets as an alternative to foreign borrowing are also examined.

Foreign debt and liquidity risks: recent crises

Large (short-term and unhedged) external debt was a contributory factor to the Asian financial crisis.[1] For example, the external debt in developing countries as a group averaged 35% of GDP at end-1996; but it reached over 50% of GDP in Indonesia and Thailand. Moreover, the debt tended to take a more volatile form than in earlier crises (Table 1). The emerging market debt crisis of the 1980s essentially involved a limited number of banks lending to governments. By contrast, the Mexican crisis of 1994–95 involved thousands of entities that had lent to the government via financial markets. In east Asia, the borrowing was predominantly by the private sector (often directly by companies in Indonesia, but mainly through the domestic banks in Thailand) from

Table 1

Taxonomy of foreign liquidity crises

Lenders	**Borrowers**		
	Governments	Companies	Banks
Banks	Latin America 1980s	Indonesia 1990s Korea 1990s	Australia 1890s Thailand 1990s
Bond markets	United Kingdom 1720s Latin America 1820s Argentina 1890s Mexico 1990s	France 1720s Netherlands 1760s	UK 1790s

Sources: Kindleberger (1996); BIS.

[1] To Furman and Stiglitz (1998), "the ability of this variable, by itself, to predict the crises of 1997 is remarkable". An even stronger statement was recently made by a major credit rating agency. According to Mahoney (1999), "the evidence suggests that not only are good fundamentals an inadequate defence against illiquidity, but also that poor fundamentals are largely irrelevant if a country is liquid". A number of statistical and econometric studies have concluded that the ratio of (short-term) foreign debt to reserves is an important indicator of vulnerability to a currency crisis.

Table 2

Share of external debt denominated in domestic currency[1]

In percentages; end-1999

	Loans from international banks		**International debt securities[2]**		
	Banks	Other borrowers	Corporate issuers	Financial institutions	Public sector
China	0	9	0	0	0
India	9	2	0	0	0
Hong Kong	3	18	14	18	25
Indonesia	0	7	2	0	0
Korea	2	8	0	0	0
Thailand	3	7	0	28	1
Argentina	5	0	3	1	2
Chile	8	0	0	0	0
Colombia	3	0	0	0	0
Mexico	9	0	0	0	0
Peru	2	0	0	0	0
Venezuela	8	1	0	0	0
Czech Republic	23	5	0	0	0
Hungary	4	1	0	0	0
Poland	14	3	12	0	0
Russia	27	1	0	0	0
Israel	1	1	0	0	0
Saudi Arabia	4	3	0	0	0
South Africa	30	11	37	73	0
Memo					
Australia	19	29	13	17	43
Canada	10	28	7	8	19
France	44	75	73	54	63
Germany	61	62	64	56	99
Japan	61	29	44	28	16
United Kingdom	10	26	44	36	13
United States	81	85	78	83	95

[1] For some emerging economies the figures may be overestimates as it is assumed all loans not denominated in a major currency are denominated in the domestic currency. [2] By country of residence.

Source: BIS.

both securities markets and international banks. As most of the foreign currency borrowing was unhedged, it left the economies very exposed to large exchange rate depreciations. Attempts to stem the

depreciations with large increases in interest rates spread the problem to domestic currency borrowers.

Because much of the foreign debt was short-term, it required frequent rolling over. For example, the share of debt with a maturity of less than one year was over twice as high in Thailand and Korea as in the average developing country. This left the economies vulnerable to swings in financial market confidence: between mid-1997 and end-1999, the total decline in international bank credit to Indonesia, Korea, Malaysia and Thailand reached almost $140 billion. Even some of the apparently longer-term borrowing was subject to put options, rendering it effectively short-term. Some recent estimates suggest that $30–40 billion worth of emerging market bonds have such options.[2]

The large unhedged foreign currency borrowing reflected a significant lacuna in financial markets. Many emerging economies with a history of high inflation and depreciation, in the words of Eichengreen and Hausmann (1999) "original sin", face great difficulty in marketing long-term securities denominated in the domestic currency. In addition, foreign lenders will not lend in the domestic currency (Table 2) and will tend to be unwilling to stand on the other side of a hedge contract.[3] In these circumstances firms can only choose between a currency mismatch and a maturity mismatch.

The concept of "national liquidity" and government debt management

The concept of "national liquidity"

Recent crises have demonstrated that countries can be faced with liquidity problems not only because of the foreign assets and liabilities of the government and central bank, but also because of the foreign (or foreign currency) liabilities of the banks and even the corporate sector. A crucial difference between domestic and foreign currency debt

[2] Greenspan (1999) cites an IMF estimate that more than $30 billion in outstanding emerging market debt instruments have put options attached. Recent BIS estimates place the amount at around $40 billion, or 10% of outstanding emerging market bonds.

[3] Hedging between domestic agents is like a game of "pass the parcel" which does not reduce the national exposure.

is that the authorities can provide virtually unlimited domestic currency liquidity but are (often tightly) constrained in their provision of foreign currency liquidity.

This has led to consideration of a broad concept of "national liquidity".[4] However, the relevance of a national balance sheet for policy purposes is controversial. One polar view is that the external deficits and debt that are the result of decisions of the private sector – and not due to government borrowing – are of little concern to policymakers. Advocates of this view, famously crystallised by UK finance minister Nigel Lawson in the late 1980s, regard private sector firms, not the government, as responsible for the consequences of their own decisions. Accordingly, the government does not need to take precautions in its own financing decisions to cover private sector foreign currency risk exposures. Indeed, any emphasis on "overall national liquidity" in public policy decisions would run the moral hazard risk of encouraging domestic borrowers, or international lenders, to expect the government to bail them out in the event of a crisis. In this view, any mismatches between demand for and supply of foreign currency that arise from private sector decisions would simply lead to equilibrating changes in the exchange rate.

Scepticism about national liquidity management is perhaps easier to defend in the case of industrial countries – whose access to international liquidity at zero risk spreads is normally assured. However, there are at least four counterarguments in the case of countries that are not so well placed. The first is the existence of *externalities*: large net borrowings by some entities in the economy tend to increase country risk premia and thus raise the interest rate charged to all borrowers.[5] Moreover, individual private borrowers may be unaware that the aggregate level of private foreign debt could strain the country's ability to pay in a crisis. In some countries, the foreign financing decisions of major business enterprises could affect macroeconomic conditions.

[4] Sheng (1996) generalises further to look at the responsibility of policymakers for national risk management. The Financial Stability Forum's Working Group on Capital Flows (2000, p 2) recently issued a report calling for "a risk management system that involves a system for monitoring and assessing the risks and liquidity of the economy as a whole, including at a sectoral level".

[5] This effect may be increasing, as studies seeking to predict financial crises are increasingly according an important role to external debt.

The quantitative importance of this effect is hard to assess. A simple econometric exercise reported in Annex A suggests that government credit ratings are more closely related to government debt than overall national debt. An increase in government debt of 8–11 percentage points of GDP causes a one notch deterioration in credit ratings (eg from B+ to B), which could lift borrowing costs by around 40 basis points.

A "first best" solution to any such externalities would be to internalise them. In theory, some form of tax on foreign borrowing could do this. If the externality is greater for shorter-term debt, the levy could be structured to reflect this difference. Such a levy might need to vary with the degree of externality. In practice, however, such a levy would be difficult to design, although the Chilean levy on capital inflows (discussed below) has some of these features.

The second counterargument is that private sector choices may be *distorted* by various government policies. One common example of this is the choice of exchange rate regime; in particular, fixed exchange rate regimes may encourage borrowing in foreign currencies to take advantage of lower interest rates. If fears of devaluation emerge – even if unjustified in terms of fundamentals – there may be a "rush to the exits" similar to a bank run. This can arise if borrowers had previously not hedged their foreign debt because they trusted the authorities to maintain the fixed rate but now suddenly doubt the authorities' resolve. If many holders of debt seek to cover themselves at the same time, the authorities may be unable to defend the exchange rate without a very large increase in interest rates. Even this may not help if high rates are not regarded as sustainable (and if the banking system is weak they will not be regarded as sustainable). A possible response would be to impose prudential limits on the private sector's foreign currency exposures. Another example of policy-generated distortion arises from implicit or explicit guarantees given to banks.

The third counterargument is that the exchange rate would *overshoot* if a country's access to capital markets dried up and it were forced suddenly to repay its foreign currency obligations. This could cause a deep recession.

The fourth counterargument is that private sector debt decisions also impinge on *government income* and balance sheets in several ways. For example, foreign borrowing implies interest payments to non-residents (non-taxable) rather than residents (taxable). If interest payments are

tax-deductible, higher gearing cuts into government revenue. If excessive foreign debt brings down companies, the government's debt will increase further as both personal and company tax revenues fall and social outlays rise.

Another policy aspect is the question of whether/how the official sector should take account of the maturity and currency mismatches of the private sector in structuring its own foreign assets and liabilities. There is a plausible prima facie case for doing so: for instance, if private sector debt is too short-term (or has an unbalanced currency structure), then it could be argued that the public sector should choose a longer maturity (or a different currency). Yet there are dangers. If the government were to act as a residual balancing item, there would be a risk that the private sector borrowing cheap (short-term) would force the government to borrow dear (long-term).

Nevertheless, the concept of a national balance sheet raises several tricky questions. How far do private sector foreign assets offset liabilities? Most would exclude private sector assets held abroad (especially if not intermediated through the local banking system – for example, flight capital) on the grounds that these are unlikely to be mobilised to meet maturing liabilities of any other sector in the economy. Hence the relevant national balance sheet may differ from the balance sheet of domestic residents. Another issue is the extent to which foreign exchange exposures fully capture vulnerability. One aspect of this is the treatment of foreign investments in domestic currency assets such as money market instruments, bonds and equities that can be sold and the proceeds converted into foreign exchange. Since domestic residents can also behave similarly (if capital markets are well enough developed), the basic distinction between domestic and foreign exposure might be questioned.

Information on national liquidity

Even if the usefulness of a national balance sheet approach is accepted in theory, several practical issues still remain. Are the available data adequate to allow the effective management of such a balance sheet? Although data on the banking sector's liabilities are widely available, accurate information on the corporate sector's debt is scarcer. The true off-balance sheet positions of banks may also be obscure. In addition,

modern financial markets permit the rapid transformation of debt profiles – long-term debt can quickly be made short-term.

Table 3 shows the proportion of 18 emerging economies with data available on various components. Coverage of government and banking data is comprehensive and regarded as reliable, although in some cases the data in individual state-owned enterprises' balance sheets are not aggregated into an overall figure. There are some gaps for other financial institutions. In two cases the breakdown into short-term debt is based on original rather than remaining maturity. The main sectors for which data are generally unavailable and/or of low quality are the corporate sector and, even more so, the household sector (in some cases household data are not separately distinguished from the corporate sector). Some countries rely on data collected from foreign lenders (including by the BIS), or samples of large companies' annual reports, for data on the corporate sector's external debt. Korea surveys the corporate sector, but only every two years. Countries are more likely to have data on the external debt of the private sector if they have, or relatively recently had, some form of capital controls. A particular area of weakness is data on foreign currency credit lines; in many countries little is known about these, even for some parts of the public sector.

Table 3

Percentage of 18 emerging economies with data available

	Central gov't	Central bank	Other gov't	SOEs	Banks	Other FIs	Com-panies	House-holds
External debt								
Domestic currency	100	100	94	67	100	61	83	28
Foreign currency	100	100	94	67	100	67	83	28
of which: short-term	100	100	94	67	94	67	78	n.a.
Domestic debt								
Domestic currency	100	100	94	67	100	67	67	33
Foreign currency	100	100	83	56	100	61	56	28
Liquid foreign currency assets	100	100	89	56	100	67	56	28
Credit lines in foreign currency	100	100	78	39	67	50	33	n.a.

SOEs = state-owned enterprises; FIs = financial intermediaries.

Source: Central banks.

Progress in agreeing or issuing international guidelines on transparency is very recent and, as yet, relatively few countries meet these guidelines.[6] In practice, information on the debt and liquid assets of the central government and central bank is generally made publicly available, but there is much less disclosure of the activities of other areas of government. The aggregate positions of the banking system are generally disclosed, but less is published about other financial institutions. A notable area of secrecy is the extent of credit lines in foreign currency of the authorities and financial institutions; even when data are available they are rarely disclosed (Table 4). Some governments do not release data if thought to be of poor quality. In some countries the authorities worry that publishing central banks' off-balance sheet positions (eg use of swaps) would compromise the effectiveness of monetary policy by revealing the government's hand. Instead they wish to maintain a "constructive amibiguity". However, there is an important distinction between disclosing actions and disclosing strategies.

Even where data are released, care needs to be taken in their interpretation. For example, there are currently differences in reporting maturity profiles of debt; some countries report debt by *original* rather than the more useful *remaining* maturity. Chile recently adopted a stricter definition for debt by remaining maturity, counting as short-term debt any repayments of long-term debt due within a year. India has also started publishing data on short-term debt by remaining maturity; short-term debt by original maturity and repayments of long-term debt due within a year are seperately identified. In some cases derivatives positions may make the published data misleading. For example, at the onset of the Russian crisis the forward position of the banks was largely unknown to western investors. Their subsequent inability to honour these large forward contracts was a risk not revealed by the external debt data.

The IMF's Special Data Dissemination Standard (SDDS) establishes minimum standards for the coverage, frequency and timeliness of key macroeconomic data. The prescriptions for international reserves data

[6] Those issued or soon to be issued include: SDDS (discussed below); Disclosure of Foreign Currency Positions; Enhancing Bank Transparency; Trading and Derivatives Disclosures by Banks: Disclosure Framework for Securities Settlement Systems; Transparency about Adherence to International Standards; and Disclosures by Financial Institutions, including highly leveraged institutions.

Table 4

Percentage of 18 emerging economies with data published[1]

	Central gov't	Central bank	Other gov't	SOEs	Banks	Other FIs	Com-panies	House-holds
External debt								
Domestic currency	83	89	67	50	78	44	67	22
Foreign currency	83	89	67	44	83	39	67	17
of which: short-term	67	78	67	28	67	33	50	na
Domestic debt								
Domestic currency	100	78	50	28	72	44	67	17
Foreign currency	83	83	61	39	56	44	39	22
Liquid foreign currency assets	61	78	61	28	56	39	17	11
Credit lines in foreign currency	50	28	61	6	33	22	11	na

SOEs = state-owned enterprises; FIs = financial intermediaries.

[1] Includes cases where debt is prohibited.

Source: Central banks.

were significantly strengthened in March 1999 to follow a template developed in conjunction with the Committee on the Global Financial System.[7] By June 2000 the majority of 48 SDDS subscribers were adhering to the template. The new template was developed in particular in response to the view that the data available on reserves in the run-up to the Asian crisis were misleading.[8]

Total external debt is included in the SDDS requirements under the "international investment position" category. As this category of data is

[7] See CGFS (1998a, 1998b).

[8] The Working Group on Transparency and Accountability (1998, pp 15–16), commented that "following the flotation of its exchange rate on 2nd July 1997, Thailand revealed that although the central bank held gross reserves of $32 billion at the end of June, outstanding forward and swap liabilities totalled $29 billion. In Korea, the central bank reported that gross reserves totalled $24 billion at the end of November, but almost two-thirds of this amount was not readily available to the Korean authorities because it had been deposited with overseas branches of Korean banks to assist the banks in meeting their external obligations." In the case of Russia there has also been strong criticism about the disclosure of reserves. Funds made available by the IMF were passed to a company outside Russia. While this company used the funds to buy short-term Russian government paper, and even to make loans to Russian banks, it was still being reported as foreign currency reserves.

known to be difficult to compile, subscribers have until the end of 2001 to disseminate it. At the time of writing (July 2000) 28 countries fully met the standard. The standard requires annual data with a two-quarter lag, although quarterly data with a quarterly lag are encouraged. A breakdown of liabilities in the form of securities and loans, by currency and maturity, is only encouraged, not required, and only for countries where analysis of debt is highly desirable. (Domestic debt denominated in foreign currencies, or indexed to them, does not have to be disclosed as part of the international investment position.) International standards are being developed for the reporting of external debt statistics by borrowing countries.

An alternative source is data from lenders. The most important source for this is the BIS data on lending by international banks (Table 5). These data are supplemented with other components of

Table 5

External debt of emerging economies

	Asia	Latin America	Europe	Africa and Middle East
From international banks				
Level (end-1999)	304	277	170	126
of which: <1 year maturity	140	134	67	69
1–2 year	24	20	13	9
>2 years	93	100	75	42
of which: by banks	108	51	72	41
by non-bank private	151	167	72	61
by public sector	37	57	24	24
Percentage change (annual rates)				
June 1995–June 1997	18.1	11.2	13.8	–0.9
June 1997–Dec 1999	–12.1	4.8	5.0	10.5
Net issues of international debt securities (US$ billion; annual rate)				
1995Q3–1997Q2	29	38	5	2
1997Q3–1999Q4	3	27	10	4

Source: BIS.

external debt from three other international agencies (OECD, IMF and World Bank) to provide statistics on the external debt of 176 developing and transition economies, which have been released quarterly since March 1999 (Table 6).

The data show a wide variation across emerging economies in the reliance on external debt and its maturity pattern. Bank loans account for around 40% of external debt. Latin America and central Europe make more use of securities (including Brady bonds) than do other regions. In Africa and the Middle East bond issuance is less common and there is more reliance on official lending. Typically between one quarter and one half of total foreign debt matures within a year, with bank loans tending to have a shorter maturity than other forms. About half the

Table 6

Composition of external debt of emerging economies

End-1999

	Asia	Latin America	Central Europe	Africa and Middle East
Composition of external debt: percentage of total[1]				
Bank loans	39	33	39	42
Debt securities issued abroad	17	32	22	10
Brady bonds	0	14	7	1
Non-bank trade credits	6	3	15	19
Multilateral claims	20	14	4	10
Official bilateral loans	17	4	12	17
Currency composition of long-term debt				
US dollars	52	87	47	62
Euro[2]	10	5	36	23
Japanese yen	29	4	3	5
Pounds sterling	2	0	2	3
Other (including multiple currencies)	6	4	13	7

[1] Approximate; based on major economies only and may include some double-counting. [2] Includes those originally denominated in legacy currencies or ECU.

Sources: Joint BIS-IMF-OECD-World Bank statistics on external debt (www.oecd.org/dac/debt/index.htm); BIS.

debt from banks is incurred directly by the non-bank private sector, a third by local banks and a sixth by the public sector. Banks have sharply cut their exposure to emerging economies, particularly in Asia, since mid-1997. Net issues of international bonds have almost dried up in Asia but are still substantial in Latin America, notably Argentina and Mexico.

The US dollar is by far the dominant foreign currency for borrowing in Latin America. In central Europe and Africa both the dollar and the euro play a large role. The dollar and yen are the most important in Asia.

Domestic and external borrowing by the government

Many emerging economies rely on external investors to hold a significant proportion of their debt. As Table 2 shows, this foreign debt is overwhelmingly denominated in foreign currency. In some countries, even a significant proportion of the domestically held debt is denominated in foreign currencies. The choice between domestic and foreign borrowing is complex and reflects several sets of factors. Four important dimensions are: macroeconomic; public choice; debt servicing; and balance sheets.

The main *macroeconomic* difference between domestic and foreign borrowing in the short term is that government borrowing locally pushes up domestic interest rates, and so crowds out private sector borrowing (perhaps forcing the private sector to borrow abroad). In the short term, foreign borrowing tends to avoid this crowding-out effect.[9] However, over time, as repayments rise, servicing foreign debts exerts a deflationary drag on the economy.

The *public choice* dimension arises because the manner of financing deficits affects the political debate about their size. Ensuring that the unpleasant consequences of heavy government borrowing are felt immediately (ie through higher domestic interest rates) may be more conducive to sober policymaking than resorting to devices (eg foreign

[9] Foreign borrowing may still push up domestic yields if it raises government debt to a level where credit risk becomes an important consideration. In practice, this seems to be a second-order effect; more important is the effect on the exchange rate.

borrowing) that postpone the pain. Even within western Europe, for example, countries have had quite divergent attitudes. The policies of Ireland and Sweden provide an illuminating contrast. Ireland in the 1980s made heavy use of foreign borrowing, preferring not to crowd out domestic borrowing by pushing up bond yields. The result was an easing of discipline on government borrowing. Eventually, mounting interest costs on foreign debt became a substantial drain on national income and the budget. By contrast, Sweden over a similar period avoided foreign borrowing almost entirely, so that the full impact of government deficits was reflected in bond yields, which rose to very high levels. In this way, it was hoped to build public support for a more disciplined fiscal stance. However, one consequence was that the private sector borrowers who were crowded out of domestic capital markets sought offshore funding – in effect, forcing the private sector to do what the public sector had avoided. Swedish banks' borrowing abroad rose substantially, and eventually doubts about their ability to meet their foreign currency obligations forced the government to guarantee them. In short, the government did not – despite its best intentions – escape the consequences of reckless private sector foreign borrowing. This was a major element of the Swedish banking crisis.

The third element is *debt servicing*. Particularly in emerging economies (whose domestic interest rates exceed international levels), the main incentive for governments to make heavy use of foreign currency debt is simply that it minimises current interest costs. But this is very imprudent because it leaves the country vulnerable to contagion risks as the bonds may become hard to roll over if there is a crisis in neighbouring or "similar" countries. If the exchange rate is devalued in such a crisis, the "cheap" debt will become very expensive (and, of course, if foreign interest rates are well below domestic rates, this is itself an indication that markets think the domestic currency is more likely to depreciate than appreciate[10]). Even in fundamentally sound

[10] If governments borrow in the foreign currency with the lowest interest rates, the situation may be even worse. This is the very currency markets are expecting to appreciate the most. This problem is exacerbated by the effect known as the "peso problem". The observed behaviour, as opposed to "textbook" behaviour, of exchange rates in high interest rate economies is not a gradual depreciation but long periods of stability followed by very sharp depreciation.

economies, there may be a liquidity crisis in the sovereign debt market if self-fulfilling adverse sentiment develops.

Another possibility is to issue debt denominated in the domestic currency but indexed to the exchange rate. The Mexican tesobonos are the best known example. From an analytical viewpoint, this is almost equivalent to borrowing in foreign currency, but can be less transparent if disclosure on currency denomination is incomplete.

Furthermore, as long-term foreign borrowing by developing countries with a low credit rating is often judged to be too expensive, there is a tendency for the "weaker" borrowers to rely too heavily on short-term borrowing because the credit risk spread is usually lower. This makes the rollover problem much more acute. While longer-term debt appears more expensive, in Greenspan's (1999) words "this short-sighted approach ignores the insurance imbedded in long-term debt, insurance that is often well worth the price". Even longer-term debt can present a rollover risk (for example, as a result of sanctions imposed on a country for political reasons) if it is concentrated on a particular maturity.

The final aspect is the *balance sheet* dimension: the nature of liabilities chosen depends on the nature of assets on the other side of the balance sheet. An approach pioneered by New Zealand is to relate government debt management to an overall government balance sheet, encompassing not just financial assets and debts but physical assets, such as schools and roads, and liabilities for future pensions. It is possible to go further and also incorporate the present discounted value of future tax revenue and social expenditures. While there are practical difficulties, such as in the treatment of contingent liabilities from implicit or explicit deposit insurance, some useful conclusions have emerged from this work:[11]

- as the average duration of government assets is quite long, longer-dated debt should be issued;
- as the assets are mostly insensitive to exchange rate movements, most debt should be in domestic currency;
- as many assets generate returns that are more stable in real than in nominal terms, there is a case for issuing inflation-indexed debt (although this raises some wider issues which are discussed below).

[11] See Anderson (1999) for further information.

The exercise could potentially be extended to cover all national assets and liabilities, adding the value of houses and factories (and human capital?) and netting out domestically held equity and pension entitlements. This would probably reinforce the message that the greater part of government debt should be long-term and denominated in domestic currency.

A final possibility to be reviewed is that the government may issue too little foreign debt from a national perspective, rather than too much. For example, the Central Bank of Chile reports that the government raised $0.5 billion in bonds in 1999, just to maintain a presence in international bond markets, even though it did not need the funds. The Bank noted that "before this sovereign debt was issued there was no reliable measure of country risk because all other Chilean bonds were corporate, and Chilean debt was treated similar to other countries' debt. Preliminary observation of spreads after this placement showed a positive externality in country-risk premium for the private sector".[12] Other countries have also noted that government foreign debt issues can usefully establish benchmarks. Furthermore, regular small issues maintain access to the market, which may be helpful in the event of a sudden need for heavier borrowing.

The Financial Stability Forum's Working Group on Capital Flows (2000, pp 24–26) recommends that a set of operational guidelines or sound practices should be developed for government asset/liability management. The IMF and World Bank are currently working on developing such guidelines.

Strategies to reduce the cost of government external debt

Another way of cutting immediate borrowing costs is to offer foreign investors some form of sweetener. As noted above, put options have been issued to allow early repayment in special conditions (eg the Industrial Finance Corporation of Thailand issued bonds with put options that could be exercised in the event of a lowering of its credit rating). But this is a risky undertaking because such options would be exercised just when the country is under pressure. In general it would seem wiser

[12] See the paper by Marshall in this volume.

for countries to buy options rather than write them to avoid paying a sovereign risk premium. As purchasers of options would know the options will only be exercised when the country is in difficulties, they will price in the possibility that the country will not honour them. Often bonds will have cross-default clauses under which the government must repay early if it defaults on obligations to any other creditors.

A preferable way of limiting interest costs is to offer an option that only pays when a country is doing well or structured notes with contingent payment terms. Thus far, as Haldane (1999, p 200) comments, "there are to date only a handful of real-world examples of emerging countries issuing state-contingent debt. They include Bulgaria which has issued GDP-indexed bonds and Mexico which has issued oil-indexed bonds". But there is scope for their wider use. The "Willard" Working Group on International Financial Crises (1998, pp 11–12) notes that "while the purchase price of such insurance may seem expensive during periods of strong capital flows to emerging markets, recent events have illustrated the potential value of … bonds linked to the prices of key commodities as well as bonds linked to overall indices of emerging market risk. The recent development in advanced markets of bonds issued by insurance companies that cease payment in the event of a catastrophic natural disaster suggests the possibility of developing markets for innovative bonds that contain a similar form of risk-sharing. It is also worth considering the addition of options to sovereign bonds and interbank credit lines that would allow a debtor government or debtor banks to extend the maturity of a bond or credit line for a specified period of time at a predetermined spread."

Greenspan (1999) suggested a rule whereby the average maturity of external liabilities should exceed, say, three years. Moreover, dates for scheduled repayments should be evenly distributed over time and not concentrated in any particular period either.[13] This would tend to limit repayments falling due during (usually short-lived) periods of crisis when

[13] Anderson (1999, p 9) also argues that "as well as reducing the pressure on markets when the supply of bonds increases unexpectedly, an even maturity profile also provides a sovereign with greater flexibility in an environment of fiscal surpluses. It increases the chances of having sufficient debt maturing with which to use surpluses without needing to repurchase debt or build up assets, which have cost and risk consequences." In addition, a rule on dispersion would prevent countries evading the intent of the rule, for example by holding a small amount of bonds with an extremely long maturity so that the "average" maturity is over three years.

credit risk spreads are abnormally high. An additional advantage is that lenders would be involved in some burden-sharing as they are exposed to capital losses on long-term bonds. While some countries might object that selling enough long-term securities to meet such a rule is impossible (or prohibitively expensive), it could be argued that this is really an admission of excessive borrowing.

Management of central government debt

Tables 7 and 8 show the institutional arrangements for government debt management. Some results from a survey of about 50 developing economies by the World Bank are given in the bottom row of Table 7 and in Table 8. It is striking that over half the respondents to the World Bank's survey mentioned institutional capacity as their major problem in debt management.

The use of benchmarks is becoming more common in debt management. For example, Colombia has benchmarks for liquidity (less than 15% of the outstanding stock should mature within a year, the average maturity should be at least 5 years), interest rate (less than 30% should carry a floating rate, the modified duration should exceed 3–4 years) and currency composition (US dollar 83%, euro 13%, yen 4%). Rationales for currency benchmarks include matching the external debt structure with that of international reserves, exports or the currencies in the basket against which the local currency is pegged or managed.[14] Countries without benchmarks often have guidelines such as limiting short-term debt, matching foreign currency debt to reserves or limiting floating rate debt. Once a benchmark is established, the next question is how much discretion should be allowed the debt managers to deviate from the benchmark. While cost savings are possible from the judicious switching between different maturities and currencies, there are also serious risks in trying to beat the market, particularly if the debt management agency does not have experienced staff and adequate middle and back office monitoring. Furthermore, the government will often be sufficiently large to move markets against it if it tries to move aggressively.

There are many other decisions to be faced in designing a government bond programme. For example, issuing bonds according to a preannounced calendar may reduce uncertainty in the market

[14] Setting the benchmarks is also not easy. Claessens (1992) presents a procedure to calculate the optimal currency mix for external debt by calculating the portfolio that "minimises the variability in domestic currency of export earnings net of foreign liability debt service". However, he finds the relevant covariances are often unstable.

Table 7

Institutional arrangements for debt and reserves management

	Central government		State/local government	SOEs	Reserves
	Domestic currency debt	Foreign currency debt		Foreign debt	
China	MoF	MoF	not allowed	SOEs	SAFE
India	CB	MoF	not allowed	SOEs	CB
Hong Kong	none	none	none	SOEs	CB
Indonesia	MoF	MoF	not allowed		CB
Korea	MoF	MoF	own responsibility[1]	SOEs[2]	CB
Singapore	MoF & CB	none			CB
Thailand	DMO under MoF	DMO under MoF	none	MoF	CB
Argentina	MoF	MoF	own responsibility		CB
Chile	none	MoF	not allowed	MoF	CB
Colombia	MoF	MoF	state govts/MoF	SOEs/MoF	CB
Mexico	MoF	MoF	SOBs	MoF	CB
Peru	DMO under MoF	DMO under MoF	DMO under MoF	MoF	CB
Venezuela	MoF	MoF	not allowed	not allowed	CB
Czech Republic	MoF	none	MoF[3]	SOEs	CB
Hungary	DMO under MoF	DMO under MoF		none	CB
Poland	MoF	MoF	own responsibility		CB
Russia	MoF	MoF	regional agencies		CB
Israel	MoF	MoF	own responsibility	SOEs	CB
South Africa	DMO in MoF	DMO in MoF	not allowed	MoF	CB
World Bank survey	MoF (55%) CB (11%) MoF & CB (30%) other (4%)	MoF (51%) CB (11%) MoF & CB (30%) other (8%)			

CB = central bank; DMO = debt management office; MoF = ministry of finance; SAFE = State Administration of Foreign Exchange; SOBs = state-owned banks; SOEs = state-owned enterprises.

[1] Require approval of Ministry of Government Administration and Home Affairs. [2] Require approval of Ministry of Planning and Budget. [3] MoF has only weak restrictive powers; large municipalities are largely autonomous.

Sources: Jensen (1999); central banks.

but has the drawback of constraining the government's flexibility. Marketing bonds to retail investors involves higher transactions costs; but such investors may be more stable holders than institutional investors (particularly foreign institutions).

Table 8

Survey of institutional arrangements for sovereign debt management

In percentages

	Oct 1999	(Oct 1997)
Coordination of foreign currency debt and reserves management		
None	34	
Meetings between ministry of finance and central bank	45	
Reserve composition and debt matched	11	
Both managed by central bank	10	
State, provincial or local governments and SOEs raise funds abroad	71	(74)
of which: with explicit central government guarantee	51	
Highest approval needed for individual borrowing transaction (domestic/foreign)		
Parliament or congress	6/21	
President or prime minister	6/9	
Ministerial board	8/12	
Minister, governor or head of debt management agency	80/58	
Government collects data on external debt of private banks	57	
Government collects data on external debt of other private entities	51	
Established a strategic benchmark for domestic currency debt management	10	
Established a strategic benchmark for foreign currency debt management	21	(2)
Using analytical tools	40	
of which: value-at-risk	15	
duration	6	
debt sustainability/sensitivity scenario	10	
other	9	
Use derivatives to hedge currency or interest rate exposure	27	(31)
Use currency swaps for liability management	29	(35)
Use exchange-traded financial futures and options	2	(0)
Use commodity futures and options	7	

Source: Jensen (1999).

There are some parallel arguments between the domestic/foreign currency choice and the nominal and indexed debt choice. Theory suggests the mix should depend on the nature of the most common shocks.[15] Frequent supply shocks (such as oil price rises) favour nominal debt. Demand and monetary shocks favour indexed debt.[16] Issuing indexed (or foreign currency) debt may avoid the cost of an inflation (exchange rate) risk premium and comparing the yields on it with those on nominal domestic debt provides a useful and timely measure of inflation (exchange rate) expectations. Supporters of indexed (or foreign currency) debt have argued it can underline a commitment to low inflation while issuing nominal (domestic currency) debt creates a temptation to inflate.[17] However, some opposition to indexed debt reflects concern that it weakens the constituency against inflation.

In practice, indexed bond markets are usually much less developed and liquid than nominal bond markets even in those countries where they have a long history.[18] Apparent reasons are unfavourable tax treatment, low expected inflation, the more complicated return offered and the illiquidity of indexed bonds, which are mainly bought by institutions such as pension funds wanting to hold them to match long-term liabilities. It remains an open question whether the heavier issuance of indexed debt would itself improve the liquidity of the market.

Some government debt is guaranteed by international agencies, allowing the governments to borrow more cheaply. For example, the World Bank guaranteed interest payments on yankee bonds issued by the Electricity Generating Authority of Thailand in April 1999 and some debt for key projects in China. A debt issue by the Petroleum Authority

[15] Missale (1999) provides a guide to the theoretical literature. Barro (1997) argues that, if the government's aim is to smooth taxes over time to minimise its distortions, it should issue long-term indexed debt. See also Anderson (1999) for the effect of this literature on actual government strategy.

[16] The argument is that "negative supply shocks (such as an oil price rise) have the effect of increasing inflation and decreasing real income, therefore leading to a deterioration in the fiscal position. To reduce the need to increase taxes in the face of such an event, a debt portfolio comprising nominal long-term debt is preferable to inflation-indexed debt. In the case of a negative demand shock (such as a tightening of monetary policy) both output and inflation would decelerate, and the government's fiscal position would deteriorate. In these circumstances, inflation-indexed debt servicing costs would fall and help offset the deteriorating fiscal position." Anderson (1999), p 4.

[17] See Jónsson (1999), who reviews Iceland's experience with financial indexation.

[18] An exception is Israel.

of Thailand in 1998 was guaranteed by Japan's Ministry of International Trade and Industry. Some Israeli debt was guaranteed by the US Treasury.

Government agencies will sometimes use derivatives to manage currency or interest rate exposure. For example, all the yen bonds and two Deutsche mark bonds issued by Colombia have been swapped into US dollars. However, their use of derivatives is only modest (Table 8), mainly reflecting a lack of institutional capacity.

Debt of other tiers of government

In some emerging economies, state/provincial and local governments and state-owned enterprises also borrow substantially abroad. This debt is usually formally guaranteed by the national government (Table 8). Even when not, it is often regarded as implicitly guaranteed. In many cases, the agency managing debt for the central government also manages debt for state/provincial governments and state-owned enterprises (Table 7).

One important question is how far the central government should control borrowing by other government entities. In practice, decisions on the coordination of debt issues are highly political. Under Indonesia's "one window" policy, the ministry of finance is the only public sector body authorised to negotiate and sign agreements on foreign borrowing. This will change in 2001 as part of a programme to allow more regional autonomy.

Coordination of reserve and debt management

In most countries, the management of foreign exchange reserves and the management of the government's foreign debt are assigned to two distinct organisations with distinct mandates. This is because reserves and debt need to be managed according to quite different objectives. The reserve manager's main mandate is to ensure adequate liquidity – and this will dictate holding short-term and highly liquid assets. But the debt manager will typically want longer term liabilities to limit refinancing risks. Assigning these two different tasks to separate institutions has the advantage of facilitating accountability since each institution can be called to account for its area of responsibility according to specially tailored criteria.

Nevertheless, a degree of coordination between the management of reserves and debt can in principle reduce risk exposures. This can apply

to levels of reserves/debt, to currency of composition, and to maturity. As to levels, it may be wasteful for the public sector simultaneously to issue large amounts of foreign debt and hold large amounts of foreign reserves, as the return on the reserves is likely to be well below the cost of the debt. However, to some extent such borrowing can be justified as a form of insurance (or purchase of liquidity) to ensure reserves are adequate to meet an unexpected demand.[19] In addition, the currency composition of reserves may influence the currency composition of debt. For example, it could be a mistake for the debt managers to buy a derivative to remove their exposure to a given currency if there is already an offsetting exposure in the international reserves. Similar considerations may apply to maturity – for example, to prevent both debt office and central bank from lengthening maturities at the same time because they have different views about future interest rate trends.

However, there are often formidable practical difficulties in organising such coordination and Table 8 suggests it often does not occur. When it does, it is more likely to result from meetings between the debt managers (often part of the finance ministry) and the central bank rather than because the one agency is responsible for both.

Colombia's Debt Advisory Committee brings together the central bank and ministry of finance to determine the currency benchmarks for external debt taking into account the international reserves and balance of payments projections. In Thailand, the National Debt Policy Committee (which comprises the central bank, two agencies within the finance ministry and the National Economic and Social Development Board) performs a coordinating role. In China, the structure and liquidity of foreign exchange reserves are often adjusted according to the external debt.

Stress testing

By analogy with bank supervisors' requirements that banks assess the effect of various adverse shocks on their capital through value-at-risk calculations, the authorities might assess the extent to which the

[19] In some countries it may reflect internal politics. Paying off government agencies' debt using international reserves may remove an important discipline on them.

national liquidity position is vulnerable to shocks. Greenspan (1999) suggests calculating "liquidity-at-risk" based on "a range of possible outcomes for relevant financial variables (exchange rates, commodity prices, credit spreads etc)". Countries could then assess whether they held sufficient liquid assets to avoid new borrowing for a year with an x0/0 probability. The calculations could (and indeed should) allow for use of credit lines or exercise of options etc.

Such an approach has several weaknesses, some remediable, others not. The first is that the exact results would be model-dependent. To address this, it may be worthwhile using alternative models and assessing the sensitivity of the results to certain key parameters. A second weakness is that these kinds of analyses typically assume that shocks are normally distributed. There is some evidence that true distributions are "fatter-tailed", at least at the far end of one tail. For example, share prices fell by a third in October 1987 but have never *risen* by a third in the space of a few days, and minor currencies seem to experience rapid large depreciations against major currencies more often than appreciations. However, there is by definition little experience of these extreme events from which to calibrate distributions. A third problem is that covariances calculated during normal times may no longer apply (and could even change signs) during extreme conditions, and may be influenced by policy responses. These factors all argue for caution in using the "liquidity at risk" approach. But however inexact these calculations, they should sharpen thinking about the risks as well as benefits of short-term foreign borrowing.

"Risk audits" or "stress tests" are carried out by only a few economies. The Central Bank of Peru evaluates different scenarios for their economic programme contingent to external shocks once or twice a year. Monthly evaluations are made of the targets of the monetary programme. Mexico's central bank conducted an exercise in mid-1998 to evaluate liquidity needs given the scarcity of foreign capital. The exercise was carried out using different assumptions regarding the rollover ratios of bonds and commercial paper maturing during 1999, as well as of credit lines from foreign commercial banks. In Korea, the effects of various shocks such as devaluation and an oil price hike on the liquidity and external debt profile of the overall economy are frequently analysed. Thailand's Ministry of Finance uses the Commonwealth Secretariat Debt Recording and Management

System (CS-DRMS) to conduct sensitivity analysis of its foreign debt. In India both the Reserve Bank and the Ministry of Finance use the CS-DRMS to undertake scenario analysis of external debt which provides an important input to policy formulation.

Implications for foreign exchange reserves

Is there an optimal level of reserves?

A crucial aspect of liquidity management is the level of (potential) international reserves. In the Asian crisis, the economies with the largest reserves were able to hold their exchange rates steady (China and Hong Kong) or suffered only relatively modest depreciations (Singapore and Taiwan) while most other emerging economies in the region suffered severe devaluations. A recent poll of reserve managers supports Fischer's (2000) supposition that "it is very likely that countries seeking to draw lessons of the international financial crisis will decide to hold much larger reserves than before".[20] One senior emerging economy central banker characterised the prevailing view as "the more reserves the better". Table 9 and Graph 1 show just how much reserves have increased in Asia since the crisis.

Even countries with a pure floating exchange rate regime hold reserves, as insurance against natural disasters. But it is no easy matter to decide how large international reserves (or the liquid component of them) need to be. The optimal level could depend on a number of factors, such as the volatility of the real economy, which is typically higher in emerging economies than in advanced economies. Countries operating a fixed exchange rate regime, or which are particularly vulnerable to exchange rate swings, may need even more liquidity. Countries with large current account deficits or undiversified exports, or that are vulnerable to contagion from weak neighbours, may also need more conservative liquidity management policies. Economies with better access to international financial markets may need fewer reserves. These factors will differ between countries but also change over time.

[20] See Weller (1999).

Table 9

Foreign exchange reserves[1]

	June 1997	December 1999	June 1997	December 1999
	in billions of US dollars		as a ratio to short-term debt	
China	121	155	4.0	8.2
India	25	32	3.3	3.7
Hong Kong	68	96	..[2]	..[2]
Indonesia	20	26	0.6	1.4
Korea	33	74	0.5	2.1
Thailand	31	34	0.7	2.4
Argentina	19	26	0.8	0.7
Chile	17	14	2.2	2.0
Colombia	10	8	1.5	1.5
Mexico	23	31	0.8	1.3
Peru	11	9	2.0	1.4
Venezuela	13	12	3.6	2.5
Czech Republic	11	13	1.8	2.4
Hungary	8	11	2.1	2.3
Poland	20	27	5.0	4.1
Russia	20	8	0.5	0.8
Israel	18	23	6.7	6.3
Saudi Arabia	14	15	2.1	1.5
South Africa	4	6	0.3	0.5

[1] Excludes gold. [2] As this includes banking sector liabilities, it is not a suitable measure for countries with a large international banking sector.

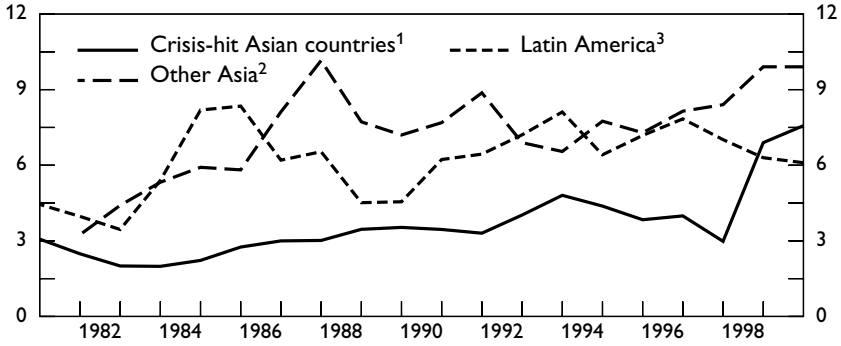
Sources: BIS; IMF.

Countries may also wish to hold temporarily higher reserves during the process of liberalising capital controls.

Some have argued there is no *objective* way of calibrating the desired level of reserves: it may simply be necessary for developing countries to maintain reserves at a level that the market (and rating agencies) perceive to be *adequate* in the circumstances. The market's idea of adequacy may depend on the "reputation" of the country, its recent record of depreciation or default. Or it may just be based on the level of reserves *relative to that in comparable countries*. If this is the case, there might be a significant problem for international economic policy:

Graph 1

Foreign exchange reserves expressed in months of imports



Note: End-year reserves divided by the average monthly imports for that year.

[1] Indonesia, Korea, Malaysia and Thailand. [2] China, India, the Philippines, Singapore and Taiwan. [3] Argentina, Brazil, Chile, Colombia, Mexico, Peru and Venezuela.

countries may "compete" with each other and drive up reserves to wasteful levels.

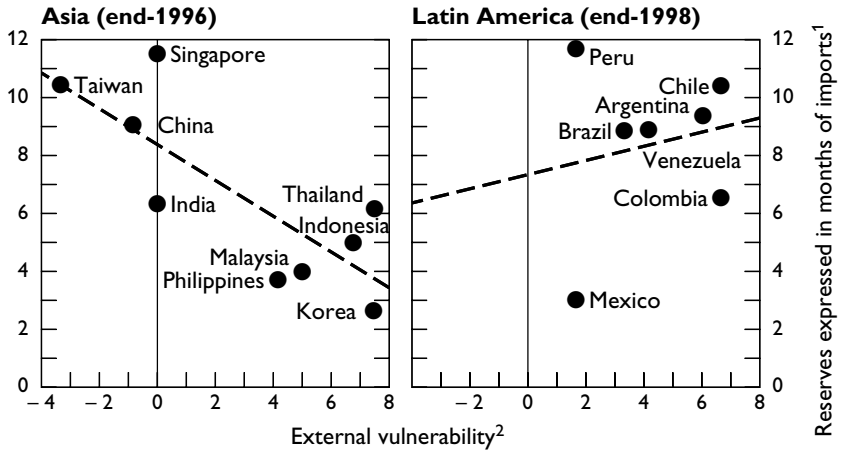
The level of reserves is often just the by-product of other policies or events. In the case of Hong Kong, the currency board arrangement means that the level of reserves is largely determined by capital flows, the size of the accumulated fiscal surplus (which is largely invested in foreign currency assets) and the earnings thereon. In other countries, the current level is largely a reflection of past intervention to achieve exchange rate objectives. Some central banks are constrained to accumulate reserves by agreements with the IMF.

In practice, however, it is difficult to establish any clear relationship between a country's reserve levels and its potential vulnerability to liquidity crises. By way of illustration, Graph 2 compares the reserve/import ratios of Asian and Latin American countries before their respective crises.[21] There does not seem to be any strong positive

[21] The index is a weighted average of scores for the following indicators of external vulnerability: the deviation of the real effective exchange rate from its long-term average, the current account balance as % to GDP, export growth relative to trend, the level and growth of external debt as % to GDP and the ratio of short-term debt to international reserves. The maximum score (ie greatest vulnerability) is 10. It is discussed in more detail in Hawkins and Klau (2000).

Graph 2

Foreign exchange reserves and external vulnerability



[1] End-year reserves divided by the average monthly imports for that year. [2] Based on BIS calculations: the higher the score, the greater the external vulnerability.

correlation. Indeed, in Asia, as shown by the fitted lines, the relationship is if anything inverse. In Latin America there is a slight positive relationship. This admittedly quick and crude test suggests that policy-makers in countries where external vulnerability is high do not direct their central bank to hold high reserves as a precaution against future trouble.[22]

There are, of course, *costs of holding reserves*. Their assessment is complicated by the alternative opportunity costs used to calculate them. The opportunity costs of reserves accumulated from a succession of current account surpluses are the returns on *forgone domestic investment*. This approach is prevalent in the academic literature. It is particularly salient at present in Asia; the large reserve accumulation

[22] Similar results apply when the IMF's indices of "vulnerability" are used. See IMF (2000). The correlation between reserve holdings relative to short-term debt in emerging economies as at end-1999 (shown in Table 9) and the volatility of economic growth over the previous two decades is actually negative while the correlation with past volatility in capital flows is zero. Nor are the high reserve holders those with the lower credit ratings. However, this lack of correlation must be interpreted with caution as, while vulnerability could lead a country to hold more reserves, this would itself lower the measure of vulnerability.

can be viewed as the counterpart of a much reduced rate of domestic investment. However, the marginal productivity of capital is hard to measure.

A more common approach by policymakers is to calculate the *quasi-fiscal* cost of acquiring assets of low-yielding international paper through the issuance of often high-yielding domestic currency liabilities.[23] For many high-inflation countries that have implemented drastic stabilisation policies based on a fixed (or nearly fixed) exchange rate, this cost has proved to be very heavy. Yet the ultimate cost of holding reserves may be lower than this once allowance is made for future depreciation of the domestic currency. In the case of foreign borrowing to build reserves, the cost is the *credit spread*, negligible for borrowers at the upper end of investment grade, but high for many emerging economies. Both of these calculations might overstate the cost of reserve accumulation to the economy as a whole; higher reserves may lead to improved sovereign credit ratings and so lower interest rates for many borrowers. Increasing foreign reserves by borrowing demonstrates that foreign counterparties are comfortable with extending credit. And of course recent crises have shown the cost of running out of reserves can be very high.

Building up and holding excessive reserves may also give rise to other types of costs, such as excessive monetary expansion – particularly when underdeveloped financial markets limit the effectiveness of sterilisation operations – or policy mistakes that high reserves allow to be maintained for longer.

Rules of thumb for reserve adequacy

In the days when the balance of payments was dominated by trade, holding the equivalent of three months' imports was regarded as a useful rule of thumb. Some countries still to some extent apply such rules. The Czech central bank aims at keeping reserves at over three months' imports while in Chile the goal is five to six months. Poland revised its reserves target from three to six months following recent

[23] This cost may be negative for those few countries (at present China, Japan and Singapore) whose domestic interest rates are lower than those paid on the currencies they hold as reserves.

currency crises. Although India does not have a specific reserve target, adequacy of reserves is assessed in relation to the stock of short-term debt and portfolio flows apart from the traditional import cover.

An alternative (or additional) rule of thumb for today's environment, where capital flows dwarf trade, was brought to public attention by Greenspan (1999). It is often called the "Guidotti rule", as a form of it was proposed by Guidotti (1999). The rule states that usable foreign exchange reserves, including any available through contingent credit lines, should be sufficient to meet all repayments and interest on foreign debt falling due over the next year.[24] (This rule is sometimes expressed as "being able to live without new foreign borrowing for up to one year". This is not a helpful way of putting it as it implicitly assumes that there is a balanced current account and no other capital transactions. In particular, it assumes no capital flight, and this is most likely to occur just when the adequacy of reserves is attracting most attention.) An earlier measure used by Reddy (1997) combined both rules of thumb; he expressed India's reserves in terms of "months of payments for imports and debt service taken together" but also noted the need to supplement this statistic with other indicators.[25]

Some recent empirical support for the Guidotti rule is provided by Bussière and Mulder (1999).[26] The rule would also have been a good predictor of the Asian crisis. The crisis-hit Asian countries' reserves had been less than their short-term debt (and their *underlying* reserve position was even weaker – see footnote 8) while the other Asian countries' reserves position was much stronger – see Tables 9 and 10

[24] But as Grenville (1999, p 49) comments, "it raises the issue of why this short-term debt was useful in the first place, if the proceeds of the short-term borrowing have to be stacked away in reserves (at a lower rate of return than the cost of borrowing)".

[25] Reddy noted that other indicators (such as short-term debt and portfolio flows) were also taken into account in assessing reserve adequacy in India: the total stock of short-term debt and portfolio flows was less than 75% of the level of reserves.

[26] They find that the level of reserves relative to short-term debt is one of a few key variables useful for predicting financial crises. It performs much better than relating reserves to imports, money base or money supply. Their results suggest (p 5) "higher liquidity (as presented by the level of reserves over short-term debt) can offset weak fundamentals (as represented by the current account deficit and the appreciation of the exchange rate) and limit the vulnerability of countries in periods of contagion". Based on the estimated parameters, "as a rule of thumb, for countries with real exchange rates that are not significantly misaligned, and modest current account deficits, a reserve coverage of short-term debt of one is broadly consistent with avoiding sizeable contagion". See also IMF (2000).

Table 10

Comparison of imports rule and Guidotti rule

	Reserves/imports	Reserves/short-term debt
	in months; June 1997	in percentages; June 1997
Crisis-hit Asian countries	3.8	66
Other Asia	8.7	123
Latin America	7.6	123

and Graphs 1 and 2. By contrast, even the crisis-hit countries had been comfortably meeting the traditional "three months' imports" rule.[27]

The Guidotti rule has the virtue of simplicity but it only focuses on one type of potential claim on international reserves. An easy modification is to add the forecast current account deficit to the denominator.[28] A more sophisticated approach would also look at other financial claims and their probability of being redeemed in a crisis. This requires greater knowledge about the terms of outstanding debt and about the different classes of investors that hold debt. A start could be made on such a distinction by looking at the volatility of capital flows during past crises. It could be argued that reserves should be related to some volatility-weighted aggregate of liabilities in order to quantify more precisely the exposure to sudden capital outflows. For example, FDI was far more stable than portfolio and bank flows during the Asian crisis; and this has generally been the case in emerging economies.[29] Reddy (1999, and his paper in this volume) suggests trade-related credit is less volatile than other forms of short-term credit. Liabilities that easily reverse might be thought to "require" higher

[27] See IMF (2000), in particular comparing Figure 1 with Figure 3, for further evidence on this point.

[28] Before the Asian crisis, Indonesia, Korea, the Philippines and Thailand failed to pass this respecified Guidotti test; but all now pass it. It is of interest that Latin American countries pass the original Guidotti test (just!) but fail once the test is respecified. On the other hand, IMF (2000) reports empirical tests suggesting the simple Guidotti rule is a better predictor than the augmented rule.

[29] See Frankel (1998) for a further discussion.

reserves than more stable inflows. However, historical volatilities may simply reflect the scale and nature of past macroeconomic shocks, rather than the intrinsic nature of capital flows, and in any case an investor "locked in" holding one asset (eg an FDI-type asset such as a factory) can easily take a potentially offsetting position using a derivative.

There are a number of other questions that have been raised about the appropriate definition of both the numerator and denominator for the Guidotti ratio. One concerns the appropriate treatment of the liquidity position of commercial banks (discussed in more detail below). The external assets held by commercial banks (as well as the central bank) can support the country's international liquidity position. If commercial banks' liquidity position is high (eg because the regulators ensure external liabilities are covered by required holdings of foreign assets – see Table 11 below), the 'need' for central bank reserves may be lessened.

Further questions include: should trade credit be excluded on the grounds it can be repaid by the proceeds of the exports it is financing? Should some liabilities of the monetary authorities be netted off reserves rather than included in debt (as in the IMF concept of net reserves)? Should domestically issued domestic currency debt now held offshore be included in external debt (and can it be measured)? What about debt issued offshore but now held domestically? Should long-term debt with put options exercisable within a year be regarded as short-term, even if the options are well out-of-the-money? Should the denominator be adjusted for any hedging, if the data are available? In currency board economies, should the numerator be only the excess of reserves over those covering the monetary base?

In practice, few, if any, economies have formal Guidotti-type rules although some have policies along similar lines. India aims to build reserves and reduce short-term debt by "encouraging non-debt creating flows and de-emphasising debt creating flows" and takes into account the maturity profile in approving individual capital account transactions.[30]

[30] Reddy (1999). Peru is required to develop a policy for the management of foreign debt under the terms of a World Bank loan. Indonesia has had since 1991 a Foreign Commercial Borrowings Team, headed by the senior economic minister, with the finance minister, central bank governor and chair of the national development agency as members. It both monitors foreign borrowing by corporations and sets ceilings for borrowing by SOEs.

A country wishing to move quickly to meet the Guidotti rule would face hard choices about abruptly raising interest rates to curtail imports and attract capital inflows or undertaking expensive long-term borrowing.

Managing reserves

If, for reasons discussed above, higher reserves are held, it becomes more important to seek higher returns on them. The reserve managers may argue they can raise returns by active management; but this depends on their ability to beat the market. It is becoming increasingly common for central banks to contract out at least part of the task to external fund managers. Several central banks have increased returns by lengthening the average maturity of their foreign assets; at the same time, the use of repo markets and other forms of borrowing have given central banks better access to liquidity. But there are important constraints on investment choices. One is the need to maintain a large amount of the reserves in securities that are liquid – and not just liquid in normal times but which will stay liquid in a crisis.

Credit lines

An alternative to building up reserves through borrowing or running current account surpluses is to arrange a credit line. If the need for liquidity is episodic or precautionary rather than continual, and the capital charge for a credit line is smaller than for drawn credit (eg it has a 50% weighting in the original Basel Accord), then contingent credit may be cheaper than the equivalent loan.

The cost of a (contingent) credit line has at least four facets:

- commitment fee;
- interest rate charged on drawdowns (which could be fixed or related to eg Libor);
- degree of contingency; drawdown at the country's discretion or only under certain conditions, such as a recession (but who defines this and how?) or the collapse of a key commodity export price;
- amount of collateral required.

Comparing the cost of borrowing reserves with arranging a credit facility is complicated by the fact that the cost of the facility is likely to be influenced by the size of the country's reserves, as this will influence the chance of the line being drawn.

A more fundamental question is whether a contract to borrow is as good as money in the bank. This question raises issues of legal provisions, of market perception, and of the reactions of credit providers. *Legal provisions* can take the form of quantitative conditions for drawing or a less precise proviso that credit can be denied in the event of a "material adverse change" in the borrower's condition. The *market* may have difficulty valuing contingent credit lines – and their value is indeed hard to determine (eg a contingent credit that can be drawn at 50 basis points over Libor is worth more to a country than one drawable at 200 basis points). Faced with such uncertainty, market analysts may place most emphasis on actual reserves.

The *reactions of credit providers* will determine the true "additionality" of credit: for instance, if the central bank arranges credit lines with the same international banks that have lent to the domestic banks and their corporate customers, the attitude of these international banks could change when problems arise in the domestic economy. They might be more disposed to restructure or roll over loans to the domestic banks if they know that the alternative is having the government drawing down on a credit line which would still leave the international bank exposed to the troubled country. However, it may also have the opposite effect. The international bank may respond to the prospect of the central bank drawing down the credit line by cutting back other exposures to the country; there is evidence of this happening when Mexico drew down its line. In Argentina, the banks providing credit lines also bought out-of-the-money options on government bonds as a hedge. Finally, there are concerns that the credit lines may be difficult to renew in times of volatility.

In 1996 the Central Bank of Argentina established a credit line, to allow assistance to banks in a crisis without violating the currency board framework.[31] Under the facility currently arranged with 16 international banks, the central bank has the right to borrow up to $7.1 billion with a maturity of two to five years at Libor plus 205 basis points collateralised by Argentine government bonds denominated in US dollars. The facility

[31] The description of Argentina's facility given here is drawn from Powell (1999), who gives further information, and Financial Stability Forum (2000).

has lasted for three years and is renewed each quarter. The commitment fee rose from around 30 to 60 basis points after the Asian crisis but has since dropped back to 33 basis points. The facility is subject to margin calls, but under a 1998 agreement the World Bank and Inter-American Development Bank would assist in meeting up to $1 billion of these under a contingent loan commitment.

Mexico established a $2.7 billion facility in November 1997.[32] Once exercised, the facility had a maturity of 18 months, and an interest rate of three-month Libor plus 50 to 100 basis points. The Mexican government had to pay a fee of 30 basis points (around $7.5 million) to keep the option alive. The facility was activated in late September 1998, allowing Mexico to borrow at a significantly below market rate. The participating banks reportedly objected to this drawdown, arguing that using the facility in a non-emergency situation[33] was against the spirit of the agreement. In March 1999 the Mexican government reached an agreement with most of the participant institutions to restructure its liabilities. More recently, Mexico has been able to negotiate financial agreements with international financial institutions as well as with its NAFTA partners. These agreements are an essential component of Mexico's strategy to ensure sound and predictable external financing and to be protected against volatility in international capital markets.

Indonesia established a series of credit lines (of $0.5 billion each) with large banks over 1994–97. During the subsequent crisis, these lines were all nearly fully utilised. Further lines have been or are being arranged under the IMF programme. After the 1997 koruna crisis, the Czech central bank arranged a $2 billion syndicated credit facility with foreign banks in order to be able to boost credibility if reserves dropped further.

The Bank of Thailand has a credit line under the IMF's Standby Arrangement. The ASEAN Swap Agreement allows Indonesia, Malaysia, the Philippines, Singapore and Thailand to request swap transactions with

[32] For further details see the paper by Sidaoui in this volume and IMF (1999).

[33] While it is arguable whether the situation in September 1998 constituted an emergency, it was certainly a stressful period, with conditions facing emerging economies in international financial markets deteriorated and the value of oil exports sharply reduced due to low prices.

each other within a small predetermined credit line. Under the recent Chiang Mai initiative these arrangements are being broadened to include China, Japan and Korea. Lines that add to liquidity may also be useful. Central banks with very large reserves invested in relatively illiquid assets (to improve returns) can be vulnerable to a sudden attack on their currency. Arrangements whereby other central banks effectively make such assets liquid (eg repurchase agreements against bonds) can be particularly useful. Such agreements do not of course relieve the central bank of the need to hold a high level of reserves but they do allow it to invest in a wider and less liquid range of assets. Ten Asia-Pacific central banks have since 1995 gradually built up a network of bilateral repo agreements but so far these facilities have not been activated. This may reflect their small size compared to the shocks faced in the Asian crisis, the simultaneity of pressure on so many of the parties to the agreements, or the need to provide collateral in the form of US Treasury bonds.

Feldstein (1999) suggests that credit lines could be collateralised. Export earnings paid to a trustee institution could form the collateral. US loans to Mexico in 1983 and 1995, for example, were collateralised against the Mexican government's future revenues from the sale of oil. Participation by the IMF and/or World Bank on the same terms as the private lenders could build confidence. The arrangement would need to be accompanied by currency controls and arrangements to ensure that the same asset is not used to collateralise loans from different banks. Other proposals include partial guarantees being provided by the multilateral development banks.

In October 1998, the G7 endorsed a US proposal for the IMF to establish a short-term line of credit for countries pursuing strong IMF-approved policies but vulnerable to contagion. The IMF instituted such a Contingent Credit Line facility in April 1999. Eligible countries would be able to borrow quickly up to three to five times their IMF quota. Loans would usually be repayable within 18 months and the interest rate charged would be 3–5 percentage points above short-term official rates.

Major questions arise concerning how eligibility for such a line should be determined. A line that is irrevocable provides no incentive for the maintenance of sound policies. On the other hand, revoking a credit line to a vulnerable country may well trigger a crisis by itself. The IMF has

set four categories of policy conditionality. An eligible country must be pursuing sound policies, must meet (or be progressing towards meeting) various international codes of conduct, must submit an acceptable policy programme and must have good relations with private creditors. Before drawing on the line, the country must satisfy the IMF that it is a victim of contagion. So far, no countries have announced they have signed up. The various reasons that have been cited for this include a concern that being an early applicant could be interpreted by markets as a sign that a crisis was expected, the cost (relative to other, less demanding, IMF facilities), and the difficulty a country might have proving it was suffering due to contagion.[34] In any event, this programme does represent a widening of the financing possibilities open to countries in crisis.

Policies for the private sector

Banks

The case for government intervention in the external liquidity policies of the banking sector is stronger than for the corporate sector. Banks are often viewed by markets (rightly or wrongly) as implicitly guaranteed by the government, even if formal deposit insurance arrangements only cover small domestic deposits. Almost invariably, governments have stepped in when a systemic crisis threatened. This has usually involved the central bank providing liquidity support or arranging for the private sector to provide it. While central banks try to retain "constructive ambiguity" about whether this assistance will be forthcoming, in practice large banks are often regarded as "too big to fail", particularly where a few large banks dominate the banking system. Furthermore, illiquidity in banks' foreign exchange balance sheet can pose systemic problems, putting confidence in the banking system at risk. In practice, generalised runs in the international interbank market, as in Norway, Sweden and Korea, led the central bank to give its banks access to its international reserves to meet interbank liabilities denominated in foreign currency.

[34] See Fischer (2000) and Group of 24 (2000).

The recognition in the market that international reserves are being or have been deployed to meet an interbank run is, of course, one of the propagation mechanisms by which a banking crisis becomes a currency crisis.

Regulation of the liquidity of banks' foreign currency assets and liabilities is, therefore, a means of promoting self-reliance, rather than implicit reliance on the authorities. Under some styles of supervision, there are strict rules limiting the size of exposures (gross, net and vis-à-vis individual currencies) relative to capital, while in others the emphasis is placed on ensuring that banks have appropriate systems in place to monitor and control such exposures.

In some cases, these rules have been tightened following recent crises. For example, the Korean authorities have strictly limited foreign-currency maturity mismatches. For residual maturities of seven days and less, assets must exceed liabilities; for residual maturities of three months or less, assets must represent 80% of liabilities; for loans of three years or more, 50% of the funding must be at three or more years' maturity. These rules may still leave banks vulnerable to defaults by counter-parties. Banks in Indonesia intending to borrow abroad must submit their annual plan three months in advance and the central bank will allocate a ceiling to each bank based on its past performance. Banks are also required to limit external borrowings under two years' maturity to less than 30% of their paid-up capital and use at least 80% of it for export credits.

Banks in emerging economies have often made extensive use of borrowing in foreign currency to fund domestic credit – both from foreign banks and, in some cases, through offering domestic residents foreign currency deposits (Table 11). In such cases the banks' direct foreign currency exposure may be small because domestic assets denominated in foreign currency "balance" foreign liabilities. But they remain exposed to credit risk and therefore need to monitor their borrowers' foreign exchange risks. In practice this often has been neglected. In addition, the gross foreign currency exposure of the total banking system might be a problem even if net positions in individual banks seemed prudent. If banks do indeed have significant foreign (gross) liabilities, there is a case for subjecting them to special liquidity ratios (eg requiring that a certain proportion of liquid assets be held in the form of liquid foreign assets). As Powell (1999) comments, "if there is a

Table 11

Banking regulations and foreign borrowing

End-1999

	Minimum liquid foreign currency assets?	Credit lines with inter-national banks?	Borrowing from foreign banks as a percentage of domestic credit
China	yes	no	4
Hong Kong	no; but need to state policy	encouraged	..[1]
Indonesia	3%	encouraged	51
Korea		no	16
Singapore	no	no	..[1]
Thailand	no	no	20
Argentina	21%	required	23
Chile	demand: 19%, time: 14%	no	7
Colombia	no	no	15
Mexico	0–50%, depends on duration	no	13
Peru	20%	yes	18
Venezuela	17%	no	19
Czech Republic	no		22
Hungary	no	no	57
Poland	no	regarded positively	21
Russia	no		152
Israel	some reserve requirements	no	4
Saudi Arabia			26
South Africa	no	no	10
Memo			
Australia			16
Canada			19
France			35
Germany			22
Japan			76
United States			15

[1] Not an appropriate measure for international banking centres.

Sources: Central banks; IMF; BIS.

crisis of confidence in an emerging country banking system, there will be an increased demand for foreign assets and reserves in domestic assets may not help". The local central bank cannot be an unlimited last resort lender of foreign currency as it can for home currency.

The different reserve (and liquid asset) requirements for local and foreign currency deposits in a number of countries are discussed in Financial Stability Forum (2000). As these alter the relative cost of local and foreign currency funding, they will affect the composition of liquidity. For example, Colombia, the Philippines, Singapore and Saudi Arabia impose reserve requirements on local currency deposits but not foreign currency deposits. China and Poland impose a lower reserve requirement on foreign currency accounts. In India, the reserve requirements on non-resident deposits are varied in line with the stance on capital flows.

The high foreign liquidity requirements imposed on Argentine banks (20% of most banking liabilities) helped them weather a banking run in 1995. Only assets with a high credit quality were acceptable: they include highly rated foreign bonds and deposits with a major designated foreign bank in New York. Allowing bank deposits rather than marketable instruments may create an additional monitoring need. In particular, the authorities will have to make sure that local banks do not conclude hidden arrangements allowing such deposits to be used as collateral for other business.

In addition to holding foreign assets, banks could be encouraged to arrange credit lines with international banks. This is akin to privatising the lender of last resort function. As such facilities will be on a commercial basis, the potential lender has incentives to examine the health of the bank seeking such a line and impose conditions on it. If a competitive market can be established, the price charged should reflect the risks involved and so encourage the banks to limit their risks. The home supervisors of the potential lenders will need to be satisfied that their banks are capable of managing large exposures to troubled banks. Such credit lines need to be legally watertight as the bank providing the facility may well baulk when faced with making a loan to a troubled customer. They might be allowed to count (but only after some appropriate discounting) in meeting required liquidity ratios. Mexican banks, for instance, are allowed to count undrawn credit lines in meeting liquidity requirements with the central bank's authorisation.

Foreign banks may be in a different position to domestic banks in managing their debt and liquidity. They may have special access to foreign currency from their parent banks. The position may differ between foreign banks present as branches and those operating as subsidiaries (particularly if only partially owned). However, prudential rules are generally applied equally to foreign and domestic banks. Foreign parents would probably save their subsidiaries if they ran into problems individually but there is no expectation that foreign banks would help in a systemic crisis.

Care needs to be taken that the presence of foreign banks does not encourage excessive use of foreign currency borrowing by domestic banks or corporations. With the benefit of hindsight, it was a mistake for Thailand to allow the banks operating in the Bangkok International Banking Facilities to use foreign funds for domestic as well as external lending, and to encourage them to believe that increased lending would be rewarded by being granted full banking licences.

Other financial institutions

Other financial institutions such as mutual funds, pension funds and unit trusts are becoming more important. Standard portfolio theory suggests that such institutions would provide the best return-risk mix to their investors by including a significant amount of foreign assets. In practice, however, a marked "home bias" has been observed; far fewer foreign assets are included than theory would imply. Most countries tend to discourage, or prohibit, funds from investing abroad so as to retain scarce capital for domestic development. One notable exception is Chile, where the authorities aim to increase the fraction of assets invested abroad in order to reduce the concentration of risk (Table 12).

Requiring institutional investors to hold a minimum proportion of foreign assets would raise national holdings of foreign assets. If the requirement were that the share of foreign assets be kept within a narrow band, it might also help stabilise the exchange rate as the funds managers would need to buy domestic currency assets following a depreciation. However, there are obvious dangers in an overly interventionist approach to institutions' investment decisions.

Table 12

Rules on holdings of foreign currency assets by funds managers

	Mutual funds/unit trusts	Pension/ superannuation funds
China	not allowed to invest abroad	
India	<$50 mn; only ADRs of Indian companies	<$50 mn; only ADRs of Indian companies
Hong Kong	no restrictions	no restrictions, except for funds under Mandatory Provident Fund scheme: <70%
Indonesia	only if issued by local company	only if issued by local company
Korea	no restrictions	no restrictions
Singapore	no restrictions	<30%
Thailand	none allowed	none allowed (except government pension fund)
Argentina	<25%	<17%
Chile	no limit	<16% (gradually raised from <2% in 1992)
Colombia	no limit	no limit
Mexico	allowed	allowed
Peru	no limit	no limit
Venezuela	no limit	no limit
Czech Republic	only OECD marketable securities	only OECD government bonds
Hungary	limited	limited
Poland	<5%	<5%
Israel	no limits	<5% (and discouraged by tax)
South Africa	<15% (and under asset "swap mechanism" can only accumulate foreign assets while they can find foeign parties investing an equal amount in the domestic market)	<15% (and under asset "swap mechanism" can only accumulate foreign assets while they can find foreign parties investing an equal amount in the domestic market)

Source: Central banks.

Foreign borrowing by the corporate sector

Data on the foreign debt of the corporate sector are sparse. But it is notable that companies in some emerging economies have borrowed extensively from foreign lenders. In the case of bonds, significant

proportions have been placed internationally. Table 2 shows that these bonds are almost invariably denominated in foreign currencies.

Preventing "excessive" foreign indebtedness of the corporate sector is a difficult policy challenge as companies are not subject to the sort of regulation applying to banks. The usual avenue would be to rely on greater public disclosure, either ex ante or ex post. Such requirements could be imposed by the government, or may be included in accounting standards or stock market listing requirements. Companies may fear an adverse response from investors and lenders to the disclosure of large foreign currency exposures and so be dissuaded from excessive borrowing. However, as disclosure through annual reports is infrequent and slow, there may be a case for requiring some form of more frequent disclosure, at least to the authorities, by large companies. Some countries are contemplating a (real-time) credit register for companies to help lenders be better informed about the current debt of potential borrowers. Credit registers have been used in several European countries. For large companies, registers might need to be established on a global level to be useful.

An alternative is to impose direct prudential controls. For example, only companies rated above a certain grade, or which can demonstrate they either have foreign currency income or adequate systems to manage the risk, could be allowed to borrow offshore. Foreign borrowings could be limited in size or a minimum maturity could be set.[35]

Prudential capital controls

Controls on capital *inflows* are a preventive measure and less likely than controls on outflows to damage confidence in the country imposing them, although over time they may reduce the efficiency of the financial system. The Chilean experience has been much discussed. Most forms of foreign investment are required to remain in Chile for a minimum period of one year (previously three to ten years, depending on the type of inflow). There is also an unremunerated reserve requirement, in the form of a non-interest-bearing deposit, that provides a disincentive

[35] In India, foreign borrowing by companies (other than trade credit) is regulated by the authorities, which insist on a minimum maturity of five years for loans over $20 million (and do not allow put options to subvert this).

to short-term capital. It affects most forms of external financing but excludes FDI. The deposit has to be kept for a year regardless of the maturity of the inflow. The rate was set at 20% in 1991, increased to 30% in 1993 and, although reduced to zero as capital flows to emerging markets dried up in 1998, has not been abolished. The requirement seems to have lengthened the maturity of debt, which should make the economy less vulnerable to sudden losses of confidence, but with the consequence of raising domestic interest rates compared with what they otherwise would have been. Indeed, one objective of the policy was to allow domestic interest rates to be held above international levels. The evidence that the policy may have lowered total inflows is rather weaker.[36] Its effectiveness may have been eroded over time as market players learnt to circumvent the intent of the rules. China limits capital inflows by distinguishing between two classes of equity, with only B shares being open to foreigners. In India, portfolio investment is restricted to registered foreign institutional investors (through which foreign corporates and individuals can invest) and non-resident Indians subject to overall limits related to the paid-up capital of a company.

Generally controls on *outflows* by non-residents are not favoured, except perhaps as an emergency measure. Edwards's (1999) reading of the economic literature concludes that controls on capital outflows are often counterproductive in that the private sector quickly finds ways of avoiding them and the authorities use them as an excuse for not undertaking more fundamental reforms. This suggests there still may be a role for temporary limits accompanied by reform. Malaysia's use of some temporary controls on capital outflows is an example. This experience is still too recent for a definitive judgment. One provisional assessment that has some support is that by Krugman (1999), who notes that controls have not had the dire consequences predicted by some, but nor do they appear to have made a decisive difference to the country's economic performance.

Developing domestic bond markets

One reason why companies in emerging markets borrow in foreign markets is that domestic securities markets are often underdeveloped.

[36] See Edwards (1999, pp 14–16, 18–19) and the studies referred to therein.

Outstanding volumes are relatively small and turnover is very low in most of eastern Europe and Latin America and much of Asia. In addition, most local debt securities in the developing world are dominated by short-term paper.

Bond markets in Latin America have been inhibited by periodic bouts of very high inflation – as low inflation becomes more established in this region, corporate bond markets should also develop. An important reason for the small size of bond markets in much of Asia is that historically governments have not run budget deficits requiring large issues of bonds. The absence of a yield curve for benchmark government bonds also makes it difficult to price corporate bonds and appears to inhibit their issuance. Indonesia does not have a government bond market and the few corporate bonds are not actively traded. However, government deficits have recently risen sharply across Asia and are likely to remain high for the foreseeable future. In addition, a large volume of bonds is being issued to finance bank recapitalisation. Thailand is considering whether it should issue some government bonds, even when the budget is balanced, to help develop the bond market. This was one reason why the Hong Kong Monetary Authority issued its own paper, despite a history of government surpluses. A similar exercise has been conducted in Singapore.

This raises the question of the official role in the development of a bond market (Table 13).[37] Providing a stable low-inflation macroeconomic environment is, of course, an important contribution by the central bank, but it may not be sufficient. In Thailand, a Domestic Bond Market Committee has been established to coordinate efforts by the central bank, securities commission and ministry of finance. The authorities can provide, or coordinate, a supporting infrastructure. Important elements would be standard documents, appropriate governing legislation and an efficient registry, trading and settlement system linked to the payment system so as to allow delivery-versus-payment and the provision of information on yields and volumes traded. Other supporting measures

[37] CGFS (1999) specifically addresses means of increasing liquidity, which it defines as "where participants can readily execute large-volume transactions with little impact on prices", in government bond markets but many of the same principles apply to the corporate debt market.

include removing legal, regulatory or tax impediments to greater market liquidity. For example, government securities in Poland used to be tax-free but now the tax treatment for all bonds has been equalised. Singapore has gone further and offers concessionary company tax rates on trading and interest income. The authorities can also help promote transparency, competition, market-making and robust trading rules. For example, the Reserve Bank of India has taken the lead in institutional development, establishing a system of primary and satellite dealers and initiating work on electronic dealing systems. Listing of bonds on the stock market may make them more liquid and ease access by retail investors; this may require changes to listing rules. International linkages between national systems could further broaden and deepen bond markets; the Hong Kong authorities set up a clearing, settlement and custodian system which they have now linked with Euroclear, Cedel and central securities depositories in Australia, New Zealand and South Korea.

Furthermore, official action to support the establishment of a secondary mortgage market would help bond markets to develop. Argentina sought to facilitate this by introducing standard procedures for the origination of home mortgages. Liquidity could also be enhanced by the public sector encouraging repo markets. Facilitating the stripping of interest payment coupons from the bonds may make them appeal to more potential buyers. Allowing short-selling may also deepen the market. Encouraging the use of international credit rating agencies, and perhaps the establishment of domestic agencies, could make such paper more marketable. Singapore has offered concessionary tax rates to attract credit rating agencies. On the demand side, the development of pension funds would create natural buyers for longer-term paper. The process of market development is partly self-fulfilling: as participants become more willing to transact in liquid markets, liquidity is developed.

One consideration that may argue for caution is that bond issues could skim off the better corporate credits from the banking system, weakening the average quality of banks' loan portfolio. This will depend in part on how far domestic corporate bond issuance substitutes for domestic bank loans. Many large corporations already rely more on issuance of international bonds than on bank loans. For such firms, a deeper domestic bond market will tend to divert business from international markets rather than from domestic banks. The overall

Table 13

Measures to develop the corporate bond market

	Extend maturity of govern-ment bonds	Trading and settlement systems	Mortgage securiti-sation	Taxation changes	Rating agencies	Funds man-agers
China	✓	✓				✓
India	✓	✓	✓	✓		
Hong Kong	✓	✓	✓	✓		✓
Indonesia		✓			✓	
Korea		✓	✓			✓
Singapore	✓	✓	✓	✓	✓	✓
Thailand		✓		✓		
Argentina	✓	✓	✓	✓	✓	✓
Chile	✓		✓		✓	✓
Colombia		✓	proposal with congress			
Mexico					✓	✓
Peru		✓		✓	✓	✓
Czech Republic	✓		✓			✓
Hungary	✓	✓				✓
Poland		✓		✓		✓
Russia		✓				
Israel	✓	✓	planned	possible	✓	✓
South Africa		✓				

Source: Central banks.

impact will therefore partly depend on whether it is only highly rated large companies (already active in international bond markets) that issue domestic securities, or whether issuance will extend to other good quality entities – or even as in the United States to the issue of junk bonds. How far (if at all) regulators should seek to influence the "credit rating cut-off" for domestic bond issuance is one important issue. A second issue is whether the authorities should discourage shorter-dated issues. The proposed new Basel Capital Accord, which aligns capital requirements more closely to the credit rating of the borrower, may change the decision between borrowing from a bank and issuing bonds for some companies.

Developing deeper domestic currency debt markets does not guarantee they will displace foreign currency debt. In Mexico, the tesobonos were developed in response to the fall in demand for the domestic currency cetes. It is also possible for deeper markets to hurt a small country. International fund managers will sometimes sell in a liquid market as a "proxy" for hedging risks in illiquid markets. Hungary and South Africa were notably affected in the wake of the Russian crisis.

The household sector

Households' direct holdings of foreign currency assets or liabilities are probably rather small in most advanced economies. The position is different where past hyperinflations or confiscations have led people to be wary of the domestic currency or banks. In some of these economies, wealthy households have foreign bank accounts or foreign currency deposits with domestic banks but this does not provide any meaningful offset to foreign debt of other sectors.

In China and India regulations aim to prevent residents either borrowing in foreign currency from local banks or placing funds with foreign banks. In Korea, households can hold deposits abroad up to $50,000 but cannot borrow in foreign currency.

Conclusion

The fact that excessive short-term foreign currency borrowing was a key ingredient of the Asian crisis has stimulated much debate about how to manage foreign debt and liquidity risks – not only of the government but also of the private sector.

In principle, the private sector should manage its own liquidity risks, and not count on the public sector to provide liquidity in an emergency. Policies to help achieve this fall under several headings. First, the supervisory system should ensure that banks not only limit the direct foreign currency maturity mismatches on their own balance sheets, but also avoid potential credit risks from borrowers overexposed to exchange rate movements. How best to do this depends on local circumstances. In some cases (eg where banks have the necessary capacities and where deep and liquid financial markets permit the

more sophisticated hedging techniques), the main emphasis will be on monitoring banks' own risk management techniques and exposures. Oversight by bank supervisors can be supplemented by more effective market discipline – requiring fuller disclosure by banks to the markets on how they manage foreign exchange and liquidity risks. Improved disclosure by non-financial corporations of their underlying foreign exchange exposures would support such an approach. In other cases, however, rather more direct regulatory mechanisms could be more appropriate. This may include ceilings on banks' net and gross foreign currency positions as well as reserve or liquidity requirements calibrated to limit foreign currency exposures.

Secondly, domestic bond markets need to be further developed. The absence of local bond markets typically forces corporations to borrow abroad, exposing themselves to foreign exchange risks. It is important that tax or legal impediments to the development of bond markets be removed. Gearing government issuance programmes to the development of more liquid markets in government bonds – which typically play a key benchmark role – can also help.

Thirdly, policy distortions that encourage excessive foreign borrowing by the private sector should also be avoided. Implicit or explicit guarantees to private borrowers fall under this heading. Another instance can be pegged exchange rate regimes which encourage borrowing in foreign currencies to take advantage of lower interest rates.

In managing its own debt, the public sector should resist the temptation to lower the immediate financing cost by borrowing short term in foreign currencies. Such borrowing exposes the government to interest rate and exchange rate risks that have often been underestimated. Borrowing in domestic markets with a wide range of maturities may well prove more expensive in the short run, but provides the borrower with greater protection against possible adverse developments in the medium term. Finally, borrowing in domestic markets as a general rule ensures that heavy government borrowing has the immediate and unpleasant consequence of pushing up domestic interest rates. Too often foreign borrowing has merely postponed the pain, and delayed corrective action.

A more controversial question is how far the government's management of its own foreign liquidity position should take account of

the configuration of the private sector's assets and liabilities. Should the national balance sheet (private sector as well as public sector) influence policy? In particular, should central bank foreign exchange reserves be higher if the private sector short-term foreign currency debt is large? Views differ about these issues. One side of the argument is that external liquidity positions that are the result of private sector decisions – and not of government policy – can be viewed as of little concern to policymakers. On this view, attempts by governments or central banks to build up reserves to cover private sector foreign currency risks may encourage more reckless behaviour in the private sector. The other side of the argument is that policymakers have to be concerned because liquidity crises provoked by excessive private sector borrowing can trigger disruptive adjustments that hurt everybody. Even in the absence of crises, externalities can be important: heavy borrowing by some entities tends in many countries to increase country risk premia and thus the interest rate charged to all borrowers.

Even if this basic issue remains unresolved, three conclusions could perhaps be offered. The first is that recent crises and the general experience of volatility in capital flows appear to have increased emerging market central banks' demand for reserves. One reason may be that measuring reserve adequacy has become an element in private sector checklists of a country's vulnerability to liquidity crises. Credit rating agencies, in particular, follow closely the ratio of reserves to short-term foreign currency liabilities. But any simple or universal "rule" on a minimum ratio of reserves to short-term foreign currency debt can only be a first step towards building greater resilience.

The second is that the cost of holding reserves and the development of financial markets make it sensible to look for alternative mechanisms. For example, financial instruments may help to protect countries from external shocks (options based on commodity prices). Contingent credit lines may also have an important role to play in supplementing actual reserves, and several countries have concluded agreements with private banks. When not used, such credit lines may help confidence and be relatively inexpensive to renew. However, it is unclear at present how far their actual use provides additional credit.

The third conclusion is that more needs to be done to monitor exposures to liquidity and foreign exchange risk, both in aggregate and at the sectoral level. This will involve fuller disclosure by both the private

and the public sectors and better, more timely statistical coverage. It will also involve continuous review of a country's vulnerability to external shocks, monitoring changes in the probability of shocks (as macroeconomic and financial conditions evolve) and measuring how exposures can be altered by such shocks (stress tests). Devising ways of designing such assessments is a formidable but important challenge for the future.

Annex A

Econometric test for externalities in foreign debt and reserves

This annex describes a test for externalities arising from external debt. The dependent variable in all the regressions is a measure of Standard & Poor's sovereign credit ratings. It has been transformed into a number by assigning the value 19 to AAA, 18 to AA+ etc down to 1 for CCC– and 0 for default. (A possible weakness of this is that experience with ratings of companies suggests default probabilities are not linearly related to ratings.) The data refer to 20 emerging markets over the period 1996–98.

The first two, common, explanatory variables are the logs of per capita GDP (on a PPP basis) and inflation, which studies such as Cantor and Packer (1996) have shown to have an important influence on ratings. They always enter with the expected sign although their significance is sometimes marginal.

Two alternative measures of external debt are employed. The first is external debt of the government itself. The second is a broader measure that adds in external debt of the private sector.

Comparing the results in specification (1) versus (2), or (4) versus (5) implies that sovereign credit ratings are more closely related to government debt than overall national debt. (1) and (4) imply increasing government debt by 8–11 percentage points of GDP would lower credit ratings by one notch, eg from B+ to B. Cantor and Packer (1996, p 44) show that a move from BBB to BB, ie three notches, lifts borrowing costs by around 1.2 percentage points. However, if (2) is considered alone, the impact is very much smaller. An increase in national debt of 43 percentage points of GDP is necessary to cause a one-notch deterioration in credit ratings.

The results may depend on definitions. S&P's sovereign credit ratings are "an assessment of each government's capacity and willingness to repay debt" while Moody's is "a measure of the ability and willingness of the country's central bank to make available foreign currency to service debt, including that of the government itself". The S&P definition appears to be more narrowly focused on the public sector.

Specification (3) looks at whether rating agencies apply something like the "Guidotti rule". Holding more reserves relative to short-term debt is associated with higher sovereign credit ratings but the variable is only marginally significant.

Specifications (4) and (5) look at the extent to which holding reserves offsets the effect of debt on credit ratings. In both cases debt and reserves have opposite signs as expected. The reserve coefficient has a larger absolute value, which would imply that borrowing to build reserves would boost credit ratings, but the difference is not statistically significant.

Table A1

Econometric test for externalities

Dependent variable: S&P sovereign credit ratings	(1)	(2)	(3)	(4)	(5)
Constant	−3.72	−6.53	−6.63	2.96	2.87
	(7.74)	(8.21)	(7.88)	(6.97)	(7.53)
Log GDP per capita	1.84	2.13	1.97	0.86	0.91
	(0.83)	(0.88)	(0.87)	(0.78)	(0.83)
Log inflation	−0.68	−0.87	−0.94	−0.65	−0.90
	(0.38)	(0.40)	(0.39)	(0.33)	(0.35)
Government external debt (as a percentage of GDP)	−0.09			−0.12	
	(0.04)			(0.03)	
Total external debt (as a percentage of GDP)		−0.02			−0.06
		(0.02)			(0.02)
Reserves/short-term external debt		0.005			
		(0.003)			
Reserves (as a percentage of GDP)				0.18	0.21
				(0.05)	(0.06)
R^2	0.40	0.32	0.35	0.56	0.51

Note: Standard errors in parentheses.

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