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ESTIMATES OF CAPITAL FLIGHT AND ITS BEHAVIOR

STIJN CLAESSENS
World Bank

Abstract

This paper presents estimates of capital flight using eight alternative methodologies, with a focus on Latin America. While these methodologies differ in approach, I show that the identities used in balance-of-payments data make most close in their final measurement. I document that capital flight is not an exclusively Latin American phenomenon, but is much wider spread than commonly thought. Compared to countries' exports, capital flight is evenly distributed, and the capital flight-exports Lorenz-curve is close to the 45-degree line. There also appear to be important common factors driving capital flight as there is considerable comovement across countries in certain years.

I. Introduction

Over the years, "capital flight" has received much attention from researchers and policy makers. Many papers have drawn attention to the magnitude of this phenomenon -particularly for Latin America. It is generally agreed that these large private capital outflows have represented an important macroeconomic problem for many developing countries in the past two decades. The reversal of capital flight in the early-1990's for some Latin American countries has added a new dimension to this phenomenon. Yet, capital flight remains a little understood aspect

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of these countries' economies and it even remains difficult to ascertain the magnitude of capital flight.

Papers on capital flight try to answer a number of questions. What is the best way to measure capital flight? Can the occurrence and magnitude of capital flight be explained by (economic) variables? And what policy implications follow (for example, how to reverse capital flight)? This paper is not intended to debate what causes capital flight or what is the best measure; nor will it try to draw policy implications. The purposes of this paper is to compare commonly used methodologies to measure capital flight with each other and to compare the relative occurrence of capital flight for many developing countries, and to investigate whether there is a commonalty of capital flight across countries.

The paper is structured as follows. Section II describes the different concepts and methodologies used for measuring capital flight. The next section starts with calculating a consistent set of capital flight data using existing measures for as many developing countries as possible for the period 1971-92. Using these data, aggregate figures are calculated for the various measures for (regional) groups of developing countries, data are presented for individual Latin American countries, and comparisons of the capital flight measures to other (macro-) variables which are made. Section IV provides some statistical analysis of capital flight, across countries and over time. Section V concludes. Notes on methodology and data are in Annexes 1-3.

II. Different Measures of Capital Flight

What is capital flight? Definitions are many (for an overview, see Lessard and Williamson, 1987). They can be broad, covering all private outflows, or narrow, seeking to exclude some "normal" flows of international transactions. For each definition there are several different measures, some of which are complementary; for example, trade misinvoicing can be added to one measure to create another. Finally, data sources vary, which leads to different estimates and makes comparisons among the various measures difficult.[1]

It is hardly surprising to find that many measures of capital flight can be constructed. The four most common approaches are the residual measure (used by the World Bank (1985), Morgan Guaranty (1986) and Cline (1987)); measuring the stock of unreported foreign assets (Dooley (1986) method); hot money measures (Cuddington, 1986); and measuring trade misinvoicing (e.g., Gulati, 1987), where the trade misinvoicing measure is complementary to the first three. Other methods use in addition data available on deposits held by developing countries at banks reporting to the Bank for International Settlements (e.g., Gajdeczka, 1989 and Gajdeczka and Oks, 1989). For each, there are further variations which lead to (minor) differences.

The starting point for the first three measures is balance-of-payment figures. To start off I present a stylized balance-of-payments framework (Table 1), using standard notation, but supplemented by World Bank debt data and based on the IMF's Balance of Payments Yearbook (BoPY).[2]

TABLE 1

BALANCE OF PAYMENTS

A. Current Account (IMF BoPY* line 1..44),
which includes:
A1. Travel: credit (IMF BoPY line 9)
A2. Reinvested earnings on direct investment abroad (IMF BoPY line 11)
A3. Reinvested earnings on direct investment domestically (IMF BoPY line 12)
A4. Other investment income: credit (IMF BoPY line 19)

B. Net Equity Flows of which:
B1. Net foreign direct investment (IMF BoPY line 45..52)
B2. Portfolio Investment: Corporate equities (IMF BoPY line 59..61)

C. Other short-term capital of other sectors: net (IMF BoPY line 93..97)
of which:
C1. Other assets (IMF BoPY line 94)

D. Portfolio investment, other bonds (IMF BoPY line 56-58)

E. Change in deposit money banks' foreign assets (IFS line 7a.dzf)

F. Reserves (IMF BoPY line 98..111)

G. Net errors and omissions (IMF BoPY line 112)

H. Other long-term capital of resident official sector (IMF BoPY line 62-68)

or

H'. Change in external debt (World Debt Tables - see further section 4)

* IMF Balance of Payments Yearbook.

All capital flight measures attempt to estimate private capital flows. This would imply that capital flight can be simply measured as the sum of identified outflows (C + D + E). And, if all unidentified capital flows were private capital outflows, then net errors and omissions (G) would also need to be included.

This seems straightforward enough. So, why so many different measures? The main reason is doubts about the quality and accuracy of the balance-of-payments statistics. As a result, analysts have preferred to derive the annual private capital flows by using the balance-of-payments identity and proxying other balance-of-payments items. The balance-of-payments identity implies that:

$$(1) \qquad A + B + C + D + E + F + G + H = 0.$$

or

$$(1') \qquad C + D + E + G = - (A + B + F + H)$$

Equation (1') implies that private capital flows plus net errors and omissions (i.e., capital flight) is equal to (the negative of) the sum of the current-account deficit, net equity flows (FDI and corporate equity), increases in reserves, and other long-term capital of the official resident sector. Measuring capital flight through either side of the equation gives the same result. On the left hand side of the equation analysts can use only the balance-of-payments data. On the right hand side, however, there is more (and often better) information available elsewhere. Therefore, the starting point for most capital flight methods is the right hand side of equation (1').

Residual Method

This measures the "residual" of the "sources of funds" over the "uses of funds." Sources of funds include all net official inflows (increases in net external indebtedness of the public sector) and the net flow of foreign direct investment.[3] Uses of funds include the current-account deficit and additions to reserves. Outward capital flight exists when sources of funds exceed uses of funds, and vice-versa for inward capital flight. In terms of balance-of-payments items, capital flight under the residual method is thus the sum of: A + B + F + H. By the balance-of-payments identity, this is also equal to - (C + D + E + G).

Consequently, the residual method does not rely only on balance-of-payments data. To get a better estimate of private capital flows for some items, other sources are used. The most notable is item H (other long-term capital of resident official sector or net official external borrowing), for which the year-to-year change in external debt according to World Bank data (H') may be more accurate. Thus, the residual method measures capital flight as A + B + F + H'; by the balance-of-payments identity, this is equal to - [C + D + E + G + (H-H')]. Capital flight is then simply the sum of identified private capital outflows (C + D + E), the net errors and omissions from the balance-of-payments accounts (G), and the difference between reported net official capital and the change in external debt according to World Bank data (H-H').[4]

The three residual methods –World Bank (1985), Morgan (1986), and Cline (1987)– use variations of the residual method:

(2)	World Bank:	A + B + F + H'
(2')	Morgan:	A + B + E + F + H'
(2")	Cline:	A - (A1+A2+A3+A4) + B + E + F + H'

The Morgan method slightly differs from the World Bank's. It includes E, the change in banking system's foreign assets (which has a negative sign in BoPY and is thus subtracted). Since the banking's system foreign assets includes both public (banks) and private (banks) claims on foreign assets, this can lead to an underestimate of the amount of private capital flows.

The Cline method is similar to Morgan's but subtracts travel (credit), reinvested FDI income (abroad and domestically), and other investment income (credit). The

reasons for subtracting travel income under the Cline method are unclear. Subtracting reinvested FDI income may lead to an overestimate of capital flight under the Cline method. Compare for example two countries which are the same, except in their reporting of reinvested earnings. In one country, (reinvested) earnings on direct investment domestically is reported on the current account (and the current account is more in deficit) and the offsetting gross inflows is reported on the capital account. In the other country, no reinvested earnings is reported under the current account (and the current account is less in deficit), no offsetting gross inflows is reported under the capital account, and the amount of net equity inflows reported under the capital account is correspondingly lower.[5] There is no difference between the two countries in net private capital flows as the sum of the current account and the net equity flows (A + B) are identical for both countries. Yet, the Cline method leads to a higher private capital flow (i.e., capital flight) number for the country with reported reinvested earnings as it subtracts the (negative) number for FDI income. The Cline method also subtracts other investment income from the current account, presumably as it relates to reported assets abroad, and thus should not add to a measure of unreported private outflows. But, these earnings can arise from both (short-term) capital of other sector held abroad or from long-term capital of resident official sector held abroad. By subtracting it, it is assumed to be all official, which may be an overestimate, thus upward biasing capital flight. As the next section will show, in practice, the differences between these three methods are minor.

The Dooley Method

This seeks to measure the stock of privately-held foreign assets that do not generate income reported to the domestic authorities (Dooley et al., 1986, and Dooley, 1986, 1987 and 1988). It does so by cumulating the identified capital outflows in the balance-of-payments accounts and making three adjustments to capture unreported capital flows. The first is to add errors and omissions (G). The second is based on a comparison of the World Bank data on the stock of external debt and the external borrowing flows reported in the balance-of-payments accounts. The Dooley method adds the difference between each year's change in external debt (according to the World Bank) and the flows as officially recorded (that is, H' - H) to the estimate of the increase in private-sector foreign assets. The third adjustment is to impute the stock of external assets needed to give the (balance-of-payments) investment income, by using an international market interest rate (for example, the one-year US Treasury Bill rate). If investment income is under-reported, then the imputed stock of external assets will be less than external assets using balance-of-payments figures (and after making the previous two adjustments). The difference between the two is the stock of flight capital; and difference from year-to year is the Dooley measure of capital flight.[6]

While the residual and Dooley methods differ greatly in conceptual approach (one looks at flows, the other at (derived) stock figures), they use some of the same measures, or measures closely linked through the balance-of payments

identity. Under the residual method, capital flight equals A + B + F + H'. By the balance-of-payments identity, this equals - (C + D + E + G+ (H-H')), the negative of private capital flows (short-term, including banks and non banks, and long-term; C, D and E), errors and omissions, G, and the difference between World Bank and balance-of-payments reported versions of official capital, H-H'. These last four items are used by the Dooley method to calculate the total (reported and unreported) assets held abroad. But, these annual changes are simply annual capital-flight estimates according to the World Bank Residual Method! These similarities also imply that the Dooley estimate can be derived more easily by taking the annual World Bank Residual flow measure and subtracting from it the flow of capital corresponding to the series for the imputed stocks of reported assets.[7] The Dooley and World Bank measures are very similar, and differences would be small, however the Dooley requirement of imputing reported assets abroad (by dividing reported interest income by an international interest rate) leads to a very volatile imputed assets figures. Furthermore by using reporting interest income implies an asymmetry in the Dooley method: while, as in the other capital flow methodologies, flows reported in the capital account are deemed unreliable, the interest income line in the current-account is deemed reliable.[8]

Hot Money Method

This calculates private capital flows directly by taking the (negative of) errors and omissions and private short-term capital figures from the balance-of-payments (see further Cuddington, 1986). The measure of private short-term capital varies (from country to country) in some of the studies employing this method and three different Hot Money measures have developed.

(3) Hot Money 1 = - (G + C1)
(3') Hot Money 2 = - (G + C)
(3") Hot Money 3 = - (G + C + D1 + D2)

Where:

G Net errors and omissions (IMF BoPY line 112)
C Other short-term capital of other sectors (IMF BoPY line 93..97) of which:
C1. Other assets (IMF BoPY line 94)
D1 Portfolio investment: other bonds (IMF BoPY line 56..58)
D2 Portfolio investment: corporate equities (IMF BoPY line 59..61)

The three Hot Money measures take a much narrower view of capital flight (with the first the narrowest, the third less narrow, and the second in between) as they consider only *reported* private outflows plus net errors and omissions. Comparing equation 3 with the World Bank measure (equation 2 and using equation 1'), three items are missing from Hot Money measures 1 and 2: E (change in

banking foreign assets), D (portfolio investment) and H-H' (the difference in reported external debt flows). And items E and H-H' are missing for Hot Money measure 3. The Hot Money measures also rely completely on the reporting by the developing country, which can lead to large misestimation of capital flight, particularly as there are often large differences between reported long-term debt flows (H) and imputed debt flows (H').

Trade Misinvoicing

Trade misinvoicing is a form of capital flight which is not measured through any of the previous, balance-of-payments based methods. It amounts to capital flight additional to the above measures. Export underinvoicing and import overinvoicing can hide capital flight, and differences in statistics of the reporting country and its trading partners can help identify it. This identification is limited, however, by the fact that difference in trade statistics can be due not only to capital flight (under-invoicing exports, over-invoicing imports), but also tax evasion (under-invoicing for both exports and imports), inconsistent reporting methods, and poor reporting. Particular poor reporting of trade is likely to make measuring capital flight occurring through trade invoicing difficult.

To estimate trade misinvoicing, I adopt here the industrial countries' reported trade figures as the standard of reference from which to calculate invoicing biases and use the IMF Direction of Trade (IMF-DOT) data. To put imports as reported by the country and imports as reported by the world (exports by the country) on a comparable basis, both are adjusted from a CIF (cost, insurance, freight) basis to a FOB (free-on-board) basis. This implies that reported imports, normally expressed on a CIF basis, are adjusted downward by a country-specific CIF/FOB ratio so that exports and imports can be compared on a consistent FOB basis. The trade misinvoicing measures are then defined as:

Export misinvoicing = (X_w/CIFFOB factor) - X_c
Import misinvoicing = (M_c/CIFFOB factor) - M_w

where:

X_w: Imports from that country as reported by the world CIF (IMF DOT-imports of world with that country as partner, line IMP_cif)
X_c: Exports as reported by the country FOB (IMF DOT-exports of country with world as partner, line EXP_fob)
M_c: Imports as reported by the country CIF (IMF DOT-imports of country with world as partner, line IMP_cif)
M_w: Exports to that country as reported by the world FOB (IMF DOT-imports of world with that country as partner, line EXP_fob)
CIFFOB factor: CIF to FOB ratio (IFS line ..v..z.)

Imports are adjusted downward by a country-specific CIF/FOB ratio. In this paper, a positive sign signifies capital flight (overinvoicing of imports or

underinvoicing of exports) and a negative sign signifies reverse capital flight (underinvoicing of imports and overinvoicing of exports). Since both export underinvoicing and import overinvoicing add to capital flight, the two should be summed for the net effect of trade misinvoicing on capital flight.

III. The Figures

I used eight of the different measures to calculate capital flight –World Bank Residual, idem plus Private Non-Guaranteed debt, Dooley, Morgan, Cline, and three Hot Money Methods– as well as the two measures of trade misinvoicing. To calculate these measures, I relied on the World Bank and IMF data, and as much as possible on published data (see Annexes 2 and 3 for data sources and adjustments). The measures require many data items from various sources over a long period, starting in 1971. For some developing countries, consistent data are not always available. I did not restrict the sample, however, to those developing countries for which data were consistently available but rather used the largest possible set of developing countries. The average number of countries for which data were available for a particular capital flight measure in a given year are reported in Table 2.[9] All flows are reported on the same basis and are not compounded for interest earned abroad. All flows can thus be grossed up using an international interest rate to derive a flight capital (stock) measure which includes the cumulative returns on the assets held abroad.

Annual flows in 1971-92 using the World Bank Residual and Dooley methods follow a similar pattern (Table 2, and Figure 1). The three other balance of payment based estimates (World Bank plus Private-NonGuaranteed Debt, Cline and Morgan methods) are very similar to the World Bank Residual method and are therefore not reported. The correlation between the Residual and Dooley methods is hardly surprising given the similarities in approach. The exceptions are 1990-1992, when Dooley shows much less capital flight and much more reversal of flight capital than the World Bank Residual measure. The reason for the difference is that, unlike the other measures, the Dooley method excludes the stock of imputed legitimate foreign exchange holdings, which is obtained by dividing reported foreign interest earnings by an international interest rate, one-year U.S. Treasury bill rate. As this interest rate fell dramatically between 1990 and 1992, the imputed stock of reported of foreign assets shot up, thus lowering the amount of capital flight. In general, because it depends on a ratio of reported earnings and the international interest rate, which may have little contemporaneous correlation, the Dooley measure is more variable than the World Bank residual measure, casting some doubt on whether the Dooley measure captures the legitimate assets abroad in a meaningful way.

The variation between the (broadest) Hot Money (the two other Hot Money measures are very close)[10] and the World Bank Residual measure arises from differences between balance-of-payments figures on the flow of public and publicly guaranteed debt and World Bank data on the change in the stock of public-sector

TABLE 2

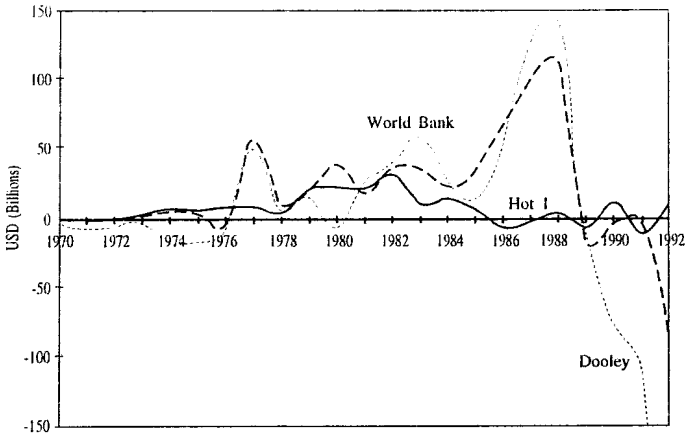
CAPITAL FLIGHT MEASURES
Annual Flows (US$ Billions)

	World Bank Residual	DOOLEY	HOT MONEY 1	EXPORTS Misinvoicing	IMPORTS Misinvoicing	TOTAL Misinvoicing
1971	-0.5	-3.8	-0.4	-9.7	4.9	-4.8
1972	-0.2	-3.3	0.0	-11.7	4.8	-7.0
1973	1.6	1.3	3.8	-18.0	2.8	-15.2
1974	4.6	-14.9	7.6	-34.3	4.7	-29.6
1975	4.0	-13.2	6.2	-29.6	5.6	-24.0
1976	-3.6	-7.6	8.6	-36.4	3.7	-32.7
1977	56.1	51.3	8.5	-37.5	9.4	-28.1
1978	9.7	8.9	4.4	-40.0	5.2	-34.8
1979	22.5	18.2	21.2	-61.7	8.1	-53.6
1980	38.5	-3.8	22.6	-98.8	16.1	-82.7
1981	17.7	27.8	21.7	-55.9	-14.7	-70.5
1982	35.9	41.3	31.2	-40.5	-12.4	-52.9
1983	35.2	60.8	10.8	-39.7	-4.5	-44.1
1984	21.5	32.7	14.9	-84.1	-13.0	-47.1
1985	33.3	15.7	6.8	-24.4	-14.7	-39.1
1986	64.7	55.9	-6.3	-16.2	-22.9	-39.1
1987	99.3	123.2	-1.8	-28.5	-26.7	-55.2
1988	111.8	146.4	4.1	-32.1	-29.9	-62.0
1989	-17.7	-6.5	-5.9	-27.6	-26.4	-54.0
1990	-3.5	-74.8	11.9	-34.9	-31.0	-65.9
1991	-1.4	-105.8	-10.4	-42.7	-27.1	-69.8
1992	-88.3	-350.9	11.9	-54.3	-6.0	-60.3
Average:	20.0	0.0	7.8	-36.8	-7.5	-44.2
Standard Deviation	40.2	93.1	10.0	18.8	14.6	20.5
Number of Countries (Average)	94.0	94.0	107.0	126.0	128.0	129.0

external debt (adjusted for currency-movements, reschedulings, etc.). Even so, up to the mid-1980s, the two measures broadly reflect the same trends (except for 1977). After 1984, the Hot Money measure shows much lower capital flight than the World Bank residual measure. This suggests that large increases in public-sector debt went unrecorded in the balance-of-payments accounts in those years (as well as in 1977). After 1990, the Hot Money measure also shows little indication of capital flight reversal, suggesting that public-sector debt increases as reported by the World Bank were less than those reported in the balance-of-payments accounts.

FIGURE 1

WB RESIDUAL, DOOLEY AND HOT 1 (FLOWS)

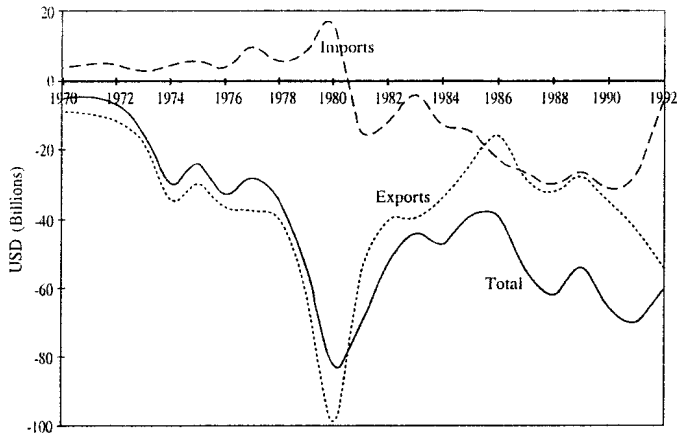


There is a strong correlation between the World Bank capital flight measure and the increase in debt stocks; across all countries and for the whole period 1971-1992, this correlation was 0.85. Especially during the 1986-92 period the correlation between debt buildup and capital flight is high, 0.93. However, there is little correlation between capital flight and the current account. For the period 1971-1992, this correlation was -0.10. Actually, all developing countries on aggregate ran current account deficits for all years. At least globally speaking, this suggests that capital flight largely involved a behavior where foreign assets holdings were built up as the same time that public external debt was incurred, with little relationship to real resource transfer (i.e., current account balance).

The three trade misinvoicing measures, exports underinvoicing, imports overinvoicing and the sum of the two, are also reported in Table 2 and Figure 2; positive numbers for exports indicate underinvoicing and for imports overinvoicing, while negative numbers for exports denote overinvoicing and for imports underinvoicing. Imports are underinvoiced after 1981; and exports are overinvoiced for the whole period. The systematic underinvoicing of imports after 1981 and the overinvoicing of exports for the whole period are of course not consistent with capital flight. Underinvoicing of imports may be because many developing countries have heavy import taxes and other value-based import restrictions, counteracting capital-flight incentives to overinvoice imports. Trade controls, especially on imports, give incentives not to declare (and record) goods. Reasons for overinvoicing exports may be related to export subsidies and other incentives to

FIGURE 2

TRADE MISINVOICING (FLOWS)



generate legitimate foreign exchange earnings. And, data problem more generally appear to affect the trade misinvoicing measures. If we take the two misinvoicing measures together, there is negative capital flight for all years, or in other words, a lower trade surplus reported by the trading partners than reported by the countries. This would imply unrecorded capital inflows to these countries. This contradicts much of the commonly accepted view of large trade misinvoicing, which suggests that relevance of these figures is very limited.

I also calculated the correlation coefficients between the various capital flight measures, averaging correlation's across countries. Table 3 provides the results. As expected, the highest correlation's are between the residual measures, varying from 0.73 between the Dooley and Cline measures, to 0.98 between the World Bank with and without Private Non-Guaranteed Debt. The Hot Money measures show large correlation's with each other (between 0.82 and 0.99), but low correlation's with the residual measures (between 0.22 and 0.38), confirming their more narrowness. The trade measures' correlation's shows that total trade misinvoicing is mainly related to import overinvoicing, a correlation coefficient of 0.64. The trade misinvoicing measures bear little correlation with the other measures, with all (mostly insignificantly) negative, confirming that they are additional sources of capital flight.

I also report the implied stock figures of flight capital using the annual flow figures over the 21 year period, with and without interest compounding at the one-year US Treasury bill rate (Table 4). According to the World Bank Residual method, at the end of 1992, the accumulated stock of flight capital was $940

TABLE 3

CORRELATIONS OF VARIOUS CAPITAL FLIGHT MEASURES
(Averages across countries)

	World Bank	World Bank plus Private Non-Guaranteed	Dooley	Morgan	Cline	Hot Money 1	Hot Money 2	Hot Money 3	Export Misinvoicing	Import Misinvoicing	Total Misinvoicing
World Bank	1.00	0.98	0.74	0.95	0.85	0.31	0.36	0.37	-0.02	-0.05	-0.07
World Bank plus Private Non-Guaranteed	0.98	1.00	0.73	0.93	0.83	0.32	0.36	0.37	-0.04	-0.04	-0.08
Dooley	0.74	0.73	1.00	0.74	0.73	0.22	0.28	0.30	0.01	-0.03	-0.05
Morgan	0.95	0.93	0.74	1.00	0.91	0.31	0.37	0.38	-0.02	-0.03	-0.05
Cline	0.85	0.83	0.73	0.91	1.00	0.27	0.33	0.34	-0.02	0.02	-0.00
Hot Money 1	0.31	0.32	0.22	0.31	0.27	1.00	0.83	0.82	-0.02	-0.03	-0.03
Hot Money 2	0.36	0.36	0.28	0.37	0.33	0.83	1.00	0.99	-0.02	-0.05	-0.05
Hot Money 3	0.37	0.37	0.30	0.38	0.34	0.82	0.99	1.00	-0.01	-0.05	-0.04
Export Misinvoicing	-0.02	-0.04	0.01	-0.02	-0.02	-0.02	-0.02	-0.01	1.00	-0.27	0.40
Import Misinvoicing	-0.05	-0.04	-0.03	-0.03	0.02	-0.03	-0.05	-0.05	-0.27	1.00	0.64
Total Misinvoicing	-0.07	-0.08	-0.05	-0.05	-0.00	-0.03	-0.05	-0.04	0.40	0.64	1.00

TABLE 4

FLIGHT CAPITAL STOCK FIGURES
(US$ Billions)

	World Bank Stock with Interest	World Bank Stock without Interest	Dooley Stock with Interest	Dooley Stock without Interest
1971	-0.5	-0.5	-3.8	-3.8
1972	-0.7	-0.7	-7.3	-7.2
1973	0.9	1.0	-6.3	-5.8
1974	5.6	5.5	-21.6	-20.7
1975	10.0	9.6	-36.5	-33.9
1976	7.0	6.0	-46.3	-41.5
1977	63.4	62.1	2.7	9.8
1978	76.5	71.8	11.7	18.6
1979	104.5	94.2	30.8	36.9
1980	153.4	132.7	30.1	33.1
1981	188.8	150.4	61.4	60.9
1982	251.3	186.2	111.3	102.2
1983	313.4	221.4	184.1	163.0
1984	361.9	243.0	232.6	195.7
1985	429.9	276.2	270.7	211.4
1986	526.9	340.9	346.9	267.4
1987	657.8	440.2	491.0	390.6
1988	807.8	552.1	665.8	537.0
1989	844.2	534.3	703.9	530.5
1990	909.0	530.8	686.2	455.7
1991	975.8	529.4	631.9	349.9
1992	940.2	441.1	315.1	-0.9

billion, or about 49 percent of their stock of external debt and 80 percent of their exports. The Dooley measure shows capital-flight stock of $315 billion, or 16 percent of debt stock and or 27 percent of their exports. The difference between the World Bank and Dooley capital flight measures ($625 billion) is equal to the imputed stock of reported assets held abroad, which, as already noted above, has increased sharply for recent years as international interest rates fell.

From Figure 1 and Table 2, one can distinguish roughly the three periods of capital flight. The first starts in 1977 with a sharp increase in capital flight, followed by a leveling off to about $ 30 billion on average per year. The second period is between 1986 to 1988, when capital flight (World Bank measure) sharply accelerates to $ 65 billion in 1986 and further to $ 112 billion in 1988. The last period, 1989-1992, sees a reversal in capital flight, or put differently, a large inflow of private capital. The reversal is largely due to return of flight capital to Latin America. This pattern can be seen in Tables 5 and 6 which provide respectively the World Bank and Dooley measures for individual Latin American countries. Latin America accounted both for much of outflows during the height of the capital flight period, 1985-88 as well as for more than half of the reflows during the 1989-92 period. In four years 1989-1992, much flight capital has in particular returned to three Latin American countries–Argentina, Brazil, and Mexico, with a total return of flight capital of respectively $ 11 billion, $ 25 billion and $ 42 billion in 1989-1992. In total, almost the same amount has returned to Latin America over the 1989-92 period as had left during the period 1985-88. This massive return of flight capital has not occurred for any other regions. While outflows have declined for most regions in the more recent years, for no other region has there been a systematic return of flight capital.

In general, most of the attention has focused on Latin America's capital flight. In absolute amount, this accounts for a large share of the total capital flight–by the World Bank residual measure (and compounding for interest) a share in the flight capital stock of about 30 percent in 1992 (Table 7). Flight capital, however, is more widespread, and relatively it is more important for many other developing countries. Relative to exports, and external debt, for instance, flight capital of Latin American countries is less than those of many other regions. For Sub Saharan Africa, for example, the stock of flight capital at the end of 1992 (excluding misinvoicing) represented more than 182 percent of the region's exports, by this measure the largest for all regions and much higher than the ratio for Latin America, 130 percent. For all regions combined, the average ratio of flight capital to exports was only 80 percent at the end of 1992. As a ratio to debt stocks, flight capital was the largest for the Middle-East and North Africa region, with a ratio of 85 percent. Relatively to exports, the least flight capital was in East Asia, only 42 percent, and relative to debt, the least in South-Asia, only 5 percent.

Ranking all countries by the stock of flight capital (Table 8, World Bank measure with interest compounding) shows that three of the top ten are from Latin America, Argentina, Mexico and Venezuela. The other countries with largest absolute capital flight are Algeria, China, Egypt, India, Indonesia, Nigeria, and Turkey. But, ranking countries by the stock of flight capital *relative* to exports,

TABLE 5

WORLD BANK RESIDUAL MEASURE FOR SELECTED LATIN-AMERICAN COUNTRIES
(Annual Flow, US$ Millions)

Year	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	Dominican Republic	Ecuador	El Salvador	Guatemala	Haiti
1971	322.4	51.5	-811.7	125.6	-256.7	-69.7	-53.3	30.1	9.3	-23.5	-29.4
1972	271.4	80.0	-1803.6	123.5	-155.0	-44.5	29.3	10.9	18.9	-39.1	-24.1
1973	248.9	47.1	-1333.8	-204.1	73.7	-51.0	-64.2	-17.7	-39.7	-31.7	-31.3
1974	373.0	111.2	-1845.0	315.7	-41.2	-110.3	-151.0	2.1	-37.9	-40.3	-38.0
1975	1325.4	72.4	-1642.9	93.2	55.2	-3.9	21.4	69.7	-89.8	-66.6	-74.7
1976	1503.7	107.1	-4172.5	-256.4	-354.8	-69.4	67.1	-77.8	16.4	-264.4	-76.1
1977	931.0	452.8	6213.2	9.2	1944.5	135.8	181.4	948.2	208.7	188.8	14.2
1978	1904.1	160.9	-960.3	-803.5	-206.8	-69.0	10.5	775.1	-137.0	-117.1	2.9
1979	1062.4	-9.6	2780.1	-1075.3	-301.8	51.4	-41.0	-245.1	172.4	107.1	10.3
1980	3779.6	403.8	1569.0	-2281.6	1.9	-83.6	-222.6	268.7	198.4	365.4	-0.8
1981	2508.3	171.8	-2173.2	-4302.3	-262.7	321.3	-35.0	798.3	34.2	26.4	20.6
1982	7396.7	-130.2	-364.8	407.5	-599.1	-38.9	-91.2	-947.7	232.2	31.8	40.4
1983	3328.2	325.6	3454.1	752.9	383.8	298.2	251.6	665.3	285.7	46.9	-36.1
1984	843.2	-0.6	5835.3	1387.0	21.1	-145.8	77.0	1026.5	122.7	259.3	10.7
1985	5750.4	-114.1	170.7	1156.4	514.7	152.8	180.2	445.9	-114.2	-59.6	-54.4
1986	-576.1	250.7	7183.2	1912.0	567.5	75.8	40.9	318.3	156.7	32.0	-65.3
1987	5654.7	216.1	6417.3	1960.7	1606.4	-5.9	55.4	140.3	152.3	-242.6	94.9
1988	2538.7	-558.2	13521.4	381.7	1475.2	-239.3	170.7	396.9	152.8	159.8	-66.7
1989	6821.2	-1174.7	1073.7	-2278.3	-285.3	-558.5	62.5	-353.6	-152.8	-543.9	-78.4
1990	1207.3	-287.5	-8531.5	-4357.6	293.1	-373.8	317.5	152.5	-266.8	-15.9	19.7
1991	-6466.8	-310.0	-292.4	-2650.7	1494.0	-593.8	-115.0	-43.6	-7.6	-690.7	-103.7
1992	-12666.9	-352.5	-16973.3	-2652.8	1011.9	-504.5	-1182.2	NA	NA	-1002.7	NA

TABLE 5

WORLD BANK RESIDUAL MEASURE FOR SELECTED LATIN-AMERICAN COUNTRIES
(Annual Flow, US$ Millions, continued)

Year	Honduras	Jamaica	Mexico	Nicaragua	Panama	Paraguay	Peru	Trinidad & Tobago	Uruguay	Venezuela
1971	-2.3	11.5	-390.0	-0.9	-0.1	-5.1	-7.2	-77.3	-29.2	70.1
1972	-3.5	-30.7	-365.7	52.4	-2.8	3.6	168.2	4.9	82.4	-248.4
1973	-23.1	4.1	454.1	-18.2	39.5	-20.3	64.6	69.7	20.4	270.8
1974	-29.8	33.2	361.7	-83.0	-62.4	-47.2	-292.1	110.4	130.2	813.3
1975	-66.7	-59.7	-265.8	-66.3	80.1	-46.2	111.1	-36.8	25.1	-289.6
1976	-57.5	169.9	2480.8	28.9	147.7	-69.6	81.2	133.7	-45.4	-1329.2
1977	61.8	123.3	8649.0	421.4	406.4	-0.2	2122.6	54.6	-100.2	2873.8
1978	1.7	137.5	1043.5	223.2	324.7	-134.8	540.5	-18.4	-221.2	214.2
1979	82.2	298.7	2513.7	278.6	94.2	-169.4	238.2	-84.2	-18.0	3294.1
1980	30.8	-16.5	3735.0	453.9	-60.5	-261.8	-39.4	2.4	-198.5	5634.8
1981	17.8	356.8	3595.3	-404.6	590.3	-150.3	-1484.2	312.9	-27.2	6718.5
1982	13.5	210.4	8862.9	-83.5	518.7	-139.1	356.1	-84.6	755.6	2707.7
1983	96.6	329.6	4125.5	627.1	943.8	-58.3	-11.1	214.9	700.8	6427.5
1984	-53.6	-159.2	2943.9	-153.8	407.3	-211.2	464.7	72.0	-20.3	1851.8
1985	158.5	-64.5	4505.8	143.4	600.0	56.2	-211.7	348.4	464.4	25.9
1986	108.4	-20.4	4599.2	504.9	448.6	43.5	1082.4	623.0	-220.3	1829.6
1987	59.5	160.7	11542.9	477.0	897.1	-78.3	1332.5	-54.0	60.9	2219.9
1988	221.5	114.4	13511.7	109.0	1406.1	65.0	795.8	665.4	-133.5	22.1
1989	-33.3	-283.5	-6353.1	553.4	734.5	93.2	-592.3	111.8	242.7	438.8
1990	43.8	-416.0	-3841.5	633.1	19.0	-677.0	-775.8	390.9	-117.0	7958.0
1991	-502.9	-28.2	-18783.6	11.2	-184.4	-554.0	-452.0	366.6	130.9	880.9
1992	-275.2	-320.3	-12722.5	-4000.9	-2503.0	NA	-8054.0	216.9	-734.7	-1912.2

TABLE 6

DOOLEY MEASURE FOR SELECTED LATIN-AMERICAN COUNTRIES
(Annual Flow, US$ Millions)

Year	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	Dominican Republic	Ecuador	El Salvador	Guatemala	Haiti
1971	382.4	-10.9	-995.5	294.5	-200.2	-69.3	-63.1	18.9	-4.5	-34.9	-29.4
1972	497.1	176.0	-3994.5	386.1	-124.7	-59.7	28.5	-22.9	27.0	-42.7	-24.1
1973	42.4	-44.0	-2621.1	-244.2	-71.1	-55.0	-65.7	-49.7	-19.5	-74.1	-31.3
1974	-847.5	165.7	-5994.9	82.7	-503.4	-123.9	-171.9	-229.6	-34.1	-117.0	-38.0
1975	2134.0	10.4	1926.6	354.2	0.4	-19.2	0.6	125.4	-128.8	-73.3	-74.7
1976	1495.1		-3167.2	-384.1	-660.6	-105.5	-16.7	-27.2	-453.2	-435.0	-76.1
1977	-445.9	620.5	5313.3	-103.0	2074.8	76.4	135.2	773.7	432.5	14.8	14.2
1978	84.2	229.9	-2722.7	-1031.8	-610.4	-107.0	-31.9	761.1	53.2	-152.4	-1.4
1979	-1027.7	-75.9	834.7	-1721.4	-948.8	184.9	-49.9	-346.3	-6.2	71.8	11.4
1980	675.5	363.6	4387.7	-3516.8	-1323.7	-98.4	-232.7	193.0	472.9	575.1	-0.7
1981	8003.8	204.3	709.1	-5651.1	-219.0	326.9	282.7	1150.7	120.1	357.1	20.7
1982	9688.3	-75.2	-2266.8	558.8	-132.4	-100.1	-36.6	-627.8	202.0	290.1	40.4
1983	3644.6	-56.5	7610.6	3785.0	2373.0	151.3	217.0	666.9	289.6	-58.7	-39.0
1984	3619.5	191.8	1741.4	457.3	2320.4	-63.7	103.4	700.1	103.6	291.3	10.7
1985	5403.8	-1.6	-5632.6	2153.1	535.2	-59.4	-42.0	733.8	-128.3	-109.3	-54.4
1986	-2920.8	227.6	13379.4	1040.3	-319.2	26.6	66.4	249.1	89.7	-100.8	-65.3
1987	8247.1	248.8	13659.8	2826.6	909.8	103.7	157.9	225.8	53.0	-192.7	94.9
1988	3336.0	-546.1	11717.8	902.1	1269.8	-150.1	254.0	626.2	465.8	316.7	-66.7
1989	6929.0	-1194.4	-2861.5	-2305.1	152.2	-1275.3	75.2	-347.9	-208.0	-288.1	-78.4
1990	1009.8	-219.4	-6070.3	-5913.5	-516.9	-476.8	293.7	86.1	-319.7	70.8	19.7
1991	-9465.1	-478.8	-379.7	-6271.9	-635.8	-703.8	-282.6	-254.7	-148.0	-1010.3	-103.7
1992	-17969.1	-360.1	-30096.1	-6123.9	-4342.0	-1121.5	-1318.8	NA	NA	-1275.1	NA

TABLE 6

DOOLEY MEASURE FOR SELECTED LATIN-AMERICAN COUNTRIES
(Annual Flow, US$ Millions, continued)

Year	Honduras	Jamaica	Mexico	Nicaragua	Panama	Paraguay	Peru	Trinidad & Tobago	Uruguay	Venezuela
1971	-17.5	-72.4	-784.8	11.7	-436.6	-21.6	-198.4	-112.8	-22.9	64.0
1972	-9.4	-22.5	-772.3	49.7	-394.4	3.7	306.2	-6.2	67.0	-711.3
1973	-15.2	111.8	1134.9	-27.1	-99.2	-17.4	41.7	145.6	-24.9	-1529.1
1974	-22.7	-21.2	-108.9	-116.4	-2680.2	-90.8	-399.9	-60.9	157.7	-223.8
1975	-108.6	-86.6	-177.7	-99.8	-2088.8	-81.9	54.5	-513.3	24.7	-8124.9
1976	-129.3	330.4	2127.2	-43.2	-1287.6	-131.4	490.9	-287.2	-113.4	-1762.2
1977	16.4	183.3	8054.2	472.9	-91.0	-52.2	2102.3	-138.4	-176.2	2615.8
1978	-2.9	208.0	-1197.0	311.7	-1048.8	-130.3	573.3	-211.0	-245.2	1264.3
1979	151.1	352.2	1598.7	326.7	-2398.5	-355.8	-105.9	179.1	-242.7	5510.3
1980	38.0	-28.8	2557.2	359.9	-21874	-427.6	-1138.4	-244.4	-233.1	903.5
1981	123.6	362.8	3560.4	-421.2	-1766.4	-140.8	-995.7	95.8	-412.5	3029.8
1982	18.2	206.5	7736.3	64.7	-3323.9	-448.0	992.7	-620.6	564.3	7805.1
1983	111.1	201.3	2979.5	641.5	10914.0	471.6	-231.3	1230.0	1495.7	15511.0
1984	-45.2	62.3	-2593.4	-119.9	17403.0	-151.7	286.4	1495.3	-143.6	-1151.4
1985	146.7	-100.6	3906.8	176.0	1546.3	72.7	-191.4	-647.5	428.5	-1514.1
1986	107.3	-58.1	6267.3	514.7	2444.9	-60.4	1435.0	1814.0	-661.1	-118.2
1987	92.5	239.8	5042.0	465.4	10406.2	454.0	1832.6	1374.3	-70.8	8453.8
1988	241.1	67.1	10266.7	103.0	24228.1	73.5	1368.4	667.0	27.4	2640.4
1989	-2.9	-267.4	1922.1	503.2	2758.4	9.5	-890.7	36.4	-425.2	7935.7
1990	82.5	-463.9	-4964.6	566.6	75.3	-988.2	-668.6	295.6	-851.6	-5052.3
1991	-561.3	-103.7	-34345.9	0.8	-4212.1	-729.1	-1584.3	35.1	-502.9	-1419.2
1992	-367.6	-493.3	-28587.9	-4028.6	-11288.4	NA	-9733.5	303.3	-2668.9	-2734.9

TABLE 7

REGIONAL DISTRIBUTION IN 1992 OF FLIGHT CAPITAL
(Stock Figures, US$ billion, unless noted otherwise)

	World Bank Stock with Interest	Exports	Debt	World Bank Stock with Interest/ Exports	World Bank Stock with Interest/ Debt	Share of World Bank Stock with Interest	Share of Exports	Share of Debt
Sub-Saharan Africa	142.9	78.5	212.4	181.9%	67.3%	15.2%	6.7%	11.1%
East Asia & Pacific	188.1	451.5	421.3	41.7%	44.6%	20.0%	38.3%	21.9%
South Asia	42.6	59.3	161.1	71.7%	26.4%	4.5%	5.0%	8.4%
Europe & Central Asia	107.4	231.6	356.1	46.4%	30.2%	11.4%	19.7%	18.5%
Middle East & North Africa	176.0	139.8	207.7	125.8%	84.7%	18.7%	11.9%	10.8%
Latin America & Caribbean	283.3	217.6	562.8	130.2%	50.3%	30.1%	18.5%	29.3%
Total	940.2	1,178.5	1,921.5	79.8%	48.9%	100.0%	100.0%	100.0%

shows that only two of the top ten are from Latin America (Nicaragua and Panama). Six are from Sub-Saharan Africa (Chad, Ethiopia, Liberia, Somalia, Sudan and Uganda) and two are from the Middle-East and North Africa (Egypt and Syria). Capital flight is in relative terms and for many countries the stock of capital flight exceeds their 1992 exports by large factors. A similar picture of much more widespread flight capital emerges when the stock of capital flight is compared to external debt (see Table 8).

That in absolute terms capital flight is not widespread and is clearly demonstrated by the Lorenz-curves for 1978, 1985 and 1992 when flight capital (using the World Bank residual measure with interest compounding) in absolute amounts is ranked from smallest to largest (Figure 3). By this measure, 80 percent of the countries represented about 10 percent of all flight capital in 1992. For about 70 percent of countries, there is actually negative flight capital in 1992. When flight capital is ranked on a relative basis, i.e., percentiles of exports are ranked against percentiles of share of flight capital, the picture drastically changes (Figure 4). The curves for all three years are actually above the 45 degree-line, indicating that countries with smaller exports have actually a higher share of capital flight. Flight capital is widespread *in relative terms* and is a substantial drain of scarce external resources for many developing countries (see also Chang and Cumby, 1991, which draw attention to this for sub-Saharan Africa). Figure 4 also shows that relative to exports, flight capital has become less concentrated in the mid-1980s as the curve moved closer to the 45-degree line, but concentration increased again in later 1980s/early 1990s. The Gini-index (which is zero when capital flight is distributed in the same way across countries as exports is) has moved over the years from 0.50 in 1978 to 0.22 in 1985 back up to 0.46 in 1992.

TABLE 8

COUNTRY RANKING OF FLIGHT CAPITAL IN 1992
(Stock Figure, US$ Billions, unless noted otherwise)

	World Bank Stock with Interest	Exports	Debt	World Bank Stock with Interest/Exports	World Bank Stock with Interest/Debt	Rank in World Bank Stock with Interest	Rank in Stock/ Exports	Rank in Stock/ Debt
Algeria	35.7	10.9	26.3	327.1%	135.7%	10	27	20
Argentina	75.9	12.2	58.0	621.3%	130.8%	4	12	22
Chad	0.9	0.1	0.7	1275.5%	138.2%	55	5	19
China	71.3	85.6	58.5	83.3%	121.8%	5	64	23
Egypt	85.8	5.2	40.5	1656.6%	212.0%	2	4	9
Ethiopia	2.1	0.3	3.6	787.0%	58.2%	46	7	44
Gabon	11.8	2.4	3.3	497.5%	359.1%	22	18	4
India	50.2	20.7	75.2	241.9%	66.7%	8	38	40
Indonesia	50.5	33.9	71.7	149.1%	70.4%	7	51	37
Liberia	5.2	0.7	1.5	699.8%	351.3%	32	10	5
Mexico	98.9	42.7	97.8	231.8%	101.2%	1	39	28
Nicaragua	2.7	0.4	7.3	774.1%	37.3%	42	8	59
Nigeria	65.7	11.8	32.8	558.4%	200.3%	6	15	10
Oman	12.1	7.8	2.7	155.5%	451.8%	21	48	3
Panama	11.0	0.5	4.3	2324.4%	258.2%	23	2	6
Romania	15.7	4.5	2.4	352.2%	667.1%	18	25	1
Somalia	0.8	0.1	1.7	762.1%	50.3%	56	9	48
Sudan	17.5	0.3	10.9	5405.1%	160.2%	15	1	15
Syria	28.6	3.1	14.8	927.2%	192.7%	11	6	12
Trinidad and Tobago	5.1	1.9	2.1	276.5%	242.4%	34	34	8
Turkey	36.5	14.7	47.8	247.4%	76.3%	9	36	35
Uganda	3.5	0.2	2.6	2049.6%	133.9%	39	3	21
Vanuatu	0.2	0.0	0.0	655.5%	556.8%	69	11	2
Venezuela	83.7	15.7	33.6	534.1%	249.2%	3	17	7

FIGURE 3

SIMPLE LORENZ CURVE OF CAPITAL FLIGHT

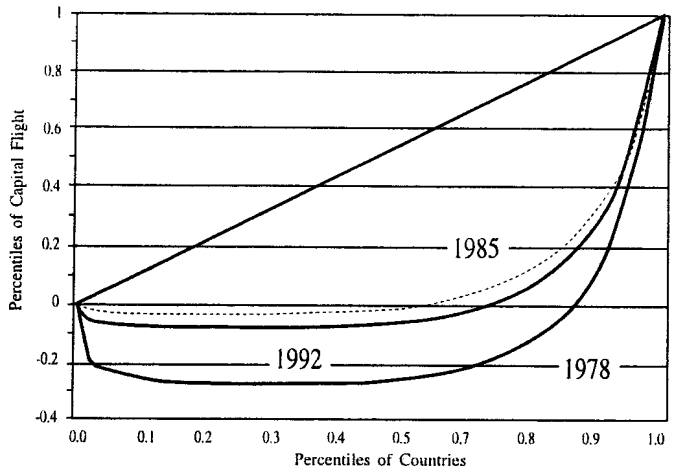
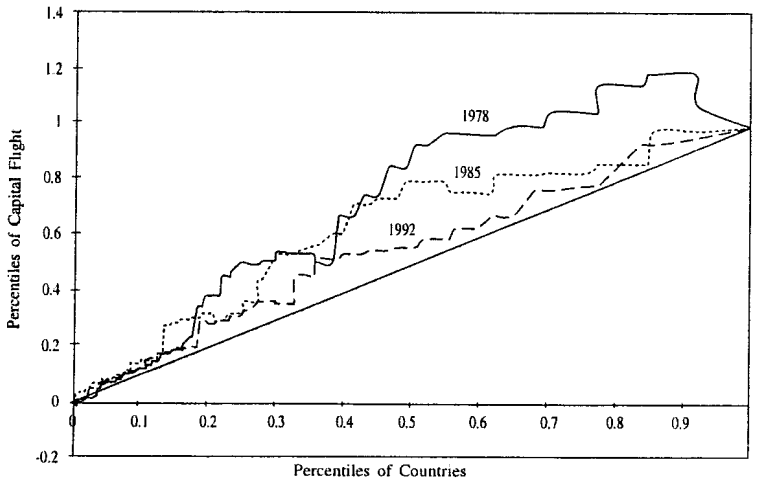


FIGURE 4

LORENZ CURVE OF FLIGHT CAPITAL



IV. Comovement in Capital Flight Measures

I already have pointed out that capital flight is a much wider-spread phenomenon than commonly assumed. A related question is whether there are some factors common to capital flight from all developing countries. Two types of global factors are likely important. First, world interest rates influence the gains for domestic residents from engaging in capital flight. It also influences the ability of the governments of these countries to service their external claims, which in turn can lead to capital flight as residents seek to avoid the fiscal consequences of high external debt service. The sharp rise in world interest rates in the late 1970s/early 1980s may well have been a factor motivating the capital flight in those years, and the decline in interest rates in the early 1990s may have been a factor in the reversal of capital flight. More generally, global economic developments (e.g., business cycles) can influence the gains from engaging in capital flight as well affect the economic conditions for many countries simultaneously (e.g., as they affect exports). Second, spillover effects, triggered by changes in the perception of foreigners of the creditworthiness of developing countries, especially on a regional basis, may lead to comovement. Equilibrium's may arise in which either a large share of domestic investors keep their money at home or, if there is a lack of confidence by (foreign) investors in the region, many take their money out (see Eaton (1987) and Diwan (1989) for such models). Arguably, this played a role in the mid-1980s when confidence among foreign investors in Latin America in general dropped sharply and outward capital flight from most countries sharply increased. The increase in confidence as a result of the announcement of the Brady-plan in 1989 may also have played a role in reducing capital flight in that and later years in many countries.

To investigate this question I used the representative measure of the World Bank Residual. Two kinds of analyses were performed. First of all, I used the standard Analysis of Variance (ANOVA), the proportion of the total variation in the capital flight figures, which is common across all countries. The results are reported in Table 9. For all countries, about 21% of variation in the absolute dollar amounts of capital flight across years and countries can be explained by the year and country classification. The fraction of the variation of capital flight explained by a given year across all countries amounts to 6.7% of the variation in capital flight, while the fraction of the variation of capital flight explained by the country classification amounts to 13.9% of the variation. Scaling the capital flight figures by exports or debt does not change this picture much (see Table 9). In other words, there appears to be some communality of capital flight across all countries in a given year, up to one-third of total explainable variance using country and year classification. This suggests that global factors may play an important role in motivating capital flight. The results may be influenced, however, by structural differences between countries which have influenced capital flight. I have therefore decomposed flows also in another fashion.

To account for the different size of capital flight across countries, I first considered scaling the annual capital flight figure for each country by its exports

TABLE 9

TEST FOR COMMONALITY IN CAPITAL FLIGHT: ANOVA RESULTS
(Percent Explained by Classification)

by:	Absolute Amounts	Relative to Exports	Relative to Debt
Country	13.9	10.0	16.6
Year	6.7	3.1	3.2
Total	21.0	13.2	19.7

and GDP. Scaling with exports and GDP is not, however, necessarily the best way to scale capital flight across countries and over time. Capital flight is a function of many factors –political uncertainty, external factors, size of distortions, etc.– many of which have little relation with the country's GDP or exports. I instead used a very simple model for capital flight and it year-to-year changes across countries and across time. I hypothesize that each country has its own "natural" level of capital flight, α_i, based on its structural political and economic circumstances, including size. Year-to-year deviations from this level are then assumed to be driven by two, multiplicative shocks: a global shock and a country-specific (and year) shock.[11] The global shock β_j is assumed to have a normal distribution with a standard deviation of σ. The country-specific shocks ε_{ij} are assumed to be drawn from a normal distribution with a country-specific standard deviation σ_i. The model is then, where KF_{ij} is the level of capital flight for country i in period j:

$$KF_{ij} = \alpha_i * \beta_j * \varepsilon_{ij}$$
$$\text{where: } \beta_j \sim N(0,\sigma)$$
$$\varepsilon_{ij} \sim N(0,\sigma_i)$$

I also tested a second model which assumes that each country has its own year-to-year *changes* in capital flight, α_i., with deviations from this mean level of changes influenced again by a multiplicative global shock and a country-specific (and year) shock, i.e.:

$$KF_{ij} - KF_{ij-1} = \alpha_i * \beta_j * \varepsilon_{ij}$$
$$\text{where: } \beta_j \sim N(0,\sigma)$$
$$\varepsilon_{ij} \sim N(0,\sigma_i)$$

To test this model I first need to standardize capital flight (or the year-to-year changes) in capital flight for a given country by the standard deviation in the country's own capital flight (or year-to-year changes) over time. This standardization corrects for the mean country-specific *level* of (or the year-to-year changes in) capital flight, α_i, as well as for the standard deviation of the country-specific shocks, σ_i. I am then in effect left for each country and year with the product of β_j and country-specific (and year specific) residuals, but where the country-specific residual now have the same standard deviation (of 1) for all countries. I then take the mean of this variable across countries for a given year which, given the large number of countries, essentially means that the average of the country-specific residuals will be close to zero. I am then left with 22 observations for β_i. Using the standard deviation of these 22 observations for β_i, I can perform a simple t-test to identify the years in which there was a significant common element to capital flight. The null hypothesis that there is no comovement in capital flight for a given year across countries implies: H0: $\beta_j = 0$ versus H1: $\beta_j \neq 0$. Table 10 provides the tests-results, where I use a t-statistics test with a 5% level of significance.

Looking at the level of capital flight, the results indicate that there are two periods of "excessive" positive comovement, i.e., when the residual β_j is significantly positive. The first is 1977. The second period is 1986-88. Ranked by size, the years with the largest positive common capital flight were 1987, 1986, 1985 and 1977. Looking at the year-to-year changes in capital flight, there are three years periods of "excessive" comovement, i.e., when the residual β_j is significantly positive or negative. The first is 1977 when there is a common

TABLE 10

TEST FOR COMMONALITY IN CAPITAL FLIGHT

Year	Normalized	Level T-test	Positive or Negative	Changes Normalized	T-test	Positive or Negative
1971	-0.15	-0.38	0	NA	NA	NA
1972	-0.09	-0.21	0	0.00	0.01	0
1973	0.18	0.45	0	0.24	0.75	0
1974	0.22	0.55	0	0.12	0.38	0
1975	-0.06	-0.14	0	-0.14	-0.43	0
1976	0.11	0.27	0	0.11	0.34	0
1977	0.73	1.80	1	0.64	2.01	1
1978	0.33	0.82	0	-0.37	-1.16	0
1979	0.36	0.88	0	0.10	0.31	0
1980	0.23	0.57	0	-0.09	-0.29	0
1981	0.08	0.21	0	-0.08	-0.25	0
1982	-0.03	-0.06	0	-0.10	-0.32	0
1983	0.22	0.54	0	0.22	0.70	0
1984	0.03	0.08	0	-0.16	-0.49	0
1985	0.16	0.38	0	0.13	0.39	0
1986	1.12	2.77	1	0.57	1.78	1
1987	1.26	3.10	1	0.29	0.93	0
1988	0.78	1.92	1	-0.14	-0.46	0
1989	-0.29	-0.72	0	-0.80	-2.53	-1
1990	0.04	0.10	0	0.23	0.74	0
1991	0.18	0.44	0	0.12	0.39	0
1992	-0.41	-1.00	0	-0.46	-1.44	0

significant increase. The year 1986 also has a common significant increase, whereas the year 1989 had a common significant decrease. The decline in the year 1992, while large, is not significant as common across all countries, perhaps as it was largely limited to Latin America.

In the years 1977, 1985-1987 and 1989 there was a common element to capital flight across countries. These years suggests that the three following factors may have been important. During 1977, the commercial lending boom to developing countries started. This was in part fueled by the effects of the first oil-shock, which affected a many importing developing countries adversely whilst providing oil-exporting countries with extra resources. It also provided commercial banks in developed countries with large amounts of oil-dollars to be recycled. The Baker plan prevailed in 1985-1987, as the international debt strategy towards heavily-indebted countries. Its focus was on rescheduling debt service falling due, combined with new money package and conditionality by international financial institutions. The large and common element in capital flight suggest that residents in the countries did not consider this as a sustainable strategy: as they anticipated heavier taxation, they engaged in large capital flight to protect their assets. Finally, the announcement of the Brady Plan in 1989 and its first implementation in 1990 for Mexico appeared to have been generally perceived very favorable as residents of many countries repatriated large amounts of their flight capital.

V. Conclusions

While capital flight methodologies differ in approach, the identities used in balance-of-payments data make them close in the final measurement. The correlation's between the various measures are generally then also generally high. I also document that capital flight is not exclusively a Latin American phenomenon, it is much wider spread than commonly thought. Compared to countries' exports, capital flight is evenly distributed, and the capital flight-exports Lorenz-curve is close to the 45-degree line. There also appears to be important common factors driving capital flight as there is considerable comovement across countries.

ANNEX 1
The Dooley method

The Dooley method can be described as:

Stock of Unreported Foreign Claims = A + B + C - D

where:

A. Cumulative Recorded non-equity Balance of Payments Assets
= A1 + A2 + A3 + A4 + A5 + A6 + A7 + A8

o/w Other Long-term Capital (Assets)
A1 Portfolio investment (IMF BoPY lines 53,36)
A2 Resident official sector (IMF BoPY lines 62..64)
A3 Deposit money banks (IMF BoPY lines 69..71)
A4 Other sectors (IMF BoPY lines 77..79)

o/w other Short-term Capital (Assets)
A5 Resident official sector (IMF BoPY lines 84..85)
A6 Deposit money banks (IMF BoPY line 89)
A7 Other sectors (IMF BoPY lines 93..94)
A8 Reserves (IMF BoPY lines 98..109)

B. Cumulative Errors and Omissions (IMF BoPY line 112)

C. Adjustment for Unrecorded Claims
= Stock of external debt as reported to the World Bank (see Section 4)
– Cumulative Recorded Balance of Payments Liabilities

where: Cumulative Recorded Balance of Payments Liabilities
= C1 + C2 + C3 + C4 + C5 + C6 + C7 + C8

o/w Other Long-term Capital (Liabilities)
C1 Portfolio investment (IMF BoPY lines 54,55,57,58)
C2 Resident official sector (IMF BoPY lines 65..68)
C3 Deposit money banks (IMF BoPY lines 72..76)
C4 Other sectors (IMF BoPY lines 80..83)

o/w Other Short-term Capital (Liabilities)
C5 Resident official sector (IMF BoPY lines 86..88)
C6 Deposit money banks (IMF BoPY lines 90..92)
C7 Other sectors (IMF BoPY lines 95..97)
C8 Reserves: IMF credit (IMF BoPY lines 110..111)

D. Capitalized Reported non-FDI Income
= Flow of other investment income: credit (IMF BoPY lines 15,17,19)/
One-year US Treasury Bill rate (IFS line 60c..zf, US)

The table below provides the source of the data used for calculating the various capital flight measures.

ANNEX 2
Description of Input Series

Output Name	Database	Label	Field	Database Name
Travel & Tourism	BOP	1D.A	D4Q	Travel: credit (BOP line 9)
Reinvested Earnings, Credit	BOP	1E1A	D4Q	Reinvested earnings on direct investment abroad (BOP line 11)
Reinvested Earnings, Debit	BOP	1E1B	D4Q	Reinvested earnings on direct investment in the country (line 12)
Investment Income	BOP	1G.A	D4Q	Other investment income: credit (BOP lines 15,17 and 19)
Other Investment Income: Private	BOP	1G3A	D4Q	Other investment income: credit (BOP line 19)
Investment in Bonds	BOP	6N1X	D4Q	Portfolio investment: other bonds (BOP lines 56 to 58)
Corporate Equities	BOP	6P1X	D4Q	Portfolio investment: corporate equities (BOP lines 59 to 61)
Other Short-Term Capital, Net	BOP	8.2X	D4Q	Other short-term capital of other sectors (BOP lines 93 to 97)
Other Short-Term Capital, Debit	BOP	8K2X	D4Q	Other short-term capital of other sectors: other assets (line 94)
Increase in Reserves	BOP	2..X	D4Q	Reserves (BOP lines 98 to 111)
Foreign Direct Investment	BOP	3..X	D4Q	Direct investment: net
Capital Account	BOP	...X	D4Q	Capital account
Current Account	BOP	A..C	D4Q	Current account
Net Errors & Omissions	BOP	.A.X	D4Q	Net errors and omissions
US Treasury Bill Rate	IFS	60C..ZF	USA	US Treasury Bill Rate
Deposit Money Banks	IFS	.7A.DZF		Deposit Money Banks: Assets
FOB-CIF Conversion Factor	IFS	..V..Z.		FOB-CIF Conversion Factor
Debt Outstand. & Disb., All	DRS	SLT_ALL_PLUSIMF	DOD	Total external liabilities (short and long term + IMF credit)
Debt Outstand. & Disb., PNG	DRS	PNG_ALL_TOTAL	DOD	Private nonguaranteed, all creditors, total
Exports (country view, FOB)	DOT	EXP_FOB	CRY	Exports of goods & services, FOB, as reported by the country
Imports (country view, CIF)	DOT	IMP_CIF	CRY	Imports of goods & services, CIF, as reported by the country
Imports (world view, FOB)	DOT	EXP_FOB	WLD	Exports of goods & services, FOB, as reported by the world
Exports (world view, CIF)	DOT	IMP_CIF	WLD	Imports of goods & services, CIF, as reported by the world
Debt Reduction, PPG	DRS	DRP		Debt Reduction, PPG
Debt Reduction, Short-Term	DRS	DRS		Debt Reduction, Short-Term
Debt Reduction, PNG	DRS	DRN		Debt Reduction, PNG
Exchange Rate Impact	DRS	XRI		Exchange Rate Impact

Notes: Database: BOP refers to IMF Balance of Payment yearbook; DRS refers to the World Bank Debtor Reporting System, as also published in the World Debt Tables: IFS refers to IMF International Financial Statistics: DOT refers to IMF Direction of Trade. Label and field refer to the labels and field mnemonics used in the respective database. Database name is the name used in the respective database.

ANNEX 3
Data Issues

Sources: This paper relies on World Bank and IMF data, and mostly on published data (the only unpublished data is the currency-adjustment factor). The IMF Balance of Payments Yearbook (BoPY) is the source for almost all BOP current and capital-account items. The World Bank Debtor Reporting System (DRS) is the source for all external debt statistics. The IMF Direction Of Trade (DOT) statistics provide the trade data. The one-year US-Treasury interest rate information came from the IMF International Financial Statistics (IFS) data set. IFS-data were also used for the change in the deposit money banks foreign assets. As data are constantly revised, variations can arise because of different vintages of data and differences between the published versions of data and tapes (and other computerized data sources).

IMF Balance of Payments Yearbook (BoPY) Data

Although no adjustments were made to any of the BoPY-figures, some conventions are worth mentioning:

a) *Signs:* Items in the IMF BoPY are prefixed by signs: + for debits (for example, exports), - for credits (for example, imports). In the capital account, assets (lending) and liabilities (borrowing) are stocks which increase (-/+) or decline (+/-). Net figures (flows) and net balances (stocks) are calculated not by subtracting debits from credits, but by adding them, for example, exports + imports = the trade balance. Thus, the capital account, reserves, and errors and omissions are added to (rather than subtracted from) the current account to arrive at the overall balance.

b) *Aggregated versus Detailed Presentation:* The Aggregated Presentation in the BoPY provides capital account and reserves figures net of counterpart items (valuation changes in reserves, {de}monetization of gold, and SDR's), exceptional financing, and liabilities constituting foreign authorities reserves, which are shown separately. As a result, the current account, capital account, change in reserves, and errors and omissions in the aggregated accounts do not add to zero. They do, however, balance in the Detailed Presentation, which includes counterpart items. Throughout, this paper uses the Detailed Presentation (see further IMF, 1992).

World Bank Debtor Reporting System

External debt data from the World Bank Debtor Reporting System (DRS), employed for the residual and Dooley measures, cannot be used directly. The measures require putting together a few separate components to obtain the annual net increase in external liabilities. The starting point is the year-to-year change in

the dollar-measured debt stock. This can inaccurately reflect net borrowings (new disbursements minus principal repayments), since it may include the effects of, say, cross-currency exchange-rate fluctuations, debt found (rescheduled or converted), and debt forgiven or reduced. To correct for these, the change in debt stock (inclusive of short-term, IMF, and exclusive of private, non-guaranteed debt) is reduced by the change in debt stocks due to cross-currency exchange-rate fluctuations, while forgiven or reduced debt and debt service is added back to the annual change.

a) *Cross-Currency Exchange-Rate Fluctuations:* One problem in using the change in dollar-measured debt stock is that non-dollar denominated debt will fluctuate in dollar terms from year to year (in addition to any net flows) due to cross-currency exchange-rate fluctuations. Excluding that part of the change due to such fluctuations, however, can only be done for the public and publicly guaranteed portion of external debt (PPG) since the currency mix is known only for these loans. (For World Bank loans, it is done only after 1983.) The currency adjustment on SDR denominated debt (for example, IMF credits) has not been calculated.

b) *Debt "found":* Debt stocks may increase each year because of debt found (for instance, during a rescheduling), debt which was incurred earlier. Since this "discovery" is often not reflected in (past) net flows, the change in the stock of debt is preferable to net flow figures, but may not reflect when the debt was incurred. I didn't correct the yearly change for any debt found, but incurred earlier.

c) *Debt converted:* When private-sector external debt is converted to public-sector debt (in, say, a rescheduling agreement), the private sector substitutes a liability to the government for a foreign liability. Although there has been no new net flow of funds, the private sector will increase its net foreign assets, which may increase the measure of capital flight. The change in the stock of debt yields better estimates of increases in the private sector's net foreign assets (and thus of capital flight) than the flow of net borrowings.

d) *Capitalization's:* The annual stock of debt may change because of capitalization of arrears, rescheduling of principal or interest payments due, and capitalization of (interest) penalties imposed, all to the extent that are not fully reflected in net flows of borrowings. Whether to include rescheduled interest (and other capitalization's) or not? In principle, balance-of-payments data show interest payments due, rather than made. As a result, when interest is rescheduled within the year, the current-account deficit will be overstated on an actual cash flow basis and thus the residual estimates of private capital flows understated. Including rescheduled interest due as an official flow in the capital account will correct this. If, however, interest paid is measured in the current account (and no new flow for the rescheduled interest payments is recorded in the capital account) using the adjusted change in the stock of debt, including rescheduled interest, will overstate the extent to which the private sector has increased its claims abroad.[12] This paper uses current-account figures from the balance of payments and does not correct the change in debt stock for the possibility that interest paid (instead of interest due) is recorded in the balance of payments.

e) *Adjustment for Forgiveness:* Forgiveness of debt, principal, and interest and other debt and debt service reductions (through market-based transactions) will decrease the debt stock in that year. This would imply a lower annual change in the stock of debt, but with no corresponding net flow (or decrease in capital flight). Therefore, the debt stock figures are adjusted for the net amounts forgiven or reduced each year.[13]

f) *Private Non-Guaranteed Debt (PNG):* Including or excluding private non-guaranteed debt in capital flight depends on whether gross or net private sector foreign assets are to be measured. If *net* private external claims are to be measured, the relevant debt figure is the change in public and publicly guaranteed external debt. If it is gross private-sector foreign assets, then the change in private, non-guaranteed debt should be included, and the residual measure of capital flight will be higher. However, since private external indebtedness represents an actual liability of the private sector (expected to be serviced and repaid by the private sector), arguably the simultaneous acquisition of a foreign asset and foreign liability should not be considered "capital flight". In calculating the World Bank residual measure, net acquisition of foreign assets by the private sector is chosen as the relevant measure and PNG-debt is thus excluded.[14] However, a measure of capital flight is also provided which includes PNG-debt (and the necessary adjustments for debt reduction, forgiveness, etc.).

h) *Short-Term Debt:* The same argument for excluding PNG-debt can be made for short-term debt-namely, that it should be included when measuring gross capital outflows, while only public and publicly guaranteed short-term debt should be used for net capital outflows. Unfortunately, World Bank data on short-term external debt are not disaggregated between public and private flows. Anecdotal evidence for Sub-Saharan Africa suggest that much short-term debt is publicly guaranteed, but this is probably not so for Latin America and Asia with their freer private sector. Including short-term debt can thus be seen as calculating a upper bound of capital flight as measured by this method, and excluding the short term as a lower bound. For the purposes of this paper, short-term debt is included.[15]

Data Convention: Interest Compounding

Given the assumption made for the Dooley measure of flows on the imputed stocks of reported foreign assets (that is, no reinvested earnings are reported in

the capital account) and the corresponding calculation of the flow figures, all flows reported here are on the same basis and are not compounded for interest earned abroad. All flows can be grossed up using an international interest rate for a flight capital measure which includes the cumulative returns on the assets held abroad.

Notes

1 For instance, Erbe (1985) uses the same methodology as the World Bank (1985) but uses OECD (not World Bank) debt data.

2 See also Cumby and Levich (1987), Chang and Cumby (1991), Chang, Claessens and Cumby (1993), and Claessens and Naude (1993) for a discussion of the relationships between capital flight figures and balance-of-payments concepts. The Balance of Payments Yearbook line item numbers are those reported in the hard copy of the BOP Year books. The corresponding codes are listed in Annex 2.

3 In contrast to much of the literature, I included the net acquisition of corporate equities in the measure of foreign direct investment. Even if portfolio investment does not establish major ownership control, it does represent a claim on a country's resources similar to foreign direct investment.

4 If both the balance of payments and the World Bank report net official capital accurately, then the change in the stock of debt reported by the World Bank will match the net borrowing flows reported in the balance-of-payments accounts. This is often not the case. Exchange rate revaluation effects, debt reclassification, and "discoveries" of existing debt may cause estimates to diverge. If, however, a discrepancy remains after corrections for these effects are made (see Annex 3), then the unrecorded increase in external liabilities must be due to an underestimation of balancing transactions, such as an unrecorded increase in external assets by the private sector (that is, capital flight).

5 The latter is typically the case for developing countries, where reinvested earnings are poorly measured and are often only recorded as net new inflows.

6 As the Dooley method obtains some stock figures for external assets and claims by cumulating balance of payments flows figures, flight capital depends on the stock assumed in the initial year (normally zero). Consequently, flow figures are more meaningful than stock figures because they do not depend on any assumption for the initial stock value. The Dooley method is further explained in Annex 1.

7 It is not correct to equate the year-to-year difference in the imputed stock of reported assets with a flow, since it includes both new flows from the country (with new flows meaning new flows beyond those occurring through reinvestment of interest earnings), as well as interest earned abroad but not repatriated. In principle, new flows and reinvested earnings should be reflected in the capital account. In Dooley, the new flows reported in the capital account are deemed unreliable. Why otherwise impute the stock of reported assets from the interest income line in the current-account and not measure it directly from the capital account? And, in practice, earnings on non-FDI investments which are reinvested abroad are seldom reported accurately in the capital account of developing countries. Since data thus do not allow the year-to-year change in the imputed stock of reported assets to be divided between new flows from the country and earnings reinvested, the arbitrary assumption was made here that none of the reinvested interest enters the capital account, i.e., that all earned interest is reinvested, and, thus, that the year-to-year difference in stocks includes interest accrued. The flow on reported assets is therefore calculated as the difference between the stock this year minus the stock last year grossed up by one plus the interest rate. For some individual countries, better adjustments can perhaps be made. See for example Eggerstedt et al. (1995) for Mexico.

8 As noted, a similar asymmetry also occurs under the Cline method.

9 Since capital flight is calculated for many developing countries, it was not feasible to correct the figures in cases where data problems appear to exist or are known. Nor was any adjustment made for country-specific information or circumstances. Eggerstedt et al. (1995), for example, draw attention to the fact that most capital flight measures do not correct for the foreign currency deposits held by state-owned companies.

10 The other two Hot Money measures and well as the other measures are not reported, but are available from the author.

11 I also considered additive shocks. This, however, did not do justice to the significant size component in capital flight.

12 The same reasoning suggests that interest arrears ought to be added to the stock of debt if interest due but unpaid is included in the current-account balance-of-payments data.

13 For market-based debt reductions transactions, for example, debt buybacks, the change in debt stock is only corrected by the discount in the transaction. The repayment part, say the cash used in a buyback (the price times the face value of the debt), represents a prepayment by the borrower, and a corresponding reduction in net liabilities. This is normally reported in the World Debt Tables under the line Amortization's. Once corrected for the discount in the debt reduction transactions, the year to year change in the debt stocks would thus correspond to the net borrowings (abstracting from possible other differences).

14 In examining net private sector acquisition of foreign assets, I differ from much previous literature. Dooley et. al. (1985), the World Bank (1985), and Morgan Guaranty (1986) all use private, non-guaranteed debt in addition to public and publicly guaranteed debt in computing residual estimates of private sector acquisition of foreign assets.

15 Erbe (1985) uses OECD data on medium and long-term gross external indebtedness with estimates of short-term debt for some countries. Cumby and Levich (1987) use public and publicly guaranteed long-term debt and all short-term debt. Morgan Guaranty (1986) excludes the increase in short-term foreign assets of the banking system from the increase in total private sector claims. Acquisition of foreign assets by non bank agents, however, continues to be considered capital flight by Morgan. Since Morgan offers no explanation for treating the banking system differently from other firms and individuals, I do not pursue its distinction here.

References

CHANG, P. H. KEVIN and R.E. CUMBY (1991). "Capital Flight in Sub-Saharan African Countries," in Ishrat Husain and John Underwood, eds, *African External Finance in the 1990s*, Washington, DC, World Bank, 162-184.

CHANG, P.H. KEVIN, S. CLAESSENS and R.E. CUMBY (1993). "Conceptual and Methodological Issues in the Measurement of Capital Flight," *mimeo*, New York University and the World Bank.

CLAESSENS, S. and D. NAUD (1993). "Recent Estimates of Capital Flight," Policy and Research Working Paper 1168, the World Bank, September.

CLINE, W. (1987). "Discussion," on Chapter 3, in Donald R. Lessard and John Williamson, eds., *Capital Flight and Third World Debt*, Washington, DC, Institute for International Economics.

CUDDINGTON, J.T. (1986). "Capital Flight: Estimates, Issues, and Explanations," *Studies in International Finance*, No. 58, Princeton University Department of Economics, Princeton, NJ.

CUMBY, R.E. and R.M. LEVICH (1987). "On the Definition and Magnitude of Recent Capital Flight," in Donald R. Lessard and John Williamson, eds., Capital Flight and Third World Debt, Washington, DC, Institute for International Economics, 27-67.

DIWAN, I. (1989) "Foreign Debt, Crowding Out and Capital Flight," *Journal of International Money and Finance*, 8:121-36.

DOOLEY, M.P., W. HELKIE, R. TRYON, and J. UNDERWOOD (1986) "An Analysis of External Debt Positions of Eight Developing Countries Through 1990," *Journal of Development Economics*, Vol. 21, No. 2, 283-318.

DOOLEY, M.P. (1986). "Country-Specific Risk Premiums, Capital Flight and Net Investment Income Payments in Selected Developing Countries," International Monetary Fund, *mimeo*.

_____ (1987). "Comment," in Donald R. Lessard and John Williamson, eds., *Capital Flight and Third World Debt*, Washington, DC, Institute for International Economics, 79-81.