GLOBAL FINANCIAL INTEGRITY

Mexico: Illicit Financial Flows, Macroeconomic Imbalances, and the Underground Economy

Dev Kar

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Global Financial Integrity Wishes to Thank
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[1] Dev Kar, formerly a Senior Economist at the International Monetary Fund (IMF), is Lead Economist at Global Financial Integrity (GFI) at the Center for International Policy (CIP). The author would like to thank Sarah Freitas, Economist at GFI, for running the models in E-Views and in STATA and for contributing the box articles. She also provided guidance on data sources and collection to Daniel Robinson, a staff intern at GFI. Thanks are also due to Raymond Baker, Tom Cardamone, Heather Lowe, Lauren Pickett and other staff at GFI and CIP for helpful comments and to Krishen Mehta, a member of GFI's Board, for helpful comments on the policy section. Any errors that remain are the author's responsibility.

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We are pleased to present here our analysis of **Mexico: Illicit Financial Flows, Macroeconomic Imbalances, and the Underground Economy.**

Global Financial Integrity has over the last four years produced reports on global, regional, and national illicit flows. We consider such outflows from developing countries to be the most damaging economic condition hurting the global poor, while at the same time significantly impacting the national security and foreign policy interests of western nations. In this report we examine the generation and movement of illicit money affecting the United States' neighbor to the south, Mexico. Interestingly, Mexico is the largest emerging market country having a border with a major industrialized democracy, and therefore it is at some level understandable that this border might be rather porous to the movement of money and people. In fact, over a period of years illicit financial outflows from the country have been devastating.

Utilizing well established economic models, our analysis indicates illicit outflows from Mexico from 1970 to 2010 at US$872 billion. Across the first decade of this century, these outflows averaged almost US$50 billion a year. Furthermore, this analysis is conservative; it does not include drug smuggling, human trafficking, and some forms of trade mispricing, data for which are not available in the statistics we analyze. Were reasonable estimates of illicit capital generated by these activities to be incorporated into the analysis, the figures would be substantially higher.

In the 1990s and 2000s, trade mispricing accounted for about 80 percent of the shift of illicit money out of the country, rising sharply after NAFTA came into being. The free trade regime was not accompanied on either side of the border with adequate mechanisms for monitoring and controlling abusive transfer pricing by multinational corporations or by mispricing between unrelated but cooperating trade partners.

Illicit financial flows and the underground economy of Mexico have a symbiotic relationship, each driving the other. Curtailing one will contribute to reducing the other.

Cross-border deposits of both licit and illicit financial flows are very difficult to analyze. Most nations that provide such data to the Bank for International Settlements in Switzerland do so with the proviso that amounts received from specific countries will not be further reported. This is a glaring shortcoming in international financial data, not only for the interest of developing countries but for richer countries also. The United States does allow its data to be treated as a single point of absorption, showing that private deposits out of Mexico into only current accounts in U.S. banks have been rising to more than US$12 billion in 2010.

The United States and Mexico demonstrate perhaps better than any other two countries the need for greater transparency in cross-border financial dealings. Take just one example: Mexico has asked the U.S. Treasury Department to accord to it the same mechanisms for automatic exchange of tax information that exist between the United States and Canada. For two years the United States has not acted upon this straightforward request from its troubled southern neighbor, an error that needs to be corrected forthwith.

Global Financial Integrity thanks Dev Kar and Sarah Freitas for their excellent work in producing this provocative analysis.

Raymond W. Baker
Director, Global Financial Integrity

January 16, 2012

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Sarah Freitas

Abstract

The study traces the evolution of illicit financial flows from Mexico over the 41-year period 1970-2010. While such outflows have increased throughout the four decades, the pace picked up in the post- compared with the pre-NAFTA period. Furthermore, in spite of the somewhat erratic nature of the outflows over time, there is a discernable pattern to these outflows in the years leading up to the macroeconomic crises and their aftermath. We develop a dynamic simulation model that examines the interactions between fiscal developments, monetary expansion, and the generation of inflation on the one hand and on the interactions between the underground economy and illicit financial flows on the other. The underground economy is first estimated using the currency demand approach and then its evolution is traced in terms of model-specific endogenous and exogenous variables. The results of model simulations show that unstable macroeconomic developments, weaknesses in overall governance (as captured by a growing underground economy) and structural factors like trade openness together drove illicit flows from Mexico in a complex process. The drivers and dynamics of the model help us to formulate a set of recommendations to curtail the cross-border transmission of illicit capital.

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Executive Summary

This study provides estimates of illicit financial flows (IFFs) from Mexico over the period 1970 – 2010 and examines the underlying drivers and dynamics in the context of a simulation model. Since the data needed to run the simulation model are only available for the period 1971-2008, the analysis of the factors driving illicit flows is confined to this shorter period.

In our definition, money is deemed to be illicit if the source, use or movement of the funds is illegal. All flow estimates are based on cross-border transfers of illicit money and do not take into account illicit money being laundered inside the country. Moreover, illicit flows resulting from drug trafficking and other illicit activities that are settled in cash are not captured by economic models such as the ones used in this study. Given the inherent understatement of illicit flows estimated through economic models and methods, we use the non-normalized (or robust) estimate of illicit flows throughout the study, although normalized or conservative estimates are also presented in the Appendix for purposes of comparison. That said the magnitude and growth rate of illicit flows out of Mexico are indicative of the severity of the problem faced by policymakers.

The study's main findings include the following:

- Over the period 1970-2010, cumulative illicit financial flows from Mexico amount to a massive US$872 billion;
- The outflow of illicit capital has grown significantly from around US$1 billion in 1970 to US$68.5 billion in 2010 after reaching a peak in 2007 when the value was close to US$91 billion;
- Average outflows of illicit capital per annum increased sharply throughout the four decades. They were US$3.0 billion in the 1970s, US$10.4 billion in the 1980s, US$17.4 billion in the 1990s, and US$49.6 billion in the decade ending 2009;
- Flows of illicit money averaged 5.2 percent of GDP over the 41-year period 1970-2010. The peak year for illicit flows as a percentage of GDP was 1995 when it reached 12.7 percent;
- As a percentage of GDP, illicit flows increased from an average of 4.5 percent of GDP in the period before NAFTA was implemented in January 1994 to an average of 6.3 percent of GDP in the 17 years that followed;
- IFFs as a percent of Mexico's external debt increased from 15.0 percent in 1970 to 28.7 percent in 2010, averaging 16.8 percent over the period 1970-2010. Most of the sharp increase in this ratio came after NAFTA was implemented in 1994;

- Baring a few significant jumps, IFFs as a percent of Mexico's exports declined from 74.4 percent in 1970 to 23.0 percent in 2010 mostly as a result of increasing oil exports over time;
- There is a stable relationship between the volume of illicit outflows and the onset and aftermath of Mexico's macroeconomic crises during the 41-year period. With reference to the six crises studied, illicit outflows increased in the crisis year compared to the two years preceding the crisis. Specifically, in the:

    - 1973 oil price shock, illicit outflows were 4.4 percent of GDP, which was almost four times higher than the average of 1.15 percent per annum during the two years before the crisis;
    - 1976 balance of payments crisis, illicit flows were 5.6 percent of GDP, which was well above the average of 3.2 percent per annum recorded during 1974-1975;
    - 1982 debt crisis, outflows were 5.3 percent compared to an average of 3.5 percent during 1980-81;
    - 1986 oil price shock, illicit flows were 8.1 percent of GDP, which was significantly higher than the average of 5.1 percent of GDP seen over 1984-85;
    - 1994 peso crisis outflows were 3.8 percent of GDP which was almost three times the average rate of 1.3 percent over the period 1992-93; and,
    - global economic crisis of 2007, illicit flows were 8.8 percent of GDP compared to an average annual rate of 5.5 percent over 2005-06.

Except for the first oil shock in 1973 and the onset of the global economic crisis in late 2007, outflows of illicit capital from Mexico continued to increase one year past the crisis. The 1994 peso crisis stands out among all crises that hit Mexico during 1970-2010 in that illicit outflows as a percent of GDP increased the most in the year following the crisis. By this measure, the peso crisis was probably the most serious crisis to have hit Mexico during this period. We find that in general, a macroeconomic crisis causes illicit financial flows to increase in relation to GDP one year past the crisis before they start to come down.

The cross-border holdings of bank deposits reported to the Bank for International Settlements (BIS) show that the United States, offshore financial centers or tax havens in the Caribbean, and tax havens in Europe, are the three top destinations for Mexican private sector deposits. These deposits consist of both licit and illicit funds. However, due to a lack of data on withdrawals and incomplete reporting by financial institutions it is not possible to determine the destinations of illicit financial flows only.

It should be noted that the methodology used in studies at Global Financial Integrity (GFI) to estimate illicit flows differs from that of some other researchers in that the models are calibrated to capture gross outflows only. The main reason why illicit inflows are not netted out from illicit outflows is that illicit inflows are also unrecorded so that the government is unable to tax the funds

or use them for economic development. Indeed, net illicit flows are a no more tenable concept than net crime. However, despite this difference in methodology, GFI's estimates of illicit financial flows from Mexico are not out of line with past studies on capital flight from Mexico, once we recognize that those studies did not include outflows due to trade mispricing, which are included in this study.

Using graphical analysis, we illustrate how illicit financial flows, generated through an underground economic activity, impact domestic asset markets under pegged exchange rates (the peso was essentially pegged to the U.S. dollar before the peso crisis hit in 1994). Extending this illustrative short-run interaction, we develop a simulation model of illicit flows from Mexico which highlights interactions between macroeconomic policies (consisting of money supply, government expenditures, government revenues, direct taxes, and the price level determined within the model), structural factors (represented by trade openness and income inequality, which are exogenous), and overall governance (represented by underground economy, a proxy, which is endogenous). The simulation finds that, of these factors, the price level can be traced quite reliably based on the interactions between monetary and fiscal policy. The resulting high rates of inflation (which were also highly variable) were found to be a significant driver of illicit flows along with a thriving underground economy and trade openness (which provided traders more opportunities to misprice trade). Model simulations on Mexico seem to indicate that while illicit flows may not respond to macroeconomic instability at lower levels (as we found in the case of India), once shocks are sufficiently large and pervasive, they could lead to a loss of investor confidence and widely anticipated exchange rate depreciation. As a result, domestic assets, both licit and illicit, become less attractive relative to foreign assets. The higher inflation led to rising nominal income which buoyed total taxes collected, but the expanded collection did nothing to shrink the underground economy (although the taxes collected had the expected negative coefficient in the equation explaining the underground economy). There is clear evidence that the underground economy in Mexico is mainly driven by illicit outflows and the size of the underground economy in the previous period (the momentum effect). Model simulations confirmed a dynamic interaction between illicit flows and the underground economy in that each drove the other.

The results of model simulations also provide an insight into policy measures required to curtail the generation and transmission of illicit capital. As significant macroeconomic instability can lead to loss of confidence in the economy and trigger illegal capital flight, the government needs to adopt prudent macroeconomic policies to curtail illicit flows. However, structural and governance-related issues also need to be addressed to stem the outflows. For instance, large outflows through trade mispricing would call for comprehensive reform of the customs administration; specifically, we propose the implementation of a risk-based price profiling system to curtail the risk of export and import mispricing used to transfer illicit capital out of the country. Furthermore, we recommend that all customs invoices be accompanied by a legal undertaking of pricing accuracy by exporters and importers and that multinational corporations be subject to country-by-country reporting requirements on their sales, operating costs, and profits in each jurisdiction where they operate. Apart from trade mispricing, we identify four other areas where policy improvements

can be beneficial—(i) implementing automatic exchange of information and double tax avoidance agreements with countries with which Mexico has strong trade and capital market links, (ii) shrinking the underground economy through measures such as greater transparency and accountability involving the awarding of government contracts, (iii) collecting information on beneficial ownership of companies and financial accounts, and (iv) adopting a strong leadership position by Mexico in international forums to require tax havens and banks to operate in a more transparent and accountable manner in order to curtail the absorption of illicit funds.

I. Introduction

Illegal capital flight or illicit financial flows involve the cross-border transfer of money mainly earned through illegal activities such as corruption, transactions in contraband goods including drugs, criminal activities, human trafficking, and sex trade to name a few. However, while money may also be earned legitimately such as profits from a registered business or individual income from a profession, the money transferred becomes illicit if applicable taxes were not paid on those profits or income. Even if taxes on the funds were paid, they may still become illicit if the cross-border transfer breaks foreign exchange regulations in effect at the time of transfer. This paper makes no attempt to link illicit financial flows, however generated, with the nature of the underlying activities, whether legal or illegal. Finally, it should be noted that the models used by economists to estimate illicit flows cannot capture those generated through drug or human trafficking, smuggling in contraband goods, sex trade, or other illegal activities that are mainly settled in cash and are not reflected in economic statistics.

Thus, loosely defined, illicit financial flows involve capital that is illegally earned, transferred, or utilized and covers all unrecorded private capital outflows that drive the accumulation of foreign assets by residents in contravention of applicable laws and the country's regulatory framework. While illicit flows are difficult to estimate and tend to exhibit random-walk characteristics, economists associate large outflows with serious governance issues, economic mismanagement, political instability, and other ills. It can be argued that debt relief may not help countries sustain their debt if the underlying drivers and dynamics of illicit financial flows are not addressed.

The purpose of this paper is to study how illicit financial flows from Mexico have evolved over the 41-year period 1970-2010 and to explain the major drivers of such flows. The period was chosen to allow tracking of illicit flows since the discovery of large amounts of oil in Mexico in the early 1970s coupled with substantial additional finds in later decades. Moreover, this is also the longest period for which consistent data on balance of payments and external debt are available for Mexico. Note that while estimates of illicit flows pertain to this period, the simulation model covers the slightly shorter period 1971-2008 corresponding to the availability of monetary data reported to the IMF and the fact that data for 1969, required to derive one-period lagged variables, are not available. The paper is organized as follows.

Section II presents an analysis of illicit flows from the country in decade intervals starting 1970 following a brief discussion of the underlying methodology used to derive these estimates. The analysis covers four decades with the last ending in 2009. Where possible, we compare our estimates with those obtained by previous researchers recognizing that the methodologies used vary significantly depending upon the definition of capital flight, the models used to estimate these outflows, and revisions to official data since those earlier studies were carried out. In Section III, we

develop a dynamic simulation model of monetary and fiscal developments, their impact on the price level, and the interactions between total taxes collected, the growth of the underground economy and resulting cross-border transfer of illicit capital. We first estimate the underground economy using the monetary approach and then use the model to test the hypothesis that illicit flows both drive, and are driven by, the underground economy. The model uses the underground economy as a proxy for the state of overall governance in Mexico given that the two are inversely related.[2] While the indirect monetary approach to estimating the underground economy has its detractors, it is still the most robust method for the purpose and has been utilized by many researchers for a number of countries. In fact, all econometric methods of estimating the underground economy have their drawbacks including those that claim to represent an improvement over the monetarist approach such as the Multiple Indicators Multiple Causes (MIMIC) method. Section IV analyzes the data on cross-border deposits of the Mexican private sector in order to shed light on the major destination of funds both licit and illicit. Section V discusses the specific policy measures needed to curtail the cross-border transfer of illicit capital, while Section VI presents the main conclusions of the paper.

[2] Extensive studies at the World Bank show that while the underground economy as a share of official GDP is relatively small in countries where governance is strong, the proportion is high in countries that are poorly governed. See, for example, Schneider, Friedrich, Andreas Buehn, and Claudio E. Montenegro, 2010, Shadow Economies All Over the World: New Estimates for 162 Countries from 1999 to 2007, Policy Research Working Paper No. 5356, The World Bank, July 2010, Washington DC.

II. Evolution of Illicit Financial Flows from Mexico

(i) Brief discussion of the methodology

As illicit financial flows are unrecorded, they cannot be measured precisely. Moreover, economists have used different methods to estimate these flows.[3] A method used extensively by many economists is based on the World Bank Residual model adjusted for trade mispricing. This same approach underlies the present study.

The World Bank Residual model captures the gap between a country's source and use of funds which should equal in a perfect world. In practice, they do not. If source of funds exceeds a country's use of funds, this implies that the unaccounted-for capital has leaked out of the country's external accounts or balance of payments. It is assumed that such unrecorded transfers of capital involve illicit funds because there is no reason why transfers of legitimate capital should go unrecorded.

The residual or gap between a country's recorded source of funds (inflows of loans plus net foreign direct investment) and use of funds (financing the current account deficit plus change in central bank reserves) allows tracking of unrecorded capital movements. If source of funds exceed use of funds, unrecorded or illicit capital must have been transferred from the country. Similarly, if recorded use is more than recorded source of funds, the country must have received illicit capital. For reasons we spell out, the method used in this paper only considers gross illicit outflows. Episodes of illicit inflows are set to zero.

Economists such as Bhagwati, Krueger, Ndikumana and Boyce, Rishi, and others have long studied trade mispricing as a conduit for the cross-border transfer of illicit capital. Their studies have corroborated the fact that foreign assets can be acquired through export under-invoicing and import over-invoicing.[4] The manipulation of trade invoices also occurs in the United States among other industrial countries.

As noted, the models outlined above can also indicate inflows of illicit capital into a country. For example, trade restrictions can provide the incentive to under-invoice imports in order to lower customs duties payable or exports can be over-invoiced in order to collect on export subsidies. The main reason why only gross illicit outflows are estimated is that a netting of illicit flows does not present a net benefit to the country. Moreover, because illicit inflows are also unrecorded, the government cannot tax the funds nor use them for economic development. Indeed, illicit inflows can amount to a loss of funds for the government as illustrated by the examples just cited. This is the main difference between the method traditionally used and the one used in this study.

[3] Reference, Tax Havens and Development: Status, Analysis and Measures, Government Commission on Capital Flight from Poor Countries, Appointed by Royal Decree of 27 June 2008, Norwegian Agency for Development Cooperation, 2008.
[4] See, for example, Illegal Transactions in International Trade, Jagdish N. Bhagwati (Editor), North-Holland/American Elsevier, 1974.

(ii) Comparison with past studies

Given the difference in methodologies, we present in Table 1 estimates of illicit financial flows from Mexico using the gross non-normalized method and the traditional method of netting out illicit inflows from outflows which were used by past researchers. Note that as there are no recent studies on capital flight from Mexico, we could not include estimates for more recent years. Also note that the estimates of illicit flows presented here differ slightly from those in GFI's 2011 IFF Update report. In that study, Hong Kong and Macao were excluded from all countries' bilateral trade due to data issues which would distort the country rankings of the top 20 exporters of illicit capital. As the problem would not arise in individual country case studies, Hong Kong and Macao are included in Mexico's bilateral trade.

Table 1. Illicit Financial Flows and Estimates of Capital Flight in Past Studies
Billions of U.S. dollars

Period	Present Study 1/ (Gross)	Other Estimates 2/ (Net Method)	Source and Comments 3/
1973-1987	111.5	61.0	Manuel Pastor (1990)
1976-1982	45.0	36.1	Cumby and Levich (Table 3.4)
1976-1984	66.4	53.6	Cumby and Levich (Table 3.4)
1979-1982	29.3	26.5	World Development Report 1985, World Bank
1981/1982	17.5	> 20.0	Moreno-Brid; period roughly 1981-1982.

1/ The estimates in this study are based on gross outflows only; illicit inflows are not netted out from outflows.
2/ Other estimates net out inward from outward capital flight and do not include trade mispricing.
3/ The estimates shown in Cumby and Levich refer to comparable definition of the World Bank Residual model used in the present study.

It is not surprising that in almost all cases, the gross outflows method exceeds the net method traditionally estimated by economists. The difference is not large except for the period 1973-1987 when large inflows substantially reduced the volume of net illicit flows. A second source of understatement of the problem of illicit flows is that the estimates in past studies shown above do not include illicit flows due to trade mispricing. Hence, the conclusion is that for all intents and purposes, the estimates of illicit financial flows from Mexico presented here are not out of line with past studies once it is recognized that illicit inflows were of dubious benefit to Mexico and that illicit outflows due to trade mispricing ought to be included in order to capture their adverse impact on the country.[5]

(iii) Macroeconomic developments and illicit flows from Mexico

The analysis of illicit flows from Mexico presented here is based on the non-normalized estimates because the conservative (or normalized) measure is likely to understate illicit flows from countries where drug trafficking is a significant problem. The traditional method of estimating illicit flows has already been rejected on the grounds that netting out illicit inflows from outflows seriously understates the adverse impact of illicit flows on poverty alleviation and economic development in

[5] Bhagwati (1974), Ndikumana and Boyce ((2008), and others have typically included trade mispricing as a conduit for the cross-border transfer of illicit capital.

developing countries. The following observations can be drawn based on estimates of illicit flows presented in Appendix Tables 6, 7A, 7B, and 7C:

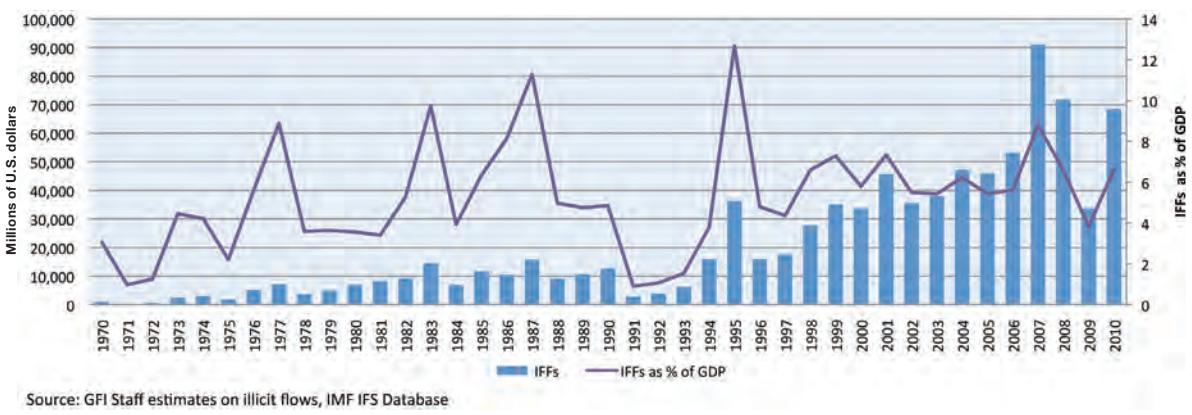
1. The 1985 World Development Report noted that "In absolute terms, no country has suffered more capital flight than Mexico."[6] Illicit flows from the country grew sharply from one billion dollars in 1970 to US$68.5 billion in 2010, or at about 10 percent per annum in current dollar terms. While Augmented Dickey-Fuller tests show that the series as a whole is non-stationary over this period, we observe that the behavior of illicit flows can be related to several economic crises that Mexico experienced during this period (see following section).
2. Cumulative illicit flows from Mexico over the 41-year period 1970-2010 amount to US$871.9 billion of which trade mispricing amounts to US$642.9 billion. For the period as a whole, it seems that trade mispricing is the preferred method of transferring illicit capital out of the country. The average per annum share of trade mispricing, measured by the Gross Excluding Reversals method (GER), stands at 73.7 percent while balance of payments leakages, measured by the Change in External Debt method (CED), account for 26.3 percent. In comparison, the Traditional method indicates that Mexico lost US$398.7 billion through net illicit outflows or about US$9.7 billion per year over the 41-year period.
3. Over the entire sample period, outflows of illicit capital from Mexico average about 5.2 percent of GDP per year. During 1970-1993, the 24-year period prior to NAFTA, illicit outflows averaged 4.5 percent of GDP while during the 17 years to 2010 that followed, such outflows increased to 6.3 percent of GDP. Outflows of illicit capital also increased in relation to external debt from 15.0 percent in 1970 to 28.7 percent in 2010, averaging 16.8 percent over the entire period. Although the progression was not smooth, outflows as a percent of external debt ratcheted upwards after NAFTA came into force in the beginning of 1994. As the discovery of oil in Mexico since the 1970s has boosted exports, illicit outflows as a share of exports have declined from 74.4 percent in 1970 to 23.0 percent in 2010.
4. Looking at the four decades, we find that illicit outflows per annum have increased sharply throughout the four decades. On average, they were US$3.0 billion in the 1970s, US$10.4 billion in the 1980s, US$17.4 billion in the 1990s, and US$49.6 billion in the 2000s. In terms of GDP, illicit flows have increased from 3.8 percent of GDP in the 1970s to 6.1 percent of GDP in the 1980s, a rising trend that reversed as a result of brisk economic growth in the 1990s to average 4.8 percent of GDP. However, in the last decade, as cross-border transfers of illicit capital outpaced economic growth, the ratio again climbed to an average of 6.1 percent per annum.
5. The pattern of illicit transfers has changed over the years. While in the 1970s and 1980s, balance of payments leakages and trade mispricing were roughly in balance, in the 1990s and 2000s, trade mispricing accounted for the bulk of illicit transfers (approximately 80 percent). The shift in the preferred method of transmitting illicit capital points to the ease with which such capital can be sent abroad through trade mispricing. The latter periods broadly coincide with NAFTA coming into effect in 1994. This raises the question whether expanding trade under NAFTA facilitated

[6] See, World Development Report, World Bank, 1985, page 64.

trade mispricing. In fact, we can see that illicit flows could not keep pace in relation to Mexico's surging exports led by oil.

Chart 1. Illicit Financial Flows and IFFs as Percent of GDP: 1970-2010

Millions of U.S. dollars or in percent



(iv) Illicit financial flows and Mexican economic crises

We now examine the behavior of illicit flows in the years immediately preceding, during, and after the various economic crises that have hit Mexico over the period of the study (1970-2010). The objective of this before-after analysis is to discern whether and how cross-border transfers of illicit capital lead and lag major Mexican economic crisis.

(a) 1973: The first oil price shock

The data (Table 2) show that the Mexican economy grew at slightly over 6.5 percent per annum during the first half of the 1970s in spite of the first oil shock which hit oil importing countries such as Mexico in October 1973, when members of the Organization of Petroleum Exporting Countries (plus Egypt, Syria and Tunisia) proclaimed an oil embargo. As a result of the sharp increase in oil and other commodity prices and rapid expansion in public spending, inflation climbed to double-digit levels in 1973, accelerating further to more than 20 percent in 1974. As the fiscal deficit soared, high rates of inflation compelled banks to actually pay negative real rates of return on deposits which led to considerable financial disintermediation. The first oil price shock adversely impacted Mexico's terms of trade because the country was a net importer of oil when international oil prices increased sharply. The deterioration of the terms of trade, higher foreign interest rates and global recession largely explained the country's widening current account deficit. Eventually, the resulting macroeconomic imbalances combined with illegal land seizures by peasants undermined investor confidence and led to significant capital flight, as investors anticipated that the government would need to take corrective policy measures. Illicit financial flows conservatively estimated at around 1-1.3 percent of GDP in the two years prior to the first oil shock jumped up to 4.4 percent of GDP in 1973 before easing slightly to 4.2 percent in the following year.

(b) 1976: The balance of payments crisis

The current account deficit progressively widened during the first half of the 1970s (Table 2) in spite of the increase in import controls and higher tariffs. The resulting balance of payments disequilibrium became unmanageable leading to widely expected exchange rate depreciation and intensification of illicit financial outflows, which increased from just 2.2 percent of GDP in 1975—the year preceding the crisis—to 5.6 percent in 1976 and nearly 9.0 percent of GDP in the aftermath. The government was forced to devalue the peso by nearly 60 percent in August 1976 as economic growth slowed due to a contraction in real wages and private investment. The country turned to the IMF and an Extended Fund Facility (EFF) was signed later that year.

Coming out of the economic crisis of 1976, the discovery of vast oil resources in 1977/78 sharply improved Mexico's economic fortunes. Proven oil reserves increased from 6.3 billion barrels in November 1976 to 16 billion barrels by the end of 1977 to 40 billion barrels by the end of the next year. As a result, the trade deficit came under better control and the government was able to negotiate better terms on its foreign debt. Some aspects of the tax system underwent significant reform in the late 1970s and income inequality was reduced. Real GDP expanded by 9 percent in the late 1970s and poverty rates declined as a result. So the loss of macroeconomic stability under the Álvarez administration had much to do with populist policies that attempted redistribution of income while pursuing protectionist trade policies. The loss of confidence leading up to the balance of payments crisis is reflected in illicit outflows which increased from just 2.2 percent of GDP in 1975 prior to the crisis to 5.6 percent in 1976 and accelerated to 8.9 percent one year after the crisis.

(c) 1982: The external debt crisis

The discovery of large oil reserves in the late 1970s turned out to be a mixed blessing. While policymakers reduced the fiscal deficit substantially during the first year under the EFF, stabilization efforts were relaxed in 1977 when proven oil reserves encouraged the government to expand public expenditures. The public sector borrowing requirement (PSBR) jumped sharply during 1978-82 as the large surpluses of the state-owned petroleum company (PEMEX) failed to keep pace with increasing government outlays. The public sector deficit as a ratio of GDP tripled over this period and, while the central bank essentially monetized the deficits in 1978, the deficits were mainly financed through foreign loans over the period 1979-1981. The racking up of external debt to finance the deficits in the latter period did not prevent inflation which averaged 27 percent during 1980-1981. In fact, the rate of growth of external debt exceeded the interest rate during this period, a condition which, according to Rojas-Suárez (1992) and Blanchard (1990), does not allow a government to remain solvent with respect to its foreign obligations.

The private sector saw that the inflows of foreign loans to finance the fiscal deficits were not sustainable in the long run, which led to expectations of exchange rate devaluation. Hence, the crawling peg exchange regime, whereby the peso was allowed to fluctuate around narrow bands and later through frequent and small depreciations, came under increasing pressure and had to be

abandoned. As the exchange rate regime became inconsistent with an expansionary fiscal policy, the premium in the forward market edged up continuously during the period 1978-81. Investors' perceptions of incurring large losses in holding domestic relative to foreign assets increased sharply leading to both licit and illicit financial outflows. The resulting capital outflows exerted substantial pressure on the stock of international reserves which policymakers sought to ameliorate through significant devaluations of the peso. But as outflows of licit and illicit capital intensified, they called into question Mexico's capacity to repay external creditors, and its access to capital markets was sharply restricted. Further devaluation of the Mexican peso led to the creation of a dual exchange rate regime and a haphazard attempt to curb capital flight through a freeze on U.S. dollar-denominated domestic deposits.

Table 2. Mexico: Illicit Financial Flows and Macroeconomic Crisis
In percent or millions of U.S. dollars, unless otherwise specified

Crisis & lead and lag years	Nature of period	Illicit Financial Flows				Current Account Balance	Fiscal Balance	Real GDP growth rate	Inflation - CPI	External Debt to GDP Ratio	Exchange Rate 1/
		Normalized	Non - normalized	Traditional	IFF/GDP-Non-norm.						
1971	Lead year 2	367.2	367.2	-681.1	1.0	-855.7	-368.23	4.2	5.3	19.9	0.013
1972	Lead year 1	546.4	546.4	-362.5	1.3	-927.0	-697.69	8.5	5.0	18.9	0.013
1973	Oil price shock	2,365.1	2,365.1	1,331.9	4.4	-1,348.1	-1,423.85	8.4	12.0	19.8	0.013
1974	Lead year 2	2,920.6	2,920.6	988.0	4.2	-2,873.4	-2,200.77	6.1	23.7	20.2	0.013
1975	Lead year 1	1,868.5	1,868.5	546.0	2.2	-4,176.0	-2,170.00	5.7	15.2	21.5	0.013
1976	BOP crisis/IMF	5,125.2	5,125.2	3,192.7	5.6	-3,444.0	-2,868.67	4.4	15.8	35.0	0.015
1977	Lag year 1	7,142.2	7,142.2	4,399.1	8.9	-1,856.0	-1,947.83	3.4	29.0	38.8	0.023
1978	Lag year 2	3,646.6	3,646.6	1,661.6	3.6	-2,889.0	-1,943.91	9.0	17.5	35.1	0.023
1980	Lead year 2	5,587.8	6,917.4	3,962.5	3.6	-10,422.0	-3,270.0	9.5	26.4	29.5	0.023
1981	Lead year 1	6,401.3	8,353.3	3,347.2	3.4	-16,240.0	-11,516.0	8.5	27.9	33.1	0.025
1982	Debt crisis	7,231.7	9,198.2	4,364.6	5.3	-5,889.0	-23,382.1	-0.5	58.9	84.6	0.056
1983	Lag year 1	14,520.5	14,520.5	9,927.2	9.7	5,866.0	-10,387.5	-3.5	101.8	74.9	0.120
1984	Lag year 2	4,190.6	6,871.7	2,450.1	3.9	4,183.0	-11,744.0	3.4	65.5	62.2	0.168
1985	Lead year 1	11,630.2	11,630.2	4,227.3	6.3	800.0	-15,422.6	2.2	57.7	76.4	0.257
1986	Oil price shock	10,475.0	10,475.0	3,848.6	8.1	-1,377.0	-16,594.8	-3.1	86.2	118.3	0.612
1987	Lag year 1	15,826.7	15,826.7	10,170.1	11.3	4,247.0	-18,881.7	1.7	131.8	125.2	1.378
1988	Lag year 2	9,107.8	9,107.8	-3,660.8	5.0	-2,374.0	-17,508.6	1.3	114.2	54.4	2.273
1992	Lead year 2	0.0	3,871.9	-23,921.0	1.1	-24,442.0	3,556.4	3.6	15.5	31.1	3.095
1993	Lead year 1	6,182.4	6,182.4	-6,581.6	1.5	-23,400.0	943.8	2.5	9.8	32.3	3.116
1994	Peso crisis/NAFTA	15,941.7	15,941.7	8,845.0	3.8	-29,662.1	-8.9	4.8	7.0	51.9	3.375
1995	Lag year 1	36,291.9	36,291.9	29,109.1	12.7	-1,576.4	-1,766.8	-6.2	35.0	68.8	6.419
1996	Lag year 2	15,948.7	15,948.7	-36.2	4.8	-2,507.7	-440.1	5.5	34.4	48.6	7.599
2005	Lead year 2	43,631.1	45,999.5	25,479.4	5.4	-5,079.7	-9,240.7	3.2	4.0	19.6	10.898
2006	Lead year 1	47,560.6	53,210.5	31,084.5	5.6	-4,487.4	-16,575.7	5.2	3.6	17.1	10.899
2007	Global econ. crisis	90,994.8	90,994.8	59,778.7	8.8	-8,850.7	-19,989.0	3.2	4.0	18.5	10.928
2008	Lead year 1	59,938.1	71,881.4	51,449.8	6.6	-16,339.3	-17,297.8	1.2	5.1	22.7	11.130
2009	Lead year 2	33,645.8	33,645.8	21,299.7	3.8	-6,351.8	-19,234.5	-6.2	5.3	21.2	13.514

Source: International Financial Statistics, IMF; Global Development Finance, World Bank; and GFI staff estimates on illicit flows.

1/ Mexican pesos per U.S. dollar. On January 1, 1993, the Bank of Mexico introduced the new peso equivalent to 1,000 old pesos. On January 1, 1996, the word "new" was dropped from references to the currency.

Even as the risks associated with holding domestic assets increased, the Mexican economy was hit by two major external shocks during the 1980s. The first shock was the international debt crisis that started in 1982 with the sharp rise in U.S. interest rates and contraction of the U.S. economy.

External debt shot up from 29.5 percent of GDP in 1980, two years before the debt crisis, to 84.6 percent in 1982 before easing to 62.2 percent two years after the crisis. But the need to tackle the balance of payments crisis and the widening fiscal deficits compelled the Miguel de la Madrid administration to adopt an orthodox stabilization program in December 1982, which prevailed until mid-1985. The strategy slashed the trade and current account deficits but failed to stabilize prices. Annual rates of inflation which had reached three-digit levels in 1983 remained very high as Mexico drifted into the second oil shock in 1986.

While the size and speed of external adjustments to the debt crisis by Mexico was exceptional in Latin America, there were some worrying fragilities. For one, the country's external adjustment policies did not lay the foundation for solid export-led growth on a sustained basis. Second, the systemic failure to meet inflation targets fueled inflationary expectations that became harder to dislodge, thereby driving licit and illicit financial outflows. Empirical tests with the dynamic simulation model confirm that inflation was a significant driver of illicit flows from Mexico.

Finally, because Mexico failed to develop and deepen domestic financial markets in the 1970s, when world interest rates increased in the early 1980s and capital inflows dried up, it could not finance its budget deficits through domestic bond financing. The central bank had to resort to inflationary finance and to the extent that financing relied on domestic capital markets, the move crowded out the private sector. The root problem was that public spending even outpaced the rapid growth in oil revenues. As a result, between 1970 and 1982, public and publicly guaranteed external debt increased by 1,400 percent to US$59 billion.

The World Bank estimated that between 1979 and 1982, cumulative capital flight from Mexico amounted to a massive US$26.5 billion or nearly 48 percent of recorded gross capital inflows.[7] It concluded that effectively, much of the money Mexico borrowed from abroad left the country through capital flight which did not allow the country to earn a return to pay back external creditors. Hence, the higher level of external borrowing was a disaster that was brewing steadily. The Bank points out that "no country has suffered more from capital flight than Mexico". The surge of official borrowing in 1980-81 helped to support the exchange rate for a short while, but the country suffered "waves of capital flight." In August 1982, Mexico was forced to suspend debt service payments, reschedule its debt, and devalue heavily.

(d) 1986: The second oil price shock

The external debt crisis in 1982 was followed by a second oil price shock in 1986 which led to a dramatic deterioration in the Mexican terms of trade. In the wake of the 1982 crisis, the Portillo administration adopted import and exchange controls as well as nationalization of the banking sector. By late 1982, the new Miguel de la Madrid administration slashed government spending

[7] Reference, World Development Report 1985, World Bank, Table 4.4, pg. 64. According to our estimates, the corresponding loss of capital over this period was US$29.4 billion.

drastically and implemented policies to expand exports. However, the economy continued to stagnate actually entering recession under the brunt of the second oil shock in 1986, then recovering anemically at an average growth rate of just 1.5 percent per annum over the next two years as a result of negative terms of trade, high domestic interest rates and the external debt overhang. As inflation accelerated from 57.7 percent in 1985 to 86.2 percent in 1986 and well over 100 percent the following two years and the fiscal position continued to deteriorate, the resulting macroeconomic instability drove larger illicit outflows which increased from 6.3 percent of GDP one year before the shock to 11.3 percent in the year following.

(e) 1994: The Tequila Crisis

The so-called Tequila crisis in 1994 is also known as the Peso or currency crisis which was brought on by foreign investors and wealthy Mexicans abruptly dumping dollar-denominated Mexican bonds and moving their money to safer U.S. assets. While the immediate cause of the Tequila crisis was the large devaluation of the Mexican peso in 1994 leading to a loss of confidence in Mexican domestic assets, the devaluation itself was triggered by large current account deficits in the years leading up to the crisis. It was the unsustainable current account deficits, driven by excessive bank credits of poor quality, that compelled the government to devalue the currency. The crisis towards the end of 1994 led to massive outflows of illicit capital which increased from 3.8 percent of GDP in 1994 to 12.7 percent in 1995 before falling to 4.8 percent the next year. The accumulation of foreign debt and debt servicing became unsustainable, pushing the Mexican government close to default in the run-up to the crisis. The Mexican government sought financial assistance from the IMF; the program was designed to help support Mexican policy reform in order to avoid contagion effects on the United States economy.

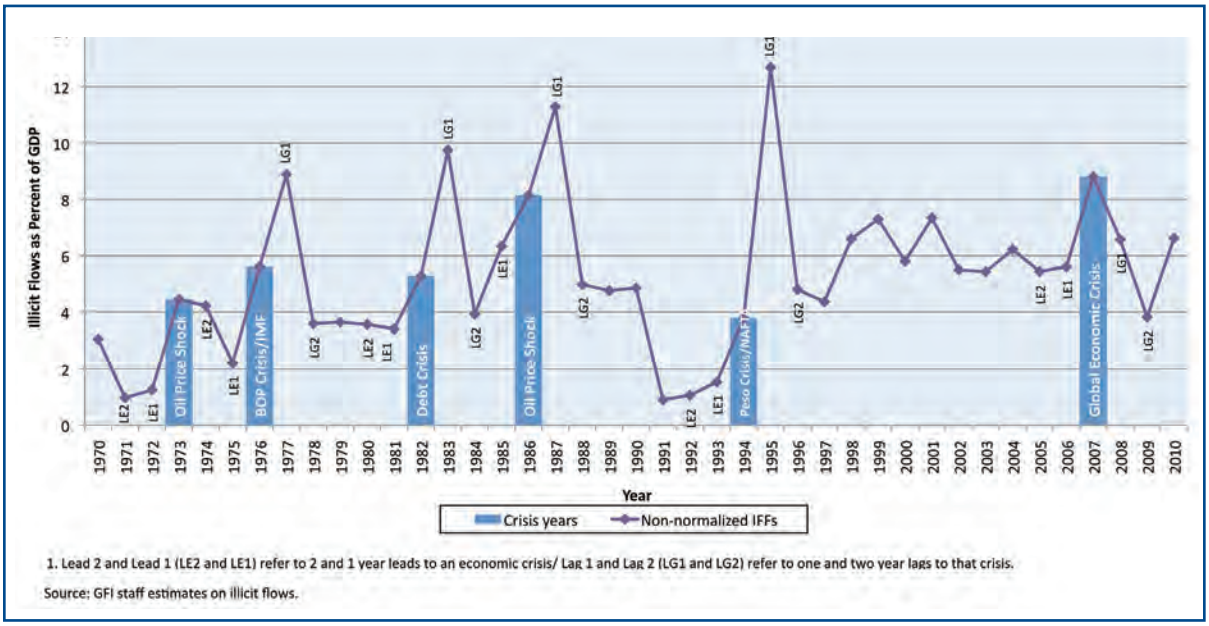
(f) 2007: The Global Economic Crisis

The global economic crisis which began in the United States in late 2007 resulted in one of the sharpest economic contractions in Mexico; real GDP growth rate slowed from 3.2 percent in 2007 to 1.2 percent in 2008 before contracting by 6.2 percent in 2009. The main reason why Mexico was so severely affected by the global economic crisis is due to the close capital, trade, and labor market links with the United States. As the United States entered the financial crisis and subsequent recession, Mexican exports declined significantly in spite of the fact that the peso depreciated by nearly 25 percent in the two years since following the beginning of the crisis in 2007. In fact, Mexico's strong economic links to the United States after implementation of NAFTA have increased the contagion effects of the United States on the Mexican economy. For instance, the United States is Mexico's largest source of foreign direct investment. The global economic crisis also led to a sharp slowdown in foreign direct investments bringing about a further contraction in economic activity.

According to Banco de México, inward remittances, which are the second highest source of foreign currency after oil, fell by 16.0 percent in 2009 to US$21.2 billion due mainly to the global financial crisis and the slowdown in the U.S. economy. The decline in remittances to Mexico is significantly greater than those to other countries in Latin America or the Caribbean.

In spite of declining exports and remittances, imports into Mexico remained buoyant. As a result, the current account deficit widened in 2007 at the onset of the crisis and nearly doubled to US$16.3 billion in 2008 before falling to US$6.4 billion the next year. A saving grace of the current economic crisis is that due to reduced trade volumes and a lower source of funds relative to use of funds, illicit flows have also declined from 8.8 percent of GDP in 2007 to 3.8 percent of GDP in 2009. However, in 2010, as a result of higher oil prices, new loans, and inflows of foreign direct investments, the source of funds increased relative to use of funds leading to an increase in illicit outflows from the country to 6.6 percent of GDP.

Chart 2. Illicit Financial Flows Two Years Before and After Economic Crisis 1/ 1970-2010
In percent of GDP



1. Lead 2 and Lead 1 (LE2 and LE1) refer to 2 and 1 year leads to an economic crisis/ Lag 1 and Lag 2 (LG1 and LG2) refer to one and two year lags to that crisis.

Source: GFI staff estimates on illicit flows.

It is possible to make the following observations based on how illicit financial flows behave before and after the economic crises that Mexico has experienced.

First, estimates of gross illicit outflows perform much better compared to the usual estimates of capital flight using the Traditional method of netting out illicit inflows from outflows. For instance, large net illicit inflows over two years prior to the Tequila crisis of 1994 are difficult to interpret in relation to the crisis.

Second, both conservative (normalized) and robust (non-normalized) estimates of illicit outflows are predictably linked to Mexico's macroeconomic crises. With reference to the six crises studied, illicit outflows have all increased in the crisis year relative to the average of the two years preceding the crisis. Outflows always seem to increase over the year immediately preceding the crisis. In the case of the second oil price shock in 1986 and the Tequila or peso crisis in 1994, illicit outflows accelerated over two years going into the crisis. Except for the first oil shock in 1973 and the onset of global economic crisis in late 2007, outflows of illicit capital from Mexico continued to increase

one year past the crises. In fact, the increase in illicit outflows one year following the peso crisis was the highest among all crises that hit Mexico during the period 1970-2009.

Third, illicit outflows tend to fall below crisis levels at varying speeds. Following the first oil crisis and global economic crisis, illicit flows from Mexico fell below crisis levels in the year following the crisis. But it took two years for illicit flows to fall below crises levels in the case of the 1976 balance of payments crisis, the 1982 debt crisis, or the second oil price shock in 1986. The peso crisis had a strong impact on illicit flows. While illicit flows have shown large fluctuations since the peso crisis, the troughs still exceed the peak reached during the peso crisis. The 1976 balance of payments crisis, the 1982 debt crisis, and the second oil price shock in 1986 were all preceded by a real exchange rate overvaluation (leading to a depreciation of the peso) and increases in the budget deficit. Cardoso and Levy (1991) argue that these macroeconomic imbalances led to widely anticipated exchange rate depreciation inducing capital flight and further instability.

(v) The underground economy and illicit financial flows under pegged exchange rates

Apart from macroeconomic crises, cross-border transfers of illicit capital can also be triggered by interactions between the underground economy and the black and official markets for foreign exchange. The example cited here and the underlying assumptions can be better related to the economic conditions that prevailed in Mexico in the pre-NAFTA (1970-1993) period than in the post-NAFTA period of economic liberalization and reform.

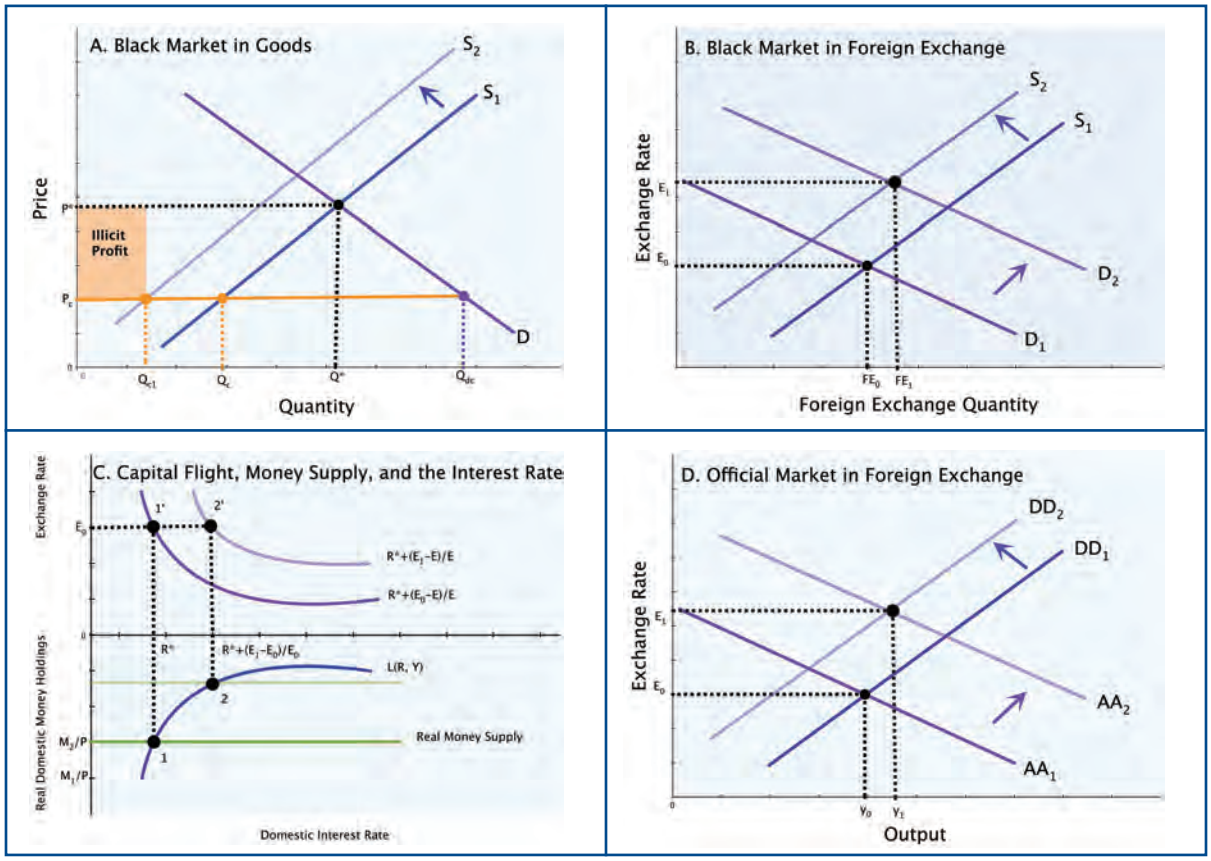
Controlled prices for certain goods can drive the underground economy, and illicit funds generated domestically can impact the foreign exchange market and lead to capital flight when black marketers transfer these funds abroad. Consider how controlled prices for certain essential consumer goods for the poor (e.g., rice) can generate illicit profits in the underground economy and how illegal transactions in the black market for foreign exchange can generate widely anticipated devaluation which can compel the government to devalue the currency under a pegged exchange rate regime.

Suppose the government controls the price $\mathbf{P_c}$ of rice for the low-income group (Chart 3A). The quantity supplied at the controlled price is $\mathbf{Q_c}$ which is far less than the quantity demanded **Q*** at the free-market price **P*** where demand and supply is in equilibrium. Now suppose a black marketer is able to capture a portion of the supply $\mathbf{Q_{c1}}$ (before the rice is released into the market as often happens when black marketers have inside connections) at the controlled price $\mathbf{P_c}$ at a total cost of $\mathbf{P_c x Q_{c1}}$ which he then sells at the free market price **P*** for a total revenue of $\mathbf{P^* x Q_{c1}}$. The fixed supply at the controlled price reduces to $\mathbf{Q_c - Q_{c1}}$ as the supply curve shifts left from $\mathbf{S_1}$ **to** $\mathbf{S_2}$. The black marketer makes a profit of $\mathbf{P^* x Q_{c1} - P_c x Q_{c1} = Q_{c1}(P^* - P_c)}$ represented by the shaded area in Chart 3A. The more black marketers are able to capture the market at the controlled price, the less is rice available to the intended lower income group at that price. The extent of black market

activity (involving buying items at the official or controlled price and selling them in the open market) determines the volume of illegal profits that are either channeled into the domestic underground economy or transferred abroad as illicit financial flows.

There are two reasons why the black marketer must use the black market for foreign exchange (say U.S. dollars) in order to transfer the proceeds abroad (Chart 3B). First, the profit he earned by buying rice at the controlled price and selling the consignment in the free market is illegal and therefore he cannot document its source in the official market. Second, the illegal profit in pesos is likely to exceed the equivalent exchange-restricted amount of dollars he could buy. The transfer of huge illegal profits by many black marketers through the domestic black market for foreign exchange shifts the demand curve to the right to $\mathbf{D_2}$, and the exchange rate in the black market increases in terms of dollars—that is, there is a devaluation of the peso vis-à-vis the dollar (Chart 3B). The extent to which the increase in demand devalues the exchange rate in the black market depends upon the elasticity of supply of foreign exchange in that market. As the spread between the black market and the official exchange rate increases, this generates expectations of devaluation in the official rate (the "news" spillover effect). Let us now consider what happens when the widely anticipated devaluation gets translated into actual devaluation in the official market.

Chart 3. Underground Economy and Illicit Financial Flows under Pegged Exchange Rates



[8] Chart 3C is used in International Economics: Theory and Policy, Paul Krugman and Maurice Obstfeld, Eighth Edition, 2008, Addison Wesley, Publisher.

In Chart 3C, we see how the central bank maintains stability in the foreign exchange market under a pegged exchange rate regime.[8] The foreign exchange market will be in equilibrium when the interest parity holds, that is, when the domestic interest rate equals the foreign interest rate **R*** plus the expected rate of depreciation of the domestic currency against the foreign currency (in this case U.S. dollars). Chart (3C) shows asset market equilibrium in points **1** and **1'** in the money market and the foreign exchange market respectively with the money supply at $\mathbf{M_1}$ that is consistent with this initial equilibrium. The expected devaluation (to a higher rate $\mathbf{E_1}$) brought about by increasing spread between the official and black market for foreign exchange brings about a rightward shift in the curve that measures the expected domestic currency return on foreign currency assets. Since the current exchange rate is still at $\mathbf{E_0}$, Krugman (2008) shows that equilibrium in the foreign exchange market (point **2'**) requires a rise in the domestic interest rate to $\mathbf{R^* + (E_1 - E_0)/E_0}$ which is the expected domestic currency return on foreign assets. It is this differential that causes an excess demand for foreign currency assets in the foreign exchange market so that the central bank has to sell foreign reserves and reduce the money supply in order to hold the exchange rate at $\mathbf{E_0}$. This is how loss of central bank reserves or capital flight follows a widely anticipated devaluation that has its origins in the underground economy, with expectations spilling over into the official foreign exchange market and driving licit as well as illicit flows from the country.

We now combine two asset markets—the foreign exchange market and the money market which together determine asset market equilibrium—using the standard **AA-DD** framework (Chart 3D). This will allow an assessment of the longer-run impact of a change in the exchange rate under a pegged exchange rate system. The **AA**-curve represents a schedule of exchange rate and GNP combinations that maintain asset market equilibrium. Actually two markets, the money market and the foreign exchange market, together are referred to as the asset market. Hence, points on the **AA** curve represent equilibrium exchange rates for every output (GNP) point of the economy. The **DD** schedule on the other hand represents aggregate demand with taxes and government expenditures as parameters so that fiscal policy determines its position. An expansionary fiscal policy, such as a cut in tax rates, increase in government expenditures, or a combination thereof would shift the **DD** curve to the left and the exchange rate would depreciate. From an asset market perspective, the **DD** schedule in Chart 3D analyzes the relationship between output and the nominal exchange rate in the goods market whereas the **AA** schedule analyzes the relationship between output Y and the nominal exchange rate in the asset market and the two determine equilibrium in output and the exchange rate in the short run. Ceteris paribus, the devaluation stimulates net demand for goods and shifts the **AA** curve to the right. This is because as the exchange rate goes up, so does expenditure because of the favorable impact on exports. At the same time, the devaluation is assumed to increase the domestic price level at a rate proportional to the pass-through effect in an open economy. Actually, the price level only adjusts gradually in the long run because most prices are sticky. Typically, in the longer run, the price level increases following the

[8]Chart 3C is used in International Economics: Theory and Policy, Paul Krugman and Maurice Obstfeld, Eighth Edition, 2008, Addison Wesley, Publisher.

devaluation; to be effective, monetary policy cannot accommodate the higher demand for money. However, if monetary policy is accommodative leading to an expansion of the money supply, then a further depreciation of the long-run nominal exchange rate comes to be widely anticipated. Such expectations could unleash a new wave of capital flight as domestic interest rates decline relative to foreign rates and foreign investors' confidence in domestic assets deteriorate.

The devaluation of the Mexican peso in August 1976 was the first break in the pegged exchange rate system in 22 years. While the Mexican peso and the U.S. dollar were viewed as close substitutes in the border towns and tourist areas, the effect of the large devaluation was to increase the perceived risk of holding pesos. Given the uncertainty with regard to the exchange regime and the stability of the rate itself, the tourist industry and the border towns shifted from a dual peso/dollar currency system to one predominantly denominated in dollars. It appears that the real demand for pesos fell even more than the real supply following the devaluation, and massive capital flight (involving both licit and illicit capital) followed.

III. Dynamic Simulation Model of Macroeconomic Imbalances, Illicit Flows, and the Underground Economy

In this section, we develop a macroeconomic model which seeks to capture several complex interactions within and between the official and the underground economies. Within the official economy the model captures how government expenditures and revenues interact to impact the money supply and thereby the overall price level and how some of these variables determine the total taxes collected. Illicit financial flows provide several channels through which the official and underground economies are linked. Thus, illicit flows not only determine the behavior of government expenditures and revenues, they are used to explain the evolution of the underground economy in Mexico. In fact, the model posits that illicit flows are both driving, and driven by, the underground economy. These complex interactions between macroeconomic imbalances, illicit flows, and the underground economy are represented in the following schematic diagram (Chart 4). The chart shows the recorded and unrecorded endogenous variables and the recorded exogenous variables that seek to explain the endogenous variables. In the interest of brevity and to avoid rendering the interactions too complicated, lagged variables, which are exogenous, are excluded. Note that the chart clearly depicts the dynamic interactions between the underground economy and illicit financial flows.

The complete model represented below will be developed and tested equation by equation using the two-stage least squares method.

$$\log R_t = -a_0 + a_1 \log GDP_t + a_2 \log P_t + a_3 \log \psi_t$$

$$\log G_t = b_0 + b_1 \log Y_t + b_2 \log P_t + b_3 \log \psi_t t$$

$$\log M_t = k_0 + k_1 \log mult + k_2 \log G_t - k_2 \log R_t + k_3 \log E_t$$

$$\log P_t = -c_0 + c_0 \log Y_t + c_2 \pi_t - c_3 \log \left(\frac{M}{P}\right)_{t-1} + c_4 \log M_t$$

$$\log TTax_t = d_0 + d_1 \log(\dot{Y})_t, + d_2 \log TTaxrate_t + d_3 \log P_t \pm d_4 \log \psi_t$$

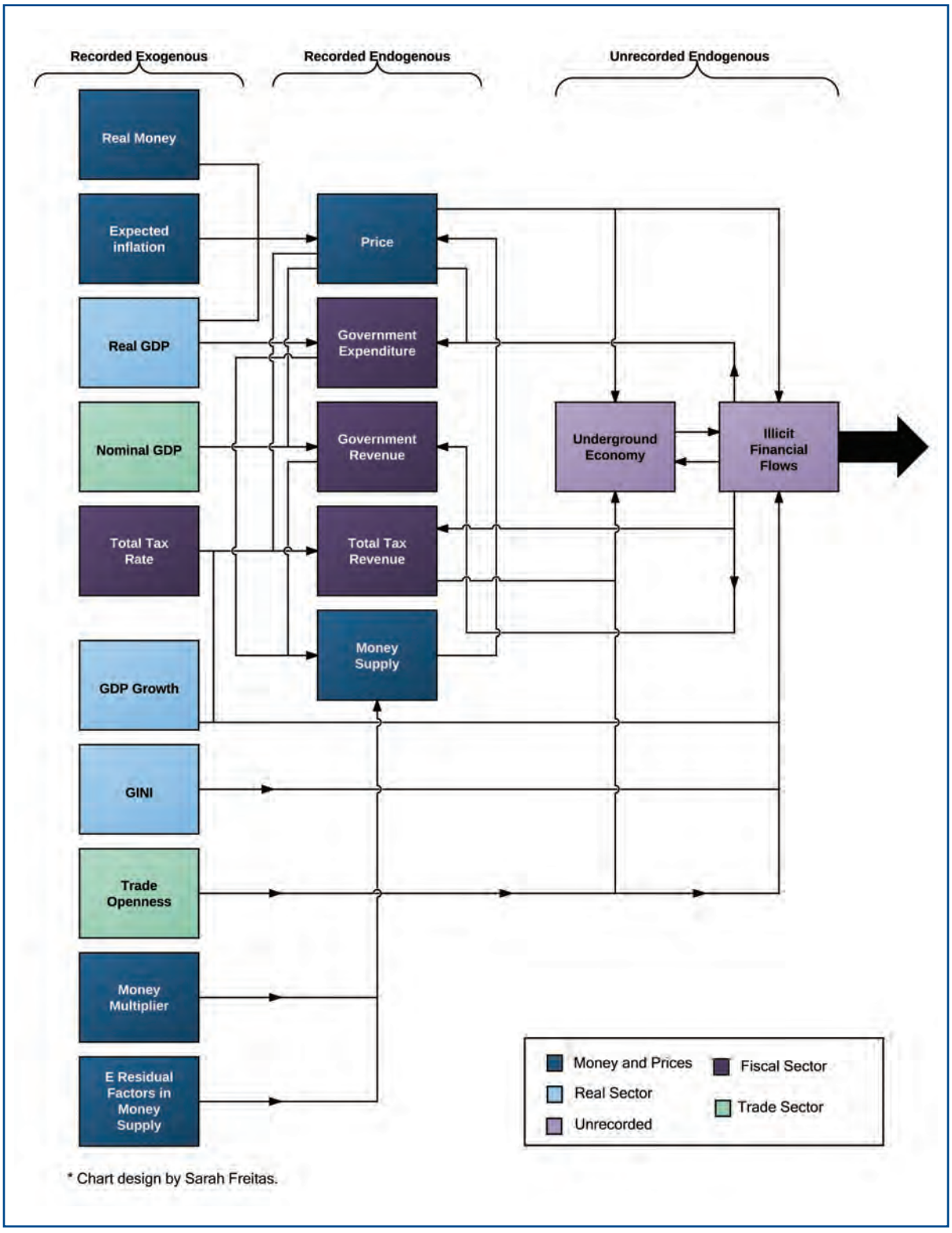
$$\pi_t = \delta \Delta \log P_t + (1-\delta)\pi_{t-1}$$

$$\log U_t = e_0 + e_1 \log P_t + e_2 \log \psi_t - e_3 \log TTax_t + e_4 \log U_{t-1} + e_5 \log TO_t$$

$$\log \psi_t = w_0 + w_1 \log P_t + w_2 \log U_t + w_3 GINI_t + w_4 \log \dot{Y}_t, + w_4 \log TO_t$$

The variables used in the above model are R_t, total central government revenues, G_t total central government expenditures, M_t the money supply (M2), $mult_t$ the money multiplier, E_t the residual factors that influence the money supply, P_t the consumer price index, $\dot{Y}_t$ the growth rate of the economy, GDP_t and Y_t are nominal and real income, ψ_t represents illicit financial flows (estimated through the CED-GER method), π_t is the expected rate of inflation generated by the adaptive

Chart 4. Mexico: A Schematic Representation of Interacting Drivers of Illicit Financial Flows



expectations model, $TTax_t$ are total taxes collected (i.e., does not include non-tax revenues of the central government), $TTaxrate_t$ is the rate of taxation defined as total taxes as a ratio of nominal GDP_t, $GINI_t$ is a measure of income inequality, and TO_t is the ratio of exports and imports to nominal GDP_t which is a proxy for trade openness.[9]

Estimating the system of equations

Two-stage least squares (2SLS) method of estimating the system of equations was chosen because (i) ordinary least squares (OLS) results in inconsistent estimates of the coefficients of a dynamic simulation model where the explanatory variables in one equation are themselves determined by another equation of the system, and (ii) the advantage of using three-stage least squares over the two-stage method is not unambiguous when the sample size is small. Individual equations were first tested for autocorrelation using OLS estimation. The Durbin-Watson (DW) test, strictly applicable for the equations for money supply, government expenditures, government revenues, total taxes collected, and illicit flows, is not applicable for equations containing a lagged dependent variable (prices and the underground economy).

Government Revenues

Total government revenues consist of direct taxes, indirect taxes, and non-tax revenue of the government. As consolidated data on general government revenues and expenditures are not available, fiscal sector operations are limited to the central government. As total government revenues as well as total direct taxes are modeled as endogenous variables, the non-tax revenues of the central government are also implicitly endogenous as a residual (though they are not considered explicitly by the model).

Total government revenue is modeled as a log-linear equation in nominal output, prices, and the volume of unrecorded transfers of capital, that is:

$$\log R_t = -a_0 + a_1 \log GDP_t + a_2 \log P_t + a_3 \log \psi_t$$

The results (Table 3) confirm that government revenues are linked significantly and positively to nominal income, while price increases tend to lower them to a small extent (but not significantly). While outflows of illicit capital, to the extent that they include tax evasion, decrease government revenues, the results presented in Table 3 show that they tend to increase revenues, suggesting that the government seeks to make up the lost revenues by raising collection from those that pay. However, the link between illicit outflows and revenues although positive, is not strong or statistically significant.

[9] Specifically, E is defined to exclude negative numbers. It is equal to (G/R-Reserve Money), so that deficits are represented by a ratio greater than 1, and negatives by a ratio less than 1.

Government Expenditures

The behavioral equation for government expenditures postulates that the government strives to maintain the real value of budgetary outlays in the face of inflation partly to counteract unintended fiscal contraction and partly to meet long-term contractual obligations in government sponsored projects. In ordinary least squares regression, we found no evidence that actual real expenditures in the current period adjust to those in the previous period and hence we impose no such adjustment between actual and desired real expenditures. Once again, illicit flows are postulated to influence government expenditures in that one would expect the government to make up for the loss of capital through higher expenditures.

The results confirm that government expenditures are related positively and significantly to prices. Illicit financial flows from the country have the effect of raising government expenditures as the government seems to offset the loss of capital through fiscal expansion. Note that while illicit flows also tend to raise government revenues, such outflows increase expenditures much more than revenues—the IFF coefficient in the expenditure equation is larger, and more significant, than in the revenue equation (see Table 3). This implies that in the case of Mexico, illicit flows are positively correlated with fiscal deficits.

The Money Supply Process

Aghevli and Khan (1978, or AK) model the money supply process by defining it as a product of the money multiplier and the monetary base:

$$M_t = m_t B_t$$

Changes in the monetary base are influenced by government budgetary operations, changes in unencumbered international reserves, and changes in central bank claims on the private and public sectors, subsumed in E_t. Hence:

$$M_t = m_t(G_t - R_t + E_t)$$

This is a non-linear function which when linearized using a computer program yields:

$$logM_t = k_0 + k_1 log\ mult + k_2 log\ G_t - k_2 log\ R_t + k_3 log E_t$$

The residual (E_t) captures all deviations between government fiscal operations and reserve money. Moreover, it is negative when government expenditures exceed revenues plus high-powered money or monetary base. In order to avoid the problem of negative logarithms, we convert the residual into a ratio of expenditures over revenues plus monetary base. The results of the 2SLS estimation shown below indicate that the money multiplier, government expenditures, government revenues, and the residual ratio are all significantly related to the money supply and have the correct sign. Moreover, the results strongly suggest that government fiscal operations, that is nominal expenditures and

revenues, have the expected signs and are highly significant. An increase in the fiscal deficit (expenditures have a larger positive coefficient than revenues which lower the money supply) results in a change in the stock of high-powered money to the extent that deficits are financed through central bank credits or drawing down cash balances held at the central bank. Essentially, the residual item E_t reflects an impact on the money supply through a (i) change in international reserves, (ii) change in central bank claims on the public and private sectors (domestic credit), and (iii) the one-period lagged impact of high-powered money. Estimates presented in Table 3 corroborate that the net impact of these residual drivers on the money supply was also positive and significant.

It should be pointed out that the formulation of the money supply starts and ends with an identity so that there remain no other variables which can explain changes in the money supply. This was a criticism of the AK model which we noted in subsequent research at the IMF.[10]

We therefore propose an alternative money supply process based on the seminal research of Karl Brunner and Allan Meltzer (1963), while recognizing that the Brunner-Meltzer (BM) formulation reduces the endogenous impact of government fiscal operations within the model (in that government expenditures and revenues do not enter the money supply equation directly). The entire model is simulated using an alternative money supply process (reference results presented in Table 4 and whole model simulations presented in Chart 7).

Prices

The equation for prices is derived from the assumption that the current actual stock of real money balances adjusts proportionately to the difference between the demand for real money balances and the actual stock in the previous period. That is:

$$\Delta \log \left(\frac{M}{P}\right)_t = \gamma\left[\log \left(\frac{M}{P}\right)_t^D - \log\left(\left(\frac{M}{P}\right)_{t-1}\right)\right], \; 1 > \gamma > 0$$

where γ is the coefficient of adjustment. The demand for real money balances in a developing country like Mexico is postulated to be:

$$\Delta \log \left(\frac{M}{P}\right)_t = c_0 + c_1 \log Y_t - c_2 \pi_t, \qquad c_1, c_2 > 0$$

where π_t, the expected rate of inflation, serves as a proxy for the opportunity cost of holding money in an economy with underdeveloped financial markets. The demand for money is eliminated

[10] Reference, Government Deficits and Inflation in Brazil: The Experience During 1948-1964", Dev Kar, IMF Working Paper Series, WP/81, October 1981, International Monetary Fund, Washington DC.

by substitution and π_t, the expected rate of inflation, is linked to the current rate of inflation. This yields:

$$log\left(\frac{M}{P}\right)_t = \gamma c_0 + \gamma c_1 log Y_t - \gamma c_2 \pi_t + (1-\gamma)\, log\left(\frac{M}{P}\right)_{t-1}, \quad 1 > \gamma > 0$$

Solving for the price level obtains:

$$log\, P_t = -c_0 + c_0\, log\, Y_t + c_2 \pi_t - c_3\, log\left(\frac{M}{P}\right)_{t-1} + c_4\, log\, M_t$$

Both the AK and the BM formulations of the money supply process produce simulations that track the actual price level quite well. We can see that the simulated price level using the AK formulation (Chart 6) has lower deviations from the actual level compared to the BM specification (Chart 7). Still, in light of the large variance in the rates of inflation in Mexico over the various decades, both models perform very well in tracking actual price developments in spite of the occasional significant errors. The model is a test of the hypothesis that government expenditures adjust much faster to higher inflation (due to inflation clauses built into government contracts, adjustment of wages, etc.) while revenues tend to lag behind due to a propensity for economic agents to lower the real value of taxes owed. Higher rates of inflation also translate into higher rates of inflationary expectations, while higher real money balances in the previous period dampen price increases in the current period.

The specification of the inflationary process is of crucial significance because the price level enters directly as an endogenous variable in explaining government revenues, government expenditures, total direct taxes collected, the underground economy, and the cross-border transmission of illicit financial flows. Hence, errors in estimating the inflationary process in a dynamic simulation model can be easily compounded through successive iterations of the model. Particularly, if prices enter directly and endogenously in many equations, it is obvious that error terms also percolate throughout the model. If errors (i.e., the discrepancies between actual and simulated values) are large, the entire model can be rendered inherently unstable. However, the simulated versus actual values presented in Charts 6 and 7 show that the model is stable and that errors are within acceptable margins. That said, one can see that the model as a whole performs somewhat better under the AK (Table 3, Chart 6), rather than the BM formulation of the money supply (Table 4, Chart 7). This is because the deviations of the actual versus simulated values (akin to a goodness-of-fit test for the model as a whole) of the inflationary process, government expenditures, tax revenues collected, and the transmission of illicit financial flows are lower under the AK than the BM formulation of the money supply process. A valid criticism is that the AK formulation is not testing a process but rather that the errors due to linearization is small. In that sense, the BM formulation of the money supply process and resulting inflationary process is much more robust.

Total Taxes Collected

Total direct and indirect taxes collected is formulated as rising along with the rate of growth of economic output. Also, as the overall tax rate, defined as a ratio of total taxes collected to nominal GDP, rises the higher tax rate would be expected to increase total taxes collected, even if evasion may increase along with marginal tax rates. Moreover, as inflation tends to increase nominal incomes, it can be expected to lead to a rise in total taxes collected through the income effect. The impact of illicit financial flows can be negative or positive depending upon whether the government succeeds in raising total tax revenues from resident tax-paying entities in spite of illicit flows or whether tax evasion through illicit flows effectively outstrips attempts to raise total revenues. Hence, the following equation for total taxes was tested:

$$log\ TTax_t = d_0 + d_1 log(\dot{Y})_t, + d_2 log\ TTaxrate_t + d_3 log\ P_t \pm d_4 log\ \psi_t$$

Model results confirm that the tax rate (measured as total taxes collected as a ratio of GDP) is positive and significant in explaining total direct taxes collected, in spite of the tendency of tax evasion to rise with rising tax rates. Also, price increases cause nominal tax collections to rise as the coefficient is positive and significant with 95 percent confidence. In contrast, recall that the price level was insignificantly (and negatively) related to total government revenues (which include non-tax revenues). Tax collections were also found to rise significantly with growth in real income and this comes as no surprise. Finally, the impact of illicit financial flows on taxes collected, while positive, is small and insignificant. This is consistent with the coefficient of illicit flows in the government revenue equation.

Evolution of inflationary expectations

Inflationary expectations are formulated as a behavioral equation. The assumption here is that expectations are formed according to the adaptive, or error-learning, process. Thus, an increase in the actual rate of inflation gets transmitted into an increase in the anticipated rate of inflation. The relationship formulated along the lines proposed by Cagan (1956) is:

$$\Delta t = \delta[\Delta log\ P_t - \pi_{t-1}],\ or$$

$$\pi_t = \delta \Delta log P_t - (1-\delta)\pi_{t-1}$$

where δ is the weight assigned to current experience with regard to inflation.

The value of the coefficient of expectations (δ = 0.9) was determined in the process of maximizing the log-likelihood function of the price level equation using the ordinary least squares estimation

technique. This was found to be 0.9. The high weight assigned to the current period probably has to do with the volatility of the inflationary experience in Mexico, causing economic agents to rely less on their previous period's inflationary experience. Results of dynamic simulations presented in Tables 3 and 4 show that inflationary expectations, generated through the adaptive or error-learning process, gets translated into actual inflation in the current period (the coefficient of expected inflation is positive and significant in the equation for the price level).

Underground economy

The underground economy was estimated using the currency demand or monetary approach developed by Vito Tanzi (1980) and others. According to this approach, the underground economy is first estimated using a set of money demand equations with and without direct and indirect taxes. Essentially, there are three variants of the monetary approach, namely fixed ratio, currency-denomination, and currency-equation. The fixed ratio variant (e.g., C/D, MV/GNP, where C is currency in circulation, D is demand deposits, MV is money supply M times the transactions velocity of money V), assumes that the ratio does not vary over time. Rather, the underground economy tends to increase these ratios relative to an "equilibrium" period when there existed no illegal activities. The currency-denomination method is predicated on the fact that underground economic activities raise the demand for certain high-denomination notes. This has led to calls for withdrawing certain high-denomination notes from circulation in some countries. In this study, we adopt the third approach which consists of estimating a demand-for-currency equation in an economy with and without direct and indirect taxes. The underlying assumption here is that taxes of any kind provide fodder for underground economic activities, so that currency, which is difficult to trace, is the preferred method of settling such transactions (as opposed to bank transactions, electronic methods of payment, etc.). As there is no record of cash transactions, the use of currencies by parties to an illegal transaction makes it almost impossible for the authorities to implicate them.

Setting apart this study from other researchers, we introduce illicit financial flows as an additional variable within the money demand equations on the hypothesis that, ceteris paribus, such outflows increase the demand for money. The higher money demand as a result of taxes and illicit flows is then compared to money demand without tax burdens. The difference in money demand (the extra money going into the underground economy) is then multiplied by the velocity of circulation (assumed to remain unchanged between the underground and official economies) to yield the size of the underground economy, U_t.

Next, the estimated underground economy is modeled in terms of the endogenous variables (price level, illicit flows) and exogenous variables (total tax rate, lagged underground economy, and trade openness). The endogenously determined underground economy would then feed into an equation representing the cross-border transmission of illicit flows. The illicit financial flows equation will consist of a number of endogenous and exogenous variables and is the most difficult part of the model to simulate due to its intrinsic non-stationary nature. In fact, all relevant variables are

subject to the Augmented Dickey-Fuller test to determine whether the series are non-stationary. The endogenous variables in the IFF equation are P_t and U_t, while the exogenous variables are TradeOpenness TO_t, $GINI_t$, a measure of income inequality, and real economic growth, $\dot{Y}_t$.

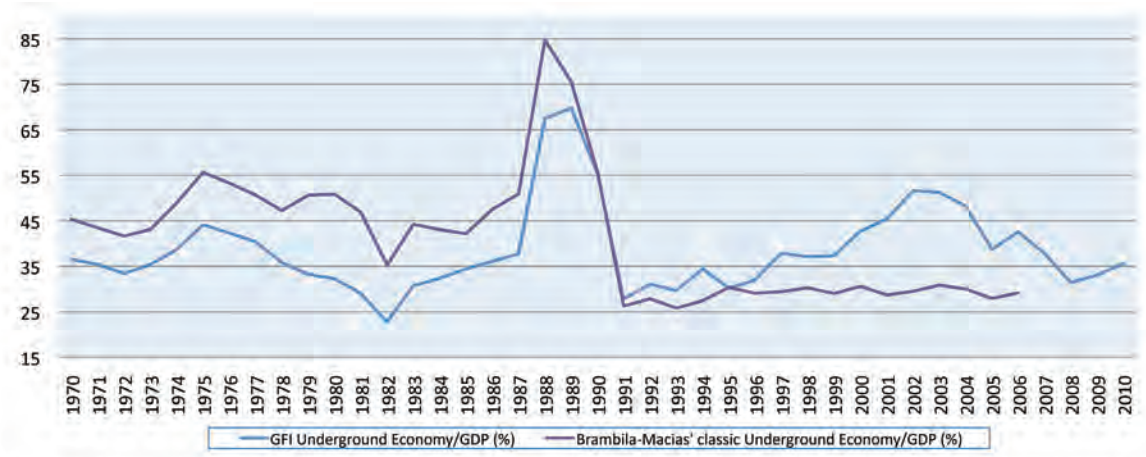
Brambila-Macias and Cazzavillan (2009) recognize that the Mexican economy has always had a significant portion that is underground. They point out that "Street vendors and their micro-businesses, known as 'vendedores ambulantes,' plague huge areas of all the major urban centers in the country." Furthermore, as they point out, official surveys conducted by the Mexican National Statistics Institute (INEGI) also confirm that some 30 percent of the economically active population is engaged in the underground economy.

In estimating the currency demand model, Brambila-Macias and Cazzavillan deflate currency outside banks by the GDP deflator rather than broad money (M2) which was adopted by Tanzi but criticized on the grounds that the ratio M2 over GDP tends to capture financial deepening and wealth accumulation over the longer term, whereas currency is used mainly to meet transactions demand. Accordingly, we also deflate the currency demand equation by the GDP deflator. However, there is an important point of departure.

Brambila-Macias and Cazzavillan argue that although remittances were modest during the 1970s, they grew exponentially in the past 20 years coming to represent the second largest source of external finance after oil revenues. They argue that remittances, which enter the country as money orders or currency in the pockets of returning migrant workers, can be expected to have a positive impact on currency demand. Moreover, currency demand in the underground economy also increases when migrant workers, seeking to avoid paying taxes on larger remittances, separate the transfers into smaller amounts or into different accounts before converting the foreign-currency denominated remittances into local currency. Besides, conversion of foreign currency such as U.S. dollars into local currency to carry out local transactions also raises the demand for currency. Given that nominal income, taxes, and remittances are all expected to raise currency demand, the excess currency over and above a normal demand (estimated with the same coefficients but excluding taxes, i.e., setting the tax coefficient to zero) is multiplied by the velocity of circulation to come up with an estimate for the underground economy.

While these methodological steps are retained in estimating the size of Mexico's underground economy, we replace remittances by illegal capital flight or illicit financial flows from the country. Illicit flows are introduced into the currency demand model based on the premise that (i) such capital outflows would probably raise currency demand much more than remittances and (ii) they would also be a relatively stronger driver of the underground economy. In fact, while remittances were larger than illicit flows in the early 1970s, the latter started to clearly outstrip remittances since 1982.

Chart 5. Mexican Underground Economy as a Share of GDP: 1970-2010 1/



1/ Underground Economy estimated by Brambila-Macias and Cazzavillan (2008), refers to the period 1970-2006. While adjusted estimates of the underground economy by Brambila-Macias and Cazzavillan and those found in this study correspond closely. They represent only around 20 percent of official GDP in recent years, which are lower than the 30 percent figure found in the study by Schneider et. al. (2010). The method of adjustment is discussed in section III.

It should be noted that estimates of illicit financial flows, prices, the underground economy, and other time series used in the model are non-stationary. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. If such a linear combination exists, the non-stationary time series are said to be cointegrated and the stationary linear equation is called a cointegrating equation which represents a long-run equilibrium relationship between the variables. The Johansen Cointegration Test (see Box 1 for a technical discussion) is a vector error correction (VEC) or non-stationary regression method to estimate a long-run cointegrating equation.

Box 1. Note on Vector Error Correction Model and Johansen Cointegration Test

Sarah Freitas

In estimating the size of the underground economy using a variant of Tanzi's currency demand approach, we found that the variables used to explain the size of the underground economy are random walk, or integrated of order 1, I(1). As I(1) variables follow common stochastic trends, traditional estimation methods produce inconsistent results. To preserve the long-run equilibrium properties of our input data so that we can apply the currency demand approach we first test for cointegration, which transforms variables that are individually I(1), through a linear combination to become I(0). Through the Johansen cointegration test we estimate long-run equilibrium relationships among our variables, allowing us to estimate the magnitude of currency demand in both the official economy and the underground economy.

Two tests feature prominently in the literature on cointegration: the Engle-Granger two-step method and the Johansen maximum likelihood procedure. Engle-Granger (1987) wrote a seminal paper on cointegration using the following procedure: first, run the cointegrating equation and obtain the residuals; second, run the regression using first-differenced variables and lagged residuals from the first step. The lagged residuals in the regression will capture the error correction term. However, the major drawback of the Engle-Granger two step method is that it only accommodates a single cointegrating relationship, and produces inconsistent results in the presence of more than one cointegrating relationship. Since the currency demand approach concerns multivariate analysis, we use the Johansen procedure to test for the case of multiple cointegrating relationships. In contrast to the Engle-Granger method, the Johansen procedure efficiently and simultaneously produces estimates of all short-run dynamics, and accounts for the necessity of normalization (see the following discussion).

To understand technical aspects of the Johansen test, consider the following Vector Autoregressive (VAR) process with *p* lags:

$$z_t = v + A_1 z_{t-1} + A_2 z_{t-2} + \cdots + A_p z_{t-p} + \epsilon_t$$

where $\mathbf{z}_t$ is a **N x 1** vector of variables, **v** is a **N x 1** vector of parameters, and $\mathbf{A}_1$ through $\mathbf{A}_p$ are **N** x **N** matrices of coefficients. More precisely, the first element of $\mathbf{z}_t$ is a linear combination of the first row of $\mathbf{A}_1$ and the **N** elements of $\mathbf{z}_{t-1}$, through the **N** elements of $\mathbf{z}_{t-p}$. We can rearrange the above equation to put it in terms of a vector error correction model (VECM) as follows:

$$\Delta z_t = v + \Pi z_{t-1} + \sum_{i=1}^{p-1} \Gamma \Delta z_{t-i} + \epsilon_t$$

where $\Pi = \sum_{j=1}^{j=p} A_j - I_k$ and $\Gamma_i = -\sum_{j=i+1}^{j=p} A_j$

A standard Vector Error Correction is modeled in terms of differenced variables, with the error correction term measured in terms of levels. However, in the presence of random walk data, this mix between levels and differenced variables could cause the error correction model (ECM) estimating equation to produce spurious results. In fact, the only time when it is valid to set up a standard VECM with random walk data is when: (1) a given row in $\mathbf{\Pi}$ consists entirely of zeros or (2) a given row of $\mathbf{\Pi z}_{t-1}$ contains a stationary linear combination of variables. Case (2) provides the backbone of the Johansen Cointegration Test because the number of rows of stationary linear combinations within $\mathbf{\Pi z}_{t-1}$ is equal to the rank of $\mathbf{\Pi}$. The rank of $\mathbf{\Pi}$ is equal to the number of eigenvalues, or nonzero characteristic roots, in $\mathbf{\Pi}$, which in turn is also the number of cointegrating relationships in the VECM.[11] Johansen's trace statistic test is based on testing for the number of characteristic roots. It is used in favor of Johansen's maximum eigenvalue test because the test requires a large sample size (about 300 observations) for reliable results.

When $\mathbf{\Pi}$ has less than full rank but is not equal to zero, a cointegration relationship is present and $\mathbf{\Pi}$ can be broken down into N x N components $\mathbf{\Pi}=\alpha\beta'$. Each column of matrix α contains the coefficients on one of the error correction terms, one for each equation in the VAR system; these coefficients are often referred to as "speed of adjustment" parameters. The error correction term contains indicators which measure the rate per period at which the endogenous variables adjust to correct a temporary disequilibrium. β is the matrix of cointegration coefficients. Any row in β that represents a cointegration relation does so because it creates a linear combination of the z elements that is stationary. However, since any constant multiplied by this row will do this, normalization is required.[12] In our procedure, this is accomplished by choosing one coefficient in each of the non-zero rows of β to equal 1. In our case, the coefficient on the natural log of currency outside banks is chosen.

Empirically, we first test for non-stationarity of the data using the Augmented Dickey Fuller Test (see Appendix Table 15 for results). Finding all variables to be I(1) in terms of levels, we use lag length criteria to determine the number of lags to include in the model. Given our small sample size, we use a maximum of two lags in the VECM, as supported by the FPE, AIC, and HQIC criterion. We define the VECM with an unrestricted constant, which allows for a linear trend in the undifferenced levels data and cointegrating equations that are stationary around a nonzero mean. The results of the Johansen test can be found in the table below. The null hypothesis of the trace statistic is that there are no more than r cointegrating relations. As seen in the table of results, we can reject the null hypothesis that there are zero cointegrating equations because the trace statistic at $r = 0$ of 80.45 exceeds its critical value at the 1 percent level. In contrast, since the trace statistic at $r = 1$ of 53.66 is less than its 1 percent critical value of 54.46, we cannot reject the null hypothesis that there is one cointegrating equation at the 1 percent level.

[11]Note that if $\mathbf{\Pi}$ consists of all zeros, $r=0$, and therefore the variables are not cointegrated.
[12]Mathematically, $\alpha\beta' = (\alpha\mathbf{Q})(\mathbf{Q}^{-1}\beta')$ for any N x N non-singular matrix **Q**

Johansen Cointegration Trace Test

Null Hypothesis	Trace Statistic	1% Critical Value
r=0	80.45	76.07
r≤1	53.66***	54.46
r≤2	29.95	35.65
r≤3	12.70	20.04
r≤4	1.88	6.65

Johansen Cointegrating Equation

logCD = 0.645logY + 0.574logTTaxrate + 0.013logIFF - 0.239logIR+1.36
(0.215)*** (0.363) (0.022) (0.04)***

Notes: ***r*** is the number of cointegrating vectors. *** indicates singnificance at the 1% level. The optimal lag length (2) was determined using the FPE, AIC, and HQIC criterion. Test includes unrestricted constant. The variables are: CD : Currency Demand; Y: real GDP; TTaxRate: Total Tax Rate; IFF: Illicit Financial Flows; IR: Interest Rate (average of time deposit rates). The cointegrating equation is normalized on currency demand, or the currency outside of banks.

Source: IMF IFS and GFS Databases, Banco de México, SHCP, and GFI staff estimates on illicit flows.

Short-run estimation results, including error correction parameters, can be found in the VECM table below. From the first row, we see that all component variables (except for $\Delta logcd_{t-1}$) have a positive and significant effect on Δlogcd in the short run. The lagged error correction term is statistically significant at the 1 percent level, confirming the presence of a long-run relationship and long-run causality from all component variables to currency demand in Mexico (Johansen, 2002), (Kremers et al., 1992). The coefficient on the lagged error term is large; this implies the speed of convergence to equilibrium is relatively fast once the system is exposed to a shock. In particular, it is notable that the lagged difference of logiff is positively related to Δlogcd in the short and long run, and that the lagged difference of logcd is positively related to Δlogiff in the short run. With this in mind, we use the coefficients specified by the Johansen test to estimate a fitted value for currency demand in the underground economy with confidence. Setting the coefficients for logttaxrate and logiff equal to zero, we also estimate a fitted value for currency demand in the above-ground economy and apply the currency demand methodology outlined in the Underground Economy section of this report.

VECM Short-Run Coefficients

	Independent Variables						
Dependent Variables	$\Delta logCD_{t-1}$	$\Delta logY_{t-1}$	$\Delta logTTaxrate_{t-1}$	$\Delta log\ IFF_{t-1}$	$\Delta logIR_{t-1}$	Constant	ECT_{t-1}
ΔlogCD	-0.42***	0.96***	0.87***	0.17***	-0.06***	0.09***	-0.34***
ΔlogY	-0.08	0.40**	0.48***	0.06	-0.01*	0.04***	-0.08*
ΔlogTTaxrate	-0.15	0.10	0.21	0.02	-0.03	0.01	0.002
ΔlogIFF	2.26**	-1.76	1.62	-0.02	-0.28	0.08	1.21*
ΔlogIR	0.46	1.18	-0.23	0.09	0.02	-0.18*	0.38

Notes: *, **, and *** indicate singnificance at the 10%, 5%, and 1% levels respectively. The optimal lag length (2) was determined using the AIC and HQIC criterion.
Source: IMF IFS and GFS Databases, Banco de México, SHCP, and GFI staff estimates on illicit flows.

The estimated underground economy is then modeled as a function of prices, illicit financial flows, total tax collected, one-period lagged underground economy, and trade openness. Illicit financial flows were found to be a significant (at 95 percent confidence) and positive driver of the underground economy. In fact, our results show that if illicit outflows are substituted for remittances, that substitution raises the demand for currency in the underground economy even further so that we obtain a somewhat larger estimate for the underground economy in Mexico, particularly in recent years compared to those found by Brambila-Macias and Cazzavillan (see Appendix Table 8). Inflation is introduced as an explanatory variable because inflation acts as a tax which "taxpayers" seek to offset by raising income from illicit activities (thereby increasing the size of the underground economy). However, the results presented show that while the rising price level is positively related to the underground economy, it is not a significant driver. Now as more of the informal economy is brought under the tax net, that would tend to shrink the size of the underground economy and raise total taxes collected. But again, the negative relationship between total taxes collected and the size of the underground economy was not found to be significant. The previous year's size of the underground economy can be expected to have an influence on its current size (the "momentum" effect), and we found this relationship to be true and significant. Trade openness was not found to be a significant driver of the underground economy even though we obtained a positive relationship between trade openness and trade mispricing (see Box 2).

Illicit financial flows

We tested the entire model using alternate formulations of the money supply process using the AK and the BM model. Model simulations seek to explain how illicit financial flows are driven by macroeconomic, structural, and governance factors. The macroeconomic drivers of illicit flows consist of government expenditures, government revenues, the money supply, total taxes collected, and the price level, and are determined within the model. Structural factors, represented by trade openness, higher rates of economic growth as a result of economic reform and liberalization, and income inequality, are exogenous in that they are not determined within the model. The state of overall governance is represented by the size of the underground economy, which is determined within the model.

In both versions of the model we found that illicit flows are significantly and positively related to rising prices, one of our macroeconomic factors. This is perhaps because inflation reduces the real value of illicit (and licit) assets, depreciates the exchange rate, and provides a significant incentive for holders of these assets to transfer the funds out of the country. A second macroeconomic factor, the size of the fiscal deficit, was captured by the government expenditure to revenue ratio in order to avoid the problem of taking the logarithm of negative deficits (or fiscal surpluses). Ratios exceeding one reflect deficits while those less than one reflect fiscal surpluses. The two-stage results show that while fiscal deficits are statistically significant and have the correct sign (meaning larger deficits drive more illicit outflows), their contribution as a driver is insignificant (the coefficient is very low indeed). So the fiscal deficit indicator was dropped from the final simulation.

Regarding structural drivers of illicit flows, we found that there is a significant and positive link between trade openness and the trade mispricing component of illicit flows (see Box 2 for a fuller discussion of this link). This implies that greater trade openness as a result of trade liberalization and globalization merely provides more opportunities for traders to misprice trade (thereby driving larger illicit outflows) in the absence of adequate regulatory oversight and improvements in governance. Real economic growth was found to be negatively related to illicit flows, which is the traditional finding in that growth tends to foster more investor confidence about economic prospects; thereby, investors retain more capital domestically rather than transfer it abroad. However, our results indicate that the salutary impact of higher growth rates on capital flight from Mexico was statistically insignificant. The other structural driver of illicit flows namely income inequality (measured by the Gini coefficient) was found to be statistically insignificant in explaining such outflows and had the wrong sign (see Box 3 for a discussion on why that was the case). Finally, illicit flows were found to be positively and significantly related to the size of the underground economy. This result is intuitively meaningful in that one would expect increasing outflows of illicit capital to require a larger underground economy to sustain them.

Box 2. Structural Factors: Trade Openness and Trade Mispricing

Sarah Freitas

Mexico's trade liberalization in 1985 marked a turning point in that the country started to move away from import substitution supporting free trade under the General Agreement on Tariffs and Trade (GATT). Soon thereafter, Mexico enacted an economic stabilization program and began introducing more market-oriented policies. By the early 1990s, the country once again started to enjoy higher rates of growth and more trade openness.

Coordinating trade and financial market liberalization proved to be more of a challenge. On the one hand, rapid credit expansion led to waste and placed bank capital at greater risk. On the other, the North American Free Trade Agreement (NAFTA) which went into effect in January 1994, eliminated or sharply reduced tariff and non-tariff barriers between Mexico, the United States, and Canada. But NAFTA came at an inopportune time when capital inflows all but halted, creating a slowdown in trade openness and contributing to the peso crisis in 1994. Still, average trade openness increased by roughly 2.5 times between the pre- and post-NAFTA periods. For the period as a whole, we find that increased trade also resulted in increased trade mispricing. The charts below show that trade mispricing (GER) and trade openness have been increasing in lock-step over the entire period studied. Under NAFTA, the slope of the trade openness time trend line increases substantially, along with the average volume of GER. Interestingly, despite a slowdown in the rate of increase in trade openness post-NAFTA (possibly due to increasing competition in U.S. markets to Mexican exports), average GER as a share of non-normalized IFFs has continued to increase to 80 percent up from 57 percent in the pre-NAFTA period.

Chart A. Trade Mispricing and Trade Openness: 1970-2010

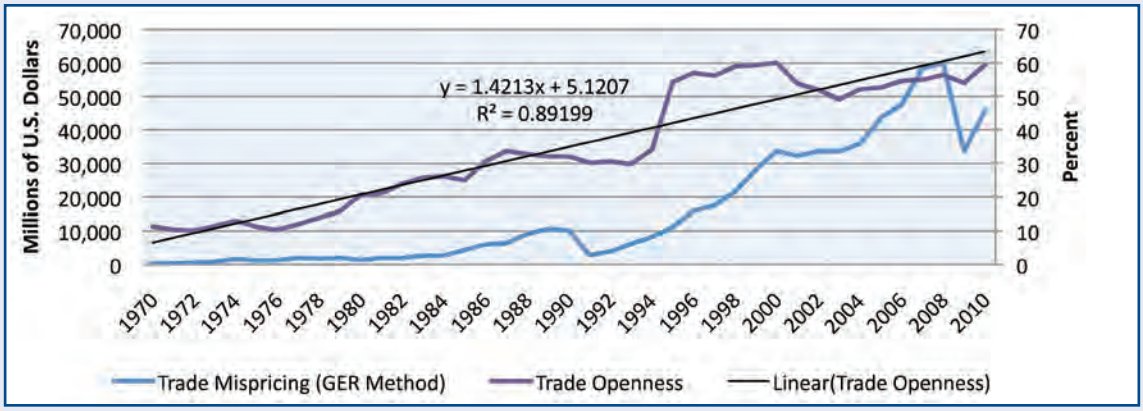
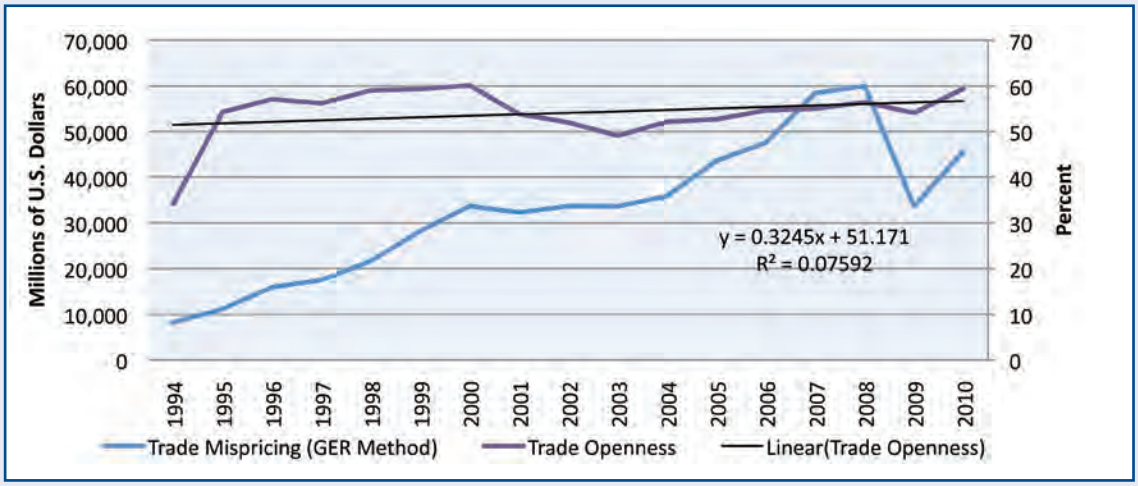


Chart B. Trade Mispricing and Trade Openness: 1994-2010



It appears that increased trade openness post-NAFTA encouraged more trade mispricing, particularly in the early 1990s. Furthermore, trade openness was found to be a positive and significant contributor to illicit financial flows in the two-stage least squares regression used to estimate the dynamic simulation model (see Table 3). To make the relationship clearer, we regressed trade openness on trade misinvoicing (represented by the GER method) for both the pre- and post-NAFTA periods. The results presented in the following table clearly show that trade misinvoicing and trade openness are positively related and statistically significant. In fact, for every 1 percent increase in trade openness, trade mispricing increased by 6.5 percent.

Regression Results for log(Trade Mispricing): GER Method

	1970-2010	1994-2010
log(Trade Openness)	6.49	4.45
	(24.74)***	(3.68)***
Constant	16.29	15.16
	(45.80)***	(20.55)***
R^2	0.94	0.47
No. of Observations	17	41

Note: t-statistics are reported in parenthesis. *** indicates significance at the 1% level.

While entering into NAFTA had many advantages for Mexico, it also provided incentives for many to transfer illicit capital abroad. Between 1994 and 2010, NAFTA seems to have facilitated illicit outflows totaling at least US$561 billion through export under-invoicing and import over-invoicing. The relationship between trade mispricing and trade openness would suggest that Mexican and U.S. Customs should exercise closer regulatory oversight in order to curtail illicit financial flows through the deliberate misinvoicing of trade. A risk-based price profiling system discussed in Section V can be helpful in the effort to curtail illicit outflows through trade mispricing.

Box 3. Structural Factors: Illicit Financial Flows and Inequality

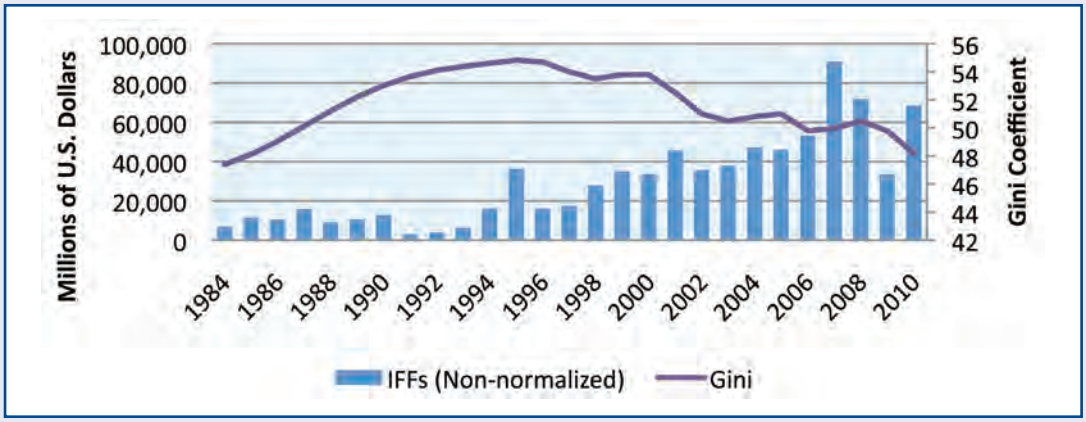
Sarah Freitas

Mexico has one of the highest income inequalities in the world. In a 2011 report, the OECD noted the average income of the richest 10 percent of the Mexican population is 27 times that of the poorest 10 percent. Despite this, income inequality was not found to be a significant driver of illicit flows from the country over the period 1970-2010. This box article examines why this is the case.

From 1970 to 2010, the country's GINI coefficient, which is a measure of income distribution, has fluctuated sharply. A steady decrease in inequality from 1970 to 1983 can perhaps be explained by the beneficial effect of remittance inflows. On average, outflows of illicit capital were not very large during this period, and they were not sufficient to offset the beneficial impact of rising remittances.

Between 1984 and 1994, illicit financial flows and inequality increased in unison. One of the reasons inequality rose can be attributed to the 1982 crisis, after which there was no progress in the struggle against poverty for ten years. This does not come as a surprise, however, since the Mexican economy experienced a period of stagnation during the 1980s. Even the oil boom in 1987 was not enough to pull the poor above the poverty line; rather, it seems that oil increased inequality. A study by Székely (2005) shows that during the period 1984-1994, the percentage of people in poverty remained constant while the percentage of the wealthiest grew.

Chart A. Illicit Financial Flows and Income Inequality: 1984-2010



[13]Moreno-Brid, Juan Carlos and Jaime Ros, *Development and Growth in the Mexican Economy: A Historical Perspective*. Oxford University Press, 2009.

Post-NAFTA, inequality began to witness a halting decline, a trend that created a striking contrast to the sudden torrent of illicit flows during the same period. For instance, during the period 1994 to 2010, Mexico introduced two social programs, *Oportunidades* and *Procampo*, coinciding with a dramatic improvement in health and educational indicators in Mexico[13]. Emigration of Mexican nationals to the United States steadily increased, hand in hand with a boom in the flows of remittances from the U.S. to Mexico. Most importantly, declining fertility rates and the increasing participation of the working-age population resulted in an expanding labor force. Therefore, household incomes increased not as a result of rising household per capita income, but due to a larger number of workers within each household. Ros (2008) confirms this finding, stating that demographic change, defined as a decrease in the dependency ratio, explains between 45 percent and 60.8 percent of the reduction in the poverty rate from 1994 to 2010. These positive developments perhaps explain the improving income distribution in Mexico during the post-NAFTA period. It appears that rising illicit flows did not adversely influence this trend.

Even though factors such as remittances and demographic shifts contributed to the decrease of inequality during the period 1994-2010, capital flight skyrocketed, presenting a competing force that increased income inequality at the same time. NAFTA removed many barriers to trade and investment between Mexico, Canada, and the United States; however, it also freed up the market for legal and illegal transactions. Between 1994 and 2010, trade mispricing grew from US$8.2 billion to US$45.7 billion, and average GER as a share of total IFFs grew from 57 percent pre-NAFTA to 80 percent after NAFTA came into effect. The presence of competing pressures on inequality may explain the halting nature of inequality's decline, and explain why the GINI coefficient was weakly but negatively related to illicit flows in dynamic simulations of our model.

That said, the GINI data also presents several limitations. While the GINI coefficient was obtained from a single source, it is estimated based on official household income surveys, which were conducted based on inconsistent sampling techniques by different government authorities until the late 1980s. In fact, we were only able to obtain 15 data points distributed across a 40-year period, and thus much of our data had to be interpolated. **More importantly, official income surveys cannot capture the income derived from illicit assets held by the upper income groups, so measured inequality based on official surveys understates income inequality.** Income surveys also exclude non-monetary incomes such as capital rents and property incomes, which are disproportionally earned by the higher income groups. The understatement would be higher for countries with the largest illicit outflows, such as Mexico.

Table 3. Structural Equation Estimates

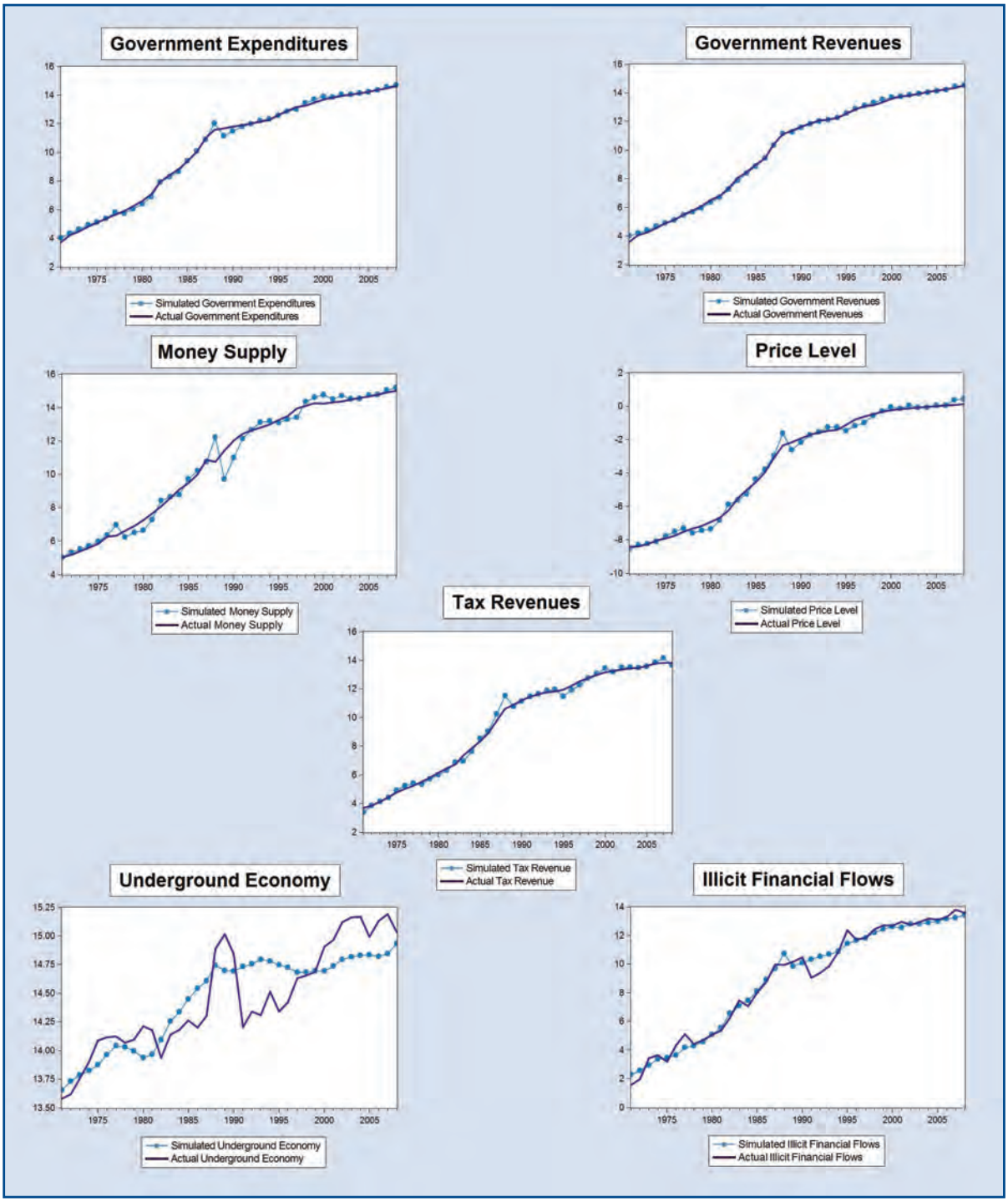
Two Stage Least Squares

$\log R_t = -1.918 + 0.889*\log GDP_t - 0.011*\log P_t + 0.144*\log \psi_t$ (-0.537) (3.207)*** (-0.047) (1.733)*	$R^2 = 0.999$ S.E. = 0.133
$\log G_t = 2.080 + 0.274*\log Y_t + 0.397*\log P_t + 0.596*\log \psi_t$ (0.3719) (0.617) (2.328)** (3.443)***	$R^2 = 0.993$ S.E. = 0.326
$\log M_t = 1.226*\log mult_t + 3.718*\log G_t - 2.717*\log R_t + 3.129*\log E_t$ (0.237)*** (3.195)*** (-1.553)*** (0.496)***	$R^2 = 0.978$ S.E. = 0.078
$\log P_t = -7.891 + 1.229*\log Y_t + 0.560*\pi_t - 1.755*\log (M/P)_{t-1} + 0.948*\log M_t$ (-1.162) (1.350) (2.156)** (-3.133)*** (17.718)***	$R^2 = 0.991$ S.E. = 0.313
$\log TTax_t = 4.580 + 2.696*\log \dot{Y}_t + 1.738*\log TTaxrate_t + 0.677*\log P_t + 0.379*\log \psi_t$ (2.203)**(1.300) (2.166)** (5.640)*** (3.660)	$R^2 = 0.995$ S.E. = 0.262
$\log U_t = 5.631 + 0.283*\log P_t + 0.218*\log \psi_t - 0.430*\log TTax_t + 0.815*\log U_{t-1} - 0.210*\log TO_t$ (2.033)** (0.991) (2.259)** (-1.330) (2.291)** (-0.529)	$R^2 = 0.851$ S.E. = 0.180
$\log \psi_t = 0.743*\log P_t + 1.176 * \log U_t - 0.070*GINI_t - 0.051*\log \dot{Y}_t + 1.621*\log TO_t$ (5.392)*** (9.282)*** (-1.714)* (-0.018) (2.174)**	$R^2 = 0.986$ S.E. = 0.473

t-statistics are reported in parentheses.

*, **, *** indicates significance at the 10%, 5%, and 1% level, respectively

Chart 6. Results of Dynamic Simulation: 1971-2008



Alternate Money Supply Process

We also tested the Brunner-Meltzer formulation of the money supply process in an alternative version of the model. According to Brunner-Meltzer, nominal money supply is a function of the monetary base, the ratio of currency to demand deposits, and the rate of interest. In their linear money supply formulation, the money supply is seen to vary positively with the monetary base (which is the amount of money issued by the government) and the discount rate (via the portfolio effect on time deposits included in broad money), and negatively with the currency (to demand deposit) ratio. The signs of these variables are confirmed in the following two-stage least squares of the money supply equation. The fact that the interest rate is not found to be significant in the money supply equation probably has to do with the fact that it was, for the most part, not market-determined in Mexico. However, the expected rate of inflation, as a proxy for the opportunity cost of holding money, also did not turn out to be significant in the Brunner-Meltzer formulation of the money supply. The model was rerun with the money supply process determined according to this formulation. The downside to this model is that government revenues and expenditures do not enter as endogenous variables in the system. The Brunner-Meltzer formulation of the money supply process is:

$$logM_t = k_0 + k_1 log\, MB_t + k_2 log\, IR_t + k_3 logCR_t - k_4 logFR_t$$

where MB_t is the monetary base, IR_t the interest rate on time deposits, and CR_t the currency to demand deposit ratio and FR_t the fiscal balance ratio defined as the ratio of government expenditure to government revenue. The results of the two-stage least squares estimation is presented below:

Table 4. Alternative Money Supply Estimates

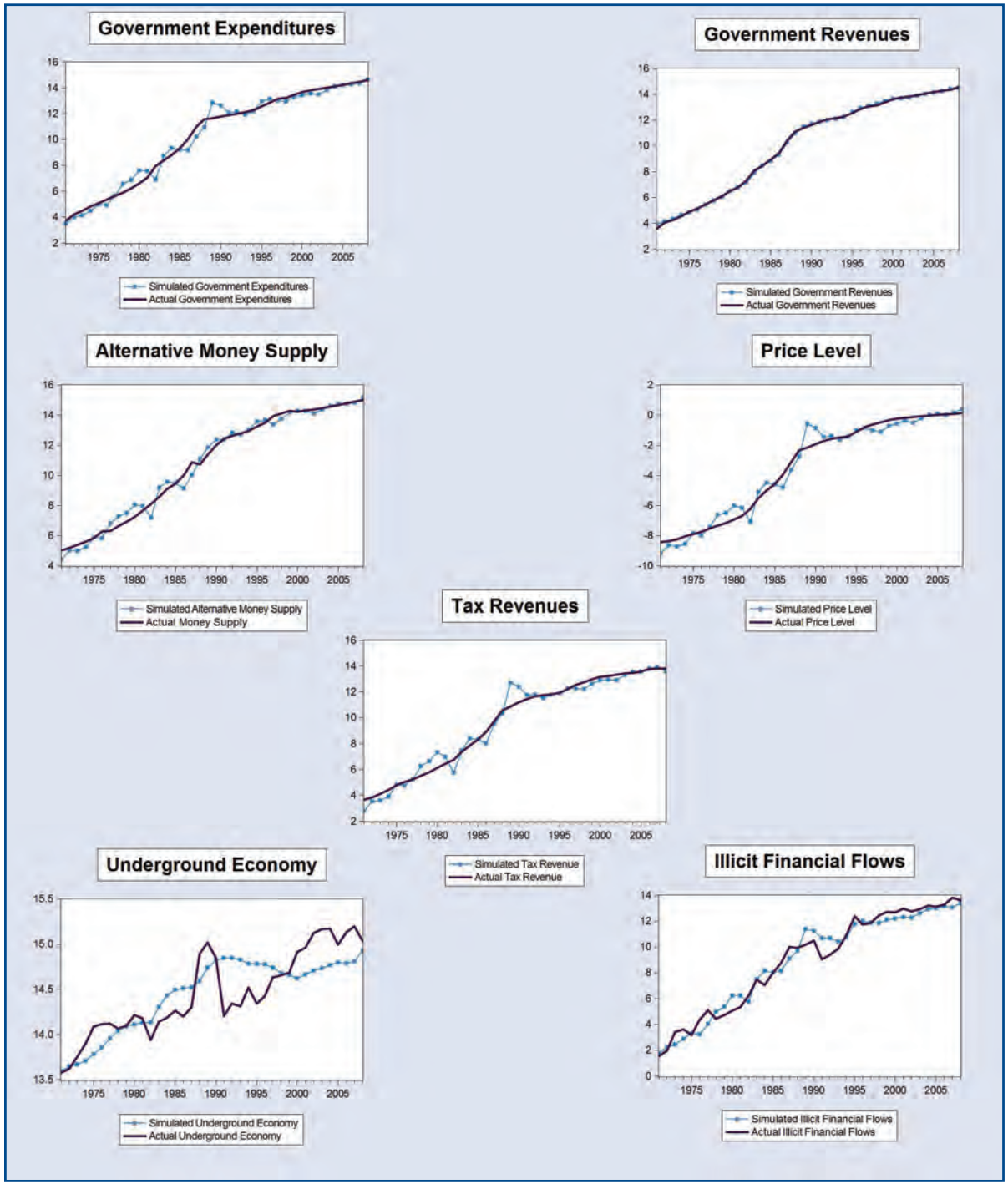
Two Stage Least Squares

$logM_t$ = 1.099*$logMB_t$ + 0.173*log IR_t + 0.704*$logCR_t$ - 0.031*$logFR_t$				
(42.237)***	(1.221)	(1.123)	(-2.871)***	
				R^2 = 0.985 S.E. = 0.448

t-statistics are reported in parentheses.
*, **, *** indicates significance at the 10%, 5%, and 1% level, respectively

The entire model was then re-simulated taking into account the Brunner-Meltzer formulation of the money supply. The results of these model simulations are presented in Chart 7.

Chart 7. Results of Dynamic Simulation with Alternative Money Supply: 1971-2008



IV. The Absorption of Illicit Flows from Mexico

In this section, we seek to map outflows of illicit capital from Mexico with two major points of absorption—offshore financial centers (OFCs) and developed country banks (henceforth banks). While OFCs have been cited in the media for their lack of transparency, large data gaps exist for banks as well. These gaps make it difficult to analyze the absorption of illicit funds, defined as the change in non-resident private sector deposits of developing countries in banks and offshore centers. Given data limitations, certain assumptions had to be made regarding the behavior of illicit flows and investments.

(i) Data Limitations

a. No data on withdrawals

There are no data on withdrawals of deposits from either OFCs or banks. Without the benefit of data on withdrawals, the change in the stock of cross-border deposits cannot be used to derive the activity in accounts. The change in deposits can be used to capture a portion of illicit flows that accumulate as deposits in OFCs and banks but without data on withdrawals, it is impossible to ascertain the totality of funds flowing through accounts.

b. No data on illicit portfolio maintained as cash deposits

Wealth surveys, conducted by private investment firms such as CapGemini and Oliver Wyman, collect information on licit portfolios only. This is because high net worth individuals (HNWIs) who hold illicit assets abroad are unlikely to reveal any information about them in such surveys. Given the total lack of data on illicit portfolios, we assume that the proportion of assets held as deposits in OFCs and banks is the same for licit as well as illicit wealth portfolios. This is a big assumption but one that is cognizant of the fact that not all assets, whether licit or illicit, are held as deposits, which generally earn lower rates of return compared to other investments such as stocks, bonds, derivatives, hedge funds, or tangible assets such as real estate, antiques, precious metals, etc. However, in light of the greater risk of holding illicit assets, a somewhat higher portion could probably be held as liquid cash deposits that can be moved electronically at a moment's notice. Mitigating against the basis for holding higher cash deposits is the lower risk associated with trust companies, derivatives, and other financial and non-financial assets which are even more difficult to trace in terms of beneficial ownership than cash deposits.

c. Limitations regarding cross-border deposit data

The Bank for International Settlements (BIS) publishes the most comprehensive dataset on cross-border international banking statistics currently available. It does not, however, provide breakdowns of the data at the country level, which would have strengthened the analysis of the absorption of illicit capital from Mexico. The BIS collects and disseminates two different sets of international banking data, based on information provided by member country banks. The first set of data, locational statistics, collects quarterly data on the gross international financial claims and liabilities

of banks arising from deposits of residents from a given country. The second set, known as the consolidated statistics, reports banks' on-balance sheet financial claims vis-à-vis the rest of the world and provides a measure of the risk exposures of lenders' national banking systems. That is to say, consolidated statistics show reporting countries' claims on the rest of the world. Once differences in reporting regimes are taken into account, the two sets of data may be used to complement one another in economic analysis.

The main purpose of locational statistics is to provide information on the role of banks and offshore centers in the intermediation of international capital flows. The key organizational criteria are the country of residence of the reporting banks and their counterparties, as well as the recording of all positions on a gross basis. Locational statistics can be used to present the combined cross-border positions of reporting banks in all the BIS reporting countries vis-à-vis individual countries listed on the locational tables. There are currently 42 countries providing these statistics (Appendix Table 1).

For our analysis of the absorption of illicit funds from Mexico, we need the cross-border deposits reported by banks on a locational basis. These data are not further broken down by private and public sectors. The consolidated statistics, however, do provide a split between public and private sector deposits. Although consolidated statistics report these banks' claims on the rest of the world, we assume each country's claims on the world have the same public/private split as other country's claims on them. In this way, we use this split in conjunction with the consolidated statistics in order to derive a proxy for private sector holdings of depositors resident in developing countries. The assumption that the private-public split in deposit liabilities of banks on a consolidated basis holds for data reported on a locational basis also introduces some errors in the mapping process.

Moreover, some of the locational banking statistics are restricted for use by reporting countries. The BIS needs specific approval from each reporting country for release of individual country data to third parties. Since we were not able to obtain country-level data from the BIS without permission from those individual countries, we requested and received aggregated regional-level data. This dataset, which does not show cross-border bank positions on a bilateral basis, could not be used to determine one or more reporting country's deposits vis-à-vis one or a sub aggregate of counterparties, except in the case of the United States which allows the BIS to identify it as an individual point of absorption.

If bilateral deposit data were available, researchers would be able to track the pattern of deposit holdings by residents of any developing country into any individual bank or offshore center. Ideally, the distribution of such holdings would account for the totality of all foreign deposits held by the private sector of a particular developing country in those points of absorption. Even at the most detailed level, however, locational data refer only to the external deposits of the 42 reporting banks vis-à-vis the non-bank sector.

The BIS provided data on the deposits of developing countries in five major destination groups: United States, Latin American financial centers, offshore financial centers, European financial centers, and banks in other developed countries. There are several countries that are classified as offshore financial centers by the IMF for which we did not receive deposit information from the BIS. The lack of coverage of financial institutions in OFCs and DCBs (which are limited to those that report to the BIS) is another limitation of the BIS data.

d. Limitations regarding CapGemini and Oliver Wyman data on licit wealth portfolios

Merrill Lynch-CapGemini (MLC) is a private consulting company that provides estimates of the proportion of cash held by high net-worth individuals (HNWIs) in their investment portfolios. In contrast, the corresponding estimates of cash investments provided by Oliver Wyman (OW) refer to the general investing public, not just HNWIs. Furthermore, OW cash deposit shares cover only a select number of developing countries, which means regional averages must be assumed from this handful of countries. In contrast, MLC's estimates of cash investment ratios refer to regional averages.

Both MLC and OW derive estimates of cash investments that are related to licit funds based on officially recorded national accounts, savings propensities, and income distributions. We use these cash investment shares to estimate the cash component of illicit flows out of developing countries. As illicit investment decisions cannot be directly observed nor information on them collected through surveys, we have to assume that illicit investors in developing countries hold the same proportion of their illicit assets in cash as do licit investors estimated by the MLC and OW wealth models. However, because illicit investments are relatively riskier, there is an incentive to hold a higher proportion in cash rather than in a more illiquid form, so that the cash deposit shares based on the MLC and OW models are likely to understate illicit deposits. This could explain some of the gap between illicit outflows and absorption.

The cash deposit shares used in our study are based on regional estimates of cash investments provided by MLC and OW. Ideally, illicit financial flows from each developing country should be scaled down by the cash investment factor relating to illicit investors in that country. However, as neither MLC nor OW provides estimates of licit investments in cash for each developing country, we scaled down regional illicit flows by the corresponding regional cash deposit shares. Of course, this method introduces estimation errors to the extent that the investors in each country hold proportions of cash investments that are different from the regional cash holdings preferences.

It should also be noted that we use MLC over OW data for almost every region because we assume that only high net-worth individuals send illicit capital abroad and not the general population. Participation in trade mispricing, for example, first requires that an individual has the capital and the opportunity to engage in international trade. The general population is unlikely to engage in international trade transactions. Because the OW cash deposit shares relate to the general

population, rather than HNWIs, the OW estimates are consistently much greater than those from MLC. A reasonable explanation for this could be that HNWIs have more sophisticated investment strategies relative to the general population, and therefore they would favor lower cash deposits in order to maximize the return on their portfolio. As such, we primarily use the cash-deposit shares estimated by MLC, rather than estimates developed by Oliver Wyman. However, as MLC provides no estimates for Africa, we used the OW deposit shares for South Africa, which was the only African country for which the estimate was available.

The MLC model provides estimates of total wealth held by high net-worth individuals in 71 countries, accounting for more than 98 percent of world gross national income. It then distributes national wealth across the adult population of the country. The model is updated on an annual basis to calculate the value of high net worth individuals' financial wealth at a macro level. Total wealth by country is estimated using the national account statistics database of the IMF and the World Bank. Annual national savings are then summed over time to arrive at a book value of accumulated national wealth. National wealth at book value is adjusted using world stock price indexes to reflect the market value of the equity portion of HNWI wealth. This stock of wealth is then distributed according to the relationship between income and wealth, using the World Bank's data on income distribution and Lorenz curve specifics for each country. The distribution of wealth among the adult population of each country yields estimates of HNWIs across countries, regions, and the world. The MLC wealth model includes values of private equity holdings at book value as well as all forms of publicly quoted equities, bonds, funds, and cash deposits. It does not include collectibles, consumables, consumer durables, and real estate used for primary residence.

The OW wealth model analyzes 48 countries grouped into seven major regions, covering some 95 percent of total world GDP. Wealth, defined as gross financial assets, consists of (i) cash and deposits, (ii) equities and bonds, (iii) mutual funds, (iv) alternative investments, and (v) individual pension assets. Residential real estate, occupational pension assets and household debt are not considered. Official records of household balance sheets provided by national central banks and the OECD are used to estimate asset data. If official data are not available, as is the case for many Latin American, Asian, or Eastern European countries, the OW model looks at the relationships between the state of economic development, GDP, and financial assets to determine the total asset pool for a specific base year.

(ii) Pattern of Absorption of Mexican Deposits

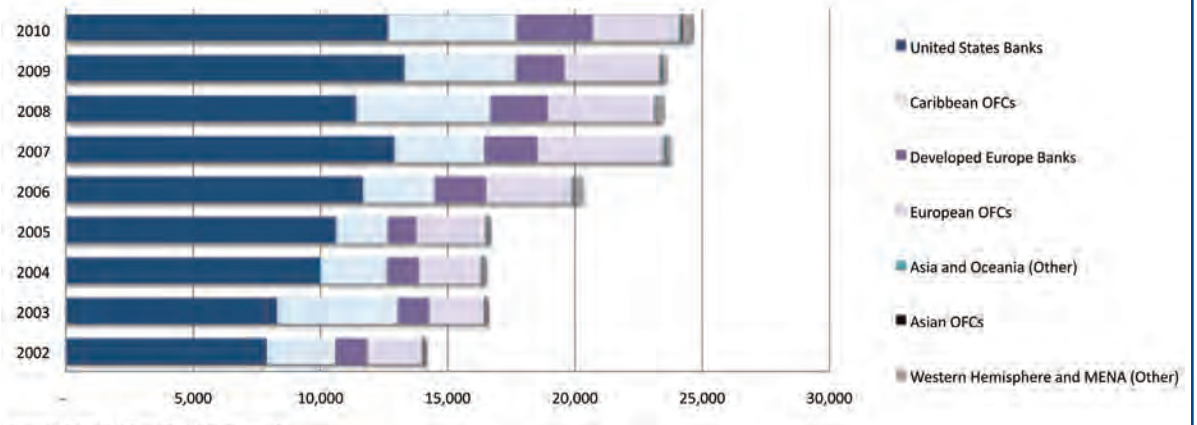
It is possible to make the following observations regarding the cross-border holdings of bank deposits by the Mexican private sector based on the data reported by the Bank for International Settlements for the period 2002-2010; see Charts 8 and 9 for the pattern of total absorption of Mexican non-bank private sector deposits in developed country banks and offshore financial centers or tax havens. Note that Mexican private sector deposits consist of both licit and illicit funds

and it is not possible to focus exclusively on the latter.

1. The United States is, by far, the preferred destination of Mexican private sector deposits into current accounts, both licit and illicit. It is estimated that private sector deposits have increased from US$8.0 billion to US$12.7 billion between 2002 and 2010 (Appendix Table 14).
2. The second most important destination of Mexican private sector deposits are a group of Caribbean Offshore Centers, i.e., Bahamas, Bermuda, Cayman Islands, Curacao, Panama, and Netherlands Antilles (Appendix Table 13). Deposits by the Mexican private sector in Caribbean OFCs increased from US$2.7 billion in 2002 to US$5.0 billion in 2010 (Chart 8, Appendix Table 14A). This is consistent with IMF and GFI studies which indicate the private sector deposits typically tend to go to regional OFCs.
3. The third most popular destination of Mexican private deposits is European OFCs consisting of Guernsey, Isle of Man, Jersey, Luxembourg, and Switzerland. Such deposits increased from US$2.2 billion in 2002 to US$3.4 billion in 2010, after reaching a peak of nearly US$5.0 billion in 2007.
4. The next most favored point of absorption of Mexican deposits is the group of banks in developed European countries such as France, Germany, United Kingdom, among others (see Appendix Table 13 for a complete list). Deposits in these banks more than doubled from US$1.2 billion in 2002 to US$3.0 billion in 2010. It seems that the European tax havens lost out to the regional ones in attracting Mexican deposits over this period (Appendix Table 14).
5. The other points of destination such as large countries in Asia and tax havens in that region seem to have played a minor role in absorbing licit and illicit deposits from Mexico.

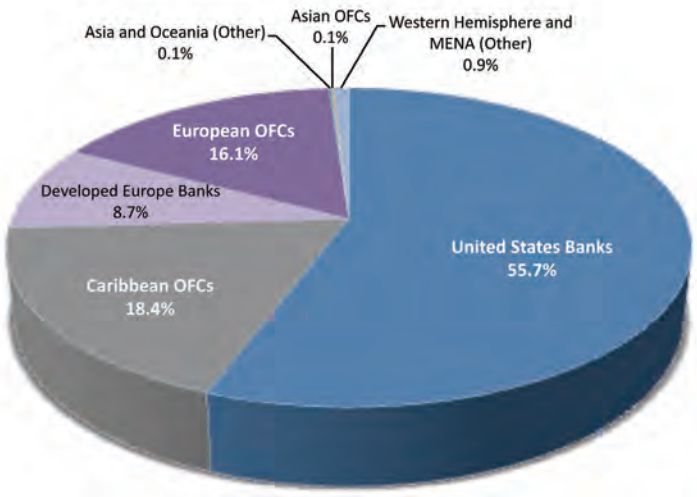
Chart 8. Total Private Sector Deposits in DCB and OFC Groupings

Millions of U.S. Dollars



Source: Bank for International Settlements and GFI staff estimates

Chart 9. Average Share of Private Sector Deposits in DCB and OFC Groupings
In percent



Source: Bank for International Settlements and GFI staff estimates

V. Policy Measures to Curtail Illicit Financial Flows

(i) Introduction

The method of estimating illicit flows (namely the World Bank Residual model adjusted for trade mispricing) and the simulation model on related drivers and dynamics throw light on the policy measures needed to curtail outflows of illicit capital. Specifically, there are five areas where policy measures need to be developed in cooperation with relevant government agencies which are the subject matter experts dealing with those areas.

First, it is clear that almost three-quarters of total illicit flows over the period 1970-2010 were generated through trade mispricing (Appendix Table 6). Moreover, model simulations indicate that increasing trade openness since 1994 when NAFTA was implemented led to more trade mispricing (see Section III, Table 3 on Structural Equation Estimates, and Box 1). This would strongly suggest that policy should be focused on curtailing trade mispricing. We will point out three policy measures that can go a long way in curbing related illicit outflows. As part of customs reform (which is an on-going World Bank project; reference footnote 15), we propose the implementation of a risk-based price profiling system to curtail the risk of export and import transactions being mispriced in order to transfer illicit capital out of the country. Furthermore, to reduce the risk of willful trade mispricing, we propose that all customs invoices be accompanied by a legal undertaking by exporters and importers as to pricing accuracy. Finally, we propose that multinationals be subject to financial and accounting reporting requirements in order to curtail abusive transfer pricing (ATP).

Second, under Mexican law, if tax matters are believed to explain the unusualness of a transaction, that transaction would have to be reported because tax evasion is criminalized and thus a predicate offense for money laundering, given the all-crimes approach to the criminalization of money laundering. As tax evasion is typically a part of outflows of illicit capital through leakages in the balance of payments (estimates of illicit flows through CED amount to a total of nearly US$230 billion over the 41-year period), recommendations to curtail illicit outflows must also involve the automatic exchange of information (AEI) with countries with which Mexico has strong trade and capital market links. Mexico has entered into a double tax avoidance agreement (DTAA) with 40 countries, including with the United States in 1992, which was updated in 2004. We will examine how DTAAs curtail tax evasion and explore the scope for Mexico to expand these agreements with other countries.

Third, as the automatic exchange of information seeks to stem outflows by plugging gaps in information in the international financial system (which tax cheats may be using to hide taxable income), this calls for Mexican regulatory agencies to commit to a policy of seeking full transparency in all financial accounts and transactions. These measures call for extensive cooperation between the tax authority under the Ministry of Finance, the Mexican equivalent of the Securities and Exchange Commission (Comisión Nacional Bancaria y de Valores) which oversees the financial, auditing,

and other regulatory aspects of domestic and foreign companies operating in Mexico that are publically owned or listed on the Mexican stock exchange, the central bank Banco de Mexico, and the Mexican Justice Department on domestic laws and penalties that apply to non-compliant transactions carried out by individuals and corporations.

Fourth, the study found that macroeconomic imbalances and growth in the underground economy are strong and significant drivers of illicit flows from the country. For instance, model simulations show that fiscal policies that result in large deficits lead to monetary expansion to the extent that deficits are financed through central bank credits or outright money creation. Furthermore, monetary expansion was in turn found to generate inflation and inflationary expectations. The model showed that inflation was a strong driver of illicit financial flows from the country. Similarly, we found a strong positive interaction between growth in the underground economy and rising illicit outflows in that they drive each other. As the underground economy is linked to the state of overall governance (typically it is large in countries with weak governance and small where corruption is limited), efforts to improve governance would tend to shrink the underground economy.

Finally, illicit financial flows involve a two-way street consisting of a source and a destination of funds. Data on Mexican private sector cash deposits compiled by the BIS show that illicit funds from Mexico are lodged in offshore financial centers or tax havens and banks in developed countries. Hence, the government of Mexico needs to exert strong leadership in various international and regional forums such as the G20, World Economic Forum on Latin America, Inter-American Development Bank (IDB), OECD, and other international institutions in order to ensure that the world's most powerful countries cooperate to curtail the ***receipt*** of illicit funds.

These policy aspects are discussed in more detail below and actionable recommendations are bolded for ease of reference.

(ii) Curtailing Trade Mispricing

a. Preamble

Trade mispricing, involving the deliberate misinvoicing of exports and imports, is a pre-dominant method for shifting illicit capital out a country—per year on average, some 55 percent of the developing world's illicit capital is siphoned off through such practices. On the same basis, nearly 74 percent of illicit capital has secretly left Mexico over the period 1970 to 2010. Given that trade mispricing facilitates the draining of scarce capital including tax evasion, a number of developing countries have recently implemented a range of policy measures to strengthen customs administration. The IMF, World Bank, World Customs Organization, UNCTAD, and other international organizations have also been extensively involved in helping countries strengthen

their customs administrations.[14] We welcome Mexico's own efforts to curtail trade mispricing by strengthening customs administration in collaboration with the World Bank.[15]

Like most of their counterparts worldwide, Mexican customs has a dual goods clearance and tax administration function. One of the main conclusions of the World Bank report is that high costs related to inefficient border clearance processes and the long clearance times for goods (seven days on average) is too high in relation to "accepted international standards." The report highlights the numerous weaknesses in Mexican customs administration including complex and non-standard procedures, duplication of activities, confused responsibilities, inadequate and non-timely information, fragmented automated systems that do not communicate with each other, etc. As a result of on-going Bank technical assistance focused on reducing collection costs and improving revenue collection, customs revenues have increased and the cost for each peso collected have come down. The overall impression one gets from the Bank-financed customs reform project is that it aims to streamline the clearance process by improving its transparency and efficiency so as to facilitate trade and reduce the cost of tax collection. In the process, the report falls short on issues related to improving governance or strengthening risk management in order to curtail trade mispricing. These topics are mentioned almost in passing. The fact of the matter is that while the facilitation of trade is important and bringing down cost of trade is an important objective, compliance with existing customs regulations is paramount if the growing trade mispricing is to be curtailed. Bank officials and Mexican authorities need to recognize that it is quite possible for trade administration costs to come down and even customs revenues to increase along with rising trade mispricing. The argument can be extended that customs revenues would have increased even more if trade mispricing were to be curtailed effectively. We now provide an outline of such a risk-based price profiling system.

b. Risk-based price profiling

Money is moved out of a country by under-invoicing exports or over-invoicing imports. Money is moved into a country by over-invoicing exports or under-invoicing imports. The International Price Profiling System (IPPS) is based on export and import transactions of the United States with the rest of the world.[16] The bilateral trade data (broken down by specific commodities) are collected by U.S. Customs and reported by the U.S. Department of Commerce. The IPPS is a risk-based analysis system that evaluates the risk characteristics of prices related to international trade transactions. It may be employed to evaluate transactions that have a risk of being related to money laundering, terrorist financing, income tax evasion, and import duty fraud.

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[14]Reference *Changing Customs: Challenges and Strategies for the Reform of Customs Administration*, Editor Michael Keen, International Monetary Fund, Washington DC, 2003. The report cites Morocco (1996), the Philippines (1990-1996) among countries that have implemented customs reform. Recently, following publication of the study *The Drivers and Dynamics of Illicit Financial Flows from India: 1948-2008*, Dev Kar, Global Financial Integrity, November 2010, Washington DC, India started to strengthen a risk-based system operated by Indian customs to monitor the valuation of exports and imports and curtail the transfer of illicit capital.

[15] Reference Project Appraisal Document on a *Proposed Loan in the Amount of US$10.025 million to the United Mexican States for a Customs Institutional Strengthening Project*, March 26, 2009, World Bank, Washington DC.

[16]The description of the IPPS is reproduced from *Illicit Financial Flows from Developing Countries: 2002-2006*, Dev Kar and Devon Cartwright-Smith, December 2008, Global Financial Integrity, Washington DC.

The IPPS evaluates an international trade price based on four (4) different filters:

- World 5th and 95th Percentile
- Country 5th and 95th Percentile
- World Mean (-) and (+) 2 Standard Deviations
- Country Mean (-) and (+) 2 Standard Deviations

The statistical filters are calculated from 12 months of international trade transaction data as reported by the United States Department of Commerce. The IPPS analysis evaluates an international trade price and produces a "Risk Index" that may range between "-4" and "+4". A negative "Risk Index" would reflect the potential of money being moved out of the United States into Mexico while a positive "Risk Index" reflects the potential of money being moved into the United States from Mexico. The magnitude of the "Risk Index" reflects the probability or likelihood that a price is overvalued or undervalued.

The IPPS has the unique advantage that the prices of transactions are derived solely from the customs invoice declaration of a value and a quantity involving the merchandise good being traded. As the system deals with specific transactions, it avoids the problem of aggregating prices of disparate commodities that vary in quality or underlying characteristics. The computed price is then compared to the world "norm" price for a specific commodity, taken as the arms-length price prevailing in free markets.

An important limitation of the IPPS system is that trade mispricing estimates are derived based on world trade with the United States. Now, although the United States is the most important trading partner for many countries, the assumption that trade mispricing implied in U.S. trade can be proportionally applied to other regions and the world is not only bold but introduces a downward bias relative to the DOTS-based estimates. This is because governance, recording, enforcement, and control procedures are much stronger in the United States than in most developing countries, so that traders are likely to be much more careful in mispricing trade with respect to the United States than with the rest of the developing world. Nevertheless, as the United States is the most important trading partner of Mexico, the IPPS trade mispricing model can provide a useful tool for Mexican customs to monitor and curtail trade mispricing involved in the bulk of its trade with the world.

Global Financial Integrity recommends that Mexico look closely into strengthening the risk-based computerized system for monitoring, controlling, and curtailing the deliberate misinvoicing of export and import transactions. Progress in curtailing trade mispricing must be measured against bilateral trade data discrepancies over time particularly with regard to trade with the United States.

c. Legally binding declaration of traders

GFI also recommends that commercial invoices for trade with Mexico require dual signatures—that of the importer and the exporter. Specifically, export and import invoice forms should contain a paragraph, to be signed by the exporter and by the importer, confirming world market pricing without any elements of mispricing for the purposes of manipulating VAT, customs duties, or income taxes (see draft paragraph below). Mexican customs authorities and/or banks should be required to check for two signatures before authorizing clearance and/or payment.

Draft Export/Import Declaration

Weights, counts, measures, descriptions, and quality specifications are accurately stated on this invoice, and prices of all items covered by this invoice conform to world market norms and contain no element of mispricing or abusive transfer pricing that serves to manipulate VAT taxes, customs duties, or income taxes. The transaction covered herein conforms to the anti-money laundering laws, anti-terrorist financing laws, banking regulations, and exchange control regulations of all countries where the transaction originates, all countries in which material actions relating to the transaction occur, and to the banking regulations and exchange control regulations of Mexico. Commissions, fees, gratuities, or other emoluments owed to or payable to any agent, broker, or representative in Mexico or of Mexican nationality is noted as to name, address, and amount, as follows:

_____

_____

_____

Exporter_____

Date_____

Importer_____

Date_____

The power of the signature, particularly as it influences multinational corporations, can be marshaled in the fight against trade mispricing.

d. Additional measures to curtail abusive transfer pricing

Mexico has some of the most sophisticated rules on transfer pricing of any developing country, including its Dictamen Fiscal rules that were enacted to specifically address the issue of mispricing in trade and services. What may be needed in Mexico is a stronger team of transfer pricing specialists that can audit companies, handle joint audits with other countries, and vigorously enforce the more than 40 double tax avoidance agreements that Mexico has with other countries.

The U.S.- Mexico DTAA treaty signed in 1992 and updated in 2004 is very important considering Mexico's strong trade links with the United States.

The use of intra-group companies located in tax havens is addressed in the Dictaman Fiscal rules. But rules by themselves are not sufficient to ensure enforcement. They are a good starting point. Without a strong enforcement capability, a well-trained staff, and a sophisticated electronic filing and audit system, the ability of the tax and customs authorities to monitor mispricing is made more challenging. Sufficient resources in this area are therefore urgently required.

While transfer pricing is legal, abusive transfer pricing (ATP) is not. The capacity to monitor and curtail ATP is important because the growing business activity of multinational companies in a globalized world has in all likelihood increased the risk of ATP. The risk of arms-length mispricing and abusive transfer pricing is higher involving services trade, which is not covered by the bilateral goods-based GER model.

The OECD prescribes, and current national laws and multinational corporations mostly follow, the arms-length principle governing transfer pricing and determining whether a particular transaction is "abusive" in relation to those principles. Briefly, a multinational corporation (MNC) group operates as separate entities rather than as inseparable parts of a single unified business. According to the OECD, the separate entity approach treats the members of an MNC group as if they were independent entities; attention is focused on the nature of the dealings between those members and on whether the conditions thereof differ from the conditions that would be obtained in comparable uncontrolled transactions. Such an analysis of the controlled and uncontrolled transactions, referred to as a "comparability analysis," is at the heart of the arms length principle.

The application of the arms-length principle to arrive at market-related pricing is fraught with practical difficulties. The principle is inherently flawed particularly in relation to intellectual property rights where it may be impossible to fix prices of comparable services trade between unrelated separate entities. In fact, as detailed bilateral trade data on services, particularly among developing countries, are not currently available, it may be difficult to estimate arms-length prices for specific services trade involving Mexico's trade with other developing countries. Hence, the comparability analysis is impossible to carry out. Moreover, even in trade involving goods, there is no widely accepted objective criterion for allocating the economies of scale or benefits of integration between associated enterprises. Also, associated enterprises may engage in transactions that independent enterprises would not undertake so that pricing comparisons are impossible or they do not provide a reliable basis to compare.

Country-by-country reporting (CCR) is a much better system of reporting by multinationals that can provide a fair and transparent basis for calculating taxes payable by MNCs in different jurisdictions where they transact business. Specifically, every subsidiary of an MNC that operates globally would be required to report data on sales, profits, and taxes paid in each country of operation.

Such a country-by-country reporting will make transparent the extent of business carried out in a particular country or jurisdiction and the taxes for which it is liable based on the sales, profits, costs of operation, depreciation, and other variables which go into calculation of taxes due. At present, most MNCs publish partial and segmented information that breaks their trade down along product or division lines. They are not required to publish geographic data, and there is no requirement to do so on a country-by-country basis. Despite publishing their accounts as if they are unified entities, MNCs are not taxed in this way. Each member company of the group is taxed individually. This makes it difficult to establish an overview of what is happening within a group of companies for tax purposes. CCR would provide information to a wide range of stakeholder groups which will strengthen efforts to monitor corrupt practices, corporate governance and responsibility, tax payments, and world trade flows. The system of reporting would also benefit investors by revealing which corporations operate in politically unstable regimes, tax havens, war zones, and other sensitive areas. CCR would also enable citizens of developing countries to determine who owns the companies that are trading in their countries, what tax is being paid, and whether that appears reasonable in relation to the tax rates in the country in question.

As an example of strong regulatory oversight, **Mexico should substantially increase its staffing in the area of transfer pricing audits and implement a more sophisticated electronic filing and auditing system.** Additional staffing will also help Mexico enforce its more than 40 double tax avoidance treaties that are currently in force, including the one with the United States. Given that Mexico has strong trade links with the United States, having a strong transfer pricing audit regime will provide close coordination with the customs authorities and help identify additional sources of revenue. Hiring and training of more transfer pricing staff and closer audit cooperation with the United States should be seriously considered. This will also send a clear message to the business community with respect to the regulatory capability of the tax authorities. In the long run it can go far toward stemming illicit outflows of capital resulting from mispricing in trade or services.

Global Financial Integrity strongly recommends that the Mexican government support the introduction of Country-by-Country Reporting in international forums such as the G20, OECD, IMF, and other international organizations in order to curtail abusive transfer pricing and related loss of government revenue.

(iii) Double tax avoidance agreement to counter tax evasion

Tax evasion is at the heart of what drives the world's shadow economy. The Tax Justice Network estimates world-wide tax evasion at US$3.1 trillion or about 5.1 percent of world GDP, placing total tax evaded in Mexico at perhaps US$25.6 billion in 2009, the 25th highest rank in the world.

Double tax avoidance agreements (DTAAs) are bilateral tax treaties designed to protect entities (whether individuals or corporations) from being taxed twice on the same income. The DTAA provisions supersede the general provisions of the taxing statue of a country and the taxable entity can chose between the provisions of the DTAA or the national tax laws, whichever is more

advantageous to the entity. Mexico has entered into more than 40 DTAAs which are currently in force, including the one with the United States that was entered into in 1992 and updated in 2004.

While a taxpayer's home country (or country of citizenship) generally has the right to tax, if the source of income is derived from work in another country, the host country can also have a right to tax. So a country can tax an individual or corporation as part of the entity's world income but the host country, which provides the source of that income, can also tax the entity. In the case of the host country, it is not world-wide income that is subject to taxation but only that portion that is sourced within its borders. As the taxable entity is subject to tax both in its own as well as in host countries, it is subjected to tax in both the countries in respect of the same income. The purpose of DTAA is to avoid such double taxation to the extent agreed upon.

An active and clear DTAA is a major factor in decisions related to FDI. The agreements seek to ensure that suitable relief is available to defray or mitigate the burden of taxation in another jurisdiction which could have a taxable interest in that economic activity or entity. Apart from providing a legal framework for avoiding double taxation of the same income, a DTAA facilitates the exchange of tax payer information, ensures a mutual assistance procedure for the resolution of disputes, and lays the groundwork for mutual assistance in pursuing recovery of taxes owed by either party to the agreement. These very same elements of a DTAA prove useful in monitoring compliance of taxable entities and individuals according to the rules of the Vienna Convention and other international tax treaties. However, a DTAA normally cannot be used to trace illicit outflow of funds from a country to the partner country that was concluded before the DTAA came into effect and neither can the agreement be used to launch "fishing expeditions" by one country against suspected tax cheats which will require the counterparty to the agreement to launch an investigation into non-resident holdings in a blanket fashion. In other words, an investigation into a failure to pay applicable taxes in the other jurisdiction cannot proceed without adequate prima facie evidence against a suspected tax cheat.

(iv) Automatic exchange of information

A significant component of illicit financial flows comprises tax evasion. Apart from leakages from the balance of payments, trade mispricing can be used quite easily to evade applicable trade taxes. For instance, import under-invoicing and export over-invoicing (resulting in so-called inflows of illicit capital in traditional models of capital flight) can also result in tax evasion to the extent that the country is cheated out of the correct amount of import duties payable or defrauded of export subsidies on overstated exports. Furthermore, import over-invoicing, normally used to transfer illicit capital abroad can also be used simultaneously to lower taxes payable on profits (e.g., if the tax on corporate profits exceeds the higher import duties payable so that on balance, the company still comes out ahead). The government ends up losing both the capital that should have been taxed as well as the underpayment of total taxes due.

One way to address the problem of tax evasion is for the source country to enter into an automatic exchange of information (AEI) agreement with the destination countries where the proceeds of tax evasion are lodged. In fact, AEIs already exist between members of the European Union (EU) under the EU Savings Tax Directive (EUSTD).

The Organization of Economic Cooperation and Development (OECD) has been at the forefront among international organizations in addressing a range of cross-border tax issues. For instance, the OECD drafted the double tax avoidance conventions (DTCs) which allocate, within a mutually agreed framework (see DTAA version above), taxing rights between two countries relating to cross-border economic activity and investment. In 2002, the Global Forum on Taxation hosted by the OECD, and made up of many tax havens, published a proposed framework for "Tax Information Exchange Agreement" (TIEA) which allows for information exchange "upon request".

However, most experts agree that for two reasons the OECD's "upon request" standard is inadequate to ensure effective international tax information exchange. First, it is very costly to draft a request for information buttressed by prima facie evidence of tax evasion. Second, the prima facie evidence requires the preparation of a detailed legal case with considerable prior information on the suspected tax evader which may not be available in a timely manner. As a result, the information exchange clauses are seldom used.

Given these serious deficiencies in the global tax exchange agreements, it would be crucial for Mexico to push for strengthening the AEI in cooperation with other large emerging markets within the G20 so that national tax authorities do not continue to be constrained by the onerous requirements of the current OECD "upon request" proposal which continue to help tax evaders cheat on taxes due.

The AEI would help tax collection in developed and developing countries by helping to curtail illicit capital flight, corruption, and tax evasion by requiring all multinational corporations to report sales, profits, and taxes paid in all jurisdictions and harmonization of money-laundering statutes globally. The AEI would require governments to collect from financial institutions data on income, gains, and property paid to non-resident individuals, corporations, and trusts. The AEI would also mandate that data collected automatically be provided to the governments where the non-resident entity is located.

Global Financial Integrity recommends that the Mexican government enter into an AEI with the EU because the EU is the largest multilateral arrangement that has a well-functioning AEI. Moreover, Mexico should pursue very aggressively the exchange of tax information with the United States as the United States now exchanges tax information with Canada. Finally, given close trade and financial links with Central American and Caribbean countries (some of which are tax havens), Mexico should implement AEIs with the countries in these regions.

(v) The importance of maintaining macroeconomic stability

The simulation model developed in this paper showed that in retrospect, macroeconomic instability played an important role in driving illicit financial flows from Mexico. Fiscal policies that result in large deficits lead to monetary expansion to the extent that deficits are financed through central bank credits or outright money creation. The model shows how expansionary fiscal policies drive growth in the money supply which together with inflationary expectations, drive inflation. High (and, for that matter, highly variable) inflation in turn was found to be a significant driver of illicit flows from the country.

We also found illicit outflows to have increased significantly following every macroeconomic crisis that Mexico faced over the period covered in this study. Outflows always increased over the year immediately preceding the crisis and tended to fall below crisis levels at varying speeds. Following the first oil crisis and global economic crisis, illicit flows from Mexico fell below crisis levels in the year following the crisis. For instance, the peso crisis had a strong impact on illicit flows—the troughs still exceed the peak reached during the peso crisis. Often, macroeconomic imbalances lead to widely anticipated exchange rate depreciation, inducing capital flight and further instability.

It therefore follows that sustainable fiscal policies together with monetary discipline can go a long way in ensuring macroeconomic stability which can help curtail illicit financial outflows. This finding contrasts with the case of India where we did not find a strong link between macroeconomic stability and illicit flows. A possible explanation is that unlike Mexico, India hardly experienced inflation in the double- and sometimes, triple-digit levels. Moreover, central government deficits as percent of GDP in the case of Mexico were on average much higher than those registered in India. Finally, Mexico also racked up external debt much more than India did so that rising debt contributed to macroeconomic instability in a way that was not the case with India. Briefly, the observation that macroeconomic instability is more likely to drive licit than illicit flows needs to be qualified—if instability is severe enough, it can indeed drive illicit outflows.

In the more recent decade, the Mexican central bank has been quite successful in bringing down inflation and lowering its variability. Fiscal deficits as percent of GDP have also been reduced significantly and the external debt to GDP ratio has fallen to about 23.0 percent. There is no question that Mexico has managed to attain macroeconomic stabilization in recent years which has contributed to a much better investment climate according to World Bank estimates. While illicit flows have continued to increase due to a number of other factors, the attainment of macroeconomic stabilization has had a salutatory effect on total outflows. **Hence, it would be very important for Mexican economic policies to continue to pursue macroeconomic stability in an effort to contain illicit flows.**

(vi) The need to improve overall governance

The size of the underground economy acts as a proxy for corruption and the state of overall governance in the country. Cross-country studies show that there is a strong positive relationship between the two—the larger the size of the underground economy, the worse the state of overall governance. Moreover, model simulations presented in this study confirm that there is a strong positive interaction between the underground economy and illicit financial flows. In fact, there is extensive evidence in economic literature that the overall state of governance in the country drives illegal capital flight. For instance, Le and Rishi (2006) suggest that, holding other determinants of capital flight constant, corruption has a positive and significant impact on capital flight. Anthony and Hallet (1995) find significant links between growth of the underground economy and the flight of illicit capital. Hence policy measures to shrink the size of the underground economy by reducing corruption and improving overall governance will curtail illicit outflows. This is a complex issue which needs to be tackled on multiple fronts.

It is outside the scope of this study to present a comprehensive repertoire of governance-related policy measures. Nevertheless, a discussion of certain salient aspects of governance-related issues will allow a sharper focus on the range of policy measures needed to curtail the generation and transmission of illicit funds. Three areas where government policies could make a difference are (i) promoting greater transparency and accountability in government contracts, (ii) strengthening the rule of law, and (iii) seeking to incorporate information on beneficial ownership in private (individual and corporate) financial transactions (flows) and assets (stocks).

Opportunities for public officials to receive bribes and kickbacks vary according to the type of government expenditures. Research indicates that corruption in government agencies impact the composition of government expenditures—for instance, goods and services supplied by large oligopolistic firms may offer more opportunities for bribes than smaller, more competitive firms whose profit margins are lower. **Hence, policy measures aimed at reducing the propensity to pay bribes and kickbacks must seek to promote greater transparency and accountability in the government contracting process.** It should be possible for a citizen of Mexico to access information related to the criteria for awarding federal, state, or local government contracts, details on the selection process, which company gets the award, and on what objective criteria, etc. **The overall objective should be to continually seek to increase, within each government expenditure category, the share of publicly productive but privately non-lucrative projects relative to those that are publicly unproductive but privately lucrative.**

A beneficial owner must always be interpreted as a natural or real person (or a listed company) who enjoys the benefits of ownership, even though title may be in another name or trust company. Any

individual or group of individuals that either directly or indirectly, has the power to vote, influence, or control transaction decisions regarding a specific security or other financial asset, is a beneficial owner. For instance, while the controlling shares of a company may be held by a chief executive, the true owner is the beneficial owner because the chief executive is required to report to the beneficial owner and act in his/her name. Mexican regulations involving financial institutions (Regulation 4 (VI and VIII), Regulation 11, Regulation 31, and Regulation 32) require them to identify the beneficial owners of accounts and transactions. In particular, Regulation 32 requires financial institutions to establish identification procedures to identify beneficial owners (propietarios reales). In practice, Mexican banks and other financial institutions often find it difficult to obtain or have timely access to adequate, accurate, and current information on beneficial ownership and control of legal persons.

The lack of information on ultimate beneficial ownership behind corporations, trusts and foundations facilitate the laundering of illicit capital (such as hiding the proceeds of tax evasion) and helps the absorption of these funds in secrecy jurisdictions without any hindrance, fear of confiscation, or penalty of any sort by any law enforcement or regulatory agency. The funds can be transferred into any other secrecy jurisdiction almost instantaneously because these points of absorption do not insist on information on ultimate beneficial ownership.

Opacity regarding beneficial ownership is used by multinational and domestic corporations, their subsidiaries, and high net worth individuals to transfer profits abroad in order to reduce tax liability or to circumvent local tax and exchange regulations (or capital controls) in developing countries. While know-your-customer (KYC) regulations require financial institutions, including banks, to identify their customers as part of their account opening due diligence, ultimate benefactors of these accounts remain hidden behind layers of companies and trusts making their uncovering in any investigation extremely difficult. The lack of information on beneficial ownership sustains the modus operandi of the world's shadow financial system and makes curtailing of illicit flows much more difficult in spite of robust domestic policy measures. Moreover, the opacity regarding beneficial ownership has serious national and global security implications.[17]

Global Financial Integrity urges the government of Mexico to open a policy dialog with other G20 member states to make publicly available lists of the true beneficial owners and controllers of corporations, limited liability companies, other legal persons and legal structures such as trusts organized under national laws. Mexico, in cooperation with other G20 member states, should urge the Financial Action Task Force (FATF) to standardize this requirement in compliance with its recommendations 33 and 34.

Furthermore, Mexico should insist that the FATF requirements for establishing beneficial ownership as part of the customer due diligence process (recommendation 5) are rigorously

[17]A recent article in the New York Times (Beirut Bank Seen as a Hub of Hezbollah's Financing, December 13, 2011) reported that U.S. law enforcement agencies found Hezbollah, a terrorist organization, to be involved with Mexican and other Latin American drug cartels in laundering massive amounts of illicit funds through the Lebanese Canadian bank, a private bank registered in Lebanon.

implemented globally. Anti money laundering laws in each jurisdiction must explicitly require financial institutions to identify the beneficial owners who are natural (i.e., real) persons or listed corporations and not settle for nominee corporations or disguised trusts. All jurisdictions must ensure that these laws are properly monitored and enforced.

(vii) Tax havens, banks, and the absorption of illicit financial flows

A recent study at Global Financial Integrity found that offshore financial centers (or OFCs also called tax havens) and developed country banks are the major points of absorption of illicit financial flows from developing countries. Although tax havens have attracted media attention regarding their lack of transparency, a recent GFI study found that large data gaps exist for banks as well.[18] These gaps make it difficult to analyze the absorption of illicit funds, defined as the change in private sector deposits of developing countries in banks and OFCs. The paper argues that both need to greatly improve the transparency of their operations. Regular reporting of detailed deposit data by sector, maturity, and country of residence of deposit holder would close many of the data gaps identified in this paper and allow for a more robust analysis of the absorption of illicit flows from developing countries.

The GFI study found that while OFCs have been absorbing an increasing share of illicit flows from developing countries over the five-year period of this study, international banks have played a pivotal role in facilitating that absorption. Depending upon whether one uses the narrower Bank for International Settlements or broader International Monetary Fund definition, OFCs hold an estimated 24 to 44 per cent of total absorption respectively, while banks hold the balance. As total absorption consists of both licit and illicit funds, the paper presents a simple algebraic analysis to estimate the portion of such deposits in banks and offshore centers. Furthermore, the analysis shows that the polar extreme (all illicit or all licit) in such holdings by either group is not logically (or mathematically) tenable given the overall volume of illicit flows and absorption.

The curtailment of illicit financial flows is difficult, if not impossible, without national and international efforts to reign in the role of OFCs and banks in the unbridled absorption of these funds including, in many cases, the active facilitation of “private banking” involving illicit funds. Global Financial Integrity strongly recommends the following measures by the government of Mexico to:

> Draft domestic banking laws that would make it illegal to open accounts in banks, securities firms, insurance companies, etc. without knowledge of natural persons owning the accounts (or beneficial ownership).
>
> Require that large transactions with tax havens and secrecy jurisdictions be referred to a special central bank or other relevant agency for review and approval.

[18]Kar, Dev, Devon Cartwright-Smith and Ann Hollingshead, The Absorption of Illicit Financial Flows from Developing Countries, 2002-2006, Global Financial integrity, Washington, DC, May 2010.

Hold company or high-net-worth individuals' auditors responsible for noting transactions with tax haven entities and the purpose of such transactions.

Fully implement all Financial Action Task Force (FATF) recommendations, and criminalize tax evasion not only as a predicate offense attached to a money laundering charge but as a crime in its own right.

VI. Conclusions

The study finds that illicit financial flows from Mexico are massive and the problem has progressively worsened since the seminal World Development Report was published in 1985.[19] Over the 41-year period 1970-2010, outflows of illicit capital average about 5.2 percent of GDP per year. During 1970-1993 before NAFTA was implemented, illicit outflows averaged 4.5 percent of GDP, while in the 16 years to 2009 that followed such outflows increased to 6.3 percent of GDP. We find that trade liberalization without strong regulatory oversight, as in the case of India, is probably responsible for larger illicit outflows through trade mispricing.

In fact, average illicit outflows per annum have increased sharply throughout the four decades; they were US$3.0 billion in the 1970s, US$10.4 billion in the 1980s, US$17.4 billion in the 1990s, and US$49.6 billion in the 2000s. In terms of GDP, illicit flows have increased from 3.8 percent of GDP in the 1970s to 6.1 percent of GDP in the 1980s, a rising trend that reversed as a result of brisk economic growth in the 1990s to average 4.8 percent of GDP. However, in the last decade, as cross-border transfers of illicit capital outpaced economic growth, the ratio again climbed to an average of 6.1 percent per annum.

Economists have long studied trade mispricing as a conduit for the cross-border transfer of illicit capital beginning with the seminal studies carried out by Bhagwati, Krueger, and others.[20] Numerous researchers such as Gunter (2004), Ndikumana and Boyce (2008), Schneider (2003), Nandi (1995), Chipalkatti and Rishi (2001), and others have argued that foreign assets can be acquired by over-invoicing imports and under-invoicing exports. The manipulation of trade invoices also occurs in the United States among other industrial countries.

The methodology used in this study differs from that used by previous researchers in that only gross outflows are included; periods of illicit inflows are not netted out from outflows as done by past researchers. The main reason why only gross illicit outflows are estimated is that a netting of illicit flows does not present a net benefit to the country. Moreover, because illicit inflows are also unrecorded, the government cannot tax the funds nor use them for economic development. Estimates of illicit financial flows from Mexico presented in this study do not seem out of line with past studies once it is recognized that illicit inflows (included in those studies) were of dubious benefit to Mexico and that illicit outflows due to trade mispricing ought to be included in order to capture their adverse impact on the country.

An econometric model was developed to explain the drivers and dynamics of illicit financial flows from Mexico. The model shows that expansionary fiscal policies led to significant growth in the money supply which generated inflation. Although the higher inflation was found to be significantly

[19]World Bank, op. cit., footnote 6.
[20]See, for example, *Illegal Transactions in International Trade*, Jagdish N. Bhagwati (Editor), North-Holland/American Elsevier, 1974.

positive in explaining total taxes collected, the increased collection in nominal terms did not shrink the underground economy which was mainly driven by illicit outflows, inflation, and the size of the underground economy in the previous period. The model confirms a dynamic interaction between illicit flows and the underground economy in that each drove the other. Two structural factors were included in the model as exogenous variables—these were trade openness and income inequality as measured by the GINI coefficient. The model simulations show that while trade openness was significant in explaining illicit flows, the expanding trade sector did not drive the underground economy. Regarding income distribution, the surprising finding was that income inequality was negatively related (at the 90 percent confidence interval) to illicit flows—in other words, larger illicit outflows have actually led to an improvement of income distribution. There are two explanations for this finding. One resides in the data on Gini which show that Mexico's income distribution has actually improved over the period 1970 to 2009. If official statistics on income distribution are to be believed, it seems closer labor, trade, and financial market ties to the United States have had some salutary impact on income distribution, such as for example through increasing remittances. Counteracting the beneficial impact of closer ties on income distribution are illicit flows which typically worsen income inequality as the rich get richer through the accumulation of illicit assets. The other explanation is that official surveys on income and wealth on which the Gini coefficients are based always fail to capture illicit assets, particularly external assets held by the high net worth individuals, thereby understating the income of the top group relative to households in the middle and low income groups.

Based on data on the cross-border holdings of bank deposits reported to the Bank for International Settlements, the study found that the United States, developed European countries, and tax havens in the Caribbean are the three top destinations for Mexican private sector deposits, which consist of both licit and illicit funds. However, due to large gaps in data such as on withdrawals, incomplete reporting by points of absorption, etc., outflows of illicit capital from Mexico could not be related to absorption.

The results of model simulations provided an insight into policy measures required to curtail the generation and transmission of illicit capital. We found that macroeconomic instability such as high fiscal deficits, inflation, and external debt can lead to loss of confidence in the economy triggering widely expected depreciation of the exchange rate which in turn can drive illegal capital flight. Hence prudent macroeconomic policies geared towards maintaining economic stability can curtail illicit flows. However, structural and governance-related issues also need to be addressed to stem the outflows. For instance, because trade openness tends to lead to greater trade mispricing in the absence of stronger regulatory oversight, specific measures to reform Customs administration would probably be required. Moreover, since the underground economy is a significant and positive driver of illicit flows, policy measures that shrink the underground economy would help curtail the cross-border transfer of illicit capital.

References

Aghevli, Bijan B., and Moshin S. Khan, 1978, *Government Deficits and the Inflationary Process in Developing Countries,* Staff Papers, International Monetary Fund, Vol. 25, No. 3, September 1978, pp. 383-416.

Anthony, Myrvin L. and Andrew Hallett, 1995, A *'hidden economy' approach to measuring capital flight*. The Journal of International Trade & Economic Development, Vol. 4, Iss. 3 .

Baker, Raymond, 2005, *Capitalism's Achilles Heel: Dirty Money and How to Renew the Free Market System*, John Wiley & Sons: Hoboken, NJ.

Bhagwati, Jagdish N., Editor. 1974, *Illegal Transactions in International Trade*, North-Holland/Elsevier

Blanchard, Olivier Jean, 1990, Suggestions for a New Set of Fiscal Indicators, OECD Publishing.

Brambila-Macias, Jose and Guido Cazzavillan, 2009, *The Dynamics of Parallel Economies: Measuring the Informal Sector in Mexico*, Research in Economics, No. 63 (2009), pp. 189-199.

Brunner, Karl, and Allan H. Meltzer, 1963, *Some Further Investigations of Demand and Supply Functions for Money*, The Journal of Finance, Vol. 19, No. 2, Part 1: Papers and Proceedings of the Twenty-Second Annual Meeting of the American Finance Association, Boston, Massachusetts, December 27-29, 1963, pp. 240-283.

Buiter, Willem H., and Szegvari, Ivan, 2002, *Capital Flight and Capital Outflows from Russia: Symptom, Cause and Cure*, European Bank for Reconstruction and Development, Office of the Chief Economist.

Capgemini and Merrill Lynch, 2011 *World Wealth Report*, Global Wealth Management, New York, NY.

Cardoso, Eliana A. and Santiago Levy, 1991, *Country Studies: Mexico* in The Open Economy: Tools for policymakers in developing countries, edited by Rudiger Dornbusch and F. Leslie C.H. Helmers, EDI Series in Economic Development, Oxford University Press, for the World Bank, pp. 348-369.

Chipalkatti, Niranjan, and Meenakshi Rishi, *External Debt and Capital Flight in the Indian Economy*, Oxford Development Studies, Vol. 29, No. 1 (2001), pp. 31-44.

Cumby, Robert, and Richard Levich, *On the Definition and Magnitude of Recent Capital Flight*, 1989, National Bureau of Economic Research, Working Paper series, Vol. w2275.

Dooley, Michael P., and Kenneth M. Kletzer, 1994, *Capital Flight, External Debt and Domestic Policies*, NBER Working Paper 4793 (Cambridge, Massachusetts: National Bureau of Economic Research).

Dornbusch, Rudiger, 1990, *Capital Flight: Theory, Measurement and Policy Issues*, Occasional Paper No. 2 (Washington: Inter-American Development Bank).

Eight Session of the ECA *Conference of Ministers of Finance*, Economic Commission for Africa, Finance for Development in Africa: An Issues Paper (E/ECA/ESPD/Cm.8/2000/1, November 21-22, Addis Ababa, Ethiopia).

Engle, R. F., and C. W. J. Granger, 1987, "Co-integration and Error Correction: Representation, Estimation, and Testing." Econometrica.

Faal, Ebrima, 2003, *Currency Demand, the Underground Economy, and Tax Evasion: The Case of Guyana*, IMF Working Paper, WP/03/7, January 2003, International Monetary Fund, Washington, DC.

Ghana—Staff Report for the 1999 Article IV Consultation, First Review Under the Enhanced Structural Adjustment Facility, and Request for Waiver of Performance Criteria, EBS/99/200, November 5, 1999, International Monetary Fund, Washington, DC.

International Monetary Fund, 2003, *Changing Customs: Challenges and Strategies for the Reform of Customs Administration*, Editor Michael Keen, Washington DC.

International Monetary Fund, 1997, *Good Governance: The IMF's Role*, August 1997.

International Monetary Fund, 2002, *Lessons from the Real-Time Assessments of Structural Conditionality,* Box 2 (Conditionality on Governance), Approved by Timothy Geithner, Policy Development and Review Department, March 20, 2002.

International Monetary Fund, 1997, *The Role of the Fund in Governance Issues—Guidance Note, EBS/97/125, July 2, 1997.*

Honda, Jiro, 2008, *Do IMF Programs Improve Economic Governance?*, IMF Working Paper WP/08/114, May 2008.

Husted, Bryan W., and Carlos Serrano, 2002, *Corporate Governance in Mexico*, Journal of Business Ethics, Vol. 37, pp. 337-348.

Kar, Dev, 2011, *Illicit Financial Flows from the Least Developed Countries: 1990-2008*, Discussion Paper to the United Nations IV Conference on the Least Developed Countries, Istanbul, Turkey, May 2011, United Nations Development Programme, New York.

Kar, Dev, and Karly Curcio, 2011, *Illicit Financial Flows from Developing Countries: 2000-2008 Update with a Focus on Asia*, January 2011, Global Financial integrity, Washington, DC.

Kar, Dev, 2010, *The Drivers and Dynamics of Illicit Financial Flows from India: 1948-2008*, November, 2010, Global Financial integrity, Washington, DC.

Kar, Dev and Devon Cartwright-Smith, 2010, *Illicit Financial Flows from Africa: Hidden Resource for Development*, Global Financial Integrity, Washington, DC.

Kar, Dev, Devon Cartwright-Smith, and Ann Hollingshead, 2009, *The Absorption of Illicit Financial Flows from Developing Countries: 2002-2006*, Global Financial Integrity, Washington, DC.

Kar, Dev and Devon Cartwright-Smith, 2008, *Illicit Financial Flows from Developing Countries: 2002-2006*, Global Financial Integrity, Washington, DC.

Kar, Dev, 1981, *Government Deficits and Inflation in Brazil: The Experience During 1948-1964*, Departmental Memorandum Series No. DM/81/76, October 19, 1981, International Monetary Fund.

Kar, Dev, 1983, *Long-term Trends in the Openness of National Economies: Comment*, Oxford Economic Papers, Vol. 35, No. 1, March 1983.

Kar, Dev, 1986, *Currency Invoicing and Exchange Conversion in International Trade*, Papers in International Financial Statistics, PIFS/86/1, International Monetary Fund, February 14, 1986, Washington, DC.

Khan, Mohsin S., and Nadeem Ul Haque, 1985, *Foreign Borrowing and Capital Flight: A Formal Analysis, Staff Papers*, International Monetary Fund, Vol. 32 (December).

Kremers, Jeroen, J. M., Neil R. Ericsson, et al., 1992, *The Power of Cointegration Tests*, Board of Governors of the Federal Reserve System (U.S.)

Krugman, Paul, and Maurice Obstfeld, 2008, *International Economics: Theory and Policy*, 8th Edition, Addison Wesley, Publisher.

Le, Quan, and Meenakshi Rishi. *Corruption and Capital Flight: An Empirical Assessment*, International Economic Journal 20, no. 4, December 2006: 534-540.

Leiti, Carlos A., *The Role of Transfer Pricing in Illicit Financial Flows from Developing Countries*, paper presented at a World Bank Seminar on Illicit Financial Flows, September 14-15, 2009

Moreno-Brid, Juan Carlos and Jaime Ros, 2009, *Development and Growth in the Mexican Economy: A Historical Perspective*, Oxford University Press, New York.

Motala, John, 1997, *Statistical Discrepancies in the World Current Account*, Finance and Development, International Monetary Fund, March 1997, Vol. 34, No. 1.

Ndikumana, Léonce, and James K. Boyce, 2008, "New Estimates of Capital Flight from Sub-Saharan African Countries: Linkages with External Borrowing and Policy Options," Working Paper No. 166, Political Economy Research Institute, University of Massachusetts at Amherst.

Ndikumana, Léonce, and James K. Boyce, 1998, "Congo's Odious Debt: External Borrowing and Capital Flight in Zaire," Development and Change, 29(2), 195-217.

Norwegian Agency for Development Cooperation, 2008, *Tax Havens and Development: Status, Analysis and Measures*, Government Commission on Capital Flight from Poor Countries, Appointed by Royal Decree of 27 June 2008.

Pastor, Manuel, 1990, *Capital Flight and the Latin American Debt Crisis*, Economic Policy Institute, Washington, DC.

Pickhardt, Michael, and Jordi Sarda, 2010, *The size of the underground economy in Germany: a correction of the record and new evidence from the modified-cash-deposit-ratio approach*, European Journal of Law and Economics, 2011, Volume 32, Number 1, Pages 143-163.

Prasad, Eswar, and Shang-Jin Wei,2005, *The Chinese Approach to Capital Inflows: Patterns and Possible Explanations*, National Bureau of Economic Research, Inc.

Rojas-Suarez, Liliana, 1992, "Limited Capital Markets and the Real Effects of Monetary Stabilization Policies Under Alternative Exchange Rate Regimes." Journal of International Money and Finance.

Ros, J. 2008. Poverty reduction in Latin America: The role of growth, income distribution, social spending, and demographic change. Mimeo, University of Notre Dame.

Rose, Andrew K., and Mark M. Spiegel, 2006, *Offshore Financial Centers: Parasites or Symbionts?* NBER Working Paper 12044, National Bureau of Economic Research, February, Cambridge, Massachusetts.

Schneider, Benu, *Measuring Capital Flight: Estimates and Interpretations*, Overseas Development Institute Working Paper No. 194, 1997.

Schneider, Friedrich, Andreas Buehn, and Claudio E. Montenegro, 2010, *Shadow Economies All Over the World: New Estimates for 162 Countries from 1999 to 2007*, Policy Research Working Paper No. 5356, The World Bank, July 2010, Washington DC.

Shaxson, Nicholas, 2011, *Treasure Islands: Uncovering the Damage of Offshore Banking and Tax Havens,* Palgrave Macmillan, New York.

Johansen, Soren, 2002, "A Small Sample Correction for the Test of Cointegrating Rank in the Vector Autoregressive Model." Econometrica.

Székely, Miguel, 2005, "Pobreza y desigualdad en México entre 1950 y 2004." El Trimestre Económico.

Tanzi, Vito, 1983, *The Underground Economy in the United States: Annual Estimates, 1930-1980*, Staff Papers, International Monetary Fund, Vol. 30, June, pp. 283-305.

Tax Justice Network, 2007, *Identifying Tax Havens and Offshore Finance Centers*, Washington, DC.

World Bank, 2009, *Project Appraisal Document on a Proposed Loan in the Amount of US$10.025 million to the United Mexican States for a Customs Institutional Strengthening Project*, Washington DC.

World Development Report, World Bank, 1985.

Appendix

Table 1. Trade Variables

Millions of Mexican pesos or in percent

	Trade		Trade Openness
Year	Exports	Imports (cif)	Trade/GDP
1970	18.2	32.0	11.3
1971	19.6	31.3	10.4
1972	22.0	35.3	10.2
1973	29.3	49.6	11.4
1974	38.4	78.7	13.0
1975	37.7	85.5	11.2
1976	51.3	90.4	10.3
1977	95.9	126.2	12.0
1978	138.1	186.5	13.9
1979	206.6	278.0	15.8
1980	414.7	509.3	20.7
1981	582.7	711.5	21.1
1982	1,347.1	993.5	24.0
1983	3,114.4	1,497.1	25.8
1984	4,888.9	2,804.1	26.2
1985	6,876.6	4,912.8	25.0
1986	13,343.9	10,754.5	30.6
1987	38,032.1	27,141.8	33.7
1988	69,761.6	66,830.4	32.8
1989	86,556.1	89,580.7	32.1
1990	114,519.5	122,501.6	32.1
1991	128,831.5	157,886.4	30.2
1992	142,975.1	201,328.1	30.6
1993	161,676.8	213,255.4	29.8
1994	205,477.4	280,378.7	34.2
1995	510,577.5	486,934.4	54.3
1996	729,501.7	711,827.5	57.1
1997	874,395.0	909,355.6	56.2
1998	1,073,110.9	1,196,338.2	59.0
1999	1,303,898.9	1,421,071.2	59.3
2000	1,573,171.1	1,727,630.3	60.1
2001	1,481,144.2	1,645,920.0	53.8
2002	1,551,543.7	1,705,314.0	52.0
2003	1,784,453.1	1,925,864.9	49.1
2004	2,133,996.4	2,331,942.9	52.2
2005	2,330,981.9	2,526,385.1	52.7
2006	2,729,560.8	2,922,768.8	54.6
2007	2,973,014.9	3,241,002.5	55.0
2008	3,248,034.5	3,618,999.2	56.5
2009	3,103,937.4	3,325,852.8	54.3
2010	3,767,272.1	4,000,001.6	59.4

Source: International Financial Statistics IMF Online Database

Table 2A. Balance of Payments Variables

Millions of Mexican Pesos

Year	Current Account: Net	Direct Investment: Net	Reserve Assets: Net	External Debt
1970	-14.2	4.2	-1.0	90.6
1971	-11.1	4.0	-6.3	97.5
1972	-12.1	3.9	-3.0	106.7
1973	-17.5	5.9	1.2	136.6
1974	-37.4	8.8	0.5	181.4
1975	-54.3	9.7	-2.6	237.0
1976	-51.7	8.9	14.1	479.3
1977	-42.7	12.4	-16.4	717.3
1978	-66.4	19.1	-12.3	821.4
1979	-124.4	30.6	-3.6	983.8
1980	-239.7	48.1	-15.7	1,319.7
1981	-406.0	77.0	-31.9	2,033.6
1982	-329.8	106.5	187.8	8,263.7
1983	703.9	263.0	-372.2	13,388.2
1984	702.7	259.1	-569.6	18,302.2
1985	205.6	509.9	625.6	36,034.6
1986	-842.7	1,468.8	-364.2	93,223.7
1987	5,852.4	3,629.7	-8,248.1	241,932.1
1988	-5,396.1	6,544.0	15,277.7	226,311.1
1989	-14,335.3	7,811.2	-1,333.3	247,833.1
1990	-20,959.7	7,409.4	-9,172.9	307,581.7
1991	-44,932.0	14,371.7	-24,609.7	350,301.4
1992	-75,648.0	13,596.3	-3,630.0	349,816.1
1993	-72,914.4	13,676.1	-18,872.3	405,393.7
1994	-100,109.6	37,032.2	62,091.8	737,753.9
1995	-10,119.2	61,149.3	-61,931.4	1,263,988.7
1996	-19,056.4	69,801.4	-13,718.5	1,226,757.5
1997	-60,691.0	101,586.4	-83,235.5	1,193,907.3
1998	-146,108.9	116,545.8	-19,366.0	1,570,392.0
1999	-133,789.8	132,684.3	-5,697.5	1,586,342.4
2000	-177,230.9	171,246.1	-27,059.8	1,444,423.7
2001	-165,484.8	237,702.5	-68,553.0	1,497,963.5
2002	-136,697.2	221,047.1	-71,218.0	1,696,005.8
2003	-77,263.6	161,717.3	-106,091.4	1,919,635.6
2004	-59,109.0	229,876.9	-46,493.4	1,928,136.3
2005	-55,358.5	192,324.6	-76,062.6	1,810,074.8
2006	-48,908.3	155,785.1	14,041.4	1,768,130.4
2007	-96,721.0	234,711.0	-112,170.4	2,093,757.3
2008	-181,856.0	279,788.6	-86,207.3	2,756,048.9
2009	-85,838.0	112,367.3	-77,074.9	2,507,426.6
2010	-71,093.6	54,773.1	-290,017.1	**3,020,509.4**

Source: From IMF IFS Database
Note: Period Average Exchange Rate MEX/USD used for Current Account Net, Direct Investments Net, Reserve Assets Net. End of Period Exchange Rate MEX/USD used for External Debt

Table 2B. Balance of Payments Variables

Millions of U.S. dollars

Year	Current Account: Net	Direct Investment: Net	Reserve Assets: Net	External Debt
1970	-1,096.1	322.8	-77.0	6,968.6
1971	-855.7	306.7	-484.4	7,496.5
1972	-927.0	300.8	-232.0	8,209.0
1973	-1,348.1	456.3	91.0	10,511.0
1974	-2,873.4	678.1	35.0	13,951.6
1975	-4,176.0	748.8	-201.0	18,230.5
1976	-3,444.0	594.5	940.0	23,966.6
1977	-1,856.0	540.3	-715.0	31,189.0
1978	-2,889.0	830.7	-533.0	35,712.3
1979	-5,409.0	1,332.0	-154.8	42,773.9
1980	-10,422.0	2,090.0	-684.0	57,377.7
1981	-16,240.0	3,078.0	-1,274.2	78,215.2
1982	-5,889.0	1,901.0	3,354.2	86,080.6
1983	5,866.0	2,192.0	-3,101.8	92,973.9
1984	4,183.0	1,542.0	-3,390.4	94,829.8
1985	800.0	1,984.0	2,434.1	96,867.3
1986	-1,377.0	2,400.0	-595.2	100,891.4
1987	4,247.0	2,634.0	-5,985.6	109,471.5
1988	-2,374.0	2,879.0	6,721.4	99,215.7
1989	-5,825.0	3,174.0	-541.8	93,840.6
1990	-7,451.0	2,634.0	-3,260.9	104,442.0
1991	-14,888.0	4,762.0	-8,154.3	114,067.5
1992	-24,442.0	4,393.0	-1,172.9	112,300.5
1993	-23,400.0	4,389.0	-6,056.6	130,519.6
1994	-29,662.1	10,972.5	18,397.6	138,545.3
1995	-1,576.4	9,526.3	-9,648.1	165,378.6
1996	-2,507.7	9,185.6	-1,805.3	156,254.9
1997	-7,664.9	12,829.8	-10,512.2	147,706.0
1998	-15,992.7	12,756.8	-2,119.7	159,188.2
1999	-13,994.8	13,879.1	-596.0	166,737.7
2000	-18,742.7	18,109.8	-2,861.7	150,900.9
2001	-17,714.1	25,444.5	-7,338.2	163,855.1
2002	-14,156.7	22,892.2	-7,375.5	164,453.2
2003	-7,161.3	14,989.1	-9,833.3	170,846.9
2004	-5,237.4	20,368.3	-4,119.6	171,161.7
2005	-5,079.7	17,647.7	-6,979.5	167,941.6
2006	-4,487.4	14,293.5	1,288.3	162,497.0
2007	-8,850.7	21,477.9	-10,264.5	192,688.9
2008	-16,339.3	25,138.2	-7,745.5	203,578.7
2009	-6,351.8	8,314.9	-5,703.3	192,007.6
2010	-5,626.3	4,334.7	-22,951.7	**239,040.0**

Source: Recent Economic Developments Archive, IMF Balance of Payments Online Database, World Bank Global Development Finance Database and IMF Article IV Consultation.

Table 3. Fiscal Variables

Millions of Mexican pesos

Year	Total Government Revenue	Tax Revenue	Total Government Expenditure	Fiscal Balance: Total Revenues - Total Expenditures
1970	33.9	29.8	40.2	-6.3
1971	36.5	32.6	41.3	-4.8
1972	58.2	53.3	67.3	-9.1
1973	69.5	63.3	88.1	-18.5
1974	95.3	89.2	123.9	-28.6
1975	133.4	125.2	161.6	-28.2
1976	168.6	156.7	211.6	-43.0
1977	240.7	229.0	285.5	-44.8
1978	322.8	308.0	367.5	-44.7
1979	438.6	417.8	505.2	-66.6
1980	675.0	639.9	750.2	-75.2
1981	894.3	838.3	1,182.2	-287.9
1982	1,519.9	1,396.7	2,829.3	-1,309.4
1983	3,221.7	2,762.3	4,468.2	-1,246.5
1984	4,773.6	4,338.3	6,746.6	-1,973.0
1985	7,820.2	7,135.0	11,783.8	-3,963.6
1986	12,643.0	11,230.0	22,799.0	-10,156.0
1987	33,683.0	29,362.0	59,702.0	-26,019.0
1988	67,476.0	56,859.0	107,273.0	-39,797.0
1989	86,858.0	76,983.0	115,428.0	-28,570.0
1990	113,289.0	102,434.0	134,138.0	-20,849.0
1991	141,373.0	128,466.0	144,770.0	-3,397.0
1992	173,530.0	154,190.0	162,523.0	11,007.0
1993	187,282.0	169,983.0	184,341.0	2,941.0
1994	212,387.0	185,004.0	212,417.0	-30.0
1995	281,138.0	235,016.0	292,479.0	-11,341.0
1996	384,466.0	321,495.0	387,810.0	-3,344.0
1997	468,187.0	413,921.0	516,230.0	-48,043.0
1998	501,231.0	450,341.0	563,990.0	-62,759.0
1999	634,449.0	562,990.0	712,137.0	-77,688.0
2000	811,431.0	725,708.0	875,775.0	-64,344.0
2001	939,114.5	654,870.3	996,950.6	-57,836.1
2002	989,353.4	728,283.8	1,124,451.4	-135,098.0
2003	1,132,985.1	768,045.3	1,232,942.1	-99,957.0
2004	1,270,211.1	769,385.8	1,373,362.0	-103,150.9
2005	1,412,504.9	810,510.9	1,513,210.1	-100,705.2
2006	1,558,808.0	890,078.2	1,739,466.7	-180,658.7
2007	1,711,220.6	1,002,670.0	1,929,660.1	-218,439.5
2008	2,049,936.3	994,552.3	2,242,461.3	-192,525.0
2009	2,000,448.1	1,129,552.6	2,260,383.6	-259,935.5
2010	2,080,013.0	1,260,425.0	2,438,436.7	**-358,423.7**

Source:IMF Recent Economic Development Archive, IMF Government Finance Statistics and Secretaría de Hacienda y Crédito Público (SHCP) Online Database

Table 4. Monetary Variables

Millions of Mexican pesos or in percent

Year	Reserve Money, High Powered Money	Money + Quasi-Money	Money Multiplier	Average of Nominal Interest Rates	Demand Deposits
1970	29.3	135.2	4.6	11.2	30.4
1971	33.4	152.8	4.6	11.1	32.7
1972	57.6	178.7	3.1	11.0	37.9
1973	75.2	223.4	3.0	11.4	45.7
1974	105.3	272.5	2.6	11.8	56.3
1975	140.8	344.3	2.4	11.9	68.6
1976	131.0	531.0	4.1	11.8	76.9
1977	295.9	554.3	1.9	12.9	109.4
1978	380.8	748.4	2.0	15.1	147.8
1979	513.5	1,016.5	2.0	16.4	203.8
1980	721.7	1,404.9	1.9	20.7	267.9
1981	1,045.0	2,110.6	2.0	28.6	331.1
1982	2,068.0	3,258.0	1.6	40.4	476.0
1983	3,225.0	5,327.0	1.7	56.7	704.0
1984	4,879.0	9,008.0	1.8	51.1	1,136.0
1985	5,706.0	12,788.0	2.2	56.1	1,689.0
1986	8,444.0	21,870.0	2.6	80.9	2,555.0
1987	14,402.0	52,818.0	3.7	94.6	5,097.0
1988	20,874.0	45,947.0	2.2	67.6	7,385.0
1989	23,012.0	90,012.0	3.9	44.6	10,627.0
1990	31,135.0	165,429.0	5.3	37.1	22,284.0
1991	39,797.0	246,834.0	6.2	22.6	73,860.0
1992	45,535.0	305,019.0	6.7	18.8	83,964.0
1993	50,274.0	356,566.0	7.1	18.6	100,549.0
1994	60,923.0	428,265.0	7.0	15.5	93,080.0
1995	81,274.0	564,692.0	6.9	45.1	87,695.0
1996	100,069.0	717,222.0	7.2	30.7	131,732.0
1997	109,136.4	1,124,959.4	10.3	19.1	173,026.0
1998	145,959.2	1,321,252.3	9.1	21.1	193,564.0
1999	198,731.0	1,568,959.7	7.9	19.7	233,478.0
2000	219,225.5	1,498,553.8	6.8	13.7	273,264.6
2001	225,730.1	1,638,342.6	7.3	10.1	327,497.5
2002	263,936.9	1,715,847.8	6.5	5.4	368,756.9
2003	303,614.1	1,905,973.1	6.3	4.5	421,303.0
2004	340,177.7	2,125,553.7	6.2	4.6	442,239.0
2005	380,033.7	2,337,892.2	6.2	6.5	529,987.8
2006	449,821.3	2,597,799.7	5.8	5.1	599,268.1
2007	494,743.5	2,955,263.0	6.0	5.0	695,346.4
2008	577,543.1	3,246,620.2	5.6	5.7	755,946.8
2009	632,032.4	3,620,664.9	5.7	4.3	…
2010	693,423.2	4,082,891.6	5.9	3.4	…

Source: IMF IFS Online Database, Brambila-Macias (2009), Banco de México Online Database

Table 5. National Accounts Variables

Millions of Mexican pesos or U.S. dollars

Year	Nominal GDP (Mexican pesos)	Constant GDP (Mexican pesos)	Nominal GDP (U.S. dollars)
1970	444.3	2,117,920.1	34,153.8
1971	490.1	2,219,430.6	37,692.3
1972	564.7	2,435,484.4	43,461.5
1973	690.9	2,659,444.8	53,153.8
1974	899.7	2,798,519.3	69,230.8
1975	1,100.1	2,971,618.7	84,615.4
1976	1,371.0	3,198,374.4	91,400.0
1977	1,849.3	3,344,267.4	80,391.3
1978	2,337.4	3,598,592.1	101,608.7
1979	3,067.5	3,996,355.5	133,391.3
1980	4,470.0	4,608,528.8	194,347.8
1981	6,136.8	4,945,693.1	245,480.0
1982	9,769.5	4,954,166.4	174,464.3
1983	17,882.3	4,494,556.6	149,016.7
1984	29,402.0	4,464,152.3	175,011.9
1985	47,167.5	4,539,835.2	183,533.1
1986	78,787.0	4,071,862.6	128,736.9
1987	193,161.5	4,306,215.0	140,175.6
1988	416,305.2	4,333,564.1	183,152.2
1989	548,858.0	4,760,835.0	223,022.3
1990	738,897.5	5,060,496.0	262,672.6
1991	949,147.6	5,299,493.1	314,495.7
1992	1,125,334.3	5,439,613.1	363,596.1
1993	1,256,196.0	5,532,650.9	403,145.1
1994	1,420,159.5	5,847,471.7	420,788.1
1995	1,837,019.1	5,602,904.8	286,184.8
1996	2,525,575.0	5,732,351.2	332,356.9
1997	3,174,275.2	5,972,751.2	400,894.2
1998	3,846,349.9	6,242,956.5	421,010.3
1999	4,594,724.2	6,396,700.8	480,619.2
2000	5,491,708.4	6,982,479.9	580,764.6
2001	5,809,688.2	6,944,908.2	621,889.3
2002	6,263,136.6	7,128,328.4	648,626.8
2003	7,555,803.4	8,225,459.4	700,324.4
2004	8,561,305.5	8,902,693.7	758,577.9
2005	9,220,649.0	9,220,649.0	846,086.4
2006	10,344,064.6	9,981,787.9	949,087.1
2007	11,290,751.7	10,479,610.2	1,033,199.1
2008	12,153,435.9	10,730,333.8	1,093,647.8
2009	11,844,513.8	9,931,592.3	879,687.7
2010	13,075,798.2	10,526,388.6	1,034,805.2

Source: IMF IFS Online Database

Table 6. Illicit Financial Flow Calculations

Millions of U.S. dollars

	Traditional			Normalized			Non - Normalized		
Year	World Bank Residual Model	Trade Mispricing	Total	CED	GER	Total	CED	GER	Total
1970	668.7	-175.6	493.1	668.7	374.0	1,042.7	668.7	374.0	1,042.7
1971	-505.5	-175.6	-681.1	0.0	367.2	367.2	0.0	367.2	367.2
1972	-145.7	-216.9	-362.5	0.0	546.4	546.4	0.0	546.4	546.4
1973	1,501.2	-169.3	1,331.9	1,501.2	863.8	2,365.1	1,501.2	863.8	2,365.1
1974	1,280.3	-292.3	988.0	1,280.3	1,640.4	2,920.6	1,280.3	1,640.4	2,920.6
1975	650.7	-104.7	546.0	650.7	1,217.7	1,868.5	650.7	1,217.7	1,868.5
1976	3,826.5	-633.8	3,192.7	3,826.5	1,298.6	5,125.2	3,826.5	1,298.6	5,125.2
1977	5,191.7	-792.7	4,399.1	5,191.7	1,950.5	7,142.2	5,191.7	1,950.5	7,142.2
1978	1,932.0	-270.4	1,661.6	1,932.0	1,714.6	3,646.6	1,932.0	1,714.6	3,646.6
1979	2,829.8	-1,569.9	1,259.8	2,829.8	2,024.0	4,853.8	2,829.8	2,024.0	4,853.8
1980	5,587.8	-1,625.3	3,962.5	5,587.8	0.0	5,587.8	5,587.8	1,329.6	6,917.4
1981	6,401.3	-3,054.1	3,347.2	6,401.3	0.0	6,401.3	6,401.3	1,952.0	8,353.3
1982	7,231.7	-2,867.1	4,364.6	7,231.7	0.0	7,231.7	7,231.7	1,966.6	9,198.2
1983	11,849.5	-1,922.3	9,927.2	11,849.5	2,671.1	14,520.5	11,849.5	2,671.1	14,520.5
1984	4,190.6	-1,740.5	2,450.1	4,190.6	0.0	4,190.6	4,190.6	2,681.1	6,871.7
1985	7,255.6	-3,028.2	4,227.3	7,255.6	4,374.6	11,630.2	7,255.6	4,374.6	11,630.2
1986	4,451.9	-603.4	3,848.6	4,451.9	6,023.0	10,475.0	4,451.9	6,023.0	10,475.0
1987	9,475.5	694.5	10,170.1	9,475.5	6,351.1	15,826.7	9,475.5	6,351.1	15,826.7
1988	-3,029.4	-631.4	-3,660.8	0.0	9,107.8	9,107.8	0.0	9,107.8	9,107.8
1989	-8,567.9	1,344.6	-7,223.2	0.0	10,607.4	10,607.4	0.0	10,607.4	10,607.4
1990	2,523.5	-818.0	1,705.5	0.0	10,212.6	10,212.6	2,523.5	10,212.6	12,736.1
1991	-8,654.8	104.5	-8,550.2	0.0	0.0	0.0	0.0	2,829.6	2,829.6
1992	-22,988.9	-932.1	-23,921.0	0.0	0.0	0.0	0.0	3,871.9	3,871.9
1993	-6,848.5	266.9	-6,581.6	0.0	6,182.4	6,182.4	0.0	6,182.4	6,182.4
1994	7,733.7	1,111.2	8,845.0	7,733.7	8,208.0	15,941.7	7,733.7	8,208.0	15,941.7
1995	25,135.0	3,974.2	29,109.1	25,135.0	11,157.0	36,291.9	25,135.0	11,157.0	36,291.9
1996	-4,251.1	4,214.9	-36.2	0.0	15,948.7	15,948.7	0.0	15,948.7	15,948.7
1997	-13,896.3	5,064.2	-8,832.1	0.0	17,490.7	17,490.7	0.0	17,490.7	17,490.7
1998	6,126.6	5,808.3	11,934.9	0.0	21,643.7	21,643.7	6,126.6	21,643.7	27,770.3
1999	6,837.8	10,605.9	17,443.7	0.0	28,216.4	28,216.4	6,837.8	28,216.4	35,054.2
2000	-19,331.3	12,171.1	-7,160.2	0.0	33,690.9	33,690.9	0.0	33,690.9	33,690.9
2001	13,346.5	15,408.0	28,754.5	0.0	32,293.1	32,293.1	13,346.5	32,289.0	45,635.4
2002	1,958.1	19,268.8	21,226.9	0.0	33,656.2	33,656.2	1,958.1	33,669.1	35,627.1
2003	4,388.1	20,148.8	24,537.0	0.0	33,605.5	33,605.5	4,388.1	33,612.9	38,001.1
2004	11,326.2	22,086.8	33,412.9	0.0	35,893.6	35,893.6	11,326.2	35,902.9	47,229.1
2005	2,368.4	23,110.9	25,479.4	0.0	43,628.3	43,628.3	2,368.4	43,631.1	45,999.5
2006	5,649.9	25,434.7	31,084.5	0.0	47,538.4	47,538.4	5,649.9	47,560.6	53,210.5
2007	32,554.5	27,224.2	59,778.7	32,554.5	58,435.4	90,989.9	32,554.5	58,440.3	90,994.8
2008	11,943.3	39,506.5	51,449.8	0.0	59,879.8	59,879.8	11,943.3	59,938.1	71,881.4
2009	-15,311.4	36,611.1	21,299.7	0.0	33,474.8	33,474.8	0.0	33,645.8	33,645.8
2010	22,789.2	20,641.0	43,430.2	0.0	45,705.2	45,705.2	22,789.2	45,705.2	68,494.4
Cumulative 1970-2010	**125,475.0**	**273,177.6**	**398,652.6**	**139,748.1**	**627,992.9**	**767,741.1**	**229,005.8**	**642,908.5**	**871,914.3**
Average 1970-2010	**3,060.4**	**6,662.9**	**9,723.2**	**3,408.5**	**15,316.9**	**18,725.4**	**5,585.5**	**15,680.7**	**21,266.2**

Source: Direction of Trade Statistics, Balance of Payments, IMF IFS Online Database, World Bank Global Development Finance
Note: All estimates are accurate as of October 2010. See Balance of Payment References in Appendix Table 2 for specific sources of raw data inputs.

Estimates differ from those published in previous GFI reports due to revisions in balance of payments data and Direction of Trade Statistics reported by Mexico or other countries to the International Monetary Fund.

Table 7A. Non-normalized Illicit Flows, 1970-2010

Millions of U.S. dollars; PPI base 2005

Year	Nominal IFFs	Real IFFs 1/	US PPI
1970	1,042.7	44.5	23.4
1971	367.2	15.2	24.2
1972	546.4	21.6	25.3
1973	2,365.1	82.7	28.6
1974	2,920.6	86.0	34.0
1975	1,868.5	50.3	37.1
1976	5,125.2	132.0	38.8
1977	7,142.2	173.3	41.2
1978	3,646.6	82.1	44.4
1979	4,853.8	97.1	50.0
1980	6,917.4	121.2	57.1
1981	8,353.3	134.2	62.3
1982	9,198.2	144.8	63.5
1983	14,520.5	225.8	64.3
1984	6,871.7	104.4	65.9
1985	11,630.2	177.5	65.5
1986	10,475.0	164.6	63.6
1987	15,826.7	242.3	65.3
1988	9,107.8	134.1	67.9
1989	10,607.4	148.8	71.3
1990	12,736.1	172.5	73.9
1991	2,829.6	38.2	74.0
1992	3,871.9	52.0	74.5
1993	6,182.4	81.8	75.5
1994	15,941.7	208.3	76.5
1995	36,291.9	457.9	79.3
1996	15,948.7	196.6	81.1
1997	17,490.7	215.8	81.1
1998	27,770.3	351.3	79.1
1999	35,054.2	439.7	79.7
2000	33,690.9	399.5	84.3
2001	45,635.4	535.3	85.3
2002	35,627.1	427.7	83.3
2003	38,001.1	433.0	87.8
2004	47,229.1	506.9	93.2
2005	45,999.5	460.0	100.0
2006	53,210.5	508.4	104.7
2007	90,994.8	829.5	109.7
2008	71,881.4	596.8	120.5
2009	33,645.8	306.3	109.9
2010	68,494.4	583.6	117.4

Table 7B. Non-normalized IFF Indicators, 1970-2010

In percent

Year	IFFs/GDP	IFFs/External Debt	IFFs/Exports
1970	3.1	15.0	74.4
1971	1.0	4.9	24.4
1972	1.3	6.7	32.3
1973	4.4	22.5	105.1
1974	4.2	20.9	98.7
1975	2.2	10.2	64.3
1976	5.6	21.4	150.0
1977	8.9	22.9	171.4
1978	3.6	10.2	60.7
1979	3.6	11.3	54.0
1980	3.6	12.1	38.4
1981	3.4	10.7	35.8
1982	5.3	10.7	38.2
1983	9.7	15.6	55.9
1984	3.9	7.2	23.6
1985	6.3	12.0	43.5
1986	8.1	10.4	48.0
1987	11.3	14.5	57.3
1988	5.0	9.2	29.7
1989	4.8	11.3	30.2
1990	4.8	12.2	31.3
1991	0.9	2.5	6.6
1992	1.1	3.4	8.4
1993	1.5	4.7	11.9
1994	3.8	11.5	26.2
1995	12.7	21.9	45.6
1996	4.8	10.2	16.6
1997	4.4	11.8	15.8
1998	6.6	17.4	23.6
1999	7.3	21.0	25.7
2000	5.8	22.3	20.3
2001	7.3	27.9	28.8
2002	5.5	21.7	22.2
2003	5.4	22.2	23.0
2004	6.2	27.6	25.0
2005	5.4	27.4	21.5
2006	5.6	32.7	21.2
2007	8.8	47.2	33.4
2008	6.6	35.3	24.6
2009	3.8	17.5	14.6
2010	6.6	28.7	23.0

Table 7C. IFF Growth and Related Indicators: Decade Analysis 2/

Millions of U.S. dollars or in percent

Period	Nominal Cumulative	Growth Rate of Nominal IFFs (%)	Growth Rate of Real IFFs (%)	IFF/GDP (Average in %)	IFF/Debt (Average in %) 3/	IFF/Exports (Average in %)
1970-1979	29,878.3	31.1	20.0	3.8	14.6	83.5
1980-1989	103,508.2	4.2	2.4	6.1	11.4	40.1
1990-1999	174,117.7	24.6	23.2	4.8	11.7	21.2
2000-2009	495,915.7	5.5	1.3	6.1	28.2	23.5
1970-1993	159,006.5	10.0	4.4	4.5	11.8	52.8
1994-2010	712,907.8	8.2	5.2	6.3	23.8	24.2
1970-2010	871,914.3	10.3	6.7	5.2	16.8	41.6

1/ Nominal IFF estimates deflated by the US producer price index from IFS.
2/ Ratio of IFF to gross outstanding external debt in percent.
3/ 1970-1993 and 1994-2009 refer to the pre-and post-NAFTA periods respectively.

Table 8. Underground Economy

Millions of U.S. dollars or in percent

Year	GFI Underground Economy Volume	GFI Underground Economy/GDP	Brambila-Macias' Underground Economy Volume	Brambila-Macias' classic Underground Economy/GDP
1970	771,847.4	36.5	774,651.4	45.4
1971	788,906.4	35.4	788,542.1	43.4
1972	820,743.3	33.4	811,255.9	41.6
1973	940,596.3	35.4	902,916.9	43.1
1974	1,087,961.0	38.7	1,101,375.8	48.9
1975	1,312,560.0	44.1	1,302,362.4	55.7
1976	1,349,125.0	42.3	1,305,000.3	53.3
1977	1,359,172.0	40.4	1,283,203.1	50.7
1978	1,287,146.0	35.8	1,298,609.4	47.2
1979	1,323,265.0	33.2	1,523,364.2	50.6
1980	1,487,648.0	32.3	1,647,321.9	50.9
1981	1,436,561.0	29.0	1,653,785.3	46.9
1982	1,130,370.0	22.8	1,234,883.9	35.3
1983	1,381,457.0	30.8	1,495,091.1	44.2
1984	1,442,483.0	32.3	1,505,319.2	43.1
1985	1,562,633.0	34.4	1,506,456.0	42.2
1986	1,469,459.0	36.1	1,643,820.2	47.5
1987	1,625,792.0	37.8	1,793,433.0	50.9
1988	2,925,032.0	67.5	3,023,989.4	84.8
1989	3,322,338.0	69.8	2,807,766.1	75.6
1990	2,803,491.0	55.4	2,176,192.3	55.8
1991	1,474,732.0	27.8	1,067,532.5	26.2
1992	1,688,507.0	31.1	1,173,933.7	27.9
1993	1,640,390.0	29.7	1,108,171.1	25.8
1994	2,012,803.0	34.4	1,230,492.9	27.4
1995	1,689,247.0	30.2	1,279,105.8	30.4
1996	1,834,380.0	32.0	1,285,957.0	29.0
1997	2,261,976.0	37.9	1,391,666.4	29.4
1998	2,315,926.0	37.1	1,501,712.0	30.3
1999	2,388,338.0	37.3	1,494,603.2	29.0
2000	2,982,109.0	42.7	1,681,114.2	30.6
2001	3,151,838.0	45.4	1,575,572.6	28.7
2002	3,680,903.0	51.6	1,631,485.7	29.5
2003	3,846,062.0	51.3	1,731,008.9	30.9
2004	3,866,246.0	48.2	1,752,441.7	30.0
2005	3,242,018.0	38.7	1,677,768.9	27.9
2006	3,728,367.0	42.6	1,831,681.1	29.1
2007	3,959,908.0	37.8	…	…
2008	3,372,428.0	31.4	…	…
2009	3,282,523.0	33.1	…	…
2010	3,752,103.0	35.6	…	…

Source: Global Financial Integrity

Table 9. Simulated vs. Actual Outputs of Variables

In log values

Year	Sim G	G	Sim M2	M2	Sim P	P	Sim R	R	Sim TTax	TTax	Sim U	U	Sim IFF	IFF
1971	4.0	3.7	5.1	5.0	-8.6	-8.4	4.0	3.6	3.4	3.7	13.6	13.6	2.3	1.6
1972	4.4	4.2	5.4	5.2	-8.3	-8.4	4.2	4.1	3.8	3.8	13.7	13.6	2.6	2.0
1973	4.6	4.5	5.5	5.4	-8.2	-8.3	4.4	4.2	4.1	4.1	13.8	13.8	2.9	3.4
1974	4.9	4.8	5.7	5.6	-8.1	-8.0	4.7	4.6	4.4	4.4	13.8	13.9	3.4	3.6
1975	5.1	5.1	6.0	5.8	-7.8	-7.9	4.9	4.9	4.9	4.8	13.9	14.1	3.5	3.2
1976	5.4	5.4	6.3	6.3	-7.5	-7.8	5.1	5.1	5.2	5.0	14.0	14.1	3.7	4.3
1977	5.8	5.7	6.9	6.3	-7.3	-7.5	5.5	5.5	5.4	5.2	14.0	14.1	4.2	5.1
1978	5.7	5.9	6.2	6.6	-7.6	-7.3	5.7	5.8	5.3	5.5	14.0	14.1	4.3	4.4
1979	6.0	6.2	6.5	6.9	-7.4	-7.2	6.0	6.1	5.7	5.8	14.0	14.1	4.6	4.7
1980	6.4	6.6	6.6	7.2	-7.4	-6.9	6.4	6.5	6.0	6.1	13.9	14.2	5.0	5.1
1981	6.9	7.1	7.2	7.7	-6.8	-6.7	6.7	6.8	6.3	6.4	14.0	14.2	5.5	5.3
1982	7.9	7.9	8.4	8.1	-5.9	-6.2	7.3	7.3	6.9	6.7	14.1	13.9	6.6	6.2
1983	8.3	8.4	8.7	8.6	-5.6	-5.5	7.9	8.1	7.0	7.4	14.2	14.1	7.1	7.5
1984	8.6	8.8	8.8	9.1	-5.2	-5.0	8.4	8.5	7.6	7.9	14.3	14.2	7.5	7.1
1985	9.4	9.4	9.7	9.5	-4.4	-4.6	8.9	9.0	8.5	8.3	14.4	14.3	8.2	8.0
1986	10.1	10.0	10.2	10.0	-3.8	-3.9	9.4	9.4	9.0	8.9	14.6	14.2	8.9	8.8
1987	10.9	11.0	10.7	10.9	-3.0	-3.1	10.3	10.4	10.2	9.8	14.6	14.3	9.7	10.0
1988	12.0	11.6	12.2	10.7	-1.7	-2.3	11.1	11.1	11.5	10.6	14.7	14.9	10.7	9.9
1989	11.1	11.7	9.7	11.4	-2.6	-2.2	11.3	11.4	10.7	10.9	14.7	15.0	9.9	10.2
1990	11.5	11.8	11.0	12.0	-2.1	-1.9	11.6	11.6	11.1	11.2	14.7	14.8	10.1	10.5
1991	11.8	11.9	12.1	12.4	-1.8	-1.7	11.8	11.9	11.4	11.5	14.7	14.2	10.3	9.1
1992	12.0	12.0	12.7	12.6	-1.5	-1.6	12.0	12.1	11.6	11.6	14.8	14.3	10.5	9.4
1993	12.2	12.1	13.1	12.8	-1.3	-1.5	12.1	12.1	11.9	11.8	14.8	14.3	10.7	9.9
1994	12.3	12.3	13.2	13.0	-1.3	-1.4	12.3	12.3	11.9	11.8	14.8	14.5	10.9	10.9
1995	12.6	12.6	13.1	13.2	-1.5	-1.1	12.6	12.3	11.5	11.9	14.7	14.3	11.4	12.4
1996	12.8	12.9	13.3	13.5	-1.2	-0.8	12.9	12.3	11.9	12.2	14.7	14.4	11.7	11.7
1997	13.0	13.2	13.4	13.9	-1.0	-0.6	13.1	12.3	12.3	12.5	14.7	14.6	11.8	11.8
1998	13.4	13.2	14.3	14.1	-0.6	-0.5	13.3	12.3	12.7	12.7	14.7	14.7	12.2	12.4
1999	13.7	13.5	14.6	14.3	-0.3	-0.3	13.5	12.3	13.1	13.0	14.7	14.7	12.4	12.7
2000	13.9	13.7	14.8	14.2	0.0	-0.2	13.7	12.3	13.5	13.2	14.7	14.9	12.6	12.7
2001	13.8	13.8	14.5	14.3	-0.1	-0.2	13.7	12.3	13.2	13.2	14.7	15.0	12.6	13.0
2002	14.0	13.9	14.6	14.4	0.0	-0.1	13.8	12.3	13.5	13.3	14.8	15.1	12.8	12.7
2003	14.0	14.0	14.5	14.5	-0.1	-0.1	13.9	12.3	13.5	13.4	14.8	15.2	12.8	12.9
2004	14.1	14.1	14.5	14.6	-0.1	0.0	14.0	12.3	13.5	13.5	14.8	15.2	12.9	13.2
2005	14.2	14.2	14.7	14.7	0.0	0.0	14.1	12.3	13.6	13.6	14.8	15.0	13.0	13.1
2006	14.4	14.4	14.8	14.8	0.1	0.0	14.2	12.3	13.8	13.8	14.8	15.1	13.2	13.3
2007	14.6	14.5	15.0	14.9	0.4	0.1	14.4	12.3	14.1	13.8	14.8	15.2	13.2	13.8
2008	14.7	14.6	15.2	15.0	0.4	0.1	14.5	12.3	13.7	13.8	14.9	15.0	13.4	13.6

Source: Global Financial Integrity

Table 10. Simulated vs. Actual Outputs of Variables: Alternative Money Supply

In log values

Year	Sim G	G	Sim M2	M2	Sim P	P	Sim R	R	Sim TTax	TTax	Sim U	U	Sim IFF	IFF
1971	3.5	3.7	4.4	5.0	-9.2	-8.4	3.9	3.6	2.8	3.7	13.6	13.6	1.8	1.6
1972	4.0	4.2	5.0	5.2	-8.7	-8.4	4.1	4.1	3.5	3.8	13.7	13.6	2.2	2.0
1973	4.2	4.5	5.0	5.4	-8.7	-8.3	4.4	4.2	3.6	4.1	13.7	13.8	2.5	3.4
1974	4.5	4.8	5.3	5.6	-8.5	-8.0	4.6	4.6	4.0	4.4	13.7	13.9	2.9	3.6
1975	5.0	5.1	5.9	5.8	-7.9	-7.9	4.9	4.9	4.8	4.8	13.8	14.1	3.2	3.2
1976	4.9	5.4	5.9	6.3	-8.0	-7.8	5.1	5.1	4.8	5.0	13.9	14.1	3.2	4.3
1977	5.6	5.7	6.8	6.3	-7.4	-7.5	5.4	5.5	5.2	5.2	14.0	14.1	4.0	5.1
1978	6.6	5.9	7.3	6.6	-6.6	-7.3	5.8	5.8	6.3	5.5	14.1	14.1	5.0	4.4
1979	6.9	6.2	7.5	6.9	-6.5	-7.2	6.1	6.1	6.6	5.8	14.1	14.1	5.4	4.7
1980	7.6	6.6	8.0	7.2	-6.0	-6.9	6.5	6.5	7.4	6.1	14.1	14.2	6.2	5.1
1981	7.5	7.1	7.9	7.7	-6.2	-6.7	6.8	6.8	7.0	6.4	14.2	14.2	6.2	5.3
1982	7.0	7.9	7.2	8.1	-7.0	-6.2	7.2	7.3	5.8	6.7	14.1	13.9	5.8	6.2
1983	8.8	8.4	9.2	8.6	-5.1	-5.5	7.9	8.1	7.5	7.4	14.3	14.1	7.6	7.5
1984	9.4	8.8	9.6	9.1	-4.5	-5.0	8.5	8.5	8.4	7.9	14.4	14.2	8.2	7.1
1985	9.2	9.4	9.5	9.5	-4.6	-4.6	8.9	9.0	8.3	8.3	14.5	14.3	8.0	8.0
1986	9.2	10.0	9.2	10.0	-4.8	-3.9	9.3	9.4	8.0	8.9	14.5	14.2	8.2	8.8
1987	10.2	11.0	10.0	10.9	-3.7	-3.1	10.3	10.4	9.5	9.8	14.5	14.3	9.1	10.0
1988	11.0	11.6	11.1	10.7	-2.7	-2.3	11.0	11.1	10.4	10.6	14.6	14.9	9.8	9.9
1989	12.9	11.7	11.9	11.4	-0.5	-2.2	11.5	11.4	12.8	10.9	14.8	15.0	11.5	10.2
1990	12.6	11.8	12.3	12.0	-0.9	-1.9	11.7	11.6	12.4	11.2	14.8	14.8	11.2	10.5
1991	12.1	11.9	12.4	12.4	-1.5	-1.7	11.9	11.9	11.7	11.5	14.9	14.2	10.6	9.1
1992	12.2	12.0	12.8	12.6	-1.4	-1.6	12.0	12.1	11.8	11.6	14.9	14.3	10.7	9.4
1993	11.9	12.1	12.7	12.8	-1.6	-1.5	12.1	12.1	11.5	11.8	14.8	14.3	10.5	9.9
1994	12.3	12.3	13.0	13.0	-1.4	-1.4	12.2	12.3	11.9	11.8	14.8	14.5	10.8	10.9
1995	13.0	12.6	13.5	13.2	-1.0	-1.1	12.6	12.5	11.9	11.9	14.8	14.3	11.8	12.4
1996	13.2	12.9	13.7	13.5	-0.8	-0.8	12.9	12.9	12.3	12.2	14.8	14.4	12.0	11.7
1997	13.0	13.2	13.3	13.9	-1.1	-0.6	13.1	13.1	12.2	12.5	14.7	14.6	11.8	11.8
1998	12.9	13.2	13.7	14.1	-1.1	-0.5	13.3	13.1	12.2	12.7	14.7	14.7	11.8	12.4
1999	13.3	13.5	14.2	14.3	-0.7	-0.3	13.5	13.4	12.7	13.0	14.6	14.7	12.1	12.7
2000	13.4	13.7	14.3	14.2	-0.5	-0.2	13.6	13.6	13.0	13.2	14.6	14.9	12.2	12.7
2001	13.6	13.8	14.3	14.3	-0.3	-0.2	13.7	13.8	13.0	13.2	14.7	15.0	12.3	13.0
2002	13.5	13.9	14.1	14.4	-0.5	-0.1	13.8	13.8	13.0	13.3	14.7	15.1	12.3	12.7
2003	13.9	14.0	14.4	14.5	-0.2	-0.1	13.9	13.9	13.4	13.4	14.8	15.2	12.7	12.9
2004	14.2	14.1	14.6	14.6	0.0	0.0	14.0	14.1	13.5	13.5	14.8	15.2	12.9	13.2
2005	14.2	14.2	14.8	14.7	0.0	0.0	14.1	14.2	13.6	13.6	14.8	15.0	13.0	13.1
2006	14.3	14.4	14.8	14.8	0.0	0.0	14.2	14.3	13.8	13.8	14.8	15.1	13.2	13.3
2007	14.4	14.5	14.8	14.9	0.2	0.1	14.4	14.4	13.9	13.8	14.8	15.2	13.1	13.8
2008	14.6	14.6	15.2	15.0	0.4	0.1	14.5	14.5	13.6	13.8	14.9	15.0	13.3	13.6

Source: Global Financial Integrity

Table 11A. Compound Interest on Illicit Financial Flows

Millions of U.S. dollars

Year	Nominal Non-normalized IFFs	Carry Forward	1/2 IFF + Carry Forward	Treasury Bill Rate 1/	Interest Earned	Total Carry Forward
1970	1,042.7	0.0	521.4	6.4	33.6	1,076.3
1971	367.2	1,076.3	1,259.9	4.3	54.7	1,498.2
1972	546.4	1,498.2	1,771.4	4.1	72.1	2,116.7
1973	2,365.1	2,116.7	3,299.2	7.0	231.8	4,713.6
1974	2,920.6	4,713.6	6,173.9	7.9	486.2	8,120.4
1975	1,868.5	8,120.4	9,054.7	5.8	527.4	10,516.4
1976	5,125.2	10,516.4	13,078.9	5.0	653.8	16,295.3
1977	7,142.2	16,295.3	19,866.4	5.3	1,045.8	24,483.3
1978	3,646.6	24,483.3	26,306.6	7.2	1,900.1	30,030.0
1979	4,853.8	30,030.0	32,456.9	10.0	3,259.6	38,143.4
1980	6,917.4	38,143.4	41,602.1	11.6	4,832.1	49,892.9
1981	8,353.3	49,892.9	54,069.6	14.1	7,611.9	65,858.1
1982	9,198.2	65,858.1	70,457.2	10.7	7,556.5	82,612.9
1983	14,520.5	82,612.9	89,873.2	8.6	7,747.1	104,880.5
1984	6,871.7	104,880.5	108,316.4	9.6	10,369.1	122,121.3
1985	11,630.2	122,121.3	127,936.4	7.5	9,581.2	143,332.7
1986	10,475.0	143,332.7	148,570.2	6.0	8,874.1	162,681.7
1987	15,826.7	162,681.7	170,595.1	5.8	9,938.9	188,447.3
1988	9,107.8	188,447.3	193,001.2	6.7	12,877.0	210,432.1
1989	10,607.4	210,432.1	215,735.8	8.1	17,504.8	238,544.3
1990	12,736.1	238,544.3	244,912.4	7.5	18,392.9	269,673.3
1991	2,829.6	269,673.3	271,088.2	5.4	14,663.2	287,166.1
1992	3,871.9	287,166.1	289,102.1	3.5	10,002.9	301,040.9
1993	6,182.4	301,040.9	304,132.1	3.0	9,181.7	316,405.1
1994	15,941.7	316,405.1	324,375.9	4.3	13,850.9	346,197.7
1995	36,291.9	346,197.7	364,343.6	5.5	20,086.3	402,575.9
1996	15,948.7	402,575.9	410,550.2	5.0	20,626.0	439,150.6
1997	17,490.7	439,150.6	447,896.0	5.1	22,708.3	479,349.7
1998	27,770.3	479,349.7	493,234.8	4.8	23,769.0	530,889.0
1999	35,054.2	530,889.0	548,416.1	4.7	25,545.2	591,488.4
2000	33,690.9	591,488.4	608,333.9	5.8	35,520.6	660,699.9
2001	45,635.4	660,699.9	683,517.6	3.5	23,595.0	729,930.4
2002	35,627.1	729,930.4	747,743.9	1.6	12,061.1	777,618.6
2003	38,001.1	777,618.6	796,619.2	1.0	8,069.8	823,689.5
2004	47,229.1	823,689.5	847,304.0	1.4	11,633.5	882,552.1
2005	45,999.5	882,552.1	905,551.8	3.2	28,543.0	957,094.6
2006	53,210.5	957,094.6	983,699.8	4.7	46,450.3	1,056,755.4
2007	90,994.8	1,056,755.4	1,102,252.8	4.4	48,609.3	1,196,359.5
2008	71,881.4	1,196,359.5	1,232,300.3	1.5	17,991.6	1,286,232.6
2009	33,645.8	1,286,232.6	1,303,055.5	0.2	2,084.9	1,321,963.3
2010	68,494.4	1,321,963.3	1,356,210.5	0.1	1,817.3	1,392,275.0

1/ Treasury Bill Rate is the rate at which short-term (90-day) T-bills are issued or traded in the market.

Table 11B. Total Illicit Financial Flows

Millions of U.S. Dollars

Total IFF with Compound Interest	Total IFF without Compounding Interest
1,392,275.0	871,914.3

Table 12. Absorption of Illicit Financial Flows

Table 12A. Countries that Report Locational Banking Statistics

Australia	France	Malaysia
Austria	Germany	Mexico
Bahamas	Greece	Netherlands
Bahrain	Guernsey	Netherlands Antilles
Belgium	Hong Kong	Norway
Bermuda	India	Panama
Brazil	Ireland	Portugal
Canada	Isle of Man	Singapore
Cayman Islands	Italy	Spain
Chile	Japan	Sweden
Chinese Taipei	Jersey	Switzerland
Cyprus	Korea	Turkey
Denmark	Luxembourg	United Kingdom
Finland	Macao	**United States**

Table 12B. Secrecy Jurisdictions

Andorra	Isle of Man	Russia
Anguilla	Israel	Samoa
Antigua and Barbuda	Italy	San Marino
Aruba	Japan*	Sao Tome e Principe
Australia*	Jersey	Seychelles
Bahamas	Lebanon	St. Lucia
Bahrain	Liberia	St. Kitts and Nevis
Barbados	Liechtenstein	St. Vincent
Belgium	Luxembourg	Singapore
Belize	Macao SAR	Somalia
Bermuda	Malaysia	South Africa
British Virgin Islands	Maldives	Spain
Cayman Islands	Malta	Switzerland
Cook Islands	Marshall Islands	Taiwan
Costa Rica	Mauritius	Tonga
Cyprus	Monaco	Turks and Caicos Islands
Dominica	Montserrat	United Arab Emirates
Germany	Nauru	United Kingdom
Gibraltar	Netherlands	United States
Grenada	Netherlands Antilles	Uruguay
Guernsey	Niue	US Virgin Islands
Hong Kong SAR	Northern Mariana Islands	Vanuatu
Hungary	Palau	
Iceland	Panama	
Ireland	Portugal	

Source: Bank for International Settlements
Note: Australia and Japan are not Secrecy Jurisdictions according to TJN, however since they are both used in the 2009 GFI study on Absorption, we include estimates of their non -resident deposits in this study. Source: Tax Justice Network, 2007, Identifying Tax Havens and Offshore Finance Centers

Table 12C. Offshore Centers, Classifications

Jurisdiction	IMF: OFC	OECD: Tax Haven	IMF: Member	BIS: Member
Andorra	X	X (uncooperative)		
Anguilla	X	X		
Antigua and Barbuda	X	X	X	
Aruba	X	X		
Bahamas, The	X	X	X	
Bahrain	X	X		
Barbados	X		X	
Belize	X	X	X	
Bermuda	X	X		
British Virgin Islands	X	X		
Cayman Islands	X	X		
Cook Islands	X	X		
Costa Rica	X		X	
Cyprus	X	X	X	
Dominica	X	X	X	
Gibraltar	X	X		
Grenada	X	X	X	
Guernsey	X	X		
Hong Kong SAR China	X			X
Ireland	X		X	X
Isle of Man	X	X		
Jersey	X	X		
Lebanon	X		X	
Liberia		X	X	
Liechtenstein	X	X (uncooperative)		
Luxembourg	X		X	
Malaysia	X		X	X
Malta	X	X	X	
Marshall Islands	X	X	X	
Mauritius	X	X	X	
Macao SAR of China	X			
Monaco	X	X (uncooperative)		
Montserrat	X	X		
Nauru	X	X		
Netherlands Antilles	X	X		
Niue	X	X		
Palau	X		X	
Panama	X	X	X	
St. Lucia	X	X	X	
St. Kitts and Nevis	X	X	X	
St. Vincent & the Grenadines	X	X		
San Marino		X	X	
Samoa	X	X	X	
Seychelles	X	X	X	
Singapore	X		X	X
Switzerland	X		X	X
Turks and Caicos Islands	X	X		
US Virgin Islands		X		
Vanuatu	X	X	X	
TOTAL	**46**	**38**	**26**	**5**

Table 13. Groupings of Deposits from Non-Bank Private Sector in Mexico to Developed Country Banks and Offshore Financial Centers 1/

United States Banks	Caribbean OFCs	Developed Europe Banks		European OFCs	Asia and Oceania (Other)	Asian OFCs	Western Hemisphere and MENA (Other)
United States	Bahamas	Austria	Netherlands	Guernsey	Australia	Chinese Taipei	Brazil
	Bermuda	Belgium	Portugal	Isle of Man	Japan	Hong Kong	Chile
	Cayman Islands	Cyprus	Greece	Jersey	Korea	Macao	Bahrain
	Curacao	Denmark	Italy	Luxembourg	Malaysia	Singapore	Turkey
	Panama	Finland	Spain	Switzerland	India		South Africa
	Netherlands Antilles	France	Sweden				Canada
		Germany	United Kingdom				
		Ireland					

1/ Classifications provided by the Bank for International Settlements. Countries listed as OFCs by the IMF (see Table 12C are also listed as OFCs in appendix tables 13-14b.

Table 14A. Private Sector Deposits in Developed Country Banks and Offshore Financial Centers

In millions of U.S. Dollars

	United States Banks	Caribbean OFCs	Developed Europe Banks	European OFCs	Asia and Oceania (Other)	Asian OFCs	Western Hemisphere and MENA (Other)	Total Liabilities to All Groupings
2002	7,979	2,695	1,210	2,181	23	11	66	14,163
2003	8,379	4,716	1,227	2,173	17	10	56	16,579
2004	10,071	2,605	1,240	2,479	21	15	95	16,526
2005	10,691	2,014	1,133	2,721	34	15	36	16,642
2006	11,724	2,812	2,000	3,415	30	27	333	20,341
2007	12,954	3,533	2,082	4,950	17	38	217	23,792
2008	11,469	5,252	2,251	4,181	31	24	289	23,496
2009	13,341	4,355	1,941	3,740	30	39	150	23,597
2010	12,734	5,014	2,975	3,425	31	44	432	24,654

Source: Bank for International Settlements

Table 14B. Share of Private Sector Deposits in Developed Country Banks and Offshore Financial Centers

In percent

	United States Banks	Caribbean OFCs	Developed Europe Banks	European OFCs	Asia and Oceania (Other)	Asian OFCs	Western Hemisphere and MENA (Other)
2002	56.3	19.0	8.5	15.4	0.2	0.1	0.5
2003	50.5	28.4	7.4	13.1	0.1	0.1	0.3
2004	60.9	15.8	7.5	15.0	0.1	0.1	0.6
2005	64.2	12.1	6.8	16.4	0.2	0.1	0.2
2006	57.6	13.8	9.8	16.8	0.1	0.1	1.6
2007	54.4	14.9	8.8	20.8	0.1	0.2	0.9
2008	48.8	22.4	9.6	17.8	0.1	0.1	1.2
2009	56.5	18.5	8.2	15.8	0.1	0.2	0.6
2010	51.6	20.3	12.1	13.9	0.1	0.2	1.8
Average	55.7	18.4	8.7	16.1	0.1	0.1	**0.9**

Source: Bank for International Settlements

Table 15. Unit Root Tests

Variables		logCD	logY	logTTaxrate	logIR	logIFF
Augmented Dickey-Fuller	Level	-0.501***	-1.299***	-3.079**	-0.397***	**-1.137*** **

Above we present the test statistics for the Augmented Dickey-Fuller test. Null Hypothesis: Variable has a unit root.

Note: **, and *** indicate singnificance at the 5%, and 1% levels respectively.
Test was conducted including a constant term and without trend.
The variables are: CD : Currency Demand; Y: real GDP; TTaxRate: Total Tax Rate; IFF: Illicit Financial Flows; IR: Interest Rate (average of time deposit rates)

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1319 18th Street, NW, Suite 200 | Washington, DC | 20036
Tel. +1 (202) 293-0740 | Fax. +1 (202) 293-1720 | www.gfip.org