

COPING WITH AND CASHING IN ON INTERNATIONAL CAPITAL VOLATILITY

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Abstract

The political economy of currency taxation suggests that the idea will receive more support if it can be shown to make a significant contribution to offsetting the perceived inefficiencies of private international capital markets. This paper explores what can be expected from a currency tax in this respect. It shows that there are simple but neglected analytical issues that make such a tax an attractive idea. If the tax is relatively ineffective in helping to avoid financial crises and calming markets, it will be relatively effective at providing the resources necessary to mitigate the aftermath of such events. The paper offers new proposals for using the revenue from currency taxation to finance the operations of the IMF.

Key words: foreign exchange, IMF, capital flows, Tobin Tax, volatility

JEL Classification: F30, F31, F34

1. Introduction

The volatility of international capital flows and the incidence of international financial crises have led to call for the existing international financial architecture to be reformed. But how? One idea that has been around since the 1970s is that a tax should be levied on international currency transactions. Would such a tax reduce capital volatility and help avoid currency crises, or would it prove ineffective and infeasible? The political economy of currency taxation suggests that the idea will receive more support if it can be shown to make a significant contribution to offsetting the perceived inefficiencies of private international capital markets.

This paper explores what can be expected from a currency tax in this respect. It shows that there are simple but neglected analytical issues that make such a tax an attractive idea. If the tax is relatively ineffective in helping to avoid financial crises and calming markets, it will be relatively effective at providing the resources necessary to mitigate the aftermath of such events. The paper offers new proposals for using the revenue from currency taxation to finance the operations of the International Monetary Fund (IMF).

The layout of the paper is as follows: Section 2 provides a statistical summary of resource flows to developing countries between 1990 and 1997 (i.e. prior to the acute market turmoil in emerging economies in 1998), and analyses the implications of what is shown. Section 3 provides an anatomy of capital flows and of a financial crisis (i.e., a typical 'boom-bust' cycle). Section 4 examines the nature of capital volatility and goes on to discuss various ways of attempting to engender greater stability in the flow of private international capital, following in particular on the idea of taxing international currency transactions. Section 5 explores the revenue-generating properties of currency taxation and examines the extent to which an apparent weakness of the tax may in fact be a strength. Section 6 explores various ways in which the revenue from the tax may be used. Having briefly examined some existing ideas, particularly in the context of enhancing foreign aid flows, the section goes on to analyse two new ideas: financing an international lender of last resort,

and (co-)financing the IMF. Section 7 offers a few concluding remarks by way of summary.

2. Resource Flows to Developing Countries

Table 1 provides World Bank (1997) data on net resource flows to developing countries over 1990-97. Overall, these tripled from \$98.3 billion in 1990 to \$300.3 billion in 1997. However, while private flows increased more than six-fold (from \$41.9 billion in 1990 to \$256 billion in 1997), official development finance (ODF) was lower in 1997 than it had been in 1990. Indeed, in 1996, ODF was only \$34.7 billion as compared with \$56.4 billion in 1990 and \$62.7 billion in 1991. Accordingly, the share of ODF in total capital flows to developing countries fell dramatically from 57 percent in 1990 to about 15 percent in 1997, slightly higher than the trough of 12 percent in 1996 (Table 2). There is therefore *prima facie* evidence of 'aid fatigue' or 'aid weariness' among donor countries. Data from donor countries fortifies this point. OECD donors have cut back significantly on foreign aid, and in 1997, this component was only 0.22 percent of the OECD's GNP, the smallest share since comparable statistics began in the 1950s (World Bank, 1998)¹

The reasons for this almost certainly involve a combination of changes. These include the global political environment, in particular the end of the Cold War which blurred ideological differences and removed much of the political motivation for aid²; a general perception that aid has been ineffective at encouraging economic growth and reducing poverty (due to, for instance, the possibility that aid substitutes for, rather than supplements domestic resources); and the desire on the part of donors to reduce their own fiscal deficits (World Bank, 1998 and White and Woestman, 1994).

While the World Bank provides only annual data on capital flows, an indication of the instability of the various forms of private capital flows may be seen from computations of

¹ The US, with foreign aid constituting an extremely low 0.08 percent of GNP has the lowest share, while France, with a share of 0.45 of GNP has the highest. Even France though had a lower share than the 1 percent target by 2000 set by the United Nations General Assembly and the Development Assistance Committee (DAC), (Tinbergen, 1990 and White and Woestman, 1994).

² See Lundborg (1998) for a formalisation of this issue.

coefficient of variation, or CVs (Table 3). Interestingly, FDI flows have the highest CVs, while portfolio flows have the lowest, suggesting that FDI flows are the most variable and portfolio flows the least variable. This conclusion is, however, misleading, as CVs do not take the trend into account. Thus, while the CV is larger for FDI than for other capital flows, there is also a consistent (and predictable) upward trend for FDI. Strictly speaking, what is needed is a measure of variation around this *trend* rather than around the *average*. With insufficient data points to identify a definite trend, perhaps a more useful indicator is the number of consecutive years over which there are positive or negative changes, without a change in direction.

For commercial bank loans, there were consecutive annual directional changes in each year between 1990 and 1993 inclusive. Although bank lending then increased persistently between 1993 and 1997 with no further directional changes, the rate of change varied, with rapid expansions in 1993-94 and 1994-95 being followed by much more modest increases in 1995-96 and 1996-97 (in both percentage and absolute terms). The pattern for bonds is a little different, with directional changes occurring only in 1992-93 and 1995-96. Bond flows increased sharply in 1992-93 when commercial bank lending was declining, and fell in 1993-94 when bank lending increased. 'Other debt flows' show four changes of direction, with these being fairly evenly spread over 1990-97.

Portfolio equity flows exhibit three directional changes over 1990-97, although these all occurred in the period between 1993 and 1997 when bank lending increased persistently. Over the earlier period 1990-93 portfolio investment persistently increased, although again the rate of increase varied, with a particularly rapid increase occurring between 1992 and 1993. While not shown by the data in Table 3, it should be noted that portfolio investment comprises some relatively stable elements, such as investments by life insurance companies and pension funds, along with highly unstable investments like country funds and mutual funds. Only FDI showed no directional change throughout the entire 1990-97 period. Moreover, as noted, the rise in FDI took place at a fairly persistent rate, and on

average, constituted about half of all private flows. This stability of FDI flows is consistent with the statistical study by Frankel and Rose (1996), who found that a low ratio of FDI to debt is consistently associated with a high probability of a currency crash; while Chuhan, et al. (1996) and World Bank (1999) have also found FDI to be a more reliable source of financing³.

The World Bank data referred to above excludes short-term flows (especially debt) or asset transactions (such as changes in foreign deposits held by developing country residents). In light of this, Table 4 provides IMF data on capital flows. While the FDI and portfolio data are in line with those of the World Bank, of significance is the component termed 'other net investment'. Broadly, this category includes short and long-term credits (including use of IMF credit) as well as currency and deposits and other accounts receivable and payable. Unsurprisingly, it is this component that shows the greatest degree of variability, whether measured by the CVs or the directional changes discussed (Table 5). It may also be seen that this component turned negative in 1994 and 1997-1998, periods corresponding to the Mexican-Tequila crisis and the turmoil in East Asia, respectively. Note also the sharp instability of net official reserves, suggesting that these act as a buffer to the variability in short-term private flows. Moreover, use of *net* data almost certainly serves to understate the degree of capital volatility.

The general points made above about the volatility of private capital flows are reinforced by Table 6 which provides data from the Institute of International Finance (IIF) for the five East Asian economies most afflicted by the regional financial crisis, (viz. Indonesia, Korea, Malaysia, Philippines and Thailand). While net private flows saw a sharp reversal (net outflow) of over \$100 billion between 1996 and 1997 and another net outflow of \$30 billion between 1997 and 1998, this was primarily due to net (short term) lending by commercial banks, which averaged about \$60 billion in 1995 and 1996, but became

³ The IMF (1998) does caution that the distinction between portfolio and FDI flows in the balance of payments can be somewhat arbitrary and that the proportion of FDI flows in aggregate capital flows may be overstated. Conversely, FDI may actually be understated in some instances. For instance, some part of the recorded short-term borrowing by Thailand was actually FDI and intra-banking

negative at about -\$26 billion in the next two years. Similarly, official reserves varied sharply: from an increase of about \$19 billion in 1996, to a decrease of \$32.5 billion in 1997, and then to a rise of about \$41 billion in 1998. To a lesser extent, portfolio flows have also been variable while, in sharp contrast, FDI flows have remained extremely stable⁴.

Not shown in any of the tables is the fact that private capital flows are very unevenly spread between developing countries. Between 1990 and 1997, the five largest recipients of capital inflows have accounted for over 50 percent of total inflows to developing countries and the top twelve have accounted for about 75 percent of that total (Lopez-Mejia, 1999 and World Bank, 1998)⁵. While the share of private capital flows has risen substantially in Asia and Latin America, accounting for well over 80 percent of total flows, ODF has remained a significant source of external finance for highly indebted poor countries, often located in Africa, and has amounted to about 7-8 percent of GNP for a typical low income country (World Bank, 1998)

3. Anatomy of Capital Inflows and a Financial Crisis

Having observed the extent of variability of net private capital flows to developing countries (debt obligations in particular), it is useful to consider a typical boom-bust episode associated with such instability in capital flows. Financial crises have been recognised as sharing broadly similar empirical regularities. Domestic and international financial deregulation in the reforming economy leads to an initial surge in capital inflows. This occurs as there is general euphoria about prospects for the economy, and investors try to arbitrage

transfers (Ostry, 1997).

⁴ Note the difference between the East Asian and Mexican crises. In the latter case, short-term portfolio flows experienced the sharpest decline, as opposed to debt flows. Indeed, the sharp rise in borrowing from international capital markets in the wake of the Tequila crisis may have led to a substitution towards commercial bank lending.

⁵ To be specific, the top twelve countries (in descending order of magnitude of capital inflows) are China, Brazil, Mexico, Thailand, Indonesia, South Korea, Argentina, Malaysia, India, Turkey, Hungary and Russia (Lopez-Mejia, 1999).

differences in *ex-ante* interest rate differentials⁶. Commercial banks and other financial institutions in the country find it relatively easy to borrow from international capital markets and concomitantly lend to domestic customers rather freely. Flush with liquidity, and given relatively lax prudential supervision of banks and other financial institutions along with inadequate disclosure, some of the funds are channeled towards 'excess' consumption of both tradables and nontradables. To the extent that it is generally more difficult to discriminate between good and bad risks during a boom, resources are also inefficiently allocated to relatively unproductive investment projects, including real estate. Non-residents also move funds into the country's stock exchange, hence further fueling asset price inflation.

Since the domestic currency is invariably pegged (usually to the US\$), there is an inevitable overvaluation of the currency in real terms (i.e. real exchange rate appreciation), as wages, other costs and the prices of nontradables in general all rise. Consequently, the export competitiveness of the economy is eroded, with resources being reallocated to the nontradables sector⁷ in which the marginal productivity of capital may be relatively low. These factors work in tandem to lead to a deterioration in the trade/current account balance⁸. Eventually, a sudden turnaround in market sentiment - from euphoria to panic -

⁶ Given the limits to sterilisation of capital inflows over the medium and long-term (see next footnote), the reasons for the relatively high (and sustained) interest rate premium offered in an economy that has undertaken financial deregulation (even after accounting for potential default and devaluation risk premia) remains a relatively under-researched area. Fisher (1993) suggests a number of microeconomic imperfections, such as the oligopolistic structures of the finance industries and excessive interlocking ownership between financial, industrial and commercial firms as relevant factors. Rajan (1999) develops a banking sector model that rationalises the persistent interest rate premium in emerging markets within a context of a perfectly competitive framework.

⁷ A nominal appreciation due to inflows of funds may be precluded initially through sterilised intervention in the foreign exchange (forex) market which keeps the domestic money supply in check. However, sterilisation is still only a short-term/temporary option. First, sterilisation leads to a hike in domestic interest rates, which in turn perpetuates portfolio capital inflows into the country. Second, the monetary authorities will be faced with mounting losses (quasi-fiscal costs), as accumulating forex reserves provide a lower return than the domestic debt issued. Conversely, allowing a nominal exchange rate appreciation helps to control inflationary pressures. See Calvo, et al. (1995), Schadler, et al. (1993) and World Bank (1999) for overviews of general issues and Glick and Moreno (1994) for a discussion of capital flows and monetary policy in the specific context of East Asia.

⁸ Given that the current account must always equal the difference between national savings and investment *ex-post*, government policies that raise private or public savings (the latter through fiscal

causes a massive selling of the currency, leading a generalised and rapid reversal of net flows. A currency crisis thus ensues, culminating in banking and financial crisis⁹ - because of high loan concentrations and other microeconomic distortions such as deposit insurance (explicit or implicit) - with potentially calamitous consequences for the real economy¹⁰. But how can this boom-bust scenario be avoided?

4. Capital Volatility and Currency Taxation

Broadly speaking there are two ways of approaching the problem of excessive capital volatility. The first is to frustrate the wishes of market participants by directly controlling market movements. The second is to use a market-based mechanism to modify the structure of price incentives that face market participants, thereby inducing them to modify their behaviour; this is where the idea of currency taxation comes in. Capital controls may or may not work in the sense of reducing volatility, but they do not generally generate revenue¹¹. In contrast, a currency tax – like all taxes - may be expected to raise revenue. But will it reduce forex volatility? There are various layers to answering this question. A fundamental issue relates to the causes of volatility and this in turn raises issues relating to the way in which forex markets function.

consolidation) may preclude a current account deterioration. The East Asian economies have generally been acknowledged as pursuing such policies. In addition, until recently, these economies ensured that capital inflows were channelled into productive investments, thus leading to a virtuous cycle of high growth and further capital inflows (Rajan, 1999a).

⁹ A study by Kaminsky and Reinhart (1996) found that of the 25 banking crises under investigation, in 18 cases financial liberalisation had been undertaken some time during the previous five years. Significantly, while there was no apparent link between balance of payments crises and banking crises in the 1970s when financial markets were highly regulated, they did become very closely linked in the 1980s, a period which involved large-scale financial deregulation. Some of these issues are formalised in Rajan (1999b).

¹⁰ The adjustment process described in the text is not unlike the classic 'Dutch Disease' phenomenon, which may lead to a loss of economic competitiveness from a temporary and large mineral discovery, or favourable but transitory terms of trade movements.

¹¹ This paper does not discuss capital controls in any detail because they do not have the implications for revenue that form our focus. Dooley (1995) provides a useful review of the theory behind them and the evidence on their effectiveness. Analysis generally suggests that market-based regulatory mechanisms are superior in welfare terms to direct controls.

4.1 Functioning of the Forex Market

Krause (1991) has very neatly documented that the issue of forex market volatility is not something new¹². For instance, in response to Keynes, Milton Friedman and James Meade in the early 1950s argued that 'rational, profit-seeking speculation' in the forex market had to be stabilising. While this was the prevailing orthodoxy by the end of the Bretton Woods era, the events in the forex markets that followed led to an about-turn in the views of most informed observers of international financial markets. In fact, William Baumol in 1957 illustrated that in the presence of uncertainty about the turning points of exchange rates (assuming they follow a cyclical pattern), an optimal short-term strategy was one of buying when the market is rising and selling when it is falling. This was in sharp contrast to the seeming commonsensical 'buy high-sell low' Friedman-Meade strategy. The Baumol strategy was also consistent with the Keynes 'beauty contest' view of international finance, and seems to be in concurrence with the views of the market participants.

Kaldor (1987) attempted to reconcile the two preceding views - i.e. the Friedman-Meade view that speculation and financial markets are stabilizing versus the Keynes-Baumol view that free markets are destabilizing. He put forward the thesis that traders follow the Baumol strategy but only for a while. Once the exchange rate is over a certain 'threshold' and seems grossly overvalued (on the basis of fundamentals), the market will reverse itself, resulting in an eventual movement towards the long-run equilibrium. Hence, while the market may temporarily overshoot the long run equilibrium (leading to 'rational bubbles', whereby the price becomes increasingly removed from the economic value of the underlier), the long-run tendency is towards equilibrium. Kaldor's other important contribution to furthering the debate was to suggest the existence of heterogeneous agents in the currency markets. In particular, he argued that financial market participants at any point in time could be divided into two broad groups, viz. the 'speculators', who followed the

¹²This paragraph and the next draw from Krause (1991). The references to the historical works can be

Baumol-Keynes strategy, and - for want of a better term - 'fundamentalists', who focused on the trend of 'non-speculative elements' or market fundamentals. Intuitively, the greater the proportion of speculators to fundamentalists, the more destabilizing is unfettered forex market trading in the short to medium term.

The Kaldorian thesis has been confirmed by three recent survey studies of forex market participants worldwide (see Bird and Rajan, 2000 and references cited within).

Motivated by these findings, Flood and Taylor (1996, p.286) have concluded that:

the finding that a high proportion of foreign exchange market participants deliberately use analytical techniques that ignore macro fundamentals (i.e. 'technical' or 'chartist' analysis), especially over shorter horizons ... underscores the importance of allowing for the interaction of diverse forces in the short run determination of exchange rates.

Referring to the same issue, Frankel and Rose (1995, pp.1713-4) note that:

(this) area of research is quite small. However, it is potentially important, since it is part of the market microstructure work that is concerned with some of the most central issues of international finance, such as excess volatility and exchange rate determination. We hope for further developments.

Frankel (1996) has himself recently specified a model which presents a realistic structure for the forex market, and which takes into account the heterogeneity of and interaction between the two groups of agents¹³. We introduce a simple formalisation of forex instability which extends the original Frankel model in the appendix. For the purpose at hand though, the main conclusions from the model may be summarised as follows:

- a) The benefit of a flexible exchange rate for any country is the ability to undertake independent macroeconomic policy (and thus experience differing inflation rates), though the drawback is its greater bilateral exchange rate variability.
- b) The greater the proportion of 'long term investors' or 'fundamentalists' in the market,

found therein.

¹³ There are other models of this flavour. DeGrauwe et al. (1993) develops a model showing how the interaction between chartists and fundamentalists is capable of generating a chaotic behaviour of exchange rates. The complex non-linearities in their model preclude manual solutions, and necessitate computer simulations. Focusing on financial assets in general, De Long et al. (1990) develop an overlapping generations model in which noise traders are not chased out of the market by fundamentalists (in contrast to the efficiency market hypothesis).

the less variable the exchange rate.

- c) Where 'chartists' dominate the market, we would expect that the exchange rate will be very variable in the short term, with this variability falling over time, in the absence of random shocks. In other words, 'fundamental things apply as time goes by' (Flood and Taylor, 1996, p.283).
- d) The model also explains the growing variability of exchange rates over time. The more variable is the exchange rate, the less certain are participants about the fundamentals driving the market, with the result that the proportion of speculators rises. In other words, there may be a vicious cycle or self fulfilling prophecy, in which speculation and variability feed on each other in the short term (De Long et al., 1990 and Shleifer and Summers, 1990).
- e) The importance of a cost-based levy in reducing exchange rate volatility also becomes apparent. An aim of international currency taxation is to reduce the volatility of spot exchange rates by lessening the speculative element in the market (Tobin, 1996)¹⁴.

4.2 How Does Currency Taxation Fit In?

The above simple model makes apparent how a tax on currency transactions can, in principle, reduce exchange rate volatility. Specifically, one of the aims of such a tax is to reduce the volatility of spot exchange rates by lessening the speculative element (i.e., agents with extrapolative expectations) in the market. The aim is to discourage short-term speculative capital movements. James Tobin in 1972 (Tobin, 1978, 1996) originally proposed such a currency tax. The so-called Tobin tax is essentially a permanent, uniform, ad-valorem transaction tax on international forex flows. Since the tax can be amortised over a longer period, the burden of a TT is claimed to be inversely proportional to the length of the transaction, i.e. shorter the holding period, the heavier the burden of tax. For instance, a TT of 0.25 percent implies that a twice-daily round trip carries an annualised rate of 365

¹⁴ With specific reference to the model detailed in the appendix, such a tax could help reduce $\text{Var}(s)$ by

percent; while in contrast, a round trip made twice a year, carries a rate of 1 percent. Accordingly, and considering that 80 percent of forex turnover in 1995 involved round trips of a week or less (BIS, 1996), the TT ought to help reduce exchange rate volatility, and curtail the intensity of 'boom-bust' cycles. Intuitively, the tax will reduce the expected gains from speculation and could, therefore, reduce the incentive to speculate.

Various aspects of the Tobin tax are explored in the papers collected in a United Nations Development Program-sponsored book (ul Haq, et al., eds., 1996), by papers in the *Economic Journal Policy Forum* (volume 105, 1995), and in Davidson (1997), Felix (1996), Spahn (1996) and Stotsky (1996). Cornford (1996), De Simone (1998), and Raffer (1998) provide fairly detailed reviews of the ul Haq et al. book, while Bird (1998) provides a more succinct review. Apart from the fundamental and possibly intractable political economy issues raised by the tax (will countries go along with the idea?), what are the main analytical issues that emerge from the research that has been done?

First, currency taxation will probably be far more successful in - and ought to be aimed at - moderating (short-term) capital *inflows* (especially debt financing), rather than *outflows*. In other words the aim should be to prevent excessive booms from occurring in the first instance, rather than attempting to eliminate the busts that invariably follow, (i.e. the tax ought to be applied counter-cyclically). This is also consistent with other empirical studies on capital restraints in general which indicate that they are more effective at preventing "excessive" capital inflows than at stemming capital flight¹⁵.

Second, the tax cannot be applied unilaterally, as this will merely lead to a migration of forex transactions to untaxed countries, (i.e. there will be geographical substitution towards tax havens). In the light of this, it has been noted that the geographical coverage of the tax must be universal in the sense of including most, if not all countries in the world¹⁶.

raising w or lowering f_s .

¹⁵ For instance, see Mathieson and Rojas-Suarez (1993) and Reinhart and Todd Smith (1997).

¹⁶ There may be scope for considering the formation of a World Tax Organisation as suggested by Tanzi (1998) to deal with issues regarding the application of universal taxes (such as the Tobin tax), international tax evasion, tax competition and such.

Third, if the tax is limited to spot transactions, (as per Tobin's original suggestion), this will lead to a tax-saving reallocation of financial transactions from traditional spot transactions to derivative instruments. As such, it ought to be applied to all derivative products such as forwards, futures, options and swaps.

Fourth, while further research needs to be done in order to determine issues such as the optimal tax rate and coverage, there is broad consensus that the tax must be levied at a rate that minimises the incentive to undertake synthetic transactions to evade it (asset substitution), and avoids creating incentives to centralise the structure of forex markets (Frankel, 1996). Suggestions of the 'most appropriate' rate of taxation have generally ranged between 0.1 and 0.25 percent (see Section 5).

In assessing the effects of a Tobin tax, much of the existing literature has focused on the elasticity of speculative capital movements with respect to currency taxation. In seeking to deter speculative capital movements and to reduce exchange rate volatility, what matters is the expected gain from speculation relative to the costs defined to include payment of the tax. In circumstances where expectations of currency devaluation strengthen, a flat rate tax will become progressively less effective. Indeed, it will be in the midst of a currency crisis, when its stabilizing properties are most needed, that a currency tax will be at its least effective because of the large expected gains from speculation. Davidson (1997) formally illustrates this point¹⁷; while more graphically, Dornbusch (1998) points out that, "anyone who contemplates 30 per cent depreciation will happily pay 0.1 per cent Tobin tax." This observation has led to suggestions that, if the prime interest is to reduce volatility, the tax may have to be applied at different rates depending on market conditions (Spahn, 1995,

¹⁷ In an earlier paper, Davidson (1997) also challenges Tobin's claim that "this simple, one parameter tax would automatically penalise short-horizon round trips, while negligibly affecting the incentives for commodity trade and long term capital investments" (Tobin, 1996, pxi). Davidson argues that, in so far as agents engaged in international trade in goods and services, FDI and other productive cross border activities hedge their financial transactions while speculators do not, the Tobin tax could provide a greater disincentive to the former than the latter. In addition, Davidson (1998) has pointed out that it is important to draw a distinction between the *volume of trading* and the *degree of volatility*. Through the law of large numbers, a currency tax that successfully reduces the volume of trading may in some circumstances increase volatility.

1996).

But does the potential insensitivity of speculative capital movements to the relatively low rates of currency taxation dictated by political feasibility eliminate any appeal that the Tobin tax may have?

5. Cashing in on Capital Volatility

The low elasticity of capital movements with respect to currency taxation reduces the effectiveness of the Tobin tax as an instrument for stabilizing capital flows¹⁸. But, at the same time, it raises its effectiveness as a generator of revenue. This important but neglected analytical point is particularly appropriate at a time when reform of the international monetary system is focusing not only on measures that will reduce the incidence of international financial crises, but also measures that will help to deal with them when they do occur¹⁹. Conventionally the Tobin tax has been presented as a preventive measure directed at reducing volatility, stabilizing capital movements and avoiding financial crises. However, more appropriately, it should be seen as an instrument for helping to deal with financial crises once they have happened. In this context, many of the criticisms that have been made of the tax disappear. While the low elasticity of capital movements with respect to currency taxation is a disadvantage from the viewpoint of calming markets and avoiding crises, it is an advantage in terms of generating revenue.

Rather than reducing capital volatility, the strength of the argument for currency taxation therefore lies in cashing in on it. From this prospective, the low elasticity is exactly what is needed. Indeed, we have a win-win situation. After all, governments tax many activities that have negative externalities, such as smoking. If cigarette taxes are effective in stopping people from smoking that is good news. If they are ineffective, that is also good

¹⁸ For formal confirmation of this intuitive point see Felix and Sau (1996).

¹⁹ Similarly, a Tobin tax will be of limited use if the objective is to increase the autonomy of national authorities to undertake discretionary monetary policy (one of the original objectives of James Tobin in proposing a currency transaction tax). This objective - of overcoming the 'impossible triad' - is probably better served by quantitative capital restraints, as suggested by Krugman (1998) and as

news in as much as the tax will generate revenue, part of which may be used to finance the cost of providing health care for smokers. Can the analogy be applied to currency taxation? The key point is that the case for the Tobin tax does not depend centrally on sophisticated and complex calculations of tax rates and elasticities. Should the elasticity with respect to the tax turn out to be relatively high, the effect will be to stabilise forex markets, and its preventive role will be significant. Should the elasticity turn out to be relatively low, as many calculations suggest, then, although the preventive role is insignificant, the relatively large amount of revenue generated may be used to help mitigate the effects of international financial crises. But in ballpark terms, what revenue would be raised by taxing currency transactions?

Estimating the revenue from currency taxation is a complicated methodological exercise since much depends on the rate and coverage of the tax; the level of transactions costs; the elasticity of capital movements with respect to the effective increase in transaction costs associated with the tax; as well as the extent to which it is avoided. Early estimates which put the annual revenue as high as \$1,500 billion or even \$3,650 billion were calculated incorrectly with a strong upward bias. Using an alternative methodology and a range of assumptions about pre-tax transactions costs and elasticities, Felix and Sau (1996) come up with a range of estimates. For a 0.25 per cent tax, they suggest that revenue of about \$300 billion would have been generated, using 1995 figures of forex turnover. The revenue would have been \$200 billion using 1992 forex volume. For a 0.1 per cent tax using 1995 forex volumes, they calculate that the revenue would have been either \$148.2 billion (with 0.5 per cent transactions costs) or \$179.9 billion (with 1.0 per cent transactions costs). Making the assumption that a Tobin tax of 0.1 per cent would double transactions costs, and that an elasticity of 0.32 'might not be a bad guess', Frankel (1996) estimates revenue of about \$166 billion. D'Orville and Najman (1995) calculate that a 0.25 per cent tax would raise about \$140 billion per year.

undertaken recently by Malaysia. Quantitative restraints, of course, raise a range of other issues.

Given these studies, it may not be unreasonable to assume that a transactions tax of 0.25 per cent will generate annual revenue of about \$150 billion. What is certainly true is that a Tobin tax may be expected to raise a lot of money. The key point here remains that the amount of revenue generated will be negatively related to the elasticity of financial flows with respect to the tax.

6. Using the Revenue from Currency Taxation

How might the revenue from currency taxation be used? Kaul and Langmore (1996) make the assumption that high income countries would have to be allowed to retain 80 per cent of the revenue to encourage their participation, whereas poorer countries would be allowed to retain more. They then go on to discuss a range of national and international uses for the proceeds of the tax. Of course, it is not difficult to construct a list of worthy uses including foreign aid, international peacekeeping and security, enhancing the global environment, improving world health, and so on. Kaul and Langmore suggest that the revenue from a Tobin tax could be used in an internationally co-operative way to overcome the sources of previous inaction on these issues arising from the free rider problem and the prisoner's dilemma. Basically, they suggest that the revenue from a global Tobin tax could be used to finance global public goods. Given their assumptions about how the proceeds from a 0.1 per cent Tobin tax would be shared, they suggest that \$27 billion could be available for 'international purposes', although their idea of capping international contributions at \$2 billion reduces this figure to \$24 billion.

Clearly, there is plenty of room for debate about the numbers used by Kaul and Langmore and the priorities amongst global public goods. Different assumptions lead to different estimations of the amount of revenue that could be used for international purposes. Why not assume that a larger proportion of the revenue (say) 50 per cent, could be used for international purposes if these were perceived as being of direct benefit to the principal financial centres thereby incentivising them to participate? This would give an annual

resource flow of about \$75 billion.

The analytical point here is that the more compelling financial centres find the uses to which the revenue from an international currency tax will be put, the more prepared they will be to retain a smaller proportion of the proceeds. With this in mind, an alternative to the 'global public good' approach is to focus on the deficiencies of global capital markets, and to consider ways in which the revenue from international currency taxation could be used to mitigate them.

We have already established that the stabilizing properties of currency taxation may be significantly reduced if financial flows have a low elasticity, but that this will in turn increase revenue generation from the tax. Can the revenue generated be used to help deal with the ramifications of international financial crises and the boom and bust pattern of financial flows? Furthermore, can the revenue help to offset the degree of concentration of private capital flows? In short, can revenue from currency taxation enhance the efficiency and equity of the international financial system? In the remainder of this paper, we focus on two alternatives that have not been examined in the existing literature. These are: the creation of an international lender of last resort (ILLR) facility, and increased financing for the IMF. A third alternative which received some scrutiny is to use the revenue in order to supplement conventional foreign aid flows, and we briefly examine this first²⁰.

6.1 Augmenting Foreign Aid Flows

As the numbers in Table 1 reveal, revenue from a currency transaction tax, even if one were to take the \$24 billion suggested by Kaul and Langmore (1996), would be large relative to other resource flows. It would have been about the same size as official grants in 1997 and would have been about a third more than loans from the multilateral institutions. The revenue from a currency tax could help deal with a foreign aid 'crisis', and help reverse

²⁰ As noted earlier, Kaul and Langmore (1996) discuss some ways in which the revenue from a Tobin tax could be used, along with some of the underlying political economy issues, but they do not make the analytical point that links the relationship between elasticity, volatility and revenue generation upon which we focus in this paper.

a downward trend in aid flows.

But if donor countries have chosen to cut conventional forms of foreign aid, why should they favour introducing a currency tax designed to raise revenue to finance aid flows via an alternative route? Much depends on whether the fall in foreign aid has reflected a budgetary constraint in donors or a perception amongst them that aid is ineffective. A currency tax would remove the domestic budgetary constraint, but it would do little for aid effectiveness, except in as much as aid channelled through multilateral institutions has generally been more effective than bilateral aid. Moreover, with growing evidence that foreign aid *is* effective when combined with good domestic economic policy, the global political environment may become less hostile to using global taxation as a way of bringing about global income redistribution aimed at poverty reduction, (Burnside and Dollar, 1997, Mosley and Hudson, 1997 and World Bank, 1998).

Much foreign aid has thus far gone to middle income developing countries, (World Bank, 1998). But perhaps it is the poorer countries which, while attempting to introduce 'appropriate' economic reforms, have often remained trapped in a 'low investment equilibrium' (Huang and Shirai, 1994) and need it more. This is not to say that impoverished countries with inappropriate/distortive policies should be overlooked. As noted by the World Bank (1998, p.6), "aid agencies need to find alternative approaches to helping highly distortive countries, since traditional methods have failed in these cases." To use the revenue from a currency transaction tax to augment multilateral aid flows would, in these circumstances, have the appeal of assisting countries that are largely by-passed by private international capital markets. Thus a policy directed towards offsetting the inefficiencies of markets could also be used to mitigate inequity.

However, the idea of currency taxation which, after all, has been around for some time, could perhaps be made more attractive to the international community if it were to be presented as a way of dealing with a new global problem rather than merely a new way of dealing with an old one. Extreme international capital and forex instability is, of course, just

such a new global problem. How might the revenue from international currency taxation be used to help in this context?

6.2 An International Lender of Last Resort

The clearest statement to date regarding the need for a *national* lender of last resort (NLLR) is probably by Mann (1999), who has noted that a NLLR exists "because distress at a single financial institution could spill over to sound financial institutions, thus impairing the conduct of the whole system...Because the economic benefit of the financial system as a whole exceeds that created by individual firms, there is a rationale for very occasional intervention by a lender of last resort to prevent contagious spillovers." Just as central banks conventionally fulfil a NLLR function in order to stabilise national monetary systems in circumstances where confidence ebbs, so it has often been suggested that an *international* lender of last resort (ILLR) should be established to fulfil a similar function internationally.

There are however a number of well-rehearsed difficulties with such a lender of last resort proposal, particularly at the international level. These range from the moral hazard problem, which may lead to over borrowing and overlending²¹, through to the costs of international institution building. Do we need another international agency? On top of these, there is the perennial question of whether an ILLR would have sufficient resources to create confidence that its operations will be successful. There is after all a fundamental difference between national and international lenders of last resort, since the NLLR has the capacity to create money and is, therefore, not exposed to a liquidity constraint. Uncertainties over the liquidity of an ILLR would undoubtedly undermine its credibility and its powers of stabilisation.

Although international currency taxation would generate large amounts of finance according to most estimates and comparators, the amount of finance would still be small

²¹ If there is a moral hazard problem, it is more prevalent in the case of *creditors* than *debtors* (given the harsh economic and political costs involved in a crisis and IMF-led 'bailout'), and among creditors, *international* rather than *domestic* ones (as the former rarely have had to take a 'haircut' of any

relative to the size of private international capital markets. The data in Table 6, for example, show a turn round of almost \$100 billion between 1996 and 1997 in five East Asian economies. This needs to be contrasted with the (albeit annual) \$24 billion that Kaul and Langmore claim might be available for international purposes from the revenue generated by a Tobin tax. It is, therefore, a reasonable presumption that at least at the outset, the revenue from such a tax would fall some way short of the level required to create an effective ILLR. Could the revenue be put to better use in another way?

6.3 Financing the IMF

While there are significant arguments against using Tobin tax revenue to finance a new ILLR, another option is to use it to help finance the operations of the IMF by augmenting or replacing other sources of finance.²² There are a number of reasons that make this an attractive idea.

The lending operations of the IMF have increased sharply in the mid-to-late 1990s. At the end of October, 1998, the Fund had stand-by EFF or ESAF arrangements with sixty one countries amounting to approved lending of nearly 49 billion SDRs (about \$68 billion). Fund lending more than doubled between 1990 and 1998. What is more, the Fund has been called upon to make loans that are individually large, notably to Korea, Brazil and Russia. The new Supplemental Reserve Facility (SRF) introduced at the end of 1997, enables countries to far exceed the conventional quota based limits on borrowing from the Fund. Its increased lending activity has created liquidity problems for the institution. The ratio of the Fund's uncommitted and adjusted liquid resources to its liquid liabilities (the liquidity ratio) fell from 120.5 per cent in April 1997 to only 44.8 per cent in April 1998. With the increased

significance).

²² The distinction between financing a new ILLR and helping to finance the IMF becomes blurred if the Fund is envisaged as developing into an ILLR. Fischer (1998) provides a useful summary and discussion of the issues distinguishing between the *crisis-lending* and *crisis-managing* roles of the ILLR. The inadequacies of financing, even with the revenues from a Tobin tax, much more heavily constrain the lending function. Without becoming a fully-fledged ILLR, the IMF could take on a more important and systemic crisis management role (Bird, 1999). This would be facilitated by a share of

demand for its financial assistance, the Fund has been forced to extend its General Arrangements to Borrow (GAB) in order to supplement its quota-based subscriptions, and in January, 1997, the Executive Board approved the New Arrangements to Borrow (NAB) under which potentially 25 participating countries stand ready to lend the IMF up to SDR 43 billion (about \$45 billion) if needed to forestall or cope with an impairment of the international monetary system or to deal with an exceptional situation that 'threatens the stability of the system'.

There are many weaknesses with the way in which the IMF is currently financed (Bird, 1987). The quota-based subscription system permits the Fund's resources to be only at best indirectly linked to the global need for IMF loans, and the generally five yearly reviews of quotas involve a methodology which is exposed to political influence and delay as the Eleventh General Review has aptly illustrated. Arrangements such as the NAB are essentially ad hoc and crisis-driven. In March 1998, the Fund assessed its own liquidity position as being 'vulnerable' and 'under considerable strain' and this surely undermines confidence and credibility in the Fund's role as an international financial institution designed to engender stability.

A proposal for using SDR allocations to finance the Fund's operations, (Polak, 1996) has garnered little support since it would increase overall global liquidity and is perceived as having potentially inflationary consequences. In contrast, using Tobin tax revenue to finance or co-finance the Fund's operations would represent an application of redistributive international fiscal policy as opposed to expansionary monetary policy. However, it would also help avoid the globally recessionary consequences of an illiquid IMF. It would provide the Fund with a year-on-year *flow* increase in resources (as opposed to the current system of occasional stock adjustments) and these increases would in one sense, be indexed against the likely needs of the international monetary system for Fund lending, since the Fund's resources would be linked to the volume of currency transactions which might be

the revenue from a Tobin tax.

expected to rise as an international financial crisis developed. There would, therefore, be an automatic counter-cyclical component in the availability of IMF resources. Moreover, since Fund lending is temporary and revolves, the resource base of the IMF would increase over time, and beyond a point at which its resources were deemed adequate, the revenue from the Tobin tax could be more heavily directed towards other uses.

A second reason why the idea of using Tobin tax revenue to help finance the Fund is attractive, is that evidence suggests that the success of Fund-backed programs is positively related to the amount of finance that the Fund itself lends, (Killick, 1995). At present, the availability of Fund finance is frequently a binding constraint on the design of adjustment and this means that countries are forced to adopt quick-acting adjustment policies which concentrate on reducing domestic aggregate demand rather than on increasing aggregate supply (Bird, 1997). This may be a particular problem for poorer countries that require structural adjustment.

Using Tobin tax revenue to help finance the IMF therefore has the appeal that it would confer benefits on low income countries to a much greater extent than would be the case if the revenue were used to establish an ILLR; the latter would be of principal advantage to those better-off developing countries and countries in transition that had attracted private capital in the first place. In the case of an ILLR, the benefits to developing countries would primarily be in the sense of releasing resources elsewhere in the system, to the extent that this occurred. Without providing sufficient resources to finance a credible ILLR, the revenue from an international currency tax could provide sufficient resources to strengthen the IMF's position in calming international financial crises. Additional financing would also provide an extra incentive for countries to involve the Fund at an earlier stage in the evolution of a crisis and this could help to avoid the worst excesses. Moreover, with more finance at its own command, there would be fewer delays in putting together financial assistance packages.

By carrying a more substantial proportion of the financial obligations itself, the Fund

could also be more effective in helping to organise an orderly work-out from a financial crisis, by encouraging private creditors to reschedule loans. Many authors have made a strong case for an international agency to fulfil this kind of role (Cohen, 1989 and Sachs, 1989 and Radelet and Sachs, 1998); revenue from international currency taxation would enable the Fund to carry out this function more effectively by allowing it to take a significant share in the related financial commitments. Furthermore, other things being equal, and as noted above, additional finance from the IMF would enable borrowing countries to adopt longer-term policies that might reduce the social, political and economic costs often associated with short-run adjustment based on contracting domestic aggregate demand. This could make IMF-backed programs more acceptable to governments and increase the commitment to and success of such programs. At present, the clear majority of Fund-backed programs remain uncompleted (Killick, 1995).

If additional financing were to have this effect then what may initially appear as a weakness of the proposal to use Tobin tax revenue to help finance the Fund becomes a strength. An objection to the proposal may come from those who claim that the Fund's operations are ill designed and counter-productive (Feldstein, 1998). If this claim is justified, why provide it with additional resources? As the existing literature shows, there is potentially plenty of scope for improving the design of IMF-backed programs with a view to making them more effective. Arguing that the Fund should be provided with extra resources is certainly not to argue that it should cease to try and improve its policy advice. Indeed, to the extent that the design of IMF-backed programs is constrained by its available resources, the Fund may be prevented from supporting superior long term economic strategies.

Bird (1997) argues that the emphasis on structural adjustment in the late 1980s and early 1990s was less successful than it might have been because the necessary short run financial assistance was inadequate. With increased resources from Tobin tax revenue, the Fund would be able to increase the size of its loans where longer term structural adjustment was required. If, as a consequence, IMF programs were to become more successful, the

demand for loans from low income countries might be expected to decline over time, and this again would serve to alleviate the Fund's own liquidity problems, reinforcing the idea that a substantial proportion of the revenue from a Tobin tax would only need to be directed to the Fund in the short to medium term. Griffith-Jones (1996) has already suggested that the IMF's Articles of Agreement should be modified to allow it to collect the Tobin tax. An extension of this idea is that the Fund should then (in the short to medium term at least) use the revenue it collects to finance its own operations.

7. Concluding Remarks

Following evidence from East Asia and Latin America that international capital volatility continues to be an important global problem, and with related claims that reforms to the international financial architecture are needed both to reduce the incidence of international financial crises and to help deal with them when they do occur, this paper has explored the relevance of taxing international currency transactions (the Tobin tax).

Although, in principle, a currency tax should reduce foreign exchange volatility by reducing the speculative element in forex flows, there is no guarantee that in practice it will have this effect. However, if a properly designed Tobin tax is unsuccessful in this regard, it must be because international capital flows are relatively inelastic with respect to such taxes. The low elasticity that limits the effectiveness of the tax in reducing capital volatility increases its power to raise revenue. This revenue may then be used to counteract the deficiencies of private international capital markets both in terms of their inefficiencies and inequities. It is in this sense that currency taxation may be an appropriate policy for dealing with the international financial problems that have been experienced in the 1990s and that lie ahead in a world of more fully liberalised capital accounts.

Of the two alternatives explored in this paper, a more compelling case is made for using the revenue from a Tobin tax to supplement the resources of the IMF than to attempt to establish a new international lender of last resort. The revenue would alleviate the Fund's

illiquidity and would, as a consequence, allow it to support longer term structural adjustment in low income countries (where necessary) and play a pivotal stabilizing role in the context of international financial crises.

Appendix: A More Specific Model on Exchange Rate Volatility

Given the predominance of the US\$ in forex transactions, we consider only bilateral exchange rates and assume the other (focus) currency to be the baht (b). All variables are in log form.

$$s = m - d + u \quad (1)$$

where: s = spot exchange rate (baht per \$); m = supply of domestic (Thai) assets relative to US assets; d = relative demand for domestic assets; u = stochastic term.

$$d = wd_i + (1-w)d_s \quad (2)$$

where: w = fraction of long-term participants or 'fundamentalists'; $(1 - w)$ = fraction of short-term participants (speculators) or chartists; d_i = relative domestic asset demand by the fundamentalists; d_s = relative asset demand by the chartists. Chartists are assumed to have extrapolative (or momentum) forecasts, i.e., they expect the exchange rate to diverge from equilibrium, (hence creating a 'bubble'), while fundamentalists expect convergence. Accordingly, we rewrite the relative demand for domestic assets (d) as follows

$$d = [wf_i q(s - \underline{s}) - (1 - w)f_s v (s - \underline{s})] \quad (3)$$

where: f_i and f_s denote the demand elasticities of the fundamentalists and chartists for foreign assets with respect to their corresponding expectations; q and v are the rates of

expected convergence (by the fundamentalists) and divergence (by the chartists) of the spot rate from the long-run 'equilibrium level', which is denoted by \underline{s} .

Thus, the fundamentalists' behaviour is stabilising or regressive in that if the spot rate is higher than the equilibrium rate, a depreciation is expected and vice versa (i.e. exchange rate reversion). On the other hand, the 'chartists', who make use of analytical techniques or trading rules ('momentum models') to forecast exchange rates, (all of which essentially extrapolate past trends), tend to have a destabilising effect.

As an extension of Frankel's model, assume that the equilibrium exchange rate (\underline{s}) is based on the purchasing power parity theorem (PPP).

$$\underline{s} = p_h - p_u \quad (4)$$

where: p_h and p_u refer to home and US (foreign) price levels respectively.

Substituting (4) into (3) and placing the result in (1), we obtain:

$$s = \frac{\{m + [wf_iq - (1 - w)f_s v](p_h - p_u) + u\}}{[1 + wf_iq - (1 - w)f_s v]}$$

$$\text{Var}(s) = (1/A^2)\{\text{Var}(m) + (1 - A)^2 [\text{Var}(p_h) + \text{Var}(p_u)] - 2(1 - A)[\text{Cov}(m, p_u) - \text{Cov}(m, p_h) + (1 - A)\text{Cov}(p_h, p_u)] + \text{Var}(u)\} \quad (5)$$

where: Var = variance, Cov = covariance and $A = [1 + wf_iq - (1 - w)f_s v]$. We assume that $\text{Cov}(u, m) = \text{Cov}(u, p_u) = \text{Cov}(u, p_h) = 0$. With the maintained assumption of $A > 1$, it can be shown that $\partial v(s)/\partial w < 0$, i.e. the greater the proportion of long-term investors or fundamentalists in the market, the less variable the exchange rate; or, conversely, the greater the proportion of speculators, the more destabilising the effect on the exchange rate. Further, $\partial v(s)/\partial(f_i q) < 0$ and $\partial v(s)/\partial(f_s v) > 0$, i.e. the more sensitive or responsive are the speculators to the expected divergence between the spot and equilibrium exchange rate

relative to the fundamentalists, the more variable will be the spot exchange rate. For a given w , this in turn is more likely the larger is $(f; q)$ and the lower is $(f_s; v)$; or conversely, for a given $(f; q)$, the lower is $(f_s; v)$ and the larger is w .

Table 1
Net Long-Term Resource Flows to Developing Countries (\$ billion), 1990-97

	1990	1991	1992	1993	1994	1995	1996	1997	Average
<u>Official Development Finance</u>	56.4	62.7	53.8	53.6	45.5	54.0	34.7	44.2	50.6
Grants	29.2	35.1	30.5	28.4	32.7	32.6	29.2	25.1	30.4
Loans	27.2	27.6	23.3	25.1	12.9	21.4	5.4	19.2	20.3
Bilateral	11.6	13.3	11.1	10.0	2.5	10.0	-7.2	1.8	6.6
Multilateral	15.6	14.4	12.2	15.2	10.4	11.3	12.6	17.4	13.6
<u>Private Flows</u>	41.9	53.6	90.1	54.6	160.6	189.1	246.9	256.0	149.1
Debt	15.0	13.5	33.8	44.0	41.1	55.1	82.2	103.2	48.5
Commercial Banks	3.8	3.4	13.1	2.8	8.9	29.3	34.2	4.1	17.1
Bonds	0.1	7.4	8.3	31.8	27.5	23.8	45.7	53.8	24.8
Others	11.1	2.7	12.4	9.4	4.7	2.0	2.3	8.3	6.6
Foreign Direct Investment	23.7	32.9	45.3	65.6	86.9	101.5	119.0	120.4	74.4
Portfolio Equity	3.2	7.2	11.0	45.0	32.6	32.5	45.8	32.5	26.2
Total	98.3	116.3	143.9	208.1	206.2	243.1	281.6	300.3	199.7

Notes: Developing countries are defined as low- and middle-income countries with 1995 per capita incomes of less than \$765 (low) and \$9835 (middle)

Source: World Bank (1997)

Table 2
Relative Shares of Net Long-Term Resource Flows to Developing Countries, 1990-97

	1990	1991	1992	1993	1994	1995	1996	1997	Average
ODF/Total	0.57	0.54	0.38	0.26	0.22	0.22	0.12	0.15	0.31
PF/Total	0.43	0.46	0.63	0.74	0.78	0.78	0.88	0.85	0.69
Debt/PF	0.36	0.25	0.38	0.28	0.26	0.29	0.33	0.40	0.31
CBL/PF	0.09	0.06	0.15	0.02	0.06	0.15	0.14	0.16	0.10
Bond/PF	0.00	0.14	0.09	0.21	0.17	0.13	0.19	0.21	0.13
FDI/PF	0.57	0.61	0.50	0.42	0.54	0.54	0.48	0.47	0.52
Port/PF	0.08	0.13	0.12	0.29	0.20	0.17	0.19	0.13	0.17

Notes: ODF - Official Development Finance; PF - Private Flows; CBL - Commercial Bank Lending; FDI - Foreign Direct Investment; Port - Portfolio Flows

Source: Computed from data in Table 1

Table 3
Relative Variability of Various Components of Private Flows to Developing Countries, 1990-97

	Private Flows	Debt	Commercial Bank Lending	Bonds	FDI	Portfolio Equity
Var ^a	6692.6	972.8	238.5	360.0	1459.0	282.7
CV ^b	44.9	20.1	14.0	14.5	19.6	10.8

Notes: a) Var – variance; b) CV - coefficient of variation

Source: Calculated from data in Table 1

Table 4
Net Capital Flows to Developing Countries (\$ billion), 1984-97

	1984-89 ^a	1990-96 ^a	1994	1995	1996	1997	Average
Private Capital Flows	17.8	129.4	133.8	148.2	190.4	139.0	117.8
Foreign Direct Investment	12.2	57.9	86.5	86.5	108.5	126.5	82.3
Portfolio Investment	4.9	51.1	22.2	22.2	52.7	55.5	43.6
Other Investment ^b	0.6	20.4	39.5	39.5	29.3	-43.0	11.6
Official Flows	27.2	16.8	32.1	32.1	3.2	-3.3	32.9
Change in Reserves ^c	5.1	-54.8	-67.1	-67.1	-95.2	-57.8	-22.6

Notes: a) annual averages; b) may include official flows; c) – implies an increase

Source: IMF (1998)

Table 5
Relative Variability of Various Components of Private Flows to Developing Countries, 1990-97

	Total Private Flows	Other Investment	FDI	Portfolio Equity	Reserves
Var ^a	3289.8	3509.5	1477.7	701.9	4681.5
CV ^b	27.9	303.7	18.0	16.1	207.4 ^c

Notes: a) Var – Variance; b) CVs - coefficient of variation; c) absolute value

Source: Calculated from data in Table 4

Table 6
Net Capital Flows to East Asia (Indonesia, Korea, Malaysia, Thailand and Philippines)

(\$ billion), 1995-99

Type of Capital Flow	1995	1996	1997	1998 ^e	1999 ^f
External Financing	81.5	100.6	28.8	-0.5	-1.2
Private Flows	79.0	103.2	-1.1	-28.3	-4.8
Equity Investment	15.9	19.7	3.6	8.5	18.7
Direct	4.9	5.8	6.8	6.4	14.2
Portfolio	11.0	13.9	-3.2	2.1	4.5
Private Creditors	63.1	83.5	-4.7	-36.8	-23.4
Commercial Banks	53.2	65.3	-25.6	-35.0	-18.8
Nonbanks	9.9	18.2	21.0	-1.7	-4.6
Official Flows	2.5	-2.6	29.9	27.8	3.5
Financial Institutions	-0.3	-2.0	22.1	21.6	-2.0
Bilateral Creditors	2.9	-0.6	7.4	6.1	5.5
Resident Lending/Others	-26.5	-26.8	-35.0	-16.9	-14.9
Reserves (exc. Gold) ^a	-14.0	-19.3	32.5	-41.1	-27.0

Notes: a) - denotes increase; b) Including resident net lending, monetary gold and errors and omissions; e) Estimates; f) Forecast

Source: IIF (1999)

Table 7
IMF-led International Financial Assistance Committed
and Disbursed to Korea, Thailand and Indonesia (\$ billion) as of January 17, 1999

Country and Source of Assistance	Amount
<u>Korea:</u>	
IMF	21.1
World Bank and ADB	14.2
Bilateral	23.1
Total	58.4
IMF <i>disbursements</i> as of 17 January 1999	19.0
<u>Indonesia:</u>	
IMF	11.2
World Bank and ADB	10.0
Bilateral	21.1
Total	42.3
IMF <i>disbursements</i> as of 15 July 1998	8.8
<u>Thailand:</u>	
IMF	4.0
World Bank and ADB	2.7
Bilateral	10.5
Total	17.2
IMF <i>disbursements</i> as of 17 January 1998	3.1

Source: IMF (1999)

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