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Measuring Capital Flight

A Case Study of Mexico

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and
Sweder van Wijnbergen

The wrong conceptual approach can distort estimates of capital flight. The debt-stock-based estimates widely used in discussions of Mexico's debt crisis largely understated capital flight in the early 1980s, but overstated it in the mid-1980s. Other estimates significantly understate the foreign asset accumulation in the second half of the 1980s by not including interest earnings.

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This paper — a product of the Country Operations 1 Division, Country Department II, Latin America and the Caribbean — is part of a larger effort in the department to understand the macroeconomic effects of capital flows. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Hedwig Abbey, room D8-099, extension 80512 (March 1993, 52 pages).

Eggerstedt, Hall, and van Wijnbergen show how the various methods commonly used to measure capital flight produce vastly different estimates (with a 100 percent difference between the lowest and the highest, in Mexico's case). They emphasize the importance of the conceptual approach to its measurement.

First, they did not try to separate "normal" capital flows from capital flight. A capital shift outward because of expected taxation is as much a response to anticipated developments in rate of return as is a shift out in response to lower interest rates at home.

Nor is it satisfactory to directly measure capital flight by taking short-term asset changes and the balance of errors and omissions from the balance of payments. Neither is necessarily related to the unreported private accumulation of foreign assets.

They chose the residual approach, which assumes that capital inflows in the form of increases in external indebtedness and foreign direct investment should finance either the current account or reserve accumulation; any shortfall in reported use can be attributed to capital flight.

Implementing the residual approach requires careful data selection and several adjustments.

The authors contend that:

- Introducing debt stock data into the analysis — instead of the changes in debt recorded directly in the balance of payments — requires many difficult adjustments and should be avoided.

- Foreign asset changes of public corporations must be subtracted.

- Rather than eliminate interest received on foreign assets from the current account, as some have done, earnings on private assets held abroad should be considered part of the "flight capital" that might have been repatriated, given different incentives and macroeconomic conditions.

- The effect on capital flight of the faking of trade invoices should be assessed, since import overinvoicing and export underinvoicing can be used to channel capital abroad.

They demonstrate the empirical importance of these choices with a new set of capital flight estimates for Mexico, based on the recommendations they present. They contrast the results of this approach with those of other approaches, to demonstrate the effect of conceptual choices.

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Measuring Capital Flight: a Case Study of Mexico

by

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1 Introduction

Capital flight, loosely defined as unreported private accumulation of foreign assets, is by its very definition difficult to measure. Yet a reasonably accurate estimate of its magnitude is important for a proper diagnosis of and prescription for many macroeconomic ills. Discussions about the extent of capital flight have been particularly important in the debate about debt relief. A $100 USb debt, like Mexico's in 1989, is difficult to present as a national solvency problem when largely offset by private assets held abroad. Large volumes of capital flight are taken as evidence for excessive taxation, economic mismanagement and lack of confidence in announced policies, casting doubt over debt relief as an appropriate response to debt service problems. Tackling the underlying problems first should in such circumstances arguably be made a precondition for any debt relief.

In spite of its importance, measurement of flight capital has remained a matter of dispute. Table 1 below demonstrates the effect of using one method versus another: it takes the case of Mexico and presents the results from applying various approaches reported in the literature to a common data set and time period. There is almost a 100% difference between the highest and the lowest estimate of capital flight over the period 1970-1985.

Some differences can be traced to differences in definition and can thus only be settled by precise reference to the questions asked. Others reflect simple oversights, such as the often made mistake of ignoring the impact of cross-currency exchange rate changes on the dollar value of debt stocks. Finally, there are unsettled issues, such as how to treat interest income on assets held abroad but not reported in the current account.

ALTERNATE CAPITAL FLIGHT ESTIMATES
(US$ billions)

Author	Original Time Period	Original Estimate	Duplication	Difference	Estimate 1970-85
Cuddington	1974-82	32.6	29.6	3.0	39.3
WDR85 I	1979-82	26.5	20.6	5.9	48.5
WDR85 II 1/	1979-82		21.5	n/a	48.6
Zedillo	1970-85	28.6	30.5	1.9	30.5
Morgan I	1976-85	53.0	46.4	6.6	45.7
Morgan II 2/	1976-85		36.2	n/a	37.6
Alvarez/Guzman	1981-87	22.0	24.2	-2.2	30.3
Gurria/Fadl	1970-90	19.7	17.6	2.1	26.5

1/ The second estimate adjusts for depreciation of dollar denominated debt.
2/ The second estimate uses debt flow data instead of change in stock data to identify how much of capital flight is attributed to debt data problems.

In this paper we set ourselves a modest aim, although one that turned out to be remarkably laborious to achieve. We will use the various methods to demonstrate some common pitfalls in quantifying capital flight. How much of the difference in captal flight estimates in one well studied case, Mexico in the 1980s, can be traced to simple errors, be they of data definition or conceptual approach, and how much to differences in economic definition? Which issues are important in the definition of capital flight, and which can actually be settled? Can one rely on mechanical approaches, or is detailed country knowledge required to avoid major mistakes?

In the next section we survey the most important data and conceptual disputes underlying the differences and, where possible, argue on theoretical ground which way they should be settled. Section 3 then derives a set of estimates based on the preferred approach that comes out of that discussion. Section 4 uses this approach as a standard of comparison for the various alternative approaches to assess the empirical importance of the various

disputes; we highlight the four most important sources of discrepancy and demonstrate their quantitative importance. Section 5 concludes.

2. Measuring Capital Flight.

Disputes on measurement can be sorted into three groups; the first one concerns the approach to measurement (directly or residual based); the second issue concerns scope of definition; and the third concerns implementation of any particular definition chosen. We discuss each group in turn.

2.1 Measuring Capital Flight: the Direct Approach.

When analyzing the reactions of private investors to macroeconomic instabilities or other policy-induced investment risks it seems straightforward to look directly at the data on foreign asset changes of domestic residents as recorded in the balance of payments. Since capital flight tends to be associated with rapid response, a case is often made to exclude long term investments. Adherents of this approach take all changes in short-term foreign assets, often called 'hot money', and interpret them as predominantly 'speculative', indicating capital flight.

One serious problem with this approach is that unrecorded outflows are not captured in this way. Another problem with using short-term asset changes as a proxy for capital flight is that long-term investments cannot be clearly distinguished from short term investments. Long-term bonds issued abroad can be close substitutes to short-term investment, because they can be purchased without significant loss of liquidity; there is after all a secondary market

in most long term instruments. It is also not clear why investment in equity and real estate should per definition be kept out of the definition of capital flight.

For the reasons mentioned above the raw data on short-term capital movements are not really suitable for an assessment of capital flight. Several authors, however, used these numbers anyhow, but made adjustments to correct for the problems touched upon. The most important adjustment they undertook was to include 'errors & omissions' in an attempt to capture unrecorded capital flows.

The errors and omissions item in the balance of payments statistics accounts for the difference between credit and debit entries of current and capital accounts. A large negative balance has been interpreted as unrecorded capital outflows. In fact, when general conditions in many developing countries were likely to trigger capital flight (debt crisis, overvaluation and subsequent massive devaluations) the value of the errors and omissions often increased substantially.

But the errors and omissions item is not identical to unrecorded capital flows. It includes true measurement and recording errors, unreported imports (smuggling) and lagged registration. These entries are unrelated to capital flight and could well change the sign and magnitude of the errors and omissions.

Unrecorded imports are debited to net errors and omissions, undeclared exports credited. Foreign exchange that has been used to import goods undeclared lack a counter-entry in the current account and thus shows up in the errors and omissions. Foreign exchange earned through illegal exports may

escape balance of payments accounting entirely, if the arnings remain undeclared in the black market. If they are recorded, however, they are credited to errors and omissions.

These problems of interpreting 'errors & omissions' do not allow an inclusion into a capital flight estimate without adjustment:, unless one decides to accept the resulting distortions (see for example Cuddington 1986). In a recent survey Sinn (1990) has tried to eliminate distortions by taking the largest positive stock estimate for accumulated 'errors & omissions' in the period analyzed (corresponds to a cumulative capital inflow) and adding it to each stock estimate. The idea is to neutralize the effect of reducing capital flight in cases of a positive balance in errors & omissions, since positive balances would be contrary to the expected trend and thus unrelated to capital flight and "random in nature".

The problem with Sinn's adjustment is that it is not sufficient in cases where smuggling accounts for most of the movements in the errors & omissions item. Since smuggling may affect the errors and omissions data in both ways, carrying out a 'one sided' adjustment (focusing on the effect of credit entries) introduces a bias. The effects of smuggling itself on capital flight can only be analyzed in the context of the use of trade data.

The method that we are proposing in the next section corrects the current account by using trade data of partner countries. This approach allows not only to incorporate net trade misinvoicing into the capital flight measure, but also to eliminate the distorting effects of smuggling, at least to the extent that smuggled goods were recorded as imports/exports in the partner countries. But overall, the conclusion that attempts to split this

balance of payments item into subcomponents and make adjustments are likely to fail is hard to escape.

2.2 Measuring Capital Flight: the Indirect Approach.

Given the problems with using short-term changes in foreign assets and the errors & omissions item, the only alternative way of quantifying capital flight is to treat it as a residual of four balance of payments components: Change in foreign debt, foreign direct investment, change in foreign reserves and the current account balance. The basic assumption is that capital inflows in the form of increases in indebtedness and foreign direct investment finance either the current account deficit or official reserve accumulation; any shortfall is indicative of private foreign asset accumulation, which in this approach is associated with capital flight. This approach has been used by most authors. Variations of this method are either related to the use of different sources of data for debt and direct investment or to various further adjustments to the 'basic residual'.

In practice, matters are even more complicated. The unadjusted residual, when it is based on balance of payment data only, actually measures all reported and non-reported changes in assets held abroad minus changes in official reserves. However, there may be public entities like state-owned enterprises which hold foreign assets. Since these entities are under public control, their net foreign asset accumulation should be subtracted from the residual just like changes in official reserves are. In the case of Mexico, the most important two examples are net foreign assets of PEMEX, the oil

company, and the foreign assets of the commercial banks after their nationalization in 1982.

2.3 Scope of the concept of capital flight

Capital flight as it is being discussed here does not necessarily involve illegal transactions. It is seen as a result of private portfolio decisions, reacting to actual or anticipated changes in macroeconomic or general business conditions in a particular country. Some have treated capital flight as a phenomenon separate from "normal" capital flows, with "normal" defined in different ways.

These authors tried to distinguish capital flight from 'ordinary' portfolio diversification and business activities of domestic residents. There are two alternatives. One way would be to make further adjustments to the residual obtained from the balance of payments in order to allow for "normal" business activities, which would have to be defined (e.g. portfolio investment, working capital of firms held in foreign currency, trade credits). This idea has been mentioned by most of the authors, although only few were able to tackle this issue in their estimations. Or, alternatively, one could apply a more general definition of "normal" flows of capital, e. g. as those foreign assets that correspond to recorded interest income. Within this concept, assets that do not generate reported income must originate from circumventing controls and are thus to be considered capital flight as opposed to normal flows. The latter approach has been applied by Dooley (1986) and subsequently by Khan and Ul Haque (1987), Deppler and Williamson (1987).

Dooley estimates changes of the "normal" stock of external claims deriving it from reported investment income and an average market yield. This approach implies some methodological problems. Firstly, interest receipts from abroad are insufficiently reported[1] and could be substantially understated. In the case of Mexico there may also be data problems, since Mexico includes an estimate of interest earned but not remitted, which of course invalidates using the Dooley approach with these data. Secondly, it is problematic to determine an average market yield. It would depend on the kind of assets acquired abroad, their maturity and currency composition. These determinants vary from year to year. Furthermore, it appears from this concept that non-interest bearing assets would automatically fall under the category of "abnormal" flows, hence capital flight.

Equally disappointing were attempts to isolate capital flight from "normal" flows by making further adjustments to the basic residual. Elements of the normal/abnormal distinction are included in Morgan (1986) and Gurria/Fadl (1991) (taking out the banks' assets even in the period before

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1/ International Monetary Fund, Report on the World Current Account Discrepancy, Washington 1987, pp. 45 ff. The world current account discrepancy can to a considerable extent be explained by international discrepancies in reported portfolio investment income data. Reported income debits often exceed corresponding credits by large amounts (e.g. $ -32 billion in 1983, total current account discrepancy in that year: $ -75.1 billion). Interest earnings by foreign residents are apparently more accurately reported than foreign interest receipts by residents. The capital account data confirm this observation by showing a cumulative net capital inflow for the world total, indicating that the countries receiving capital were in a better position to measure the flows than the countries where the creditors resided and were thus better able to record the related investment income flows. The Fund study locates the main source of the discrepancy in insufficiently recorded investment income and capital outflows in developing countries. The Fund study also shows that adjustments can be made by using cross-border liabilities and assets of banks and employ the relevant market interest rates. However, Dooley does not use this information for his calculations, interest receipts and cumulated stocks of external claims are obtained from the balance of payments.

their nationalization) as well as in Cuddington (1986) (excluding long-term portfolio investment). Most authors mention that one would have to subtract in some way trade finance, working capital and even assets held for reasons of portfolio diversification. Only Gasser and Remolona (1987) have tried to roughly quantify these components. However, their approach is too arbitrary, assigning 50 per cent of value increases of exports to trade finance and 50 per cent of export related wealth gains[2] to portfolio diversification.

Varman (1989) has attempted to adjust the residual obtained from the balance of payments data by using a model designed to interprete the resulting time series. Behavioral equations are used to estimate 'normal' balances for transaction purposes[3] and 'capital flight' as motivated by certain events[4]. Consequently, capital flight is explained as a residual by a particular event structure that motivated it. The event structure takes the form of a prior setup of dummy variables. This statistical approach, however, is unlikely to produce precise results. Firstly, it is not convincing that transaction

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2/ This wealth term is computed by multiplying the increase in export prices by last years quantity of exports. These trade financing and portfolio diversifying adjustments are made only if they do not change the sign of capital flows.

3/ Varman's study does not contain an applied methodology to estimate 'normal' portfolio investment. The two case studies presented, India and Philippines, did not warrant such a methodology, since capital controls did not permit this type of transaction. The author proposes to use a portfolio adjustment model that defines the optimal allocation of domestic household's wealth among domestic financial assets, domestic inflation hedges such as land, and foreign financial assets. Such a model would have to be country specific.

4/ The estimation technique is based on the factors that motivate gross capital outflows. The equation is specified as:

$$KO = f(x+m, d_n), \quad f_1 > 0, \ f_n > 0,$$

where KO is the calculated measure of gross capital outflows, (x+m) is the volume of external trade transactions, and d is the dummy variable introduced to capture the different sources of political and economic uncertainty. According to the number of events defined (dn), the estimation will yield n results for the size of non-normal capital outflows.

balances should be closely linked to the trade volume at any given point in time. Secondly, the events that are represented by dummies are assumed to be known a priori, so that no conclusions can be drawn as to what other effects could have caused capital flight.

Separating capital flight from 'normal' portfolio diversification and trade transactions is fraught with difficulties. Especially in countries that have close economic relationships with neighboring countries, such a distinction makes little sense. How would one deal with migration, tourism, workers remittances, intra-firm trade etc.? Thus corrections for "normal" capital fows seem practically impossible. Moreover, they would also be definitionally unclear. A shift out in response to anticipated taxation is just as much a response to anticipated rate of return developments as a shift out in response to lower interest rates at home.

In the face of such difficulties, we have in the end settled for capital flight as a broad concept that covers private capital flows of any kind, as long as they constitute a build-up of assets by residents in a foreign country.

2.4 Debt flows versus differences in measured debt stocks

Erbe (1985) and the World Development Report 1985 (WDR85) observed significant discrepancies between the changes in debt stock as reported in the World Bank's debt statistics (World Debt Tables) and the new debt actually contracted according to the balance of payments statistics. To the extent that changes in stock were higher than flows as shown in the balance of payments, it was suspected that balancing transactions were underestimated and

the difference revealed acquisitions of foreign assets by the private sector. The estimations of Erbe and WDR85 therefore include these differences. Their measure of capital flight is generally higher than those that are derived relying on debt flow data.

There are serious problems with mixing debt stock and balance of payments data, which are flow data. The dollar value of debt stock is affected by exchange rate changes, and by the combined effects of shifts in the currency composition of the debt stock and exchange rate changes. Adjustments would have to be made to isolate real stock changes from these effects.

It is possible to make adjustments for changes in currency composition and cross currency exchange rate effects, but other problems are less easy to overcome. Changes in debt reporting and the data coverage over time affect the quality and usefulness of debt stock data for analyzing capital flight problems. Debt restructuring exercises present an obvious set of pitfalls. For example Mexico's various debt arrangements concluded in the eighties affected debt stocks without corresponding flows showing up in the balance of payments, thus introducing additional discrepancies between stock and flow data of debt. The following chapter (section 3.2.1) includes a presentation of the impact of these distortions on the capital flight estimates. Based on these considerations, we in the end came out against using debt stock data.

2.5 Interest Earnings on Flight Capital as Capital Flight

Many countries include in their current account an item for interest retained abroad. It consists of an estimate of interest received on assets

held abroad even for assets where the associated income was not remitted. The current account deficit is in that case smaller than it would be if only interest actually transferred back into the country had been included[5]. The capital flight measure would be smaller if the current account were corrected for non-remitted interest income.

Several authors[6] have argued that interest retained abroad should not be included and that the current account should be corrected accordingly. The rationale for this view is not always well spelled out, but seems to come down to something like the following: interest income that has not returned home and was never intended to be repatriated, cannot flow out either; for that it would have to come back first.

However, these interest receipts represent income earned by residents from foreign sources and are thus per definition a current account item. Keeping them outside the country therefore implies, by the logic of double entry bookkeeping, an instantaneous and offsetting capital outflow. They thus become part of private funds held abroad that could potentially be repatriated, given a change in incentives and macro-economic conditions. Logic thus argues against leaving interest earnings retained abroad out of the current account.

5/ In Mexican balance of payments statistics there is also an offsetting capital account item for these non-remitted interest receipts. However, this has no influence on the basic residual for estimating capital flight in most formulas used.

6/ Zedillo (1987), Alvarez/Guzman (1988), Gurria/Fadl (1991).

2.6 Faked Trade Invoices and Capital Flight.

When invoices for imports or exports are being faked, or imports are carried out avoiding registration, balance of payments data do not fully reflect the actual flows of goods, services and capital. If smuggling conceals a larger current account deficit, capital flight is actually lower than the value obtained as a residual from balance of payments data. Residents spend more foreign exchange than is apparent.

Also, foreign assets can be acquired by overinvoicing imports and underinvoicing exports. However, trade restrictions create strong incentives to use the practice of trade misinvoicing in the other direction: imports are not overinvoiced to transfer funds abroad, but underinvoiced to lower the burden of customs duties and (value based) quantitative restrictions.

To determine the overall effect on capital flight, the "net misinvoicing position" has to be taken into account. The only way to track down misinvoicing and smuggling[7] is by comparing trade statistics of trading partners. Differences in recording systems, proper identification of origin and destination of goods, valuation methods and different time spans covered can cause serious problems in comparing trade data from different countries. In the case of Mexico these problems are less serious, since the largest

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7/Import-smuggling has the same effect from the viewpoint of capital flows as import-underinvoicing. More goods have entered the country than were actually recorded. The current account has to be adjusted accordingly, requiring a capital inflow as balancing entry. Though export-smuggling has probably also occurred, since some highly subsidized goods may have leaked out across the borders, undeclared imports have most likely been much higher. The correction for net-misinvoicing applied here captures both effects to the extent that trading partners have recorded the respective flows of goods.

portion of trade is carried out with the U.S. and reporting procedures are relatively harmonized.

The incentive to over- or underinvoice depends on the structure of tariffs and subsidies and on the black market premium (cf Arslan and van Wijnbergen (1992) for empirical evidence). Even with a zero premium, there may still be an incentive to over- and underinvoice, because of the trade regime. With a positive premium, the incentive to misinvoice depends crucially on the level of this premium vis-a-vis the relevant tariff or subsidy rate. High tariff protection, for example, would require an even higher black market premium in order to make import-overinvoicing attractive and thus bring about a capital outflow. However, when the difference between official and free exchange rate narrows while the import tariff level does not change, overinvoicing would occur, bringing about an outflow. A capital outflow, adding to overall capital flight, happens when the black market premium (or free exchange rate) is higher than the export subsidy per unit exported. Only under these conditions is it attractive to raise the necessary foreign exchange on the black/free market.

It is obvious that capital flows can go in both directions. Exporters and importers can both profit from misinvoicing in ways that will trigger offsetting flows. However, the foreign exchange premium constitutes an important constraint. It is, in fact, at least partly endogenous: export-overinvoicing and import-underinvoicing increase the demand on the market for free/black foreign exchange. The price mechanism on the free foreign exchange market thus dampens one-way capital flows. Note by the way that the procedure to capture the effects of over- and underinvoicing also captures import- and

export-smuggling, as long as the trade-partner countries record the respective flows of goods.

While misinvoicing can be used as a vehicle of capital flight, other motives for misinvoicing may be as important and the impact on capital flight is therefore likely to be ambiguous.

3 A new estimate of Capital Flight

In this section a method of estimating capital flight will be introduced that attempts to address the issues discussed sofar. Empirical estimates for capital flight from Mexico over the period 1960 to 1990 will be presented and subsequently contrasted with estimates that result from applying methods suggested by other authors. Using the same data base for each method will allow the obvious shortcomings of traditional measures to be pointed out.

The method we propose is based on the residual approach, assuming that capital inflows in the form of increases in external indebtedness and foreign direct investment should finance either the current account deficit or reserve accumulation, and that any measured shortfall reflects capital flight. Thus the starting point would be the following equation:

(1) KF = DEBTFLOW + DFI - CAD - CHRESERVES

where:

DEBTFLOW : net flow of external debt

DFI : new plus reinvested direct foreign investment

CAS : current account deficit

CHRESERVES : change in stock of gross official reserves (incl. gold)

The aim is to measure for each year the assets that private residents accumulate abroad. Based on the discussion in Section 2, we make three adjustments to the residual obtained from (1). Consider them in turn.

3.1 Adjustment for Non-Private Asset Changes

In so far as foreign assets have been accumulated by publicly owned entities, they must be discounted as non-flight capital. Investments by government controlled enterprises and institutions are to be treated as an official 'use of funds' (as in the case of changes in reserves) rather than like investments of residents in other currencies or countries. Changes in these 'public assets' have to be subtracted from the basic residual. This point was recognized by other authors who estimated capital flight in Mexico (Zedillo 1987, Gurria & Fadl 1991). Capital flight would be substantially overestimated, especially in 1979 and 1983, if changes of foreign assets of public entities were not subtracted: by 1.1 billion US$ in 1979, and by 2.8 billion US$ in 1983.

3.2 Adjustment for Trade Misinvoicing

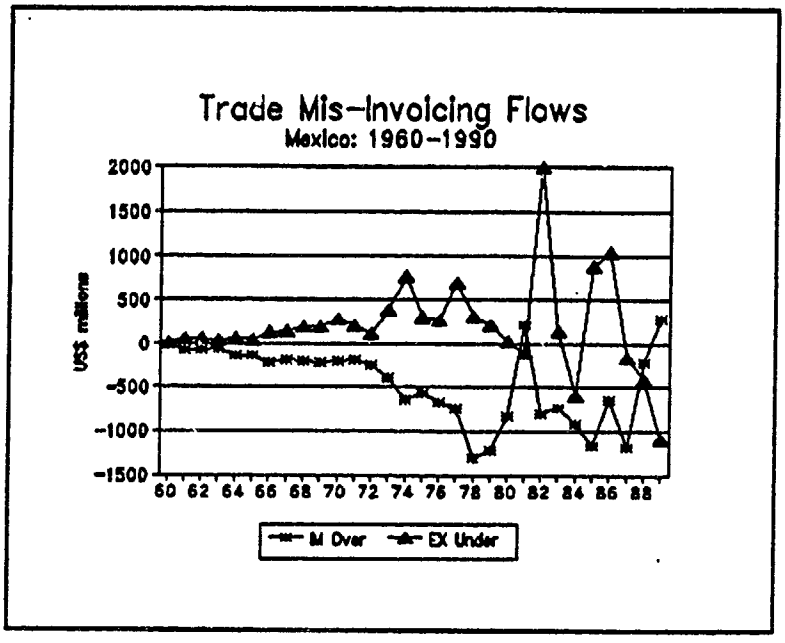
In a country with strong tendencies to capital flight it is likely that misinvoicing will be used as a vehicle for capital movements. However, net-misinvoicing should not be expected to automatically add to capital flight. This is because it is often dominated by other motives, such as circumventing trade restrictions or taking advantage of subsidies. In that case misinvoicing can imply a flow of capital in the opposite direction: imports are not

overinvoiced, to transfer funds abroad, but underinvoiced, to lower the burden of customs duties and (value based) quantitative restrictions. Or exports are overinvoiced rather than underinvoiced because high export values capture advantages like export subsidies and preferred access to subsidized credit. Our results for Mexico show this ambiguity. There is substantial import underinvoicing up to very recently; it is very high even in times of massive capital outflow. Export values were understated in most years, however. Only from 1988 onwards do we observe a switch to export overinvoicing. This switch may well be related to the very high interest rates prevailing at the time in Mexico: exports provided access to relatively cheap, subsidized credits.

During the 1980s there are several years when import underinvoicing was much higher than export overinvoicing, which caused a drain on unofficial sources of foreign exchange. According to the United States - Mexican bilateral trade data[8] reported by the Direction of Trade Statistics, annual import underinvoicing reaches levels of well over US$1 billion in 1980, 82, 83 and 84. On the other hand, export overinvoicing occurs and is particularly important in 1984 and 1987. Since export overinvoicing implies surrendering more foreign exchange than was actually earned on the company level, there must have been incentives to "officialize" foreign exchange from other sources, e.g. from the black market or from assets held abroad.[9]

8/The data presented are based on a comparison of Mexican and U.S. imports and exports. On average, these data represent at least two thirds of Mexican foreign trade over the period considered. It is also likely that misinvoicing is concentrated on a trading partner with whom very close relations exist. Furthermore, world wide trade data were anyhow not available for al countries and all periods. Where available for the entire period, however, figures obtained directly from the respective countries are used.

9/Another reason for export overinvoicing could be substantial export subsidies. In Mexico, this is relevant between 1987 and 1990 when interest rates were high and given export subsidies, export overinvoicing provided



Where high import underinvoicing and low export underinvoicing (or even export overinvoicing) coincide, the result is a considerable capital inflow, which in turn reduces the amount of flight capital estimated. However, the very high negative numbers for net misinvoicing in 1980, 81 and 84 are difficult to interpret and could be overestimated due to problems with the trade data as reported in the Direction of Trade Statistics. A more conservative approach is, to only use US counterpart data, which are presumabvly more reliable and anyhow cover about 70% of trade. The magnitude of misinvoicing proves significantly lower in most years, although it follows a similar pattern over time. A comparison of the two series is presented in Table 4 of the Statistical Annex. The following graph illustrates the measureable mis-invoicing flows between Mexico and the United States, the net of which is used to adjust the capital flight measure.

Other authors have not adjusted their estimations for misinvoicing, presumably because of the data difficulties.

The formula including the two adjustments discussed sofar is as follows:

(2) KF = DEBTFLOW + DFI - CAD - CHRESERVES - CHPUBASSET - TRADEMIS

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access to cheap credit.

where:

CHPUBASSET : change in stock of foreign assets held by public sector

TRADEMIS : net trade misinvoicing

(2) is not yet the final word; one more correction needs to be introduced.

3.3 Including Returns on Private Assets Held Abroad

Several authors chose to subtract interest earned and retained abroad from the residual (Zedillo 1987, Alvarez/Guzman 1987, Gurria/Fadl 1991) to obtain a 'correct' estimate of capital flight. However, since private foreign asset accumulation is the focus of attention, interest retained abroad should not only not be subtracted from the residual, on the contrary, the compounded interest should be added. More in general, to the extent that the measure of accumulated past flight capital exceeds measured deposits held abroad, adjustments are called for. To obtain a consistent time series of capital outflows, assets have to be adjusted for the interest income of previous years and the actual earnings have to be based on the adjusted stock.

Using the residual calculation from (2), we obtained estimates of new annual outflows of capital. In order to calculate the total stock of external claims held by Mexican's, however, it is necessary to accumulate these flows and estimate the interest earned on these assets. Interest earned on the stock of recorded deposits is already accounted for in the current account with the item "interest retained abroad". All that is left is to include interest earned on the excess of estimated cumulative flight capital over recorded deposits held abroad. We calculate interest earnings using the

methodology employed by Mexican authorities to measure interest retained abroad in the balance of payments statistics: We assume that two-thirds of the stock of deposits[10] is held in the US, and one third off-shore. Thus interest is calculated using the following weighted interest rate:

$$(3) \quad r = .67(\text{US CD rate}) + .33 (\text{Libor 3 month})$$

Since interest earned on the stock of deposits is already accounted in the balance of payments statistics, we need only to calculate interest on the difference between these deposits and the stock of other external claims. This is done in the following way, with the results shown in Table 3 of the Statistical Annex:

$$(4) \quad KFS_t = KF_t + r(KFS_{t-1} - DEP_{t-1}) + KFS_{t-1}$$

where:

KFS : the stock of "capital flight"

KF : the annual capital outflow:

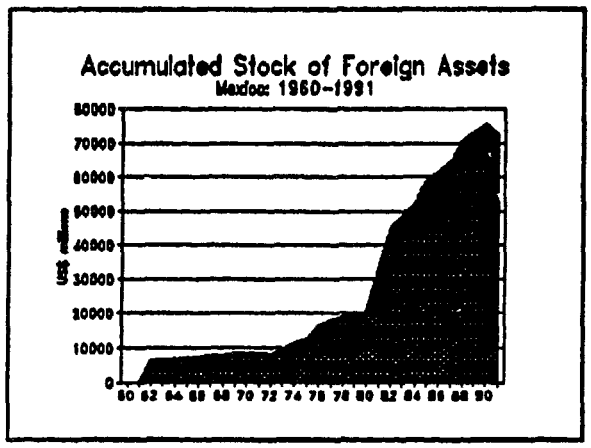
(DEBTFLOW + DFI - CAD - CHRESERVES - CHPUBASSETS)

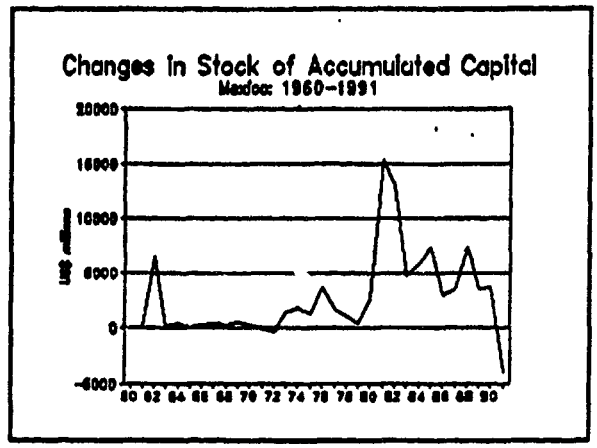
DEP : the stock of deposits held by Mexican non-banks

10/ Prior to 1981, deposits are defined as the short-term liabilities of US banks to Mexican non-banks: for these years only the US CD rate is employed. Beginning in 1981, deposits are equal to the cross-border bank deposits of nonbanks (series 7xrd) as reported in the International Financial Statistics, published by the IMF. Between 1981 and 1990, the weighted interest rate is used.

3.4 Capital flight from Mexico 1960-1990

The following figures show the size and variation of the accumulated stocks calculated using (2-4).





The diagrams show that, with the exception of a blip in 1962 (which looks suspiciously like an artifact), capital flight only became a problem in the early seventies. This is also the beginning of the populist policies associated with the Echevaria government, coming after decades of fiscal conservatism. The balance of payments crisis of 1976 is clearly associated with a peak in capital flight, while the subsequent oil discoveries seem to have led to some restoration of confidence and a slowing down of capital flight.

1980 shows the beginning of trouble: capital flight starts picking up as the strong fiscal expansion and current account deficits of the period sow doubts about sustainability of the economic policies and the exchange rate. In 1981 and 1982 capital flight explodes in a run on the currency that ultimately led to Mexico's suspension of debt service in August 1982 and the end of the fixed exchange rate against the dollar. While the extremes of 1981 and 1982

were not repeated, capital flight remained high right up until the implementation of the Brady package in 1990.

The 1989/90 debt reduction deal was clearly a watershed agreement: 1991 sees, for the first time, a massive return of flight capital. Higher frequency data would almost certainly have shown that this started late 1990 rather than in 1991; the Brady deal was implemented in March 1990, and fears about Mexico's ability to raise the funds necessary for the collateral accounts that were part of that agreement receded into the background towards the second half of that year.

4. Alternative Approaches

We now use the estimates just derived as a benchmark to assess the various malternatives against.[11] The comparison is grouped around the main set of issues identified in Section 2: (i) use of debt flows or stocks; (ii) Inclusion of returns on assets held abroad; (iii) Trade-misinvoicing; (iv) direct approaches based on Errors & Omissions.

4.1 Distortions Resulting from the Use of Debt Stock Data

The largest discrepancies between the estimates presented in Section 3 and the estimates generated by using alternative methods stem from the use of debt stock data instead of balance of payments data about debt flows. This starts with the year 1962 where only the residual methods that are based on

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11/ Data availability limits the comparison period to 1960-1990; 1991 could not be included for all series.

debt flow data measure substantial capital flight. The 1962 balance of payments statistics show a sudden increase in new debt contracts during the early months of the year. Since these inflows are not matched by a current account deficit, change in reserves or change in public assets, we assume that the funds not used for these official purposes (about $6.4 billion) have turned into private asset changes abroad[12].

During the following decade up to 1972, only minor capital in- and outflows occur and, on balance, it can be stated that there was no substantial capital flight. For the years 1973/74 and 1976/77 all measures show an increase in capital flight, without differing too much. The 1973/74 surge is measured lowest at $460 million by Morgan and highest at $3.1 billion by our revised measure. The measures based on debt stock data (Morgan, WDR85) obtain a low average for these two years. The main reason is that the largest debt increase was in 1973, whereas debt flows continued to be high in 1974. For 1976/77 results are again similar within the two groups of measures, debt stock or debt flow based. This time there was a sharp increase in debt stock in 1977 pushing the results of WDR85 and Morgan up to around $10 billion for the two years of 1976 and 77. The debt flow based measures as well as the errors & omissions based estimates show approximately $4.5 billion. Our revised measure yields $5.2 billion.

Capital flight estimates by the World Development Report (WDR 1985) and Morgan Guaranty Trust (Morgan 1986) are both residual approach methods which measure changes in external indebtedness (a "source" of funds) with changes in debt stocks. The measures that are based on changes of debt stock result in a

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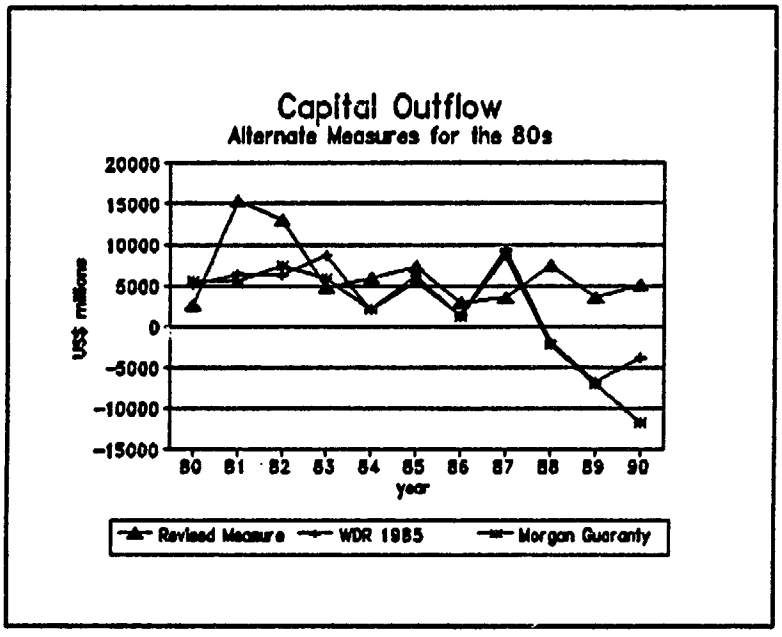
12/ Zedillo (1987) and Gurria/Fadl (1991) also record this number; the measure presented in Section 3 amounts to $ 6.37 billion, a small difference due to an adjustment for trade misinvoicing.

similar level of capital flight for the 1980s on average, but they differ from our revised measure particularly during the 81/82 capital flight "boom" and the end of the decade when private capital starts to flow back.

The weakness of definitions using debt stock rather than debt flow data is clearly illustrated in the following graph. The debt stock based definitions missed the 1981 surge in flight capital, a phenomenon that many analysts suggest triggered the 1982 debt crisis. For 1981/82 these measures estimate around $6 billion outflows per year. All other measures yield numbers of around or significantly above $10 billion for 1981 and above $7 billion for 1982.



In 1989 and 1990 the WDR85 and Morgan estimates report substantial net capital inflows. These numbers are clearly distorted due to debt reduction deals. The $11.7 billion inflow of 1990 as shown by using Morgan's approach is particularly misleading, since it includes the reduction of debt under the Brady plan but not the acquisition of US-Treasury Bonds as collateral by the banking sector. The distortions in the data obtained on the basis of debt stock changes originate to a large extent from the following events:

i) Debt rescheduling schemes contribute to discrepancies in debt data and misleading results in capital flight estimation. Several reschedulings of interest payments on official public debt were negotiated between the Mexican government and the Paris Club (1983, 1986/87 and 1989). The relief granted in interest payment was linked to a capitalization of interest, leading to a higher level of debt. Since no new loans were disbursed, flows were not affected. Thus the increase in indebtedness in the debt stock statistics suggests a greater availability of funds than that which actually existed. Capital flight would be overestimated as a consequence. In 1983, for example, the difference between our estimate and that of the WDR methodology is $7.4 billion. The amount of debt changes in response to reschedulings were $58 million in 1986, $198 million in 1987, and $128 million in 1989[13].

ii) Debt-equity swaps were carried out in order to reduce the debt burden. To the extent that debt was traded at a discount, the debt stock was reduced without a corresponding flow in the capital account: new direct foreign investment will be lower than the reduction in nominal debt to the extent that the buy back implicit in the debt equity swap took place at a discount.

This problem explains discrepancies between the two measures of debt changes of no less than $4 billion in 1988 and $2.5 billion in 1989. Of course the mismeasurement of capital flight would be less, since there are offsetting DFI flows; the mismeasurement would equal the debt reduction just mentioned times the discount implicit in the deal. In Mexico this discount has averaged between 10 and 15 percent (Sanguines (1989), leading to a still

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13/ World Bank, World Debt Tables 1990-91, p. 241

substantial gap of almost a billion dollars over 1988 and 1989. The source of funds would be overestimated, meaning that the estimate of capital flight would be too high by a corresponding amount.

iii) The debt reductions under the Brady Plan have a similar effect, reducing debt stocks without a corresponding entry in the Balance of Payments. Estimates based on debt stock changes therefore suggest a much higher reduction in sources of funds, in fact, a decrease in indebtedness, and thus a much higher capital repatriation (negative 'capital flight'). This is evidenced by the large discrepancy between the basic residual and that of Morgan estimate in 1990, when the Brady deal was completed. For 1990 balance of payments data show an inflow of $11.9 billion, reflecting the new debt contracted under the Brady debt deal. The stock data show a reduction in debt, since new debt is netted out against old debt. The debt stock reduction was much higher (due to the discount) than the new inflow so that stock data show a decrease in debt.

iv) Another obvious problem is due to cross currency exchange rate changes between the different currencies in which Mexico has debt denominated. Such changes have an impact on the changes in debt stock expressed in US dollars without a counterpart entry in the BoP; Stock based measures pick this up as capital flight, clearly an inappropriate conclusion.

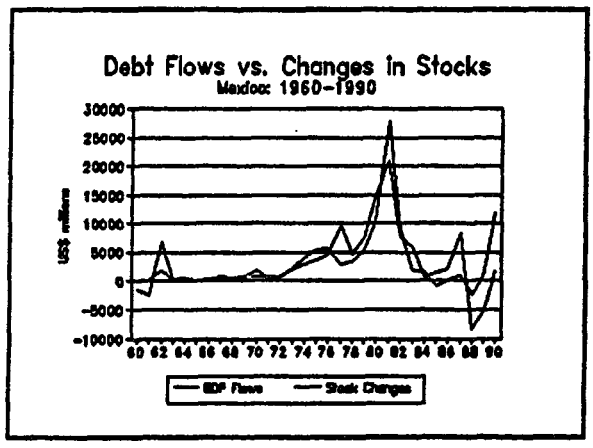
The impact of Cross Currency Effects (CCE) on the capital flight measure can be calculated. Assume that changes occur smoothly over the period. Integration of the resulting exponential then leads to the following formula:

$$CCE = \frac{B'}{(A'+B')} (E(1)B^*(1) - E(0)B^*(0))$$

where B' = ln (E(1)/E(0)) and A' = ln(B*(1)/B*(0)).

A depreciation of the US dollar versus other currencies results in a higher non-dollar denominated debt when expressed in dollars. The inflow of funds and consequently the residual 'capital flight' seems higher. In order to correct for this effect, the cross currency effect has to be subtracted from the capital flight measure.

The dollar depreciation affects the Mexican capital flight estimates particularly in the years 1973 (CCE = $2.5 billion), 1986 (CCE = $1.3 billion), 1987 (CCE = $2.4 billion) and 1990 (CCE = $2 billion). The opposite (appreciation of the US dollar) occurred in 1975 (CCE = -$3.7 billion) and, more gradually, during 1980 to 1984 (annual CCEs of on average around -$400 million). The magnitude of these valuation effects, which should obviously be purged from capital flight estimates, clearly shows that capital flight measures based on unadjusted data of changes in debt stock are likely to be highly inaccurate.



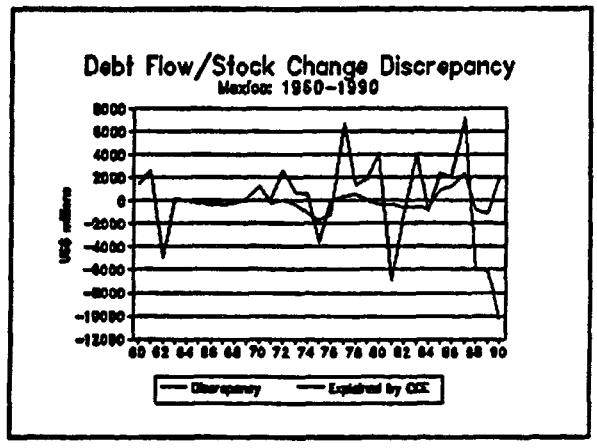
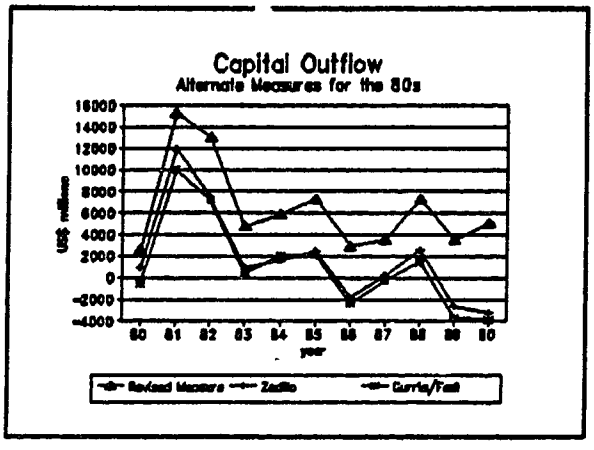


Fig. 5 lists the difference between debt changes recorded in the BoP and changes in debt stocks. The diagram shows that the discrepancies are large in years of debt deals, gyrations in the dollar and large D/E programs, all features that introduce extraneous noise in stock-based estimates of capital flight. For this reason we have opted for flow-based measures instead.

4.2 Consequences of Neglecting Investment Returns.

Ignoring interest retained abroad of course does not have much of an impact if there are not many interest earning assets held abroad to begin with. Since Mexican capital flight only started to take off on a major scale in the late seventies/early eighties, this issue only starts to play from the mid eighties onwards. Most authors take into account at least the interest retained abroad that is accounted for in the Meican BoP statistics. None goes as far as we do in insuring consistency between our own past estimates of capital flight and the implicit assumption on this in estimating interest retained abroad. Most extreme in ignoring the issue are Zedillo and Gurria/Fadl, who not only ignore interest earned on unrecorded stocks held abroad (as estimated by their own capital flight estimates for earlier years), but even leave out the measure that is recorded in the Mexican BoP. As a consequence, our measure shows substantially higher numbers, although a very similar trend over time.



The massive outflow in 1981/82, in particular, leads to significantly increased earnings on the new higher stock of external assets in later years. Therefore our measure is substantially higher throughout the end of the decade.

4.3 Trade Misinvoicing

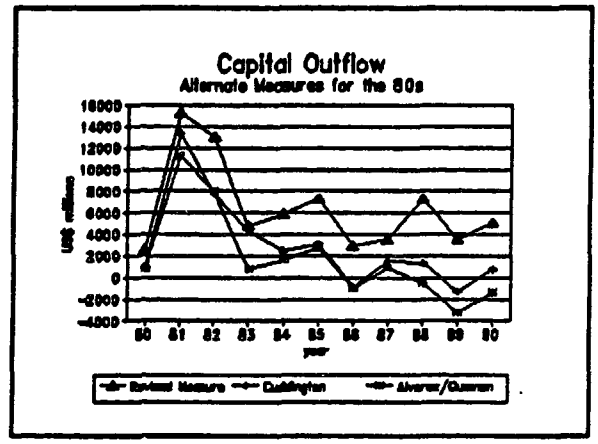
However, the difference between both approaches is somewhat mitigated by the fact, that our revised measure accounts for trade misinvoicing which most of the time tended to imply some capital inflow. The misinvoicing data calculated for Mexico show that, although capital flows induced through trade misinvoicing to a large extent offset each other, they nevertheless can have a significant impact on overall estimates of capital flight (see Table 11 in the Data Annex). During the two decades prior to 1980 there was simultaneous import underinvoicing and export underinvoicing. Unofficial foreign exchange was generated by underdeclaring revenues from exports and, at the same time, it was used to finance imports above the declared values.

Given the presence of import barriers and the moderate black market premiums that existed during that time, these types of misinvoicing would be expected. In the 60s and 70s the largely offsetting capital movements hardly affected the overall capital flows, except in the late 1970s when import-underinvoicing rose to relatively high levels, as one would expect given the high tariffs of the period. For example, for 1981 Zedillo's method produces outflows of $11.9 billion, whereas our revised measure shows $13.5 billion, for 1985 and 1988 Zedillo's numbers would be approximately $2.5 billion, while our measure yields $6.8 and $6.2 billion, respectively. But overall, it

appears that trade misinvoicing was generally not used as a vehicle for capital flight, but rather as a means to exploit existing tax and subsidy structures on trade flows.

4.4 Errors & Omissions Based Estimates

As far as the trend over time is concerned, direct approaches (the measures combining errors & omissions and recorded changes in private foreign assets (Cuddington and Alvarez/Guzman)) yield results similar to those produced by our estimate. The main difference is the magnitude in the later years, a difference that can mostly be traced back to the compounded returns on foreign assets. This difference has to be expected since Cuddington and Alvarez/Guzman focused on 'short-term' capital flows, completely ignoring interest retained abroad on assets accumulated in the past.



There are additional reasons for discrepancies. For 1983, Cuddington substantially overestimates 'new' capital flight, because he does not subtract changes in foreign holdings of public entities (2.8 billion US $ in that year). Moreover, in the years of 1982, 1985 and 1988 the errors & omissions based measures underestimate 'new' captial flight significantly, by about $4 billion each. During those years of relatively high capital outflows changes of external assets have apparently been particularly under-reported, without the errors & omissions item picking this up.

5 Conclusions

We show in this paper how the various methods commonly used to measure capital flight lead to vastly different estimates. This shows the fundamental importance of choosing an appropriate conceptual approach in analyzing the data. First of all, we did not attempt to separate any measure of "normal" capital flows from capital flight. This is not only practically impossible, but also definitionally unclear. A shift out in response to anticipated taxation is just as much a response to anticipated rate of return developments as a shift out in response to lower interest rates at home.

Second, measuring capital flight directly by taking the short-term asset changes and the balance of errors and omissions from the balance of payments is unsatisfactory. Both items are not necessarily related to unreported private accumulation of foreign assets. Therefore the residual approach has been chosen; this approach starts from the observation that capital inflows in the form of increases in external indebtedness and foreign direct investment should finance either the current account or reserve accumulation; any shortfall in reported use can then be attributed to capital flight.

Implementing the residual approach requires careful data selection and several adjustments. Most importantly, the introduction of debt stock data into the analysis, instead of the changes in debt recorded directly in the BoP, requires many difficult adjustments to be made and should in our view therefore be avoided. Secondly, foreign asset changes of public corporations have to be subtracted. Thirdly, rather than eliminating interest received on foreign assets from the current account, as some have done, earnings on private assets held abroad should be considered part of the 'flight capital'

that potentially could have been repatriated, given different incentives and macro-economic conditions. Finally, the effect of the faking of trade invoices on capital flight should be assessed, since import overinvoicing and export underinvoicing can be used to channel capital abroad.

We demonstrate the empirical importance of these various choices by presenting a new set of capital flight numbers for Mexico based on the recommendations just presented. We then contrast the results with those obtained using alternative methods. This exercise clearly demonstrates the significance of the conceptual choices and adjustments suggested in this paper. For example, the debt stock based estimates that were widely used in the discussion of the debt crisis, largely understated capital flight in the early 1980s but overstated it in the mid 1980s. Other estimates significantly understate the degree of foreign asset accumulation during the second half of the 1980s by not including interest earnings.

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Appendix I

The Data Base

Balance of Payments Data. Current and capital account series are taken directly from the Central Bank of Mexico statistical publications and data bases. The current account figures include recent methodological changes to the treatment and measurement of transfers and workers remittances, these changes appear in the data beginning in 1989[14]. External debt flows include public, private, short-term and IMF debt. Thus the change in reserves variable employed measures changes in gross reserves plus valuation changes, the purchase and sale of gold and silver and SDRs. Direct foreign investment measures total DFI, which includes both new investment and reinvested profits.

Asset Data. Flow data for short-term and long-term assets comes from the Central Bank of Mexico's data base. Changes in bank asset data (used only in the duplication of Gurria and Fadl's results) is taken directly from the authors work (Gurria and Fadl, 1991). The stock of public assets is calculated using data from the Central Bank of Mexico's Indicadores Economicos publications. It is defined, according to Mexican authorities, as the sum of liquid external assets, investment in external securities and credit to the external sector of development banks and commercial banks [15] plus the value of lagged exports by PEMEX. The various data series are unavailable prior to 1970, therefore the stock of public assets is assumed constant between 1960 and 1970. Calculated stocks are adjusted for the purchase and subsequent holding of collateral instruments associated with the Morgan Bond exchange in 1986 ($532 mn) and the commercial bank debt deal in 1990 ($7.1 bn).

Trade Mis-Invoicing Data. Several attempts were made to obtain consistent and accurate partner country trade data to measure trade mis-invoicing. Originally, data was extracted from the TARS (Trade Analysis and Reporting System) data base system of the World Bank which accesses data reported to and maintained in the United Nations COMTRADE data base. Comparisons were made using total merchandise exports and total merchandise imports for 1) Mexico and the World, 2) Mexico and it's top 9 trading partners[16]. Some adjustments to the data are necessary however, due to the Maquiladora Industry in Mexico.

14/Estimates of workers remittances were revised upward by approximately $1.5 billion annually, thus increasing net current transfers and reducing the current account deficit.

15/Assets of commercial banks are included after their nationalization in 1982.

16/These partners include the United States, Germany, Japan, Canada, Great Britain, France, Brazil and Italy and accounts for an average of 90 percent of Mexico's total trade.

Mexico's trade figures for merchandise trade exclude both the imports made by the Maquila and the industry's exports. The net value of exports by the Maquila is included as trade in non-factor services and is listed as "in-bond" within exports of non-factor services. This net value is equal to the value added to goods processed by these border industries: it includes domestic raw materials and packaging, salaries, wages and social security payments, spending for utilities, building and machinery rental, and any customs costs. In order to make Mexico's reported exports and imports comparable to those reported by its trading partners, two adjustments must be made. For Mexico's exports to other countries, the "value added" component of maquila exports plus imports by the maquila[17] are added to reported merchandise exports. This series is then compared to what Mexico's trading partners report as imports coming from Mexico. On Mexico's import side, the value of imports going to the maquila industry is added to reported merchandise imports from its trading partners. This figure is compared with merchandise exports destined for Mexico as reported by the country's various trading partners. A cif/fob conversion factor of 5% is assumed constant throughout the period.[18]

Original estimates for import overinvoicing and export underinvoicing lead to the conclusion that problems existed with the data series retrieved from the TARS system. As an alternative, the analysis was repeated using data from the Direction of Trade Statistics (published by the IMF), but this time only trade flows between Mexico and its largest trading partner, the United States, were used. Again, the necessary adjustments were made for the maquiladora industry and the cif/fob conversion. There was some improvement with these results, but certain years still show seemingly irrational trade misinvoicing behavior. By way of comparison, trade flow data between the United States and Mexico were obtained directly from the respective countries, the US Department of Commerce and the Banco de Mexico. These data, however, were only available from 1978 to 1990 for the United States and from 1980 to 1989 for Mexico. It is during this time period, however, that the more important data problems occurred. As the table in section 3.5 shows, the direction is more or less identical, but the magnitude of the misinvoincing is significantly smaller with these data. For this reason, we have chosen to combine the two data series, using the Direction of trade statistics data for 1960 thru 1979 and the original reporting data for 1980 onwards. The data taken from the original reporting sources does not need any cif/fob adjustment given that both the United States Commerce Department and the Central Bank of Mexico reported imports and exports fob. Adjustments are still made, however, for the maquilladora industry.

17/Gross exports by the maquila is represented by the value of the imports made by the border industries plus the value added or net exports. It should be noted that the actual calculation of "value added" is merely the export income earned minus the value of imports used.

18/This figure is obtained from the International Monetary Fund's International Financial Statistics publications. Given that an average of 75% to 80% of Mexico's trade is with the United States and transportation costs should be low, this cif/fob factor may be an overestimate.

APPENDIX II

Alternate Empirical Estimates of Capital Flight

Presented below are the various definitions of capital flight that were used as points of comparision for this paper. Each author's methodology and estimation results are presented with our attempt to duplicate the author's results. This was done mainly to ensure that a proper interpretation of the author's work had been made. The differences between original estimates and the duplications we performed are, overall, non significant and can usually be explained by differences in the data sources used.

1.1 Cuddington

For Cuddington (1986) the objective was to "isolate short-term capital movements that might reasonably be considered capital flight", or capital outflows by agents other than money banks and official institutions. He defines capital flight as "hot money" or "short-term speculative capital outflows". Estimates were made for six Latin countries plus Korea between 1974 and 1982. For each country the errors and omissions item is used plus certain subcategories of recorded short-term capital flows. For the different countries, the decision as to which items to include was based on data and descriptions available in the International Monetary Fund's International Financial Statistics yearbook. For Mexico, flight capital is measured using errors and omissions[19] plus "short term, other sectors, other assets". Capital flight is thus represented as:

$$(1)\quad KF = -(E\&O) + STPRNBASSET$$

where:

E&O = net errors and omissions
STPRNBASSET = short-term non-bank private sector external asset flows

For the above mentioned period, Cuddington estimates that $32.6 billion in flight capital left Mexico. This figure is then compared to the increase in Mexico's external debt over the same period which he places at $82.6 billion. Roughly 40 percent of the increase in Mexico's foreign debt is estimated to have financed capital flight. Using Cuddington's methodology, our data show capital flight during the same period, 1974-82, to be $29.6 billion. One explanation for the discrepancy may be that Mexican balance of payments statistics do not distinguish between bank and non-bank short-term assets, thus the formula we used actually adds total short-term assets to errors and omissions. In an attempt to determine if this indeed accounts for the difference, we created another estimate using Cuddington's methodology but

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19/As Cuddington (1986) points out, errors and omissions is net by definition since it contains unrecorded capital inflows as well as outflows.

employed a change in stock measure for short-term non-bank assets, rather than the balance of payments flow data already mentioned. The series is constructed using data found in the US Treasury Bulletin (US Banks' short-term liabilities to Foreign non-banks) through 1978, and thereafter, data on the deposits of Mexican non-banks held by BIS reporting Banks.[20] The series proved incomplete, however, with no data available from either source for 1979-1981. The alternate approach was thus discarded.

1.2 Alvarez and Guzman

Alvarez and Guzman (1987) are perhaps the only authors who focus on the errors and omissions approach but, at the same time, argue along the lines of the balance of payments identity mentioned in chapter 3. Capital flight is measured using the errors and omissions approach with the following adjustments : 1) interest imputed on external assets that remains abroad is subtracted, thus increasing the current account deficit and reducing the measure of flight capital, 2) asset accumulation of the public sector and commercial banks is not considered to be flight capital and is thus subtracted and 3) transactions in gold and silver and valuation gains on official reserves (including SDRs) are netted out of official reserves. The resulting formula:

(2) KF = -(E&O) +CHASSET -INTRET -VALADJ -INCRPUBASSET -INCRBANKASSET

where:

E&O = net errors and omissions
CHASSET = flows of private, public and bank sector external assets
INTRET = interest on external assets retained abroad
VALADJ = purchase/sale of gold + reserve valuation changes + SDRs
INCRPUBASSET = increases in public sector external assets
INCRBANKASSET = increases in bank external assets

From 1981 to 1987, an estimate of US$22 billion is obtained where 1986 and 1987 show capital repatriation, not flight. Using our data and the above mentioned formula, we obtained an estimate of US$28 billion for the identical time period. One reason for the discrepancy may be the definition of public and bank sector assets and the corresponding data series employed.

1.3 World Development Report 1985

With regard to the sources and uses of funds approach, the World Bank (WDR 1985) estimates capital flight in Mexico during the period 1979 to 1982 to be $26.5 billion. It is approximately equal to 50 percent of the country's gross capital inflows during the period. The methodology defines capital

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20/Bank for International Settlements, "International Banking Statistics", various issues.

flight as the "sum of gross capital inflows and the [illegible] deficit, less increases in official foreign reserves"[21], where capital inflows are the sum of net direct foreign investment and the changes in gross public and private debt. It assumes then, that any capital inflow that does not finance the current account deficit or reserve accumulation leaves the country in the form of "flight" capital. To the extent that normal portfolio investment abroad and any trade mis-invoicing exist, they are included in this measure. The resulting formula is as follows:

$$(3)\quad KF = CHEXTDEBT + DFI + CAB - CHRESERVES$$

where :

KF = capital flight
CHEXTDEBT = change in stock of gross external debt [22]
DFI = net direct foreign investment (new and reinvested)
CAB = current account balance (negative is deficit)
CHRESERVES = change in the stock of official international reserves

Our attempt to duplicate these results, using World Debt Tables data for changes in external debt stocks and Mexican balance of payments statistics for the remaining variables, yields an estimated $20.5 billion in flight capital from 1979 to 1982. Differences in data sources is one obvious explanation for the discrepancy. The World Development Report figures place gross capital inflows (net direct foreign investment plus changes in gross foreign debt) during the period at $55.4 billion, our data for the same period measures inflows at $57.8 billion. In addition, it is unclear from the article which measure of "official foreign reserves"[23] was used to calculate changes in reserves. Our reserve data uses the stock of gross reserves including gold to calculate changes.

In order to see the magnitude of the effect of exchange rate changes, we have also calculated the WDR85 measure adjusting for the cross currency effects (as discussed in section 3.2.1). This adjustment is presented in various tables with the heading WDR85 II.

1.4 Morgan Guaranty Trust

Morgan (1986) defines capital flight as "the reported and unreported acquisition of foreign assets by the non-bank private sector and some elements

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21/The World Bank (1985), p. 64.

22/Total external debt includes public and publicly guaranteed (PPG), private non-guaranteed (PNG) and short term debt. It excludes liabilities to the International Monetary Fund.

23/A distinction between gross reserves (which include use of International Monetary Fund credit) and net reserves (which exclude IMF transactions) is not made.

of the public sector".[24] The residual measurement employed by the World Development Report (WDR) is thus adjusted for changes in selected gross foreign assets. Foreign assets are defined as assets other than reserves held by the monetary authorities and assets of commercial banks and other banking institutions. This definition considers the accumulation of assets primarily by agents other than the banking system to be flight capital. Capital flight, is thus defined as:

(4) KF = CHEXTDEBT + DFI + CAB - CHRESERVES - FOREIGNASSET

Using this method, Morgan estimates net capital flight to be $53 billion during the period 1976 to 1985. Capital inflows during the period, according to Morgan, amounted to $75 billion in additional external debt and $11 billion in direct investment flows. While cumulative current account deficits and foreign asset changes amounted to only $32 billion over the same period. Our data yields an estimate of $46.4 billion for an identical time period. While the individual series differ slightly, the cumulative totals for change in external indebtedness and direct foreign investment used by Morgan ($87 bn) exactly equals that obtained by our data ($87 bn). The discrepancy can be found, however, in the data used for the current account balance. Morgan shows a cumulative current account deficit of $29 billion between 1976 and 85, while our figures show a cumulative deficit of $35 billion. This $6 billion difference in the "uses" of funds accounts almost entirely for the difference in our duplication and Morgan's original estimate.

To show the effects of using debt stock changes versus debt flow data, a second "Morgan" definition was calculated using Morgan's methodology with debt flow data substituted for the "CHEXTDEBT" variable. This calculation is referred to in various tables as Morgan II.

24/Morgan Guaranty Trust (1986), pp. 13-15.

1.5 Zedillo

Several authors have made additional adjustments to the residual capital flight measure used by Morgan and the World Development Report. Zedillo (1987) employs the WDR measure with the following adjustments. He argues for using debt flow data rather than change in stock data to measure changes in external indebtedness. These flows are more reliable since they are consistent with other items in the balance of payments and are more consistent over time. An example for Mexico is given where a change in the coverage of the debt reporting system resulted in a large increase in external debt that was not matched by capital inflows as recorded in the balance of payments. The current account is also adjusted for interest that is earned and retained abroad. By showing a larger current account surplus or a smaller current account deficit, this imputed interest overestimates current flows of flight capital. A smaller current account deficit implies less legitimate "use" of capital inflows, thus increasing the residual or "flight capital" measure. The amount of interest retained abroad is estimated as the imputed interest on identified deposits of Mexicans held abroad. The resulting measure of capital flight:

$$(5) \quad KF = DEBTFLOW + DFI + CAS - CHRESERVES - INTRETAIN$$

yields an estimate of the balance of payments residual for 1970-85 of $28.6 billion. Zedillo refrains, however, from attributing this residual totally to capital flight. He suggests that in certain periods, particularly 1981-82, trade mis-invoicing was probably sizeable and therefore overestimates actual outflows of flight capital.[25]

1.6 Gurría and Fadl

Although a recent addition to the literature, Gurría and Fadl's (1991) capital flight estimate is actually similar in methodology to that of Zedillo (1987). As in Zedillo, capital inflows are measured using balance of payments flow data, but only new investment (reinvested profits are excluded) is counted as direct foreign investment and added to debt flows. The current account is again adjusted for interest retained abroad. Changes in external assets held by the public and bank sector are not considered to be flight capital, and are thus subtracting from the residual. The resulting formula:

$$(6) \quad KF = -DEBTFLOW + NEWDFI + CAS - CHRESERVES - INTRETAIN - INCRPUBASSET - CHBANK$$

where

25/See Table 7.6 in Zedillo (1987), p.177.

NEWDFI = new direct foreign investment only [26]
CHBANK = change in external assets held by commercial banks

gives a capital flight estimate of $19.75 billion for 1970 to June of 1990. As we were unable to construct a reliable series for external assets held by banks, this series was taken directly from Gurria and Fadl's work. Using their data for changes in bank assets and our data for all other series, we obtained an residual of only $17.6 billion for 1970 to 1990. The main source of the discrepancy is that our estimate uses data through end 1990, while Gurria and Fadl include figures through end-June 1990. This time difference alone accounts for $2 billion in capital that is repatriated (thus reducing the cumulative flight capital estimate).

26/Gurria and Fadl under estimate the residual to the extent that only new DFI is included as a source of funds. Given that reinvested dividends are included in the current account, it should be treated as both a source and a use of funds when measuring the residual.

STATISTICAL ANNEX

TABLE 1: ALTERNATE MEASURES OF CAPITAL FLIGHT

Year	Cuddington	WDR85	WDR85+CCE	Zedillo	Morgan I uses chdebt	Morgan II uses debtflow	Alvarez Guzman	Gurria/ Fadl	The Basic Residual	The Basic Residual w/ Trade Misinvoice /1
1960	-203.6	-125.6	-125.6	-1600.7	-125.6	-1557.6	-247.4	-1668.5	-1557.6	-1559.9
1961	-4.2	-228.3	-228.3	-2866.9	-228.3	-2858.8	-12.0	-2960.9	-2858.8	-2869.4
1962	-7.3	1527.0	1527.0	6432.7	1527.0	6442.8	-17.2	6342.5	6442.8	6420.2
1963	-136.0	121.6	120.9	-21.3	121.6	-9.0	-158.6	-102.6	-9.0	-38.7
1964	180.3	226.9	215.7	189.4	226.9	203.0	151.3	77.3	203.0	133.0
1965	-155.2	-290.5	-290.4	-118.9	-290.5	-101.9	-178.5	-271.4	-101.9	-196.4
1966	-7.4	-225.1	-224.1	4.7	-225.1	23.7	-108.4	-94.0	23.7	-50.7
1967	170.8	-119.1	-135.1	111.1	-119.1	131.7	101.6	40.8	131.7	100.0
1968	-77.8	-253.5	-251.6	-118.5	-253.5	-94.0	-107.6	-226.2	-94.0	-105.6
1969	-20.2	197.0	202.9	-30.0	197.0	-0.8	-302.5	-229.4	-0.8	-31.1
1970	-353.3	773.9	760.4	-424.1	773.9	-392.7	-7.7	-423.7	-392.7	-318.4
1971	-223.9	-472.6	-542.4	-471.9	-629.6	-444.4	-395.4	-471.8	-444.4	-430.0
1972	-485.0	-464.5	-2993.8	-596.6	-526.7	-562.5	-578.4	-596.8	-562.5	-687.7
1973	850.4	606.3	-101.3	753.7	528.1	828.5	684.4	754.0	828.5	834.1
1974	212.9	39.6	-548.0	872.5	-66.8	981.6	32.4	872.5	981.6	1113.4
1975	1377.1	-655.7	3020.2	848.2	-800.1	935.2	1141.6	848.2	935.2	679.0
1976	3144.4	2101.8	2063.9	3372.1	2298.4	3453.3	3246.9	3372.4	3453.3	3047.4
1977	1133.8	7736.3	7430.1	833.5	7854.1	1164.7	1093.5	1057.5	940.7	898.6
1978	601.9	2011.8	1393.3	697.4	2192.2	817.1	594.6	629.3	885.1	-103.3
1979	1082.5	2750.7	2732.2	-585.3	1319.4	-575.1	-655.9	-882.5	-278.1	-1271.1
1980	955.1	5153.4	5404.8	901.8	5595.4	1441.5	814.8	-550.9	1599.5	797.6
1981	13326.1	6346.3	6589.0	11906.5	5481.0	12424.4	11216.0	9979.3	12852.4	12968.0
1982	7787.8	6319.0	6792.2	7483.2	7444.5	8781.6	7992.6	7176.6	8387.6	9589.5
1983	4373.9	8667.2	9168.8	918.0	5863.3	1790.6	821.8	448.7	1790.6	1208.0
1984	2441.7	2034.5	2691.5	1562.9	2134.7	3043.8	1578.9	2089.2	3043.8	1541.1
1985	3095.8	5584.7	4713.9	2463.7	6238.5	3881.0	2673.9	2148.8	3881.0	3605.2
1986	-842.9	1362.4	98.9	-1855.5	1184.1	-783.5	-990.8	-2441.5	-783.5	-366.8
1987	1505.2	9386.2	6993.2	232.4	8705.0	1406.8	928.4	-232.3	1406.8	61.4
1988	1331.3	-1909.8	-979.0	2576.8	-2164.7	3883.1	-458.1	1460.2	3883.1	3263.1
1989	-1314.3	-6715.7	-5659.6	-2690.3	-7003.8	-929.7	-3229.1	-3721.4	-929.7	-1724.2
1990	723.1	-3831.6	-5831.8	-3238.7	-11689.7	-1442.4	-1422.9	-3904.4	-1442.4	-1442.4
1991	-316.8	..	..	-9914.3	..	-7931.4	..	..	-7931.4	-7931.4
1970-85	39321	48533	48575	30536	45700	37569	30254	26451	37902	33471

1/ The 1990 and 1991 trade mis-invoicing numbers are not available from our direct source but are assumed to be minimal (based on comparisons with direction of trade statistics).

Table 2: Discrepancy Between Debt Stock and Debt Flow Data

	flows of ext debt	Stock of external debt		Stock/Flow Discrepancy	Cross Currency Effects	Discrepancy Explained by CCE
	accum. flo	annual	change		accum. flows	
1960	-1432.0	0.0	0.0	1432.0	0.00	0.00%
1961	-2630.5	0.0	0.0	2630.5	0.00	0.00%
1962	6702.1	1786.3	1786.3	-4915.8	0.00	0.00%
1963	245.5	2162.3	376.1	130.6	0.67	0.51%
1964	567.1	2753.4	591.0	23.9	11.24	47.05%
1965	167.6	2732.3	-21.0	-188.6	-0.09	0.05%
1966	409.0	2892.5	160.2	-248.8	-0.99	0.40%
1967	781.5	3423.2	530.6	-250.9	15.97	-6.37%
1968	622.7	3886.4	463.2	-159.5	-1.92	1.20%
1969	556.1	4640.4	753.9	197.8	-5.86	-2.96%
1970	712.7	6519.7	1879.3	1166.6	13.50	1.16%
1971	668.4	7002.8	483.2	-185.2	69.79	-37.68%
1972	614.0	7652.6	649.7	35.8	2529.31	..
1973	2336.0	9688.2	2035.6	-300.3	707.63	..
1974	4059.9	12699.7	3011.5	-1048.4	587.57	-56.04%
1975	5483.4	16447.7	3748.0	-1735.3	-3675.84	..
1976	5724.4	21017.2	4569.5	-1154.9	37.82	-3.27%
1977	2973.4	30680.1	9662.9	6689.4	306.16	4.58%
1978	3378.8	35434.0	4753.9	1375.2	618.56	44.98%
1979	5363.5	42692.0	7258.0	1894.5	18.48	0.98%
1980	10531.8	57377.7	14685.7	4153.9	-251.34	-6.05%
1981	27780.9	78215.2	20837.5	-6943.4	-242.62	3.49%
1982	8919.6	85797.7	7582.5	-1337.1	-473.27	35.40%
1983	1833.6	91704.0	5906.3	4072.7	-501.60	-12.32%
1984	1667.2	92462.1	758.1	-909.1	-656.98	72.27%
1985	-923.5	93896.1	1434.0	2357.5	870.81	36.94%
1986	148.3	96012.0	2115.9	1967.6	1263.51	64.22%
1987	974.3	104284.4	8272.4	7298.1	2392.98	32.79%
1988	-2289.0	95947.7	-8336.8	-6047.8	-930.86	15.39%
1989	677.3	90550.9	-5396.8	-6074.1	-1056.08	17.39%
1990	11892.4	92196.0	1645.1	-10247.3	2000.23	-19.52%

Table 3: Accumulated Stock Calculations for "The Revised Approach"

	Basic Residual						w/o trade misinvoice				w/trade misinvoice 2/	
		w/ Trade Misinvoice 2/	Deposits of Mex nonbnks per avg	USTBILL	LIBOR3M	Weighted int. rate used	Stock External Assets	Annual changes	Stock External Assets 1/	Annual changes	External Assets	Annual changes
1960	-1557.6	-1559.9	132.2	0.029	NA	0.029	0	0	0	0	0	0
1961	-2858.8	-2869.4	161.9	0.024	NA	0.024	0	0	0	0	0	0
1962	6442.8	6420.2	210.7	0.028	NA	0.028	6442.8	6442.8	1527.0	1527.0	20.2	6420.2
1963	-9.0	-38.7	224.1	0.032	0.040	0.032	6630.7	187.9	1559.6	32.6	6577.7	157.5
1964	203.0	133.0	270.0	0.036	0.043	0.036	7061.2	430.5	1810.0	250.5	6936.3	358.6
1965	-101.9	-196.4	308.5	0.040	0.048	0.040	7227.5	166.3	1768.9	-41.1	7003.2	66.9
1966	23.7	-50.7	299.8	0.049	0.061	0.049	7588.8	361.3	1863.8	94.9	7279.2	276.0
1967	131.7	100.0	312.7	0.043	0.055	0.043	8036.2	447.4	2063.3	199.5	7681.4	402.2
1968	-94.0	-105.6	338.3	0.054	0.064	0.054	8355.4	319.3	2063.0	-0.3	7970.0	288.7
1969	-0.8	-31.1	337.0	0.067	0.098	0.067	8891.0	535.6	2177.6	114.6	8449.5	479.5
1970	-392.7	-318.4	300.5	0.064	0.085	0.064	9049.2	158.2	1903.5	-274.1	8653.5	204.0
1971	-444.4	-430.0	330.5	0.043	0.066	0.043	8984.5	-64.7	1528.7	-374.8	8586.0	-67.5
1972	-562.5	-687.7	380.3	0.041	0.054	0.041	8774.2	-210.3	1014.9	-513.7	8234.3	-351.7
1973	828.5	834.1	641.8	0.070	0.094	0.070	10192.8	1418.6	1888.0	873.1	9620.6	1386.3
1974	981.6	1113.4	1095.3	0.079	0.109	0.079	11926.1	1733.3	2967.7	1079.7	11440.6	1820.0
1975	935.2	679.0	1353.3	0.058	0.070	0.058	13491.7	1565.6	4011.9	1044.2	12721.7	1281.1
1976	3453.3	3047.4	1759.3	0.050	0.056	0.050	17550.7	4059.0	7597.9	3586.0	16336.4	3614.6
1977	940.7	898.6	2185.3	0.053	0.060	0.053	19323.6	1772.9	8846.3	1248.4	18003.2	1666.8
1978	885.1	-103.3	3608.9	0.072	0.088	0.078	21538.0	2214.4	10248.0	1401.7	19126.8	1123.6
1979	-278.1	-1271.1	5032.6	0.100	0.121	0.107	23181.0	1643.0	10681.3	433.3	19518.4	391.6
1980	1599.5	797.6	6456.3	0.116	0.142	0.125	27043.3	3862.3	12985.1	2303.8	22122.2	2603.8
1981	12852.4	12968.0	7880.0	0.141	0.169	0.150	42983.6	15940.3	26816.8	13831.7	37440.0	15317.8
1982	8387.6	9589.5	10866.0	0.107	0.133	0.116	55432.5	12448.9	37395.3	10578.5	50449.4	13009.4
1983	1790.6	1208.0	11909.3	0.086	0.097	0.090	61226.9	5794.4	41569.2	4173.9	55213.5	4764.1
1984	3043.8	1541.1	13650.3	0.096	0.109	0.100	69214.3	7987.4	47586.1	6016.9	61095.5	5881.9
1985	3881.0	3605.2	15604.0	0.075	0.084	0.078	77421.5	8207.2	54109.3	6523.2	68394.8	7299.3
1986	-783.5	-366.8	16085.8	0.060	0.069	0.063	80510.7	3089.2	55738.1	1628.8	71335.2	2940.4
1987	1406.8	61.4	17586.0	0.058	0.072	0.063	85958.2	5447.5	59631.9	3893.8	74861.8	3526.6
1988	3883.1	3263.1	20115.3	0.067	0.080	0.071	94697.1	8738.8	66501.0	6869.2	82192.5	7330.8
1989	-929.7	-1724.2	20578.3	0.081	0.093	0.085	100107.0	5409.9	69514.2	3013.2	85745.0	3552.5
1990	-1442.4	..	19518.8	0.075	0.083	0.078	104848.0	4741.1	71876.6	2362.4	89369.4	3624.4
1991	-7931.4	..	18444.3	0.054	0.060	0.056	101696.3	-3151.7	66878.1	-4998.6	85350.7	-4018.7

1/ This stock definition substitutes debt stock for debt flow only in 1962 due to the seemingly large difference

2/ The 1990 and 1991 trade mis-invoicing numbers are not available from our direct source but are assumed to be minimal (based on comparisons with direction of trade statistics).

Table 4: Trade Misinvoicing

	Import Over-invoicing	Export Under-invoicing	Import Over-invoice	Export Under-invoice			Import Over-invoicing	Export Under-invoicing	NET
	MEX-US Trade Dir of Trade Stats		MEX-US Trade (Commerce/B de M)		DOT STAT NET	Direct NET	Combined		
1960	-16.2	13.9			-2.2		-16.2	13.9	-2.2
1961	-71.5	60.9			-10.6		-71.5	60.9	-10.6
1962	-81.7	59.0			-22.6		-81.7	59.0	-22.6
1963	-63.3	33.6			-29.7		-63.3	33.6	-29.7
1964	-139.1	69.0			-70.0		-139.1	69.0	-70.0
1965	-136.1	41.6			-94.5		-136.1	41.6	-94.5
1966	-213.2	138.8			-74.4		-213.2	138.8	-74.4
1967	-182.2	150.4			-31.8		-182.2	150.4	-31.8
1968	-211.3	199.7			-11.6		-211.3	199.7	-11.6
1969	-224.6	194.3			-30.3		-224.6	194.3	-30.3
1970	-210.8	285.0			74.3		-210.8	285.0	74.3
1971	-195.3	209.6			14.3		-195.3	209.6	14.3
1972	-247.0	121.8			-125.2		-247.0	121.8	-125.2
1973	-387.1	392.7			5.6		-387.1	392.7	5.6
1974	-640.8	772.5			131.8		-640.8	772.5	131.8
1975	-567.4	311.1			-256.2		-567.4	311.1	-256.2
1976	-676.1	270.1			-405.9		-676.1	270.1	-405.9
1977	-741.1	699.1			-42.1		-741.1	699.1	-42.1
1978	-1307.2	318.7			-988.4		-1307.2	318.7	-988.4
1979	-1214.5	221.5			-993.0		-1214.5	221.5	-993.0
1980	-2176.7	-259.6	-831.6	29.7	-2436.3	-801.9	-831.6	29.7	-801.9
1981	-998.2	-411.7	226.5	-110.9	-1410.0	115.6	226.5	-110.9	115.6
1982	-1343.5	1336.6	-794.4	1996.3	-6.8	1201.9	-794.4	1996.3	1201.9
1983	-1286.3	-346.7	-736.5	153.9	-1633.0	-582.5	-736.5	153.9	-582.5
1984	-1747.3	-1459.5	-914.4	-588.3	-3206.8	-1502.7	-914.4	-588.3	-1502.7
1985	-517.9	409.9	-1168.6	892.9	-108.0	-275.7	-1168.6	892.9	-275.7
1986	-291.6	998.3	-636.0	1052.7	706.7	416.7	-636.0	1052.7	416.7
1987	-683.9	-473.7	-1184.9	-160.5	-1157.6	-1345.4	-1184.9	-160.5	-1345.4
1988	-313.8	-662.0	-217.5	-402.5	-975.7	-620.0	-217.5	-402.5	-620.0
1989	403.2	-1743.7	296.0	-1090.5	-1340.5	-794.5	296.0	-1090.5	-794.5
1990	6457.0	-6499.3	..	..	-42.3	..	..	..	..
1991	0.0	1535.5	..	..	1535.5	..			

Table 5 The Basic Data

	current account 1/	errrors & omiss. 1/	interest receipts 1/	interest held abroad 2*/	Direct Foreign invest 1/	New DFI	Change in Gross reserves 1/*	flows of ext debt 1/	Stock of external debt 2*/	
	accum. flows	accum. flows	accum. flows	based on interest receipts	accum. flows	Accum Flows	accum. flows	accum. flows 4/	annual	change
1960	-202.0	135.6	63.2	43.1	67.8	..	-8.6	-1432.0	0.0	0.0
1961	-343.7	104.7	11.9	8.1	94.0	..	-21.4	-2630.5	0.0	0.0
1962	-249.4	64.2	14.9	10.2	90.2	..	100.1	6702.1	1786.3	1786.3
1963	-226.1	210.5	17.9	12.2	81.3	..	109.7	245.5	2162.3	376.1
1964	-444.7	-105.8	20.0	13.6	112.1	..	31.5	567.1	2753.4	591.0
1965	-442.9	79.7	24.8	17.0	152.5	..	-20.9	167.6	2732.3	-21.0
1966	-477.9	-43.0	27.8	19.0	98.7	..	6.1	409.0	2892.5	160.2
1967	-603.0	-4.4	30.2	20.6	70.3	..	117.1	781.5	3423.2	530.6
1968	-775.4	310.6	36.0	24.5	107.7	..	49.0	622.7	3886.4	463.2
1969	-708.4	90.7	42.9	29.2	199.4	..	47.9	556.1	4640.4	753.9
1970	-1187.9	396.1	46.1	31.4	184.6	185.0	102.1	712.7	6519.7	1879.3
1971	-928.8	193.5	40.3	27.5	172.9	173.0	199.9	668.4	7002.8	483.2
1972	-1005.8	798.7	50.0	34.1	156.2	156.0	264.6	614.0	7652.6	649.7
1973	-1528.8	-400.2	109.6	74.8	221.7	222.0	122.2	2336.0	9688.2	2035.6
1974	-3226.0	267.6	160.0	109.2	291.0	291.0	36.9	4059.9	12699.7	3011.5
1975	-4442.6	-1181.7	127.5	87.0	204.0	204.0	165.1	5483.4	16447.7	3748.0
1976	-3683.3	-2390.6	118.9	81.2	211.7	212.0	-1003.9	5724.4	21017.2	4569.5
1977	-1596.5	-22.5	157.0	107.2	327.0	327.0	657.1	2973.4	30680.1	9662.9
1978	-2693.0	-127.0	275.1	187.7	385.1	385.0	434.2	3378.8	35434.0	4753.9
1979	-4870.5	686.2	450.1	307.2	782.2	782.0	419.0	5363.5	42692.0	7258.0
1980	-10739.7	245.1	1022.4	697.7	2155.1	860.4	947.6	10531.8	57377.7	14685.7
1981	-16052.1	-9030.1	1386.1	945.9	2835.7	1336.5	1274.8	27780.9	78215.2	20837.5
1982	-6221.0	-6831.8	1325.3	904.4	1657.3	956.7	-3300.2	8919.6	85797.7	7582.5
1983	5418.4	-908.6	1278.7	872.6	460.5	70.2	3118.0	1833.6	91704.0	5906.3
1984	4238.5	-1041.3	2074.0	1480.9	391.1	543.4	3353.1	1667.2	92462.1	758.1
1985	1236.8	-1850.7	1821.7	1417.3	490.5	269.6	-2423.5	-923.5	93896.1	1434.0
1986	-1672.7	438.7	1462.5	1072.0	1522.0	944.0	602.8	148.3	96012.0	2115.9
1987	3966.5	2709.7	1888.1	1174.4	3247.6	2910.9	6100.4	974.3	104284.4	8272.4
1988	-2901.2	-470.8	2312.1	1306.3	2594.7	1953.1	-6733.5	-2289.0	95947.7	-8336.8
1989	-3960.2	2203.5	2580.0	1760.6	3036.9	2028.8	395.6	677.3	90550.9	-5396.8
1990	-5254.2	-479.1	2632.3	1796.3	2583.2	2017.5	2805.8	11892.4	92196.0	1645.1
1991	-13282.8	1241.0	2905.9	1983.0	4761.5		7821.5	9348.2		

Sources:
1/ 1960-1979: Bank of Mexico, "Indicadores Economicos: Acervo Historico"
1980-current: Bank of Mexico, SIE-Bernoulli.
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2/ Bank estimates
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5/ file is "asset.wk1", stock calculated according to Mexican authorities
6/ file is "asset.wk1", after 1982 includes commercial bank assets
e/ 1960-78 is US Treas bulletin (ST Liab to Mex N-Banks), 1981-90 IMF series 7xrd,
period between allocates growth rate (81/78) over the period

	Non banking assets abroad 3/		Cross Currency Effects 2*/	capital account 1/	valuation Adjustment	Long term ext. asset 1/	Long term ext. asset		Short term ext. asset 1/	Change in Bank Assets	Foreign Public Assets 1/	
	stocks	flows	accum. flows	accum. flows	BoP accum flow	accum. Bal of Payment flows	Stocks 5/ eop	Change	accum. flows	(Gurria) US$ mn 1990*Jan-Jun	Stocks 6/	Change
1960	0.0	0.0	0.0	275.7	..	..	0.8	0.8	68.0	..	265.6	0.0
1961	0.0	0.0	0.0	217.3	..	..	0.4	-0.3	-100.5	..	265.6	0.0
1962	0.0	0.0	0.0	202.2	..	..	0.2	-0.3	-56.9	..	265.6	0.0
1963	0.0	0.0	0.7	125.2	..	..	10.5	10.3	-74.5	..	265.6	0.0
1964	0.0	0.0	11.2	582.1	..	..	25.8	15.3	-74.5	..	265.6	0.0
1965	0.0	0.0	-0.1	342.3	..	..	32.1	6.3	75.5	..	265.6	0.0
1966	0.0	0.0	-1.0	527.0	..	..	114.2	82.0	50.4	..	265.6	0.0
1967	0.0	0.0	16.0	647.2	..	..	162.7	48.6	-166.4	..	265.6	0.0
1968	0.0	0.0	-1.9	513.8	..	..	168.0	5.2	-232.8	..	265.6	0.0
1969	0.0	0.0	-5.9	665.6	..	..	421.0	253.0	-70.5	..	265.6	0.0
1970	0.0	0.0	13.5	848.5	..	..	44.0	-377.0	-42.8	..	265.6	0.0
1971	0.0	0.0	69.8	895.8	..	..	31.0	-13.0	30.4	..	422.6	156.9
1972	0.0	0.0	2529.3	432.5	..	..	28.0	-3.0	-313.7	..	484.8	62.3
1973	0.0	0.0	707.6	2051.2	..	..	41.0	13.0	-450.2	..	563.0	78.2
1974	0.0	0.0	587.6	3822.5	..	..	6.0	-35.0	-480.5	..	669.4	106.4
1975	0.0	0.0	-3675.8	5458.9	..	..	10.0	4.0	-195.4	..	813.8	144.5
1976	0.0	0.0	37.8	5069.9	..	..	23.0	13.0	-753.8	..	617.2	-196.6
1977	0.0	0.0	306.2	4271.4	..	..	74.0	51.0	-1111.3	-224.0	723.4	106.2
1978	0.0	0.0	618.6	4689.0	..	..			-474.9	68.0	475.0	-248.4
1979	0.0	0.0	18.5	4591.1	..	..			-1768.7	297.0	1609.3	1134.3
1980	0.0	0.0	-251.3	11442.3	-70.9	-44.5			-1200.2	158.0	1009.3	-600.0
1981	0.0	0.0	-242.6	26357.0	262.6	36.4			-4296.0	428.0	1446.6	437.3
1982	0.0	0.0	-473.3	9752.7	-115.4	131.7			-955.9	-394.0	715.0	-731.6
1983	0.0	0.0	-501.6	-1391.8	17.1	-220.6			-3465.4	79.0	3519.0	2804.0
1984	0.0	0.0	-657.0	155.9	152.2	-296.1			-1400.4	-374.0	3418.9	-100.2
1985	0.0	0.0	870.8	-1809.5	-95.1	-340.5			-1245.1	94.0	2765.1	-653.8
1986	15088.0	0.0	1263.5	1836.8	-382.2	-728.2			404.2	8.0	2943.4	178.3
1987	18167.0	485.7	2393.0	-575.8	-824.0	-582.8			-4214.9	128.0	3624.6	681.2
1988	17793.0	-41.7	-930.9	-3361.4	393.5	-640.3			-860.5	475.0	3879.5	254.9
1989	0.0	0.0	-1056.1	3037.3	124.1	-281.0			-889.2	23.0	4167.6	288.1
1990	0.0	0.0	2000.2	8849.1	-181.4	-7427.0			-244.0	100.0	12025.7	7858.1
1991				20179.0	315.7	-546.5			-924.2		12962.5	936.8

Sources:
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a/ 1960-78 is US Treas bulletin (ST Liab to Mex N-Banks), 1981-90 IMF series 7xrd,
period between allocates growth rate (61/78) over the period

Table 6: Interest Retained Abroad Calculation

		S218 current account	Gurrie/Fadl current account	Reinvested DFI	Residual interest retained
1960	1960	-202		..	
1961	1961	-343.7		..	
1962	1962	-249.4		..	
1963	1963	-226.1		..	
1964	1964	-444.7		..	
1965	1965	-442.9		..	
1966	1966	-477.9		..	
1967	1967	-603		..	
1968	1968	-775.4		..	
1969	1969	-708.4		..	
1970	1970	-1187.9	-1255	..	67.1
1971	1971	-928.8	-998	..	69.2
1972	1972	-1005.8	-1078	..	72.2
1973	1973	-1528.8	-1690	..	161.2
1974	1974	-3226	-3460	..	234
1975	1975	-4442.6	-4630	..	187.4
1976	1976	-3683.3	-3857	..	173.7
1977	1977	-1596.5	-1826	..	229.5
1978	1978	-2693	-3096	..	403
1979	1979	-4870.5	-5566	..	695.5
1980	1980	-10739.71	-10826	934.9	1021.19
1981	1981	-16052.06	-16173	1265.1	1386.04
1982	1982	-6220.98	-6776	770.4	1325.42
1983	1983	5418.396	4336	197.3	1279.696
1984	1984	4238.451	2380	215.3	2073.751
1985	1985	1236.75	-353	231.8	1821.55
1986	1986	-1672.672	-2548	587.1	1462.428
1987	1987	3966.546	2560	481.4	1887.946
1988	1988	-2901.216	-4386	563.7	2048.484
1989	1989	-3960.221	-5814	643	2496.779
1990	1990	-5254.17	-2771	653.6	

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