

CHAPTER 2

METHODS OF MEASURING CAPITAL FLIGHT

- ***INTRODUCTION***
- ***BROAD MEASURE OF CAPITAL FLIGHT***
- ***HOT MONEY MEASURE***
- ***COMPONENTS OF BROAD ESTIMATE***
- ***DATA PROBLEMS***
- ***CAPITAL FLIGHT: A SUB SET OF PRIVATE CAPITAL
OUTFLOW***
- ***CRITICAL ASSESSMENT OF MEASURING PROCEDURE***
- ***MEASURING CAPITAL LOW AS ILLEGAL TRANSACTION***
- ***BRIEF DESCRIPTION OF THE METHODS OF
MEASUREMENT***
- ***CALCULATION OF CAPITAL FLIGHT***

CHAPTER 2

METHODS OF MEASURING CAPITAL FLIGHT

2.1 INTRODUCTION

Since the debt crisis in 1982 capital flight figures have been widely quoted. This section critically reviews the methods to estimate these figures. The most widely accepted figures used have error components of unexpected magnitude and are based on different estimation procedures which often lead to confusion regarding the size and sometimes even the direction of the capital flow. In reality it is difficult to itemize this phenomenon in a statistical data series and there are strong arguments to support the view that we do not capture what we endeavor to measure. Deppler and Williamson (1987) succinctly sum up the argument by pointing out that the weakness of the statistical base on which any definition could be based is the classification of data "according to characteristics that are too closely related and indirectly related to the constructs being measured."

Problems regarding the magnitude of capital flight arise because there is no direct source for gleaning recorded foreign assets of the private sector in developing countries. Although the Bank for International Settlements (BIS) and the International Monetary Fund (IMF) compile data on the change in cross-border deposits as reported by recipient banks, the coverage is limited in its scope. The BIS provides a geographical breakdown of the liabilities of all its members but the data series is restricted to members of the BIS and liabilities are not broken down to the official and private sectors. The IMF reports the assets of non-banks in 33 banking centers but also does not distinguish between the official and private sectors.

The U.S. Treasury also provides data on the liabilities of US banks and brokerage houses to the private, non-banking sector of foreign countries. The shortcoming of this source of data is that it covers the flow of private capital only into the United States and assets only in bank and custody liabilities. This data series can, however, be regarded as the minimum measure of the external assets of developing countries.

Attempts to measure the magnitude of capital flight can at best only serve as an indicator to the actual figure due to the problems associated with identifying the phenomenon. Estimates of the scale of capital flight vary with the type of definition employed. Capital can flee through channels which, one can safely assume will not be reported to the balance of payments compiling authorities.⁹

Data problems pose an additional constraint. Several indirect methods to measure capital flight are in existence ranging from all outflows of capital being treated as capital flight to a subset of these flows (the other sub-set being normal flows). The balance of payments data is the starting point for estimating all measures of capital flight from developing countries.

2.2 BROAD MEASURE OF CAPITAL FLIGHT

An indirect method for estimating capital flight from developing countries is widely prevalent.¹⁰ In the early 1980's, following the debt crisis, it was presumed that both debt and asset flows were not properly recorded in the balance of payments. As a result, data recorded in the balance of payments was supplemented with data from other sources. On the liability side, data on external debt compiled by the OECD and World Bank was considered a better record of liabilities compared to the flow data in the balance of payments. On the asset side, capital flight was a major problem in many indebted countries, and therefore indirect methods were used to supplement information on external assets. Dooley et al. (1983) used such a method to compute private external claims. Although Dooley et al. (1983) refrained from terming this estimate capital flight, several subsequent studies interpreted the estimated unrecorded flows as capital flight, for example: Claessens and Naude (1993), Claessens and Chang), Morgan Guaranty Trust Company(1986) and notably the World Bank (1985) and Ajayi and Khan (2000). A few departures from this line of interpretation were Lessard and Williamson (1987), Deppler and Williamson (1987) Gordon and Levine (1989), Varman-Schneider (1991), and Anthony and Hallet (1992).

The estimation method uses reported balance of payments data as a starting point. They provide a link between the increase in gross external debt and the portfolio and spending decisions of the economy. An increase in the gross external debt corresponds to three broad sources identified from the balance of payment accounts: the building up of official reserves and other official balances abroad, the financing of current account deficits and the accumulation of private assets abroad. The technique compares the sources of finance (i.e. the increase in gross external debt and the net inflow of direct investment capital, both liabilities and assets) with the uses of finance (i.e. changes in official reserves, current account deficits, and capital outflows). Since the accumulation of private assets are not properly recorded in the balance of payments due to flight motives or incomplete reportage due to inadequate balance of payments recording procedures, an indirect method is in use for their estimation.

The measuring procedure consists of comparing officially recorded changes in foreign indebtedness (data is used based on either the OECD debt data or the World Bank data) with the net figures for all credit related positions in the balance of payments. The difference between the two aggregates allows conclusions to be drawn as to the scale of gross capital outflows. The calculation is based on

the assumption that the current account deficit and the changes in foreign exchange reserves give rise to a financing requirement, which would have to be reflected in the change in gross foreign indebtedness (the redemption of previous loans has already been carried out here). Resident capital outflows are thus estimated as a residual from the balance of payments data and are widely interpreted as capital flight.

TABLE 2.1: SUMMARY PRESENTATION OF MEASURING PROCEDURE
(Broad and Hot Money Measure)

Current Account surplus	A
Net Foreign Direct Investment	B
Private short-term Capital Outflows	C
Portfolio Investment Abroad: Bonds+Equities	D
Banking System Foreign Assets	E
Change in Reserves	F
Errors and Omissions	G
Change In Debt	H
IMF Credit	I
Travel (Credit)	J
Reinvested FDI Income	K
Other Investment Income	L
Counterpart items	M
Capital Flight	CF

Broad Measure

a) Erbe and the World Bank::

$$CF = H + B + A + F$$

b) Morgan Guarantee Trust Company:

$$CF = H + B + A + F + E$$

Hot money measure

c) Cuddington:

i) $CF = (-G - C)$

ii) $CF = (-G - C - D)$

Dooley et. al (1983) first estimated the gross capital outflow for eight developing countries. The methodology has since been used in several other studies – for example, the World Bank (1985) and Erbe (1985), Collier et al. (1999) and Ajayi and Khan (2000). The residual resulting from the estimating equation includes the assets of both the banking and then on-banking sector in the estimate of capital flight.

Morgan Guaranty Trust Co. (1986) excluded the acquisition of foreign assets by banks. In this study banking assets were included in the broad measure, motivated by the experience of Mexico in the early 1980s where capital flight was largely transacted through the banking sector leading up to the debt crisis.

2.3 HOT MONEY MEASURE

A common practice when measuring hot money flows is to regard the errors and omissions entry in the balance of payments as a measure of private capital flows. The errors and omissions line is the statistical discrepancy in the credit and debit entries in the current and capital account. This is the narrowest measure of capital flight. Some studies regard the narrow measure of capital flight as one in which the short-term capital outflows of the non bank private sector is added to the error and omissions line in the balance of payments. As discussed in the previous section, it is very difficult to argue that outflows of capital, whether long or short-term are only related to capital flight. In a world where trade and financial market integration is on the increase, it is difficult to argue that developing countries would have no outflow of short-term capital in the normal course of business activity. Assigning flight motivations need additional research. The discussion below on data problems will reveal the difficulty in assigning errors and omissions category as only due to capital flight.

2.4 COMPONENTS OF THE BROAD ESTIMATE

Figure 2.1 presents the components captured by the broad measure of capital flight. The analytical content of these measures is very different and they do not distinguish between the flight component and the non-flight component. They are obviously measures of capital outflows. The literature on capital flight has speculated on the underlying motive of these flows and differences in sectoral coverage arise from different opinions as to which transaction was used as a means for capital flight.

The broad measure of capital flight covers a wide range of transactions. It includes short-term foreign assets by the non-bank private sector; errors and omissions recorded in the balance of payments; assets of the foreign assets of deposit banks; outward portfolio flows; long-term assets of the banking sector; the non-reserve transactions of the monetary authorities and the asset transactions of the non-bank official sector. The broad measure of capital flight can be treated as a measure of resident capital outflows. Deppler and Williamson (1987) point out that although the non-asset transactions of the monetary authorities and the asset transaction of the non-bank official sector are asset transactions of the public sector it may be odd to include them in the private claims measure. This is probably due to the evidence that these items are usually relatively small for most countries.

The broad measure of capital flight thus captures the external claims of residents. As developing countries develop trade and financial relations with the rest of the world, their residents claim on foreigners should increase. Trade credit

is extended along with infrastructure investments to support trade related activities like marketing, warehousing, supplier relationships, finance and insurance. It is difficult to see how outflows of capital related to trade activity can be labeled as capital flight.

In the absence of adequate balance of payments recording procedures which do not capture every type of asset, type of transactor as well as cross-border currency transactions, this is an indirect method of arriving at some measure of the magnitude of capital outflows from developing countries. It would be erroneous to consider all claims of developing countries as capital flight.

Increasing developing country financial integration is evident when we look at various indicators of financial integration. The first indicator is the liberalization of the capital account in a large number of developing countries starting with the move towards liberalization by Argentina, Chile and Uruguay in the mid-1970s. By 1993 one quarter of the 155 developing countries was free of restrictions. The ratio of gross capital flows to GDP is also rising for many countries. A widely debated and discussed indicator of financial integration is the saving-investment correlation ships. Schneider (1999) showed that saving-investment correlations were generally lower in the 1980s than in the 1970s. If developing countries gain by diversifying their portfolios internationally, there is no sound reason for classifying asset diversification by residents in developing countries as capital flight.

Although the term capital flight refers to domestic investor response to discriminatory treatment of domestic capital and economic and political instability, the measure of capital flight fails to identify this as the flight component. Perfectly "normal" outflows of capital are clubbed with "abnormal" flows in the capital flight measure.

In terms of an accounting identity the broad measure of capital flight consists of:

$$KO = TB + PI + BA + CF$$

where KO is the broad measure of capital flight, TB are the transaction balances flowing abroad, PI are the portfolio investments, BA are the assets of the banking sector and CF, capital flight emphasizing that capital flight is only a sub-set of the gross capital outflow. Precise estimates are difficult to come by as the reportage on them is incomplete either due to inadequate reporting procedures for compiling balance of payment statistics or to a conscious effort to avoid their discovery. Data on transaction balances of firms engaged in international trade is scarce and so is data on the outflow of portfolio investment.

The problem is further aggravated by dynamic growth in financial instruments, developing country financial integration with global markets and by the insufficiency of reporting procedures to cover all types of financial instrument and

all types of investors in the balance of payments. Assets of the banking sector are reported but during the debt crisis it was widely believed that bank deposits were used as a vehicle of capital flight. It is difficult to delineate the “normal” from the “abnormal” flow because of the inadequate statistics on these components. Problems exist not only at the empirical level, but at the conceptual level as well.

The distinction between portfolio investments and capital flight becomes blurred in a savings-short economy. Many believe that poor countries should be able to keep their savings at home, as well as draw on foreign savings. Declining saving-investment correlations for many developing countries on the other hand show that developing countries are increasingly in the process of goods and financial markets integration. Outflow of capital as a consequence is perfectly normal. Further research is needed on a case by case basis to make judgments about capital flight. In this study, estimates arrived at through this measure are referred to as resident capital flows.

2.5 DATA PROBLEMS

As the method of calculating resident capital outflows is essentially an indirect one it can only be as realistic as the corresponding input of data. Some of the problems with the data for both the broad and hot money measure are discussed below.

Errors and Omissions

This category is part of both the broad measure and its variant hot money flows. Although often equated with capital flight, this item in the balance of payments has many other sources. The IMF's Balance of Payments Compiler's Guide (1995, p. 226) points out some possible interpretations. In their view, different patterns may provide insights into the possible causes of errors and omissions in the BOP statistics. Small or large errors or omitted entries do not indicate whether private capital flows have increased or decreased. Statistically, it is quite possible that small errors or omissions are due to mistakes in compiling debit and credit entries in either or both of the current and capital account, or certain transactions not being measured at all. A persistently large but stable (positive) or negative (debit) net errors and omissions item may suggest that coverage of a certain credit or debit item is inadequate. A fluctuating but offsetting (from period to period) item may be evidence of timing differences on volatile terms such as financial account items or large, 'lumpy' current account transactions.

Large errors and omissions that arise in periods of exchange rate fluctuations may suggest problems with methods of currency conversion used to compile accounts. Inadequate coverage of certain types of transactions may be evidence of relationships. For example, a positive net errors and omissions item coinciding with an increase in imports may suggest under-coverage of trade credit liabilities. Similarly, changes in economic circumstances or policies accompanied by changes in the net errors and omissions may suggest some relationship, for example, a large negative errors and omissions item could be attributed to unmeasured capital flight

occurring after the introduction of a law requiring surrender of foreign currency receipts. It is puzzling that the errors and omissions item in the balance of payments is classified as private capital outflow induced by distortionary domestic policies since it has many sources of error. The estimated capital flight measure is liable to obvious measurement problems. A negative errors and omissions entry is no guarantee that capital flight is taking place. As explained above, it picks up other elements which may or may not include capital flight.

Short-term flows

A difficulty with the hot money measure is the interpretation of the short-term assets of the non-bank assets of the private sector as capital flight. The short-term capital item consists largely of commercial credit and this line will tend to increase when imports increase. It therefore includes non-flight "normal" flows and omits long-term assets, which may be relatively good substitutes of the short-term assets covered in this measure. Flight of capital into real estate or an equity portfolio is missing from this measure. Furthermore, since short-term and long-term securities are actively traded in the international financial markets, there is little distinction between the two assets. [Dooley and Claessens and Warner (1993) examine whether short-term flows are more volatile than long-term flows and come to the conclusion that very often long-term flows are as volatile as short-term flows and that by looking at time series (statistics) only, one will be unable to identify the short-term or long-term properties of the flow.] The coverage of short-term transactions of the non-bank sector in the balance of payments data is patchy and also includes normal flows.

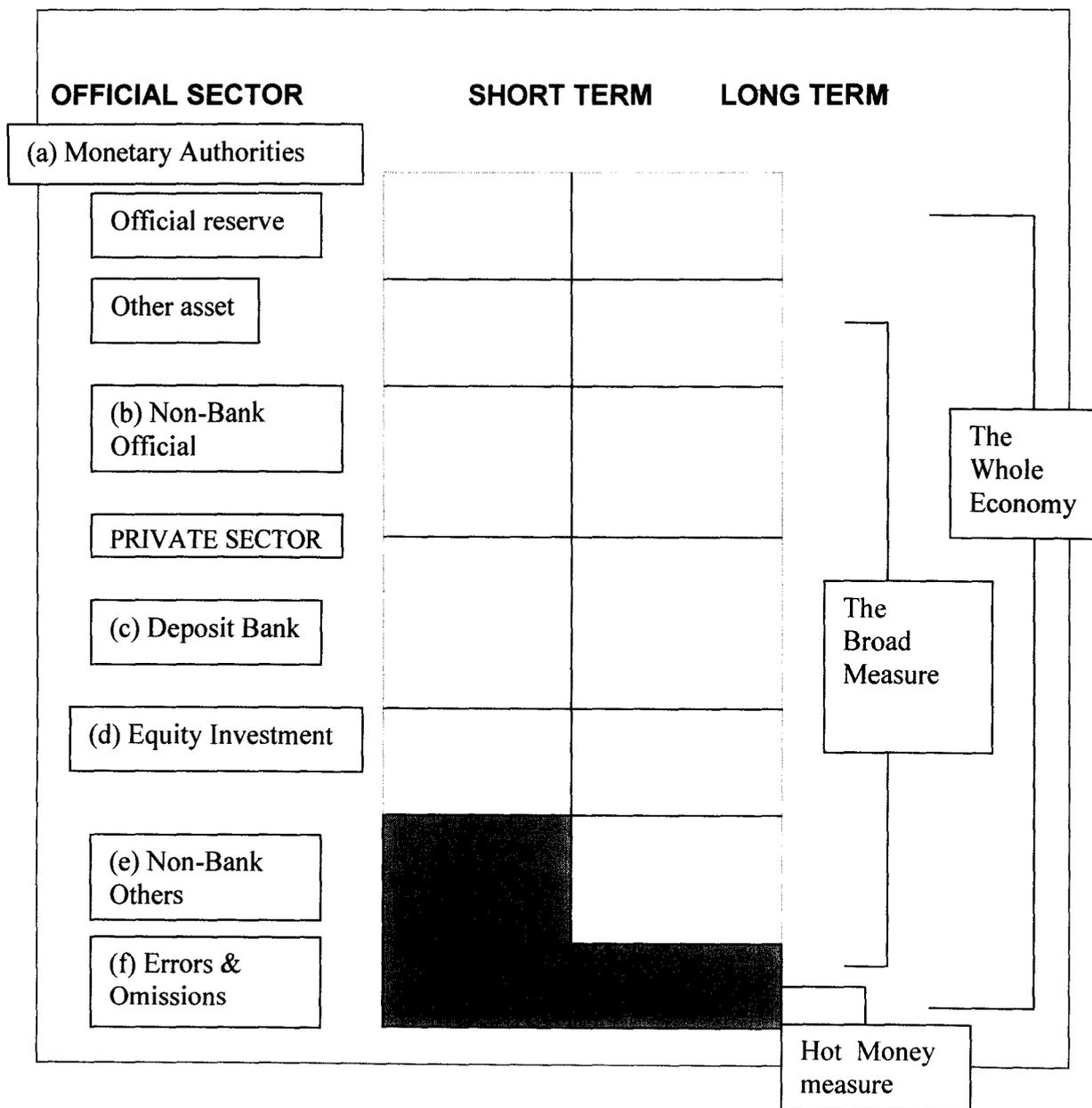
A further problem is the data on short-term flows in the new IMF database. Beginning in 1993 with the publication of the fifth edition of the Balance of Payments Manual (BPM5), capital flow data is reported with emphasis on the type of instrument rather than by maturity. Prior to 1993 (with the use of BPM4), maturity was stressed, hence the reason for the short-term capital flow series. Under BPM5 countries no longer report by maturity for Direct and Portfolio Investment and derivatives. Data for other investment are however reported by maturity

[NOTE: In the fifth edition, coverage of financial flows and stocks is significantly expanded and restructured. The modification reflects, first, an orientation towards compatibility with other IMF statistical systems and the SNA and, second, widespread alterations in the nature and composition of international financial transactions since the fourth edition was published in 1977. These changes include the emergence of financial innovations, new instruments, and transactors that are partly associated with a trend towards increased asset securitization. Such developments tend, in many instances, to blur the distinction between long- and short-term maturities and to make it more difficult to identify resident/nonresident transactions, especially when such transactions involve a number of currencies and a variety of actual and contingent financial instruments or arrangements. Together with the easing or abolition of exchange controls in many countries and the progressive deregulation of national financial markets, these developments create new challenges and problems for data compilers and users. Further complications arise as a result of external debt problems experienced by a number of countries (e.g., accounting for arrears, debt forgiveness or debt reduction schemes, and associated innovative financial arrangements). Partly in response to such developments, classification of the financial account is

Given the nature of current reporting, it is impossible to find a unique total for short-term capital assets, but some of it will show up in the 'other investment' asset category. Unfortunately, the new requirements for the reporting of capital flows make it practically impossible to identify all of the short-term capital assets for the countries.

re-oriented. To cover new financial instruments coverage of nonequity *portfolio investment* is broadened to include long and short-term securities supplementary classifications covering exceptional financing transactions (with selected arrears-related entries for balance of payments accounts) and other items of analytical interest are introduced. These include international trade in services; international banking flows and stocks; asset securitization and principal market developments; external debt problems: income payments and growth and links between exchange rates and current account and financial account flows.]

**FIG. 2.1: BROAD MEASURE OF CAPITAL FLIGHT: SECTOR WISE
 COVERAGE OF FOREIGN ASSETS** [Adapted from Deppler and Williamson (1987)]



External debt data

The external debt of many developing countries is underreported and the capital accounts themselves prove to be poor indicators of gross capital outflows and inflows. The stock of debt cumulated from the balance of payments data is, in the case of many developing countries, lower than the stock of debt data compiled by the OECD and the World Bank. The difference is often attributed to capital flight.

The estimates presented in this study are based on data from the World Debt tables. Until recently no data was available for the changes in debt stock due to cross-currency exchange rate fluctuations. All non-dollar debt will fluctuate with the exchange rate without any changes in borrowing. With a depreciation of the dollar the value of non-dollar denominated debt increases and the reverse occurs with a dollar appreciation.

A further issue is debt forgiveness which, in real terms, increases the stock of debt and should be added back to the stock of debt. Since 1989, a new section on debt stock-flow reconciliation has been added to the World Bank debt data making it possible to adjust the data series for exchange rate changes, debt forgiveness, interest capitalized and net change in interest arrears. What is notable is a residual item that represents the statistical discrepancy and cannot be accounted for. Misreporting of data could lead to such a discrepancy.

Other data problems pertain to military imports. The estimated measure of capital flight may be too high if military imports are not recorded in the statistics unless the imports are off-set by corresponding military exports or the military imports are financed by military aid credits recorded in the external debt data.

Another problem is the flight into imported durables. Dornbusch (1985) analyses the case of some indebted developing countries with overvalued exchange rates and strict capital controls. Investors will anticipate a devaluation and step up their imports of producer and consumer durables and build up inventories in order to realize inventory or capital gains once the devaluation has taken place. Such behavior can push up the current account deficit in periods of anticipated devaluation thereby, underestimating gross capital outflows.

2.6 CAPITAL FLIGHT: A SUB-SET OF PRIVATE CAPITAL OUTFLOWS

Capital flight is sometimes described as a sub-set of private capital flows developed in response to the asymmetrical development in the asset positions of the public and private sectors. Resident capital outflows coincide with non-resident capital inflows. Domestic investors, it is assumed, are aware of the differences in risk involved in investing at home and abroad. Investment risks can be higher at home due to the taxation structure and/or unattractive rates of return combined with an underdeveloped financial system. Foreign investors in developing countries are usually protected by government guarantees.

The asymmetric structure provided the motivation for foreign sources of finance flowing in and private capital from developing countries moving out. The procedure for measuring the magnitude of the transfer of assets in response to dissimilar risks is to be found in Dooley (1986), and has been used by Khan and UI Haque (1987), Deppler and Williamson (1987) and Varman-Schneider (1991).

The basic premise is that capital flight can be explained by differences in risk perceived by residents and non-residents in holding claims on residents of the

country studied. Empirical tests show that yields implied by recorded investment receipts on external claims have fallen well below levels consistent with market interest rates. The relatively low yield on claims is interpreted as a reflection of capital flight. Whereas yields on claims are lower than market interest rates, rates of return implied by recorded payments on external debt have exceeded levels consistent with market interest rates by a substantial amount. This reflects country risk premiums. Capital flight may be interpreted as a reflection of the differences in perception by residents and non-residents and may be related to the level of confidence that either group of investors place in such holdings.

Dooley (1986 and 1988) identifies capital flight as the stock of claims that do not generate investment income receipts in the creditor's balance of payments data. This approach permits an empirical distinction between capital outflows motivated by normal portfolio decisions and those based on the desire to place these assets out of the control of domestic authorities. The first step in the measuring procedure is to a stock of claims by cumulating identified flows in the balance of payments accounts. The flow data is changed into stocks by capitalizing the first year on the basis of data on reported investment income.

Adjustments are made by adding errors and omissions. The discrepancy between cumulated data on external liabilities in the balance of payments accounts and the World Bank external debt data is added to the measured stock of claims. It is assumed that the discrepancies between the two sources of data are underestimated balancing transactions and represent the acquisition of foreign assets by the private sector. The next step is to cumulate a market interest rate for each country's assets.

Since the currency composition of assets is an unknown variable, market interest rates are computed on a very restrictive assumption, namely that the currency composition of assets is the same as that of external liabilities. The average yield on external debt is calculated with weights assigned to the ratio of official, private, variable and dollar-denominated debt in total debt. These are used in conjunction with appropriate interest rates. The same weighted average is applied to the yield on claims by assuming the share of liabilities to official creditors in OECD debt as one, i.e. the market interest rate is the yield on external liabilities to private creditors, and the average yield is applied to capitalize the investment income receipts reported in the balance of payments data. This measure of the stock of external claims is compared to the calculated stock of claims. The difference between the receipts is the measure of capital flight.

TABLE 2.2: SUMMARY PRESENTATION OF MEASURING PROCEDURE
(Capital Flight: A Sub-set of Total Claims)

<u>Item</u>	<u>Notation</u>
Stock cumulated from flows of External Claims	A
Stock cumulated from flows of Errors and Omissions	B
Aggregate Cumulative Capital Outflow (A+B)	C
Unrecorded Stock of External Claims	D
[Where D=OECD External Debt Data — Balance of Payments External Debt Data]	
Total Cumulated Claims (C+D)	E
Recorded Investment Income Receipts	F
Average Yield on External Claims	G

Step by step explanation of the estimation technique:

1. Calculate the stock of external claims implied by investment income receipts and average yield on external claims. These reflect normal portfolio investment.
2. The difference between total cumulated claims (E) and capitalized investment income in the balance of payments accounts as in (1) above is the measure of capital flight.

2.7: CRITICAL ASSESSMENT OF MEASURING PROCEDURE

Theoretically, the measure proposed by Dooley (1988) to capture capital flight by identifying it as the stock of claims on which investment income receipts are not reported is far superior to other measures in that private capital flows are bracketed according to their motives.

However, it is not possible to establish whether the income on the stock of claims which is not reported is beyond the reach of the authorities of individual countries. Also, such estimates include reinvested income in the estimate of capital flight. The measure only captures changes in the stock of capital flight. Capital flight ceases when asset holders report investment income abroad which may not be repatriated. Thus, reversing capital flight need not necessarily increase the resources available domestically in the country from which the

capital outflow occurred. In practice several problems exist with the availability of data as well as methodological problems. Capital flight as measured by this technique is sensitive to:

- 1) A reliable record of the outstanding stock of external claims
- 2) The level and structure of relevant interest rates. In the absence of information on the currency mix of assets, the market interest rate is calculated assuming that the currency mix of assets is identical to the currency mix of liabilities to private creditors.
- 3) A dependable reporting procedure for compiling investment income receipts.

In Varman-Schneider (1991) the drawbacks on these three points are discussed and a sensitivity analysis carried out for India and the Philippines.²³ The technique is found to be highly sensitive to all three. It is difficult to make up for the gaps in data which lead to these shortcomings. Estimates of the stock of claims are liable to deficiencies in estimation because of the changes in debt stock due to exchange rate valuation of non-dollar denominated debt and debt forgiveness. But discrepancies may also occur between the money, banking statistics and the debt data. It is possible that capital flight is underestimated because of such discrepancies.

It is difficult to obtain the currency composition of assets for an item which itself is elusive in nature. In Varman-Schneider capital flight was estimated with the assumption that the currency composition of assets was the same as that of liabilities to private creditors and the results compared to estimates based on cross-border interest rate adjusted for currency mix and a six month lag on US LIBOR. The difference in results was dramatic.

In the case of investment income, it is not always the case that the balance of payment figures are compiled from transactions reported by those involved. In the United States for example, interest income receipts are calculated on the basis of figures for various kinds of capital stock and associated interest rates, rather than from the recipients of interest. In Mexico, balance of payment compilers include allowance for imputed interest on foreign assets in investment income when no income is remitted resulting in capital flight being underestimated.

Also when outflows of capital do not generate financial returns, such as investment in real estate abroad, the outflow is classified as capital flight. Practices also vary in India, Chile and Venezuela. In India, investment income recording practices cover only that due to the government and the Reserve Bank of India. In Chile they mainly cover those of the Central Bank and in Venezuela those of the Central Bank, public enterprises and the government. In none of

these is there a scope for recording investment income of the external assets of the private sector.

Capital flight estimated by this method is subject to large measurement errors. Claessens and Naude (1993) discuss the link between the broad measure of capital flight and capital flight measured as a sub-set of claims. Although both the measures differ conceptually, they use some of the same measures and are thus linked through the balance of payments accounting identity. Under the broad measure, capital flight is equal to the sum of change in debt, net foreign direct investment, current account surplus and the change in reserves. By the balance of payments identity this equals the negative of private capital flows (short- and long-term), errors and omissions, and the difference between the World Bank stock of debt and the stock cumulated from the balance of payment statistics.

The last four items were used by Dooley (1986) to calculate the total (reported and unreported) assets held abroad. The annual changes in the total assets held abroad are the simple annual capital flight estimates in the broad measure.

Although Dooley treats only those claims on which investment income is not reported as capital flight, the trend in the broad measure of capital flight (shown in the graph as World Bank residual) and annual changes in the Dooley measure are similar. It is for this reason that this approach was not used for this study as the estimates of flows capture the same information.

2.8: MEASURING CAPITAL FLIGHT AS AN ILLEGAL TRANSACTION

Illegal foreign exchange transactions due to systematic underinvoicing or overinvoicing of imports can be detected through the use of partner country trade statistics as introduced by Zuckerman (1920). This technique was further used by Morgenstern (1959), Bhagwati (1964), Bhagwati, Krueger, Wibulswadia (1974), Gulati (1987), Gemaelich (1989) and Claessens and Naude (1992) who estimated the series for 126 countries. The measurement is based on the assumption that domestic traders falsify trade documents when incentives exist to keep capital abroad.

The estimation procedure can be summarized in the following two equations:

$$\text{Export Misinvoicing} = (X_i / \text{CIF factor}) - X_c$$

$$\text{Import Misinvoicing} = (M_c / \text{CIF factor}) - M_i$$

Where,

X_i are imports from that country as reported by the industrialized countries cif.

X_c are exports as reported by the country fob to the industrialized countries

M_c is imports as reported by the country with the industrialized countries as trade partner. CIF factor is calculated from World Bank data, it is the extra amount that is given by the trader.

Mi is exports to that country as reported by the industrialized countries.
(cif is the cost of insurance and freight, fob is free on board, i.e. without transaction costs.)

A positive sign signifies capital flight and a negative sign, capital repatriation. Since both underinvoicing of exports and overinvoicing of imports contribute to capital flight, the two are added for the net effect of misinvoicing. There is no reliable method to attribute this discrepancy to current or capital account transactions. It does not consist solely of capital flight. Moreover, as Gulati (1987) argues, the systematic outflow under this item is primarily attributable to tariff and quota-evasions by importers. Indeed the factors underlying this discrepancy can be very complex and could include illegal practices such as smuggling.

Thus the estimate of illegal export of private capital includes that which is due to the evasion of tariffs and quotas. It may also include capital outflows due to tax evasion and criminal activities. It is impossible to distinguish these components from the estimated series. The phenomenon of capital flight has many dimensions that are not captured by such estimated series. It cannot only be regarded as the transfer of foreign exchange to thwart domestic regulations. Conceptually, it is useful to think of capital flight through misinvoicing as additional to those transacted through other channels.

2.9: BRIEF DESCRIPTION OF THE METHODS

In the literature there is no straight forward measurement of capital flight (CF) and a number of CF measurement are available in the literature. Following Classens & Naude (1993) five different measures of CF can be distinguished. 1) The Residual Method 2) The Dooly Method 3) The Hot Money Method 4) The Trade Misinvoicing Method 5) The Asset Method.

Let us consider a brief description of these methods.

1) The Residual Method:

This is the difference or the residual between the sources of funds and the use of funds. Sources of capital inflow include net increase in external debt and net outflow of foreign investment, i.e. all net official inflows. The use of fund includes current account deficit and addition to foreign reserves. Thus, when the resources of funds exceed the use of funds, there is outward CF and inward CF for vice-versa.

Therefore, in terms of BOP items CF in residual method (CF_R) is

$$CF_R = \Delta ED + FI - CAD - \Delta FR.$$

ΔED is the change in external debt, FI is the foreign investment, CAD is the current account deficit and ΔFR is the change in foreign reserve position.

Form the BOP identity CF is the sum of identified private capital outflow (which includes short-term capital other sector, portfolio investment, change in deposit on banks foreign asset), the net errors and omission and the difference between reported net official capital and the change in the external debt according to the World Bank data.

2) The Dooly Method:

In this method the stock of privately held foreign asset is measured which do not generate income to the domestic country. According to this version, CF is all capital outflow based on the desire to place wealth beyond the control by the domestic authority. It considers some modification with the Residual method.

First, errors and omission (EO) are taken into account to measure total outflow of capital.

Second, the difference between the World Bank data on the change in the stock of external debt and external borrowing as reported in the BOP Statistics (WBIMF). If the first is larger than the second the difference is assumed to be a part of CF.

Third, the stock of external asset (ES) is the deflated interest earning (Intear) by the representative market interest rate (the US interest rate).

Finally, the difference between the total capital outflow and the change in the stock of external asset is defined as CF.

Thus, $CF_D = TKO - \Delta ES$

Where, $ES = \text{Intear} / r_{US}$.

$TKO = FB + FI - CAD - \Delta FR - EO - \Delta WBIMF$.

3. Hot Money Method: In this measure of CF the private short-term capital outflow and the net errors and omission (NEO) from the BOP are added up. Same as Dooly Method this method also considers that due to illegal nature of capital movement CF goes unrecorded. There are three variants of CF in the Hot Money Method available in the literature.

i) $CF_{H1} = -(OSCOS + NEO)$

ii) $CF_{H2} = -(OLCOS + NEO)$

iii) $CF_{H3} = -(OLCOSOA + OSCOSOA + NEO)$

Where: OSCOS = other short term capital, other sector

OLCOS = other long term capital, other sector
OSCOSOA = other short term capital, other sector, other asset
OLCOSOA = other long term capital, other sector, other asset

4. Trade Misinvoicing Method:

CF can also occur through export underinvoicing and import overinvoicing. Comparing the export- import data furnished by the reference country's trading partner with the official data of the reporting country can identify trade misinvoicing. The discrepancy between official export of the reporting country to the World and World's import from the reporting country can be defined as export misinvoicing. Similarly the import misinvoicing is also identified by cross checking of the reference country and the rest of the World's export – import data. Traditionally all export data are in f.o.b. terms (excluding the cost of shipping & insurance) and all import data are in c.i.f. (Including the cost of shipping & insurance). Therefore the export and import data are to be adjusted by c.i.f. /f.o.b. factor, (say, θ). In this way export and import can be compared on a consistent f.o.b. basis.

Thus, Export misinvoicing = $(X_W / \theta) - X_C$

Import misinvoicing = $(M_C / \theta) - M_W$

Both the misinvoicing adds to CF. So, by adding these two we can get the net effect of trade misinvoicing on CF.

5. Asset Method:

Authors like Hermes & Lensink (1992), Collier (2001) considered total stock of assets of non-bank residents held at foreign banks as a measure of CF. But this can not capture most of the asset held in foreign country as people may hold their asset other than bank account, like foreign equity holding. Till 1994, data on bank asset was provided by IMF, but for recent time this method cannot be applied for the deficiency of information.

2.10: CALCULATION OF CAPITAL FLIGHT:

Calculation of CF from a country essentially uses the official BOP data. In our present analysis calculation is done according to the Residual Measurement of CF. A schematic BOP is shown in the table below.

TABLE 2.3: BALANCE OF PAYMENTS (IMF Balance of Payments Yearbook)

- A. CURRENT ACCOUNT: includes—
 - 1. Travel : Credit
 - 2. Reinvested Earning on Direct Investment Abroad.
 - 3. Reinvested Earnings on Direct Investment Domestically
 - 4. Other Investment Income: Credit.
- B. NET EQUITY FLOWS: of which,
 - 5. Net Foreign Direct Investment
 - 6. Portfolio Investment: Corporate Equity
- C. OTHER SHORT-TERM CAPITAL OF OTHER SECTOR : net of which
 - 7. Assets
- D. 8. Portfolio Investment, Other Bonds.
- E. 9. Change in Deposit Money, Banks' Foreign Assets
- F. 10. Reserves
- G. 11. Net Errors & Omissions
- H. 12. Other Long Term Capital of Resident Official Sector or
- H' 13. Change in External Debt.

Following the methods of measurement of CF stated above (specially the Residual Method)and the BOP items, the private capital outflow including the outflow of loans is equal to $[-(5) -(6) + (8) + (9) -(12)]$. In order to avoid problems associated with the term Net Errors & Omission another measurement of CF would be $[(8) + (9) - (12)]$, which is more relevant. This considers the total net private capital outflow minus the net flow of loans. From the BPO accounts the Residual Measurement of CF can be calculated directly. The Residual Measure is defined as:

Change in Debt + Net Foreign Investment – (Current Account Deficit + Change in Reserves).

Of the methods surveyed in this study, the broad measure of capital flight is, in practice, the best method to estimate resident capital flows. The hot money measure is part of this measure and can be regarded as the minimum flow of

resident capital. Estimates of capital movements through misinvoicing of trade documents capture some illegal capital flight along with other items. In as far as country specific analysis reveals that they are due to capital flight, they can be regarded as additional to any measure of capital flight. None of the procedures in current use can be regarded as complete estimates of capital flight without further analysis.

The usefulness of the methodology lies in the estimation of resident capital flows which form the basis for research on delineating normal flows from capital flows with the use of country specific information and statistical procedures.

It is suggested here that it is more meaningful to carry out research with flows rather than stocks. The previous discussion highlights the difficulty in observing flows to conclude whether they are two-way flows or event driven without country-specific analysis. It is therefore, not desirable to convert these flows into a stock. Claessens and Naude (1992) and Collier (1999) convert flows into stocks without taking the components of these flows or the type of capital flight taking place into account. The derivation of stocks from the flow data is problematic. The cumulating procedure is carried out by applying the US Treasury Bill rate to the flow data, assuming that all flight capital is in US dollars. The currency composition of flight capital is important if accumulation is to be carried out. (Moreover, there is not much to be gained by this for the regression analysis. Theoretically this is correct, but the very nature of flight capital makes it difficult to apply conventional portfolio theory to explain the phenomenon). For instance Ugandan flight capital usually finds its way to South Africa, therefore the Treasury bill rate in South Africa is relevant. If the assets are in different currencies, then applying the US TB rate across countries and composition of assets makes the resultant number flawed. It would be simpler, to stick to flow data. More information can be gleaned while working with flows. The consequence of each type of transaction will be different for the country in question.