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Illicit Financial Flows to and from Developing Countries: 2005-2014

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Global Financial Integrity

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We are pleased to present here our analysis of **Illicit Financial Flows to and from Developing Countries: 2005-2014**. This is the seventh report in this series that we have provided since 2008. These analyses have contributed to securing the illicit flows issue on the global development agenda in the Financing for Development document, the Addis Tax Initiative, and the Sustainable Development Goals.

While we have recognized illicit inflows in earlier reports, here we give this side of the equation equal emphasis. Illicit inflows frequently occur when imports are under-invoiced for the purpose of evading customs duties and VAT taxes. The magnitude of estimated illicit inflows in the latest year (2014) ranges from $1.4 to $2.5 trillion. This large range reflects the fact that more precise calculations are difficult to make using available data.

Years of experience with businesses and governments in the developing world have taught us that the decision to bring illicit flows into a particular developing country often marks only the first phase of a strategy to subsequently move funds out of the country. Additionally, such factors as the misinvoicing of services and intangibles, same-invoice faking, and cash movements related to many criminal activities tend to affect outflows from developing countries more than inflows to those countries. If so, we might surmise that the omission of such factors from even the best available data (used by GFI and other researchers) might mean that our figures on outflows are underestimated to a larger degree than our inflows are overestimated. In other words, the excess of estimated inflows over outflows might be exacerbated by limitations of the merchandise trade data used here and in related research. Much work remains to be done in coming to grips with estimates of both outflows and inflows.

In producing this year's outflows data, we are again, as in earlier reports, employing a methodology that leads to conservative estimates. Our traditional approach affords an outflows estimate of $970 billion in 2014, consistent with rising figures in recent years. In addition, we have taken a second approach, attempting to handle trade between developing countries more conservatively. This approach produces an estimate of $620 billion for that year.

The combination of illicit outflows and inflows, arising from both balance of payments data and direction of trade statistics, leads to an estimate of IFFs at 14 to 24 percent of total developing country merchandise trade. This is a staggering figure, underlining the enormous harm done to developing countries by illicit financial flows, however they are generated. The order of magnitude of these estimates, much more so than their exactitude, warrants serious attention in both the

developing countries and in the wealthier world. Maximizing domestic resources and achieving sustainable development goals is dependent upon substantially curtailing illicit financial flows.

GFI thanks Matt Salomon and Joe Spanjers for the very thoughtful analysis and presentation embodied here. The continuing influence of Chief Economist Emeritus Dev Kar is gratefully acknowledged.

We welcome opportunities to engage with governments, institutions, and scholars addressing illicit financial flows and their impact on domestic resource mobilization, all undertaken for the benefit of billions of people in emerging market and developing countries.

Raymond Baker
President
Global Financial Integrity

April 2017

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Executive Summary

This report, the latest in a series of annual reports by Global Financial Integrity (GFI), provides estimates of the illicit flow of money out of the developing world—hereafter referred to as illicit financial flows (IFFs) or illicit outflows—from 2005 to 2014, the most recent ten years for which data are available. In addition to the estimated outflows GFI has presented in the past, this report highlights estimated illicit inflows to developing countries. It has become increasingly evident that both types of illicit flows represent a challenge to economic and social progress in the developing world. While GFI has regularly estimated both outflows and inflows in the past, it reports on both measures on equal footing here. Additionally, GFI now reports ranges for its estimates: lower estimates that conservatively accounts for trade between developing countries only and higher estimates, also conservative, that adds into the account some portion of illicit flows between developing countries.

Consistent with its reports, GFI finds that IFFs remain persistently high. The study finds that over the period between 2005 and 2014, IFFs likely accounted for between about 14.1 percent and 24.0 percent of total developing country trade, on average, with outflows estimated at 4.6 percent to 7.2 percent of total trade and inflows between 9.5 percent to 16.8 percent (see Table X-1). Total IFFs likely grew at an average rate of between 8.5 percent and 10.1 percent a year over the ten-year period. Outflows are estimated to have grown at an average annual rate between 7.2 percent and 8.1 percent and inflows at a slightly faster pace, between 9.2 and 11.4 percent per year. Those growth rates translate to an estimated range for total IFFs of $2 trillion to $3.5 trillion in 2014; outflows are estimated to have ranged between $620 billion and $970 billion in that year, while inflows ranged between $1.4 trillion and $2.5 trillion (in 2014).

GFI's measures of illicit financial flows stem from two sources: (1) deliberate misinvoicing in merchandise trade (the source of GFI's low and high estimates), and (2) leakages in the balance of payments (also known as "hot money flows"). Of those two sources, **trade misinvoicing is the primary measurable means for shifting funds in and out of developing countries illicitly**. Even using the lower of GFI's two estimates for trade misinvoicing, GFI finds that an **average of 87 percent of illicit financial outflows were due to the fraudulent misinvoicing of trade** (see Table X-2).

Table X-1. Estimated Illicit Financial Flows, All Developing Countries, 2005-2014
(Percent of total developing country trade except where noted)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Average, 2005-2014	2014 Billions of US dollars	2014 Average annual percent change since 2005
A. Total (outflows plus inflows)													
Low estimate	15.7	15.1	14.4	14.3	15.3	14.6	13.0	13.3	13.9	13.8	14.1	2,010	8.5
High estimate	23.5	24.0	23.7	23.4	25.7	24.8	23.8	23.3	24.5	24.0	24.0	3,507	10.4
Midpoint	*19.6*	*19.6*	*19.0*	*18.9*	*20.5*	*19.7*	*18.4*	*18.3*	*19.2*	*18.9*	*19.1*	*2,759*	*9.7*
B. Outflows													
Low estimate	5.4	4.9	4.8	4.8	5.8	5.1	3.9	4.3	4.2	4.2	4.6	620	7.2
High estimate	7.8	7.4	7.5	7.5	8.9	7.6	6.6	6.7	6.7	6.6	7.2	970	8.1
Midpoint	*6.6*	*6.1*	*6.1*	*6.1*	*7.4*	*6.4*	*5.3*	*5.5*	*5.4*	*5.4*	*5.9*	*795*	*7.7*
C. Inflows													
Low estimate	10.3	10.3	9.6	9.5	9.5	9.5	9.2	9.0	9.7	9.5	9.5	1,391	9.2
High estimate	15.6	16.6	16.2	15.9	16.8	17.2	17.2	16.6	17.8	17.4	16.8	2,537	11.4
Midpoint	*12.9*	*13.4*	*12.9*	*12.7*	*13.1*	*13.3*	*13.2*	*12.8*	*13.7*	*13.4*	*13.2*	*1,964*	*10.6*

Source: GFI staff estimates using data from the International Monetary Fund.
Note: Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics. The low estimates are based on bilateral trade data between developing countries and advanced countries only (details are provided in Appendix II). The high estimates scale up the low estimates country by country to account for misinvoicing between developing countries. The midpoint is the simple average of the low and high estimates.

Table X-2. Estimated Composition of Illicit Financial Flows, All Developing Countries, 2005-2014
(Percent of total developing country trade except where noted)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Average, 2005-2014	2014 Billions of US dollars	2014 Component as percent of total
A. Total (outflows plus inflows)													
Total	15.7	15.1	14.4	14.3	15.3	14.6	13.0	13.3	13.9	13.8	14.1	2,010	100
Trade misinvoicing (low estimate)	13.8	13.7	13.1	12.3	13.0	12.4	12.0	11.6	12.3	12.0	12.4	1,756	87
Unrecorded BOP flows	1.9	1.5	1.3	1.9	2.3	2.2	1.1	1.7	1.6	1.7	1.7	254	13
B. Outflows													
Total	5.4	4.9	4.8	4.8	5.8	5.1	3.9	4.3	4.2	4.2	4.6	620	100
Trade misinvoicing (low estimate)	4.4	4.1	3.8	3.5	3.8	3.3	3.0	2.8	2.9	2.8	3.3	406	66
Unrecorded BOP flows	1.0	0.8	0.9	1.2	2.0	1.8	0.9	1.4	1.3	1.5	1.3	213	34
C. Inflows													
Total	10.3	10.3	9.6	9.5	9.5	9.5	9.2	9.0	9.7	9.5	9.5	1,391	100
Trade misinvoicing (low estimate)	9.4	9.6	9.3	8.8	9.2	9.1	9.0	8.8	9.4	9.2	9.2	1,350	97
Unrecorded BOP flows	0.8	0.6	0.4	0.7	0.3	0.3	0.2	0.2	0.2	0.3	0.4	41	3

Source: GFI staff estimates using data from the International Monetary Fund.
Note: Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics. The trade misinvoicing flows reported here are the low estimates, based on bilateral trade data between developing countries and advanced countries only (details are provided in Appendix II).

To enhance the accuracy of the estimates, GFI has made some changes to its procedures apart from the inclusion of illicit inflows. Those include some changes in the way GFI implements the matched-trade methods it continues to use to estimate misinvoicing, changes which are intended to improve the accuracy of the estimates reported here. The basic data used to estimate misinvoicing is regularly revised by the International Monetary Fund (IMF). The list of countries for which reliable data are available has also changed somewhat to reflect both improved reporting by developing countries to the IMF and to incorporate judgments by GFI's analysts as to the reliability of data from selected individual countries. Additionally, this report uses supplementary bilateral data now published by Switzerland that permits a clearer identification of bilateral gold flows to and from that country than was possible in previous years. (Details on all these changes as well as their effects on the estimates are provided in Appendix II.)

Finally, in the interests of both transparency and continuity with GFI's reporting practices in previous years, the report presents a range of estimates of trade misinvoicing. Estimates at the lower end of each reported range reflect estimated trade gaps between developing countries and their advanced-country trade partners. Consistent with GFI's reporting in earlier years, the higher estimates are calculated by scaling up the low estimate for each developing county to account for misinvoicing between that country and other developing countries, assuming that each country's propensity for misinvoicing with its developing country partners is the same as for its trade with advanced countries (likely a conservative assumption). *At the individual country level, these higher, scaled-up estimates may be interpreted as an accurate estimate of that country's misinvoicing propensity in all of its trade.* However, because these scaled-up estimates include trade gaps between developing countries, adding the misinvoicing estimates for any two developing countries may lead to overcounting in the total, with the likelihood of overcounting rising as the number of countries being aggregated increases. By the same token, the lower estimate deliberately excludes misinvoicing in trade between developing countries and, therefore, is likely to underestimate trade misinvoicing at the individual country level.

To facilitate comparison of GFI's current estimates with those it reported in previous years, the dollar volumes of estimated outflows are depicted in Figure X-1. In 2014, for example, the estimated dollar magnitude of illicit financial outflows ranges from $620 billion to $970 billion. In the past, GFI has reported only the higher of the two estimates. The current high-end estimate of $975 billion of outflows in 2013 is comparable to the $1,090 billion reported for that year by GFI in 2015. The difference between the two is largely attributable to data revisions by the IMF as well as several methodological changes discussed more fully in Appendix II.

Figure X-1. Estimates of Illicit Financial Outflows, 2005-2014
(Millions of US dollars)
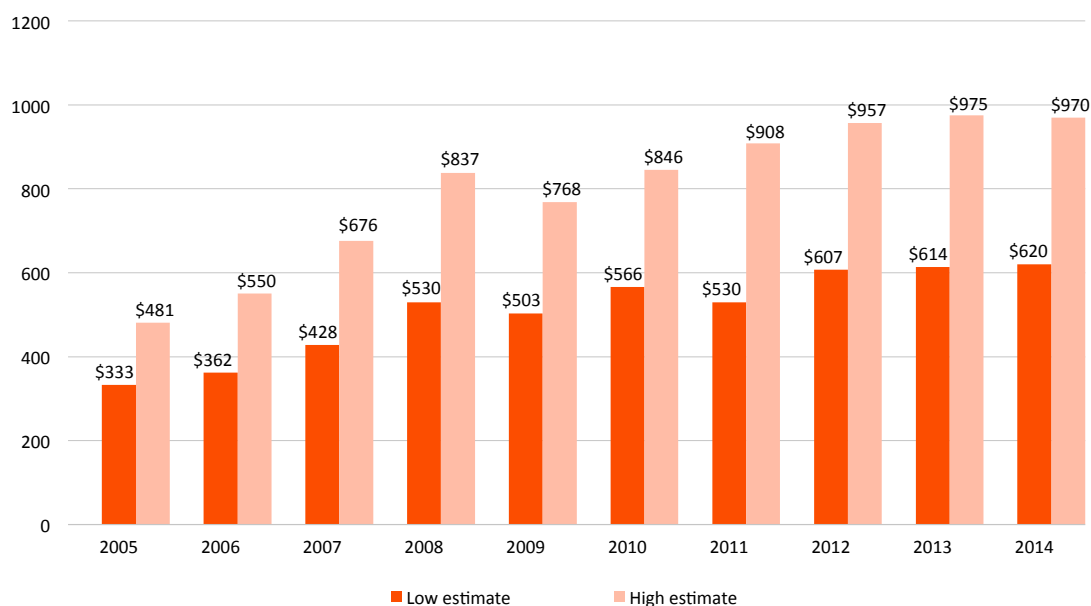
Year	Low estimate	High estimate
2005	$333	$481
2006	$362	$550
2007	$428	$676
2008	$530	$837
2009	$503	$768
2010	$566	$846
2011	$530	$908
2012	$607	$957
2013	$614	$975
2014	$620	$970

Source: GFI staff estimates using data from the International Monetary Fund.
Note: The low estimates are based on bilateral trade data between developing countries and advanced countries only; the high estimates scale up the low estimates country by country to account for misinvoicing between developing countries.

Even after taking into account all these changes in the methods and data, the message in the numbers presented here is remarkably similar to those reported in GFI's previous annual reports. The magnitude of IFF outflows and inflows remain persistently large. Moreover, the regional dimensions of IFFs have changed little from previous GFI reports. On either the broad or narrow basis of calculations, developing countries in Asia continue to be associated with the largest dollar-denominated flows. While smaller in dollar volume, developing countries in Eastern Europe, Sub-Saharan Africa, and Latin America consistently indicate high propensities for IFFs over the ten-year period, with Sub-Saharan Africa leading all other regions for illicit outflows (estimated at between 7.5 percent and 11.6 percent of total trade, on average over the period) and Developing Europe leading other regions for illicit inflows (estimated at between 12.4 percent and 21.0 percent of the region's total trade).

GFI continues to offer its global estimate of IFFs as illustrative of a significant obstacle facing the developing world. And, despite the uncertainties attending the estimates, GFI continues to regard the magnitude of IFFs reported here, both low and high, as likely to be conservative. For one thing, the scope of IFFs reported here—narrowly defined to accord with available macro trade data—is

only a small part (but the most readily measurable part) of all illicit flows between states. Moreover, the data available for estimating bilateral trade discrepancies are restricted to merchandise trade alone, excluding trade in services and intangibles, surely a more attractive channel for trade misinvoicing than trade in goods. Finally, collusive behavior by related parties on both sides of a particular trade (e.g., same-invoice faking) would not likely show up as misinvoicing in the available data. The lack of data that would shed light on services trade and same-invoice faking underscore GFI's view that its estimates of IFFs are conservative.[1]

In 2015, IFFs became part of development orthodoxy in the UN's Sustainable Development Goals and at the Financing for Development Conference in Addis Ababa in 2015. World leaders still have much to do to curb the opacity in the global financial system that facilitates these outflows. GFI recommends a number of steps that governments and other international regulators can take to develop greater financial transparency and curtail illicit outflows, including:

Beneficial Ownership

- Governments should establish public registries of verified beneficial ownership information on all legal entities, and all banks should know the true beneficial owner(s) of any account in their financial institution.

Anti-Money Laundering

- Government authorities should adopt and fully implement all of the Financial Action Task Force's (FATF) anti-money laundering recommendations; laws already in place should be strongly enforced.

Country-by-Country Reporting

- Policymakers should require multinational companies to publicly disclose their revenues, profits, losses, sales, taxes paid, subsidiaries, and staff levels on a country-by-country basis.

Tax Information Exchange

- All countries should actively participate in the worldwide movement towards the automatic exchange of tax information as endorsed by the OECD and the G20.

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[1] Another important factor supports GFI's interpretations of its estimates of IFFs as understated. To ensure the widest possible scope for its global estimates of illicit outflows, GFI uses country-level bilateral trade flows as reported in the IMF's DOTS database. These data are highly aggregated, a fact that introduces imprecision to the calculations. While the alternative of using a data set with more refined commodity detail on bilateral trade flows between countries (such as the UN's Comtrade database) might allow for more precise estimates for some (though not all) countries, the corresponding estimates of misinvoicing using finer commodity detail *would also necessarily raise the overall estimate* for trade-based misinvoicing.

Trade Misinvoicing

- Customs agencies should treat trade transactions involving a tax haven with the highest level of scrutiny.
- Governments should significantly boost their customs enforcement by equipping and training officers to better detect intentional misinvoicing of trade transactions, particularly through access to real-time world market pricing information at a detailed commodity level.
- GFI has developed a product to assist governments in the detection of potential misinvoicing in real time: GFTrade™ is a proprietary risk assessment application developed to enable customs officials to determine if goods are priced outside typical ranges for comparable products.[2]

Sustainable Development

- Governments should sign on to the Addis Tax Initiative to further support efforts to curb IFFs as a key component of the development agenda.

The massive flows of illicit capital shown in this study represent diversions of resources from their most efficient social uses in developing economies and are likely to adversely impact domestic resource mobilization and hamper sustainable economic growth. For example, some portion of the illicit flows highlighted here may correspond to tax revenues lost by developing country governments which would then be unavailable for use by those governments toward reducing inequality, eliminating poverty, and, more generally, raising the quality of life for people living in those countries. Whatever the source of the illicit flows, it is necessary to consider their role in any discussion of the development equation. It is important to consider not only the volume of resources legally flowing into and out of developing countries but also the illicit flows associated with leakages of capital from the balance of payments and trade misinvoicing. Governments and international organizations must strengthen policy and increase cooperation to combat this scourge.

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2 Additional information on GFTrade™ is available on GFI's website; see http://www.gfintegrity.org/gftrade/

I. Overview of the IFF Estimates for 2005-2014

The corrosive impact illicit financial flows (IFFs) can have on economic progress and poverty alleviation efforts became part of development orthodoxy in 2015. In July of that year, the Addis Ababa Action Agenda of the Third International Conference on Financing for Development was adopted, committing all nations to "redouble efforts to substantially reduce illicit financial flows by 2030, with a view to eventually eliminating them."[3] Furthermore, noting the report of the High Level Panel on Illicit Financial Flows from Africa,[4] the Addis Action Agenda invites "appropriate international institutions and regional organizations to publish estimates of the volume and composition of illicit financial flows."[5] As has been true in the past, Global Financial Integrity's *Illicit Financial Flows from Developing Countries: 2005-2014* is just that: an estimate of the volume and composition of illicit financial flows at the country level and disaggregated by type.

The United Nations adopted the Sustainable Development Goals (SDGs) in September 2015, which include, in Goal 16.4, a target that countries will "by 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime."[6] This statement, coupled with that seen in the Addis Action Agenda, underscores the international community's recognition of the severity of the illicit flows challenge and its embrace of efforts to tackle illicit flows in order to promote development and vigorous societies.

IFFs are illegal movements of money or capital from one country to another. Institutions such as the World Bank have used similar descriptions of IFFs in their publications. Broadly, GFI defines such flows as illicit if the funds crossing borders are illegally earned, transferred, and/or utilized.[7] If the flow breaks a law at any point, it is illicit.

In constructing its global estimate of IFFs, GFI focuses on only those flows that may be inferred from available global data: leakages from the IMF's balance of payment accounts (BOP) and misinvoicing in merchandise trade estimated from the IMF's Direction of Trade Statistics (DOTS). Of those two sources of IFFs, the dominant channel for IFFs moving in and out of the developing world is trade misinvoicing—according to this report, trade misinvoicing accounted for at least 66 percent of measurable IFF outflows and 97 percent of measurable inflows in 2014.

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3   "Resolution Adopted by the General Assembly on 27 July 2015: Addis Ababa Action Agenda of the Third International Conference on Financing for Development (Addis Ababa Action Agenda)," United Nations General Assembly Resolution (New York, NY: United Nations, August 17, 2015), 8, http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/69/313.

4   "Report of the High Level Panel on Illicit Financial Flows from Africa" (UNECA, February 26, 2015), http://www.uneca.org/sites/default/files/publications/iff_main_report_english.pdf.

5   "Addis Ababa Action Agenda," 8.

6   "Goal 16: Promote Just, Peaceful and Inclusive Societies," *United Nations Sustainable Development Goals*, 16, accessed November 1, 2015, http://www.un.org/sustainabledevelopment/peace-justice/.

7   "Issues: Illicit Financial Flows," *Global Financial Integrity*, November 2, 2015, http://www.gfintegrity.org/issue/illicit-financial-flows/.

The misinvoicing of trade is accomplished by misstating the value or volume of an export or import on a customs invoice. Trade misinvoicing is a form of trade-based money laundering made possible by the fact that trading partners write their own trade documents, or arrange to have the documents prepared in a third country (typically a tax haven)—a method known as re-invoicing. Fraudulent manipulation of the price, quantity, or quality of a good or service on an invoice allows criminals, corrupt government officials, and commercial tax evaders to shift vast amounts of money across international borders quickly, easily, and nearly always undetected.

By their nature, IFFs are typically intended to be hidden and unobservable. Accordingly, measurements of illicit flows can only be made indirectly using related data. Such measurements are necessarily imprecise. Additionally, there are many forms of illicit flows that cannot be picked up using available economic data and methods. For example, cash transactions, same-invoice faking, misinvoicing in services and intangibles, and hawala transactions are simply not registered directly in available economic data.

For those reasons, GFI characterizes the estimates presented here as likely to be conservative. Even so, they provide one measure of the largely unobservable IFFs problem. Moreover, GFI believes that the numerical significance and persistence of its estimates amply demonstrate the severity of the IFFs problem.

The estimated volume of illicit flows is staggering, ranging between $2 trillion and $3.5 trillion in 2014. Estimated illicit outflows from developing countries to the advanced world alone sum up to $620 billion in 2014 in the most conservative calculation and illicit inflows from the advanced countries into the developing world totaled more than $2.5 trillion.

In dollar terms, total IFFs are estimated to have grown at an average annual rate between 8.5 percent and 10.4 percent a year over the 2005-2014 period, with outflows estimated to have risen between 7.2 percent and 8.1 percent a year and inflows at an even higher pace, between 9.2 percent and 11.4 percent annually. By comparison, inflation in advanced countries averaged only 1.4 percent a year over that ten-year period.[8]

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8   Inflation is here measured as the average annual change over the ten-year period in the price deflator for gross domestic product (GDP) for advanced countries as reported by International Monetary Fund in its October 2016, World Economic Outlook Database (https://www.imf.org/external/pubs/ft/weo/2016/02/weodata/index.aspx).

IFFs have remained a persistently large share of developing country trade over the ten-year period (see Figure I-1). Total IFFs amounted to between 13.8 percent and 24.0 percent of total trade (i.e., exports plus imports) in 2014, with illicit outflows representing 4.2-6.6 percent of total trade and illicit inflows averaging 9.5-17.4 percent of trade in that year. Such significant and persistent propensities for IFFs in trade are a development challenge that merits serious attention and action from domestic and international policymakers alike.

Figure I-1. Estimates of Illicit Financial Flows, 2005-2014
(Percent of total trade)

Inflows (low estimate)   Outflows (low estimate)   Inflows (high estimate)   Outflows (high estimate)

Source: GFI staff estimates using data from the International Monetary Fund.
Note: The low estimates are based on bilateral trade data between developing countries and advanced countries only; the high estimates scale up the low estimates country by country to account for misinvoicing between developing countries. A country's total trade is defined as its exports plus its imports. Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

II. Estimates of Illicit Financial Outflows and Inflows

Total illicit financial flows to and from developing countries are estimated to have amounted to between 13.8 percent and 24.0 percent of total developing country trade (exports plus imports) in 2014, a sizeable magnitude and close to the average for the entire 2005-2014 period. The significant size and persistence of IFFs is the central theme of this report.

A. Estimates of Outflows

In dollar terms, total Illicit financial outflows grew at an average annual rate between 7.2 percent and 8.1 percent over the years from 2005 to 2014, reaching estimated levels between $620 billion and $970 billion in 2014 (Table II-1). Over that period, total developing country trade grew at an average 10.1 percent annual rate. Because growth in estimated outflows was less than growth in total trade, outflows are likely to have declined slightly as a share of total developing country trade over the ten-year period, from 5.4-7.9 percent in 2005 to 4.2-6.6 percent in 2014.

It would be a mistake, however, to read too much into that decline in the propensity for illicit outflows between 2005 and 2014. For one thing, both the low and high estimates of the 2005 propensities were higher than for any other year in the sample except for 2009, largely due to unusual volatility in trade growth in the years just prior to 2005. Following a 29 percent surge in 2004, total trade returned to more typical growth of over 20 percent in 2005. That unusual pattern of trade growth in 2004 and 2005 is largely responsible for the unusually large estimated propensities for illicit outflows in that year.

Furthermore, it would be a mistake to try to divine shifts in trends over a decade that was dominated by the global financial crisis and its aftermath. Illicit outflows varied considerably relative to total trade between 2005 and 2014 (Figure II-1). Most notably, the estimated range for illicit outflows relative to total trade rose sharply in 2009, the year in which the economic impacts of the financial crisis were most acutely felt. In 2009, estimated outflows were down by as much as 8.3 percent for all developing countries, while total trade for those countries is estimated to have declined even more substantially, dropping by 22.6 percent. Since 2009, however, illicit outflows relative to total trade appear to have remained remarkably stable despite considerable year-to-year variation in the dollar volumes of both outflows and trade.

Table II-1. Estimated Illicit Financial Outflows, All Developing Countries, 2005-2014
(Percent of region's total trade except where noted)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Average, 2005-2014	2014 Billions of US dollars	2014 Average annual percent change since 2005
All developing countries													
Low estimate	5.4	4.9	4.8	4.8	5.8	5.1	3.9	4.3	4.2	4.2	4.6	620	7.2
High estimate	7.8	7.4	7.5	7.5	8.9	7.6	6.6	6.7	6.7	6.6	7.2	970	8.1
Midpoint	*6.6*	*6.1*	*6.1*	*6.1*	*7.4*	*6.4*	*5.3*	*5.5*	*5.4*	*5.4*	*5.9*	*795*	*7.7*
Sub-Saharan Africa													
Low estimate	9.9	9.6	9.6	10.1	13.8	6.4	4.6	4.4	7.0	5.3	7.5	36	1.8
High estimate	12.6	13.8	14.3	14.5	18.7	8.9	8.4	8.6	11.3	9.9	11.6	69	6.3
Midpoint	*11.2*	*11.7*	*12.0*	*12.3*	*16.3*	*7.6*	*6.5*	*6.5*	*9.2*	*7.6*	*9.5*	*52*	*4.5*
Asia													
Low estimate	4.8	4.5	4.0	3.8	5.0	4.5	2.6	3.7	3.3	3.9	3.9	272	9.0
High estimate	6.4	6.1	5.8	5.7	6.7	6.1	3.9	5.1	4.9	5.6	5.4	388	9.8
Midpoint	*5.6*	*5.3*	*4.9*	*4.7*	*5.9*	*5.3*	*3.2*	*4.4*	*4.1*	*4.8*	*4.7*	*330*	*9.5*
Developing Europe													
Low estimate	6.0	5.3	5.5	5.6	7.2	6.7	6.3	5.0	5.3	4.8	5.7	119	6.1
High estimate	9.4	8.7	9.7	9.4	13.1	11.5	11.8	8.9	8.7	7.9	9.8	195	6.6
Midpoint	*7.7*	*7.0*	*7.6*	*7.5*	*10.1*	*9.1*	*9.0*	*7.0*	*7.0*	*6.3*	*7.8*	*157*	*6.4*
MENA+AP													
Low estimate	2.9	2.8	3.3	3.8	4.2	3.1	3.2	3.3	2.8	2.8	3.2	63	9.6
High estimate	4.9	5.7	6.0	6.2	6.7	5.4	6.2	6.0	5.5	5.2	5.8	119	10.9
Midpoint	*3.9*	*4.3*	*4.6*	*5.0*	*5.4*	*4.3*	*4.7*	*4.6*	*4.2*	*4.0*	*4.5*	*91*	*10.4*
Western Hemisphere													
Low estimate	7.2	5.8	5.5	5.4	5.8	6.6	5.3	5.8	6.1	5.8	5.9	129	5.6
High estimate	10.8	8.7	8.7	9.0	9.5	9.6	8.6	9.0	9.4	9.0	9.2	200	6.0
Midpoint	*9.0*	*7.3*	*7.1*	*7.2*	*7.7*	*8.1*	*6.9*	*7.4*	*7.8*	*7.4*	*7.5*	*164*	*5.8*

Source: GFI staff estimates using data from the International Monetary Fund.
Note: Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics. The low estimates are based on bilateral trade data between developing countries and advanced countries only (details are provided in Appendix II). The high estimates scale up the low estimates country by couintry to account for misinvoicing between developing countries. The midpoint is the simple average of the low and high estimates.

Figure II-1. Estimates of Illicit Financial Outflows, 2005-2014
(Percent of total trade)

Source: GFI staff estimates using data from the International Monetary Fund.
Note: The low estimates are based on bilateral trade data between developing countries and advanced countries only; the high estimates scale up the low estimates country by country to account for misinvoicing between developing countries. A country's total trade is defined as its exports plus its imports. Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

As in past GFI reports, illicit outflows continue to vary across major regions of the developing world. The estimated dollar levels of illicit outflows continue to be largest in Asia (where outflows are estimated to have grown between 9.0 percent and 9.8 percent a year over the decade, reaching $272 billion to $388 billion in 2014) and lowest in Sub-Saharan Africa (where outflows grew 1.8 percent to 6.3 percent a year to levels in the $36 billion-$69 billion range by 2014).

The regional differences in dollar levels are greatly influenced by the scale of economic activity (trade in particular) across the regions. Measured against the level of trade, Sub-Saharan Africa ranked highest in illicit outflows, ranging from 5.3 percent to 9.9 percent of total trade in 2014, while Asia ranked lowest of the major regions with estimated illicit outflows ranging from 3.9 percent to 5.6 percent of total trade (Figure II-2, low estimate). Developing Western Hemisphere countries (i.e., Latin America) ranked relatively high on both the dollar volume of outflows in 2014 ($129 billion to $200 billion) and in propensity (5.8 percent to 9.0 percent of total trade).

Figure II-2. Estimates of Illicit Financial Outflows from Developing Countries
(Low estimate as percent of total trade, averaged over the 2005-2014 period)

Source: GFI staff estimates using data from the International Monetary Fund.
Note: The low estimates are based on bilateral trade data between developing countries and advanced countries only; the high estimates scale up the low estimates country by country to account for misinvoicing between developing countries. A country's total trade is defined as its exports plus its imports. Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

B. Estimates of Illicit Financial Inflows to Developing Countries

The dollar volume of estimated inflows exceeded estimated outflows (by more than double in 2014) as did the rate of growth over the 2005-2014 period. Moreover, the growth rate of dollar inflows has exceeded that of dollar outflows, on average, for all developing countries in the sample. Finally, the range of estimates (high versus low) for estimated inflows was wider than it was for outflows.

Illicit financial inflows are estimated to have grown at an average annual rate between 9.2 and 11.4 percent over the years from 2005 to 2014, reaching an estimated level between $1.4 trillion and $2.6 trillion in 2014 (Table II-2). These growth ranges bracket the 10.1 percent increase in total developing country trade over that period.

As was the case with outflows, interpreting trends in estimated inflow propensities over a decade dominated by the disruptions of the global financial crisis is tenuous. That said, estimated inflows appear to be a large and surprisingly stable portion of total developing country trade (Figure II-3). Notably, the estimated propensities for inflows have not varied much since the worst of the global downturn in 2009.

Table II-2. Estimated Illicit Financial Inflows to Developing Countries, 2005-2014
(Percent of region's total trade except where noted)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Average, 2005-2014	2014 Billions of US dollars	2014 Average annual percent change since 2005
All developing countries													
Low estimate	10.3	10.3	9.6	9.5	9.5	9.5	9.2	9.0	9.7	9.5	9.5	1,391	9.2
High estimate	15.6	16.6	16.2	15.9	16.8	17.2	17.2	16.6	17.8	17.4	16.8	2,537	11.4
Midpoint	*12.9*	*13.4*	*12.9*	*12.7*	*13.1*	*13.3*	*13.2*	*12.8*	*13.7*	*13.4*	*13.2*	*1,964*	*10.6*
Sub-Saharan Africa													
Low estimate	9.4	6.3	5.9	7.1	8.0	8.6	7.9	7.2	7.5	6.3	7.4	44	4.5
High estimate	13.8	11.4	10.3	10.4	14.4	18.2	14.7	14.5	13.9	11.8	13.5	81	7.3
Midpoint	*11.6*	*8.8*	*8.1*	*8.7*	*11.2*	*13.4*	*11.3*	*10.9*	*10.7*	*9.0*	*10.4*	*63*	*6.2*
Asia													
Low estimate	10.5	10.0	10.2	9.7	9.3	9.4	9.0	9.5	10.3	9.9	9.7	686	10.7
High estimate	14.9	15.6	16.2	14.8	15.7	16.6	16.2	16.7	18.2	17.7	16.5	1,229	13.6
Midpoint	*12.7*	*12.8*	*13.2*	*12.3*	*12.5*	*13.0*	*12.6*	*13.1*	*14.3*	*13.8*	*13.1*	*958*	*12.5*
Developing Europe													
Low estimate	13.3	14.2	12.4	13.3	11.8	12.1	12.3	11.7	11.7	12.2	12.4	302	7.7
High estimate	21.3	21.5	20.5	22.5	20.1	20.6	22.7	20.5	20.2	19.9	21.0	495	8.1
Midpoint	*17.3*	*17.8*	*16.4*	*17.9*	*16.0*	*16.3*	*17.5*	*16.1*	*15.9*	*16.0*	*16.7*	*398*	*7.9*
MENA+AP													
Low estimate	9.6	10.4	8.4	7.3	8.1	8.0	6.9	5.8	7.1	6.8	7.5	154	6.0
High estimate	16.5	18.9	16.5	14.4	17.2	15.6	15.2	12.8	16.4	16.6	15.7	377	10.2
Midpoint	*13.0*	*14.7*	*12.4*	*10.8*	*12.7*	*11.8*	*11.0*	*9.3*	*11.7*	*11.7*	*11.6*	*265*	*8.8*
Western Hemisphere													
Low estimate	7.3	7.7	7.2	7.4	9.2	8.7	8.6	8.5	9.0	9.3	8.4	205	11.0
High estimate	11.3	12.9	12.3	13.4	16.5	16.4	16.5	16.5	16.7	16.0	15.2	355	12.3
Midpoint	*9.3*	*10.3*	*9.7*	*10.4*	*12.9*	*12.6*	*12.5*	*12.5*	*12.9*	*12.6*	*11.8*	*280*	*11.8*

Source: GFI staff estimates using data from the International Monetary Fund.

Note: Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics. The low estimates are based on bilateral trade data between developing countries and advanced countries only (details are provided in Appendix II). The high estimates scale up the low estimates country by country to account for misinvoicing between developing countries. The midpoint is the simple average of the low and high estimates.

Figure II-3. Estimates of Illicit Financial Inflows, 2005-2014
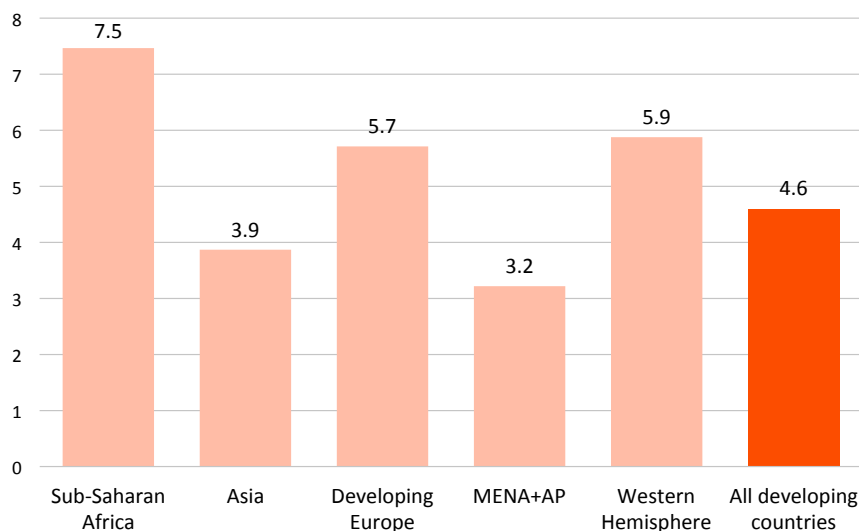### (Percent of total trade)

Source: GFI staff estimates using data from the International Monetary Fund.
Note: The low estimates are based on bilateral trade data between developing countries and advanced countries only; the high estimates scale up the low estimates country by country to account for misinvoicing between developing countries. A country's total trade is defined as its exports plus its imports. Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

Again, as with outflows, estimated inflows show considerable variation—in level and growth—across major regions of the developing world. The estimated dollar levels of illicit inflows were largest in Asia (where inflows are estimated to have grown at an average annual rate of 10.7 percent to 12.8 percent a year over the decade, reaching between $686 billion and over $1.2 trillion in 2014) and lowest in Sub-Saharan Africa (where inflows grew between 4.5 percent and 7.3 percent a year over the decade, reaching a level between $44 and $81 billion in 2014).

Developing countries in eastern Europe ranked highest in estimated illicit inflow propensities: 12.4 percent to 19.9 percent of total trade in 2014 (Chart II-4, low estimate). Sub-Saharan Africa, which ranked highest for outflows in 2014, ranked lowest among the major regions on inflow propensity for that year, with estimated inflows comprising between 6.3 percent and 13.1 percent of total trade.

Figure II-4. Estimates of Illicit Financial Inflows to Developing Countries
(Low estimate as percent of total trade, averaged over the 2005-2014 period)

Source: GFI staff estimates using data from the International Monetary Fund.

Note: The low estimates are based on bilateral trade data between developing countries and advanced countries only. A country's total trade is defined as its exports plus its imports. Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

III. A Guide to Interpreting the Misinvoicing Estimates

As stated at the outset, the IFF estimates reported here are imprecise. The main reason is that, by their nature, IFFs are generally not observable so estimates must be measured indirectly using related observed data. However the observed data are also imprecise. Furthermore, to draw inferences from the observed data, analysts apply methods and enabling assumptions that are necessarily imperfect. Facing such formidable measurement difficulties, therefore, researchers must take pains to clearly state the objectives of the measurement exercise, to use the best data and most robust techniques available in a manner consistent with the research objectives and, most important, to be absolutely clear on both the strengths and limitations of the estimates they report.

This section of GFI's report attempts to do just this. In the first subsection, GFI presents its research objectives, and outlines the data and methods underlying its estimates of trade misinvoicing in developing countries, identifying the main strengths and limitations of the estimates.[9] (GFI's methods are discussed in greater detail in Appendix II). Given the objective of its research—to provide a conservative global benchmark magnitude for trade misinvoicing—GFI strives to make the best use of publicly available global data. The scope of GFI's definition of IFFs is determined by the availability of global data and is much narrower than what IFFs encompass, in principle. Even so, GFI's estimates of trade misinvoicing are large and persistent over time. Moreover, the steps governments could take to curtail trade misinvoicing are relatively inexpensive. Accordingly, the expected benefits to countries that undertake such policies seem worthwhile.

In the second subsection, GFI examines one of its key assumptions that allows reported imports to be comparable with reported exports. GFI assesses the sensitivity of its misinvoicing estimates to changes in the rate at which the conventional basis for evaluating imports ("cost, insurance, and freight" or CIF) are marked up over the conventional accounting basis for evaluating exports ("free on board" or FOB). The IMF data on imports are only reported on a CIF basis, so they must be converted to an FOB basis to facilitate comparisons with corresponding export flows. The simple sensitivity analysis concludes that changes in the assumed CIF-to-FOB markup rate does not change the overall estimate for total IFFs, though it alters the mix between estimated outflows and inflows.

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9   This section excludes discussion of the component of IFFs identified as unrecorded balance of payment (BOP) flows, sometimes referred to as "hot money narrow." As presented earlier in the report, that component of IFFs (taken directly from the IMF's estimates of "Net Errors and Omissions" (NEO) as published in its BOP database) tends to be relatively small: no more than 13 percent of the total IFF estimate in 2014, for example. Those unrecorded flows represent flows in and out of countries that cannot be definitively assigned to any of the major categories (the current, financial and capital accounts) which are estimated separately by the IMF, using independent sources. Because, as an accounting matter, the three major BOP accounts must balance, a residual magnitude (NEO) is a statistical inevitability. GFI's use of this residual as a component of IFFs derives from its widespread use in earlier economic research as a component of capital flight (see, for example, Stijn Claessens and David Naudé, "Recent Estimates of Capital Flight" (Policy Research Working Paper no. 1186, International Economics Department, The World Bank, Washington, DC, September 1993), http://documents.worldbank.org/curated/en/878311468739518251/pdf/multi0page.pdf). GFI assumes that the entire magnitude of unrecorded flow is illicit. Because the magnitudes owing to this factor are small, changes in that assumption typically will have a relatively small impact on the IFF total.

A. Overview of the Strengths and Limitations of the Trade Misinvoicing Estimates

GFI defines IFFs broadly to be *illegal movements of money or capital from one country to another—such financial flows are considered to be illicit when the funds are illegally earned, transferred, or utilized.* The proliferation of such IFFs would clearly signal the presence of significant social costs, a fact that gives rise to the question of measurement: how significant is the magnitude of IFFs?

In this report, as with its earlier reports, GFI addresses the question of the significance of the magnitudes of IFFs in the context of social costs incurred by developing countries, those that, because of their critical dependence on commerce with advanced countries, are generally most vulnerable to the social costs associated with IFFs. In some cases, those social costs might easily translate into revenue foregone by the governments of developing countries. In others, IFFs may have no direct implications for public sector saving in the developing world. Whatever the factors motivating IFFs, a proliferation of IFFs generally signals unproductive accumulations of wealth that can have corrosive effects on developing countries. Countries that cannot (or will not) take sufficient steps to curtail IFFs are more likely to face increased inequality and diminished credibility in their institutions of governance, for example. Over time, such social corrosion exacerbates the deterioration, making it more and more difficult for a country to achieve and sustain adequate living standards for its citizens.

Because IFFs are unobserved, the question of measurement cannot be answered with precision. But because the question is critical to the futures of a large chunk of the world's population, any indication of the collective significance of IFFs to the developing world is helpful to policymakers, citizens, and other stakeholders in those countries. Many of these groups are already very well aware of the problems created by IFFs, particularly misinvoicing. GFI believes that the availability of more comprehensive estimates serves to support the cases they may be making within their countries to take effective (and relatively inexpensive) steps to reduce the social costs of abiding trade fraud.

GFI's approach to estimating the significance of IFFs focuses primarily on trade misinvoicing. While misinvoicing is only a small part of all IFFs as implied by GFI's (or anyone's) definition, it is a portion for which some data exist, thereby allowing some indirect measurement of the issue. In its country-focused research, GFI attempts to use all available data and techniques to make robust inferences about IFFs. However, for the purposes of its annual reports, such use of country-specific and commodity-specific bilateral trade is too unwieldy at this time (too unwieldy, for example, to allow others to easily replicate GFI's results); it is also not necessarily conducive to providing a "conservative" estimate of trade misinvoicing that covers as large a swath of developing countries as is desired.

The only data source currently available that is both sufficiently broad in its country coverage and also consistent with GFI's objective of providing a conservative illustration of the magnitude of misinvoicing is the IMF's Direction of Trade Statistics (DOTS). These data provide a comprehensive mirror-trade accounting of annual trade flows between developing and advanced countries, which allows for the identification of significant and persistent gaps between the trade reports of developing countries and their advanced country trade partners.[10]

That said, the DOTS data are innately limited in what information they can yield for global estimates of misinvoicing. Those limitations have been noted in recent critiques of the mirror-trade approach.[11] A discussion of such limitations would include at least the following seven:

1. **Unobserved transaction cost markups.** Data on transactions costs of trade are not generally available. Most notably, imports are conventionally reported as valued on a CIF basis and must be converted to the FOB basis conventionally used for exports before mirror-trade discrepancies can be identified.

2. **Regional aggregation.** Consistent bilateral trade data are not generally available for all countries engaged in trade.

3. **Commodity aggregation.** Even when consistent bilateral trade data are available for a selection of countries involved in trade, bilateral reporting may not be available for all goods traded.

4. **Timing of trade.** Transactions take time to complete and countries on either side of a transaction may record trade volumes in different years.

5. **Entrepôt trade.** Reported country sources and destinations for trade may reflect reporting from intermediate ports where goods from an originating country are warehoused for a time before they are shipped to the ultimate destination in other countries. The problem arises when exports and imports passing through entrepôt ports are reported by both the entrepôt countries and the source/destination countries, leading to over-counting in official data and apparent trade gaps where none should be. We address this where possible.

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10 The closest competitor to DOTS would be the United Nation's Comtrade database. GFI regularly uses the Comtrade data in its country-specific research (along with other data when available including detailed trade data produced by some developing countries) because of the rich commodity-specific bilateral trade data available in Comtrade, but not DOTS. GFI is investigating the possibility of using Comtrade for its annual global estimates but at the moment, both retrieval and processing of the Comtrade data for all countries and commodities is not feasible for GFI. Moreover, while the Comtrade data would arguably permit GFI's misinvoicing estimates to be more precise, the same limitations that attend the mirror-trade approach applied to DOTS data would also limit inferences from the more detailed Comtrade data. Moreover, if the Comtrade and DOTS data are broadly consistent with each other, using Comtrade would be very likely to increase (and certainly not decrease) the estimated magnitude of misinvoicing. That's because trade gaps that offset each other when presented at the country level (DOTS), would not offset when presented at the commodity level (Comtrade).

11 For example, see Volker Nitsch, "Trade Mispricing and Illicit Flows," in *Draining Development? Controlling Flows of Illicit Funds from Developing Countries*, ed. Peter Reuter (Washington, D.C.: World Bank, 2012), 309–34, https://openknowledge.worldbank.org/handle/10986/2242 and, most recently, Volker Nitsch, "Trade Misinvoicing in Developing Countries" (CGD Policy Paper 103, Washington, DC, February 2017), https://www.cgdev.org/sites/default/files/trade-misinvoicing-developing-countries.pdf .

6. **Currency conversion.** While much world trade is transacted in vehicle currencies (e.g., the U.S. dollar) other trades are not. The exchange rates used by the official agencies to convert trade data to dollars may differ from those that may have directly affected the choices made by the parties to particular trades. For countries that maintain multiple exchange rate regimes, the possibilities for such errors are magnified, as are the motivations for misinvoicing.

7. **Country idiosyncrasies.** Particular countries may not report bilateral trade flows for particular goods for particular years for one reason or another.

Each one of those limitations does indeed work to undermine the precision of misinvoicing estimates, and there are no remedies available to researchers that would completely mitigate any such impediments to precision. Many observers have suggested that using better data would improve the accuracy of the estimates. This is certainly true, but the kind of data that would allow researchers to circumvent the kinds of limitations listed above unfortunately do not exist for all but a few countries at this time. Moreover, an ideal data set (i.e., one containing enough information for all countries to allow researchers to completely control for all of the seven distorting factors listed above) would still not be able to identify misinvoicing with certainty: for example, the most precise imaginable trade gap estimated from ideal data would still not allow researchers to distinguish illicit misinvoicing from unintended human error, much less the direction of misinvoicing implicit in an estimated trade gap.

As with all social measurement, additional assumptions are needed. In choosing such assumptions, researchers must try to be as realistic as possible in the absence of additional information. Moreover, in presenting their estimates, researchers must make decisions about presenting their results in such a way that minimizes the likelihood of users misinterpreting their results. This consideration accounts for much of the changes in the presentations in this report. GFI highlights the misinvoicing estimates as averaged over the 2005-2014 period to minimize to some extent the timing effects of trade reports that straddle a year. Furthermore, the emphasis on regional averages of misinvoicing estimates mitigates to some degree the effects of entrepôt trade, as well as pointing out that the results for individual countries are likely to be even less precise than for regional and global aggregates. GFI includes adjustments to the DOTS data for all known country data idiosyncrasies (see Appendix II for more details on the Hong Kong, Swiss, South Africa and Zambia adjustments). GFI highlights its estimates over time as propensities (i.e., IFFs as a percent of total trade) to limit the influence of other trends (such as globalization) that affect the year-to-year dollar totals. This analysis presents a range of estimates to underscore uncertainties inherent in the exercise. Finally, GFI constructs its estimates and makes them available to other interested researchers in such a way as to keep the process as transparent as possible, to enable others to easily replicate the work and, most importantly, to invite productive comments from the community that will allow GFI to improve its estimates in a way that is consistent with its objective.

To sum up: with its annual global estimates, GFI is attempting to provide an **indication of the overall magnitude of misinvoicing**, a measure that, by design, tends to **understate** the unobserved overall magnitude.[12] The result that a significant share of total developing country trade is potentially misinvoiced is alarming. Fortunately, there are concrete (and relatively inexpensive) steps that developing countries can take to reduce such misinvoicing. These measures will not eliminate all illicit financial flows, but governments still have space to potentially significantly curtail misinvoicing, thereby addressing to an extent the social, economic, and political ills this flows are causing.

The next subsection examines the sensitivity of the GFI misinvoicing estimates to changes in its enabling assumption for the CIF/FOB markup.

B. Sensitivity of the Estimates to the Adjustment of CIF Basis Imports to FOB Basis

Because the DOTS data reports dollar volumes of exports on an FOB basis and associated imports on an (inflated) CIF basis, the paired trade flows must be adjusted to a comparable basis. In its estimates, *GFI assumes that the FOB flows are marked up at a constant 10 percent rate* over the FOB basis. GFI implements this assumption by multiplying all reported import flows by a factor equal to $(1 + 0.1)^{-1}$ to put those import flows on an FOB basis, making them comparable with the reported export flow.

GFI follows longstanding IMF usage (for example, in IMF's imputations of missing data in DOTS) by assuming an ad-valorem markup rate of 10 percent. While the 10 percent assumption is ultimately an arbitrary choice (for GFI—as well as for the IMF and others—owing to the scarcity of consistent data on the costs of transnational transport and other factors) it generally accords with previous economic research practice and, for that reason, GFI has maintained this assumption in all of its annual reports and continues to assume this here.

There are weaknesses to this assumption and approach, however, as one might expect CIF/FOB markups to vary with the distances goods must travel from the exporting country to the importing country. Moreover, the markup rate might also be expected to vary by the mode of transport (e.g., truck, ship, or plane) used in shipping the goods and it might be expected to change over time (as transport costs are generally believed to have been on declining trend). Finally, the markup rate is assumed to be symmetric (i.e., imports by country B of a given FOB value of associated exports

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12 Recall that the use of more commodity detail on goods trade is virtually guaranteed to raise the aggregate misinvoicing estimate (and certainly not lower it), and the inclusion of services trade fraud and same-invoice faking (were adequate data available) would further raise the total.

from country A necessarily equal the markup rate for a comparable shipment of the same goods from country B to country A)—this need not hold in practice.[13] However, detailed data on transport costs have historically been hard to come by.

A natural question to ask, then, is: how sensitive are GFI's baseline (10 percent) estimates to changes in the CIF/FOB markup rate? To address this, GFI computed alternative estimates of misinvoicing based on markup rates that bracket its baseline assumption of 10 percent. The results are illustrated in Figure III-1.

The overall propensities for misinvoicing turn out to be relatively insensitive to the assumed CIF/FOB markup rate (see Figure III-1). The baseline estimate of total misinvoicing (assuming a 10 percent markup) is 12.5 percent and ranges from a low of 12.3 percent (assuming an 8 percent markup) to 13.2 percent (assuming a 15 percent markup).

Figure III-1. Estimates of Trade Misinvoicing Flows Under Alternative Assumptions Regarding the CIF/FOB Markup Rate
(Low estimate as percent of total trade, averaged over the 2005-2014 period)
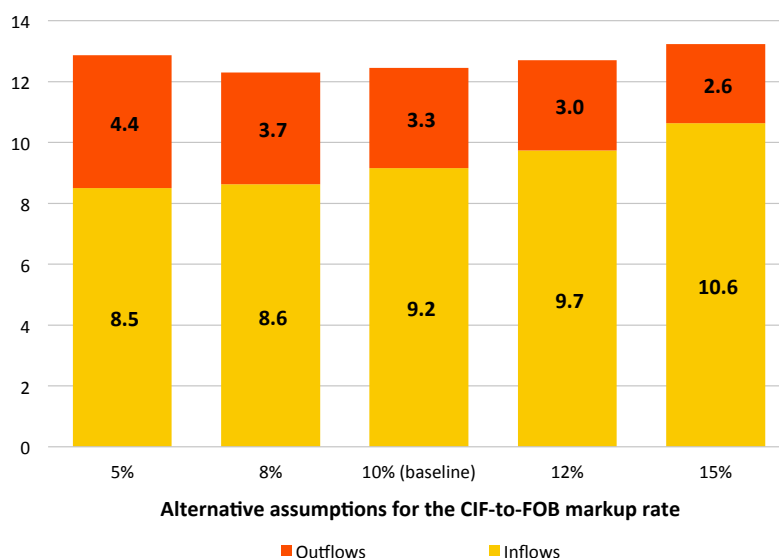
Alternative assumptions for the CIF-to-FOB markup rate

■ Outflows   ■ Inflows

Source: GFI staff estimates using data from the International Monetary Fund.
Note: The low estimates are based on bilateral trade data between developing countries and advanced countries only. A country's total trade is defined as its exports plus its imports. Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

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13 For example, think of country A being predominantly flat and country B being mountainous. All other things held equal, transporting goods imported by B over mountainous terrain might be expected to cost more than transporting the same goods imported by country A to some final interior destination.

That said, the distribution of misinvoicing by type exhibits some sensitivity to the assumed markup rate. A higher assumed rate tends to lower outflows and increase inflows. Estimated misinvoicing outflows (3.3 percent of total trade at 10 percent) vary between 4.4 percent (assuming an 8 percent markup) and 2.6 percent of total trade (assuming a 15 percent markup rate). Conversely, estimated inflows vary directly with the assumed markup rate: from a low of 8.5 percent of trade (assuming an 8 percent markup rate) to 10.6 percent (assuming a 10.6 percent markup rate).

What this means is that total misinvoicing is probably more robustly estimated by GFI's method than its components (i.e. outflows and inflows taken separately), other things being equal. This result is not surprising, as changes in the markup rates, under the constancy and symmetry assumptions, have predictable algebraic effects on the size and direction of the trade gaps underlying the misinvoicing estimates (reflected in the direction in which the numerical estimates reported in Figure III-1 change as the assumed markup rate changes).

The relative sensitivities reported are only illustrative, as they are critically dependent on the constancy and symmetry that GFI assumes for the markup rates. In future work, GFI plans to test this assumption further by calculating its misinvoicing estimates using research data that have become available in recent years that allow for more realistic assumptions concerning the markup rates on trade.[14]

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14 Those data are described in Guillaume Gaulier and Soledad Zignago, "BACI: International Trade Database at the Product-Level, The 1994-2007 Version" CEPII Working Paper, No 2010-23, October 2010, http://www.cepii.fr/PDF_PUB/wp_nts/2010/wp2010-23.pdf

IV. Policy Recommendations

A.   Overview

Illicit financial flows from developing countries are facilitated by a lack of transparency in the global financial system that encourages tax havens and secrecy jurisdictions, anonymous trusts and shell companies, bribery, and corruption. There are countless techniques to illegally move funds out of a country and/or to launder dirty money, including the misinvoicing of trade, which can be used to shift proceeds of criminal activity across national borders.

Though policy environments vary from country to country, there are best practices that all countries should adopt themselves and promote at international and regional forums and institutions, including the G20 countries, the United Nations, the World Bank, the IMF, the OECD, and the African Union. This section highlights these best practices and suggests further steps domestic and international regulators could take to curtail illicit financial flows.

B.   Anti-Money Laundering

At a minimum, all countries should comply with the Financial Action Task Force (FATF) Recommendations to combat money laundering and terrorist financing. The most recent update to those recommendations was released in 2012, introducing new priority areas on corruption and tax crimes.[15]

Despite good intentions and good policy, actually stopping money laundering often comes down to enforcement. Regulators and law enforcement officials must strongly enforce all anti-money laundering laws and regulations already on the books. This includes prosecuting criminal charges against and imposing appropriate penalties upon employees of financial intuitions who are culpable for allowing money laundering to occur as well as other culpable professional facilitators such as lawyers, accountants, and corporate service providers.

C.   Beneficial Ownership of Legal Entities

Information on the ultimate, true, human owner(s) of all corporations and other legal entities, referred to as "beneficial owners", should be disclosed upon formation, updated regularly, and made freely available to the public in central registries. Countries and international institutions should require gatekeepers to the financial system—lawyers, accountants, corporate service providers, and financial institutions—to identify the beneficial owners of their accounts and clients. In particular, beneficial owners for all banking and securities accounts should be identified in order to address the problems posed by anonymous companies and other legal entities.

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15 Financial Action Task Force, "The FATF Recommendations: International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation" (Paris, France: FATF, February 2012), http://www.fatf-gafi.org/topics/fatfrecommendations/documents/fatf-recommendations.html.

In 2015, the European Union adopted legislation requiring each EU Member State to create registers of beneficial ownership information by May 2017 that are freely accessible by law enforcement authorities and financial institutions, and available to third parties that can demonstrate a legitimate interest in the information. Nothing prevents EU Member states from creating entirely open registries, however, and a few countries both within and outside the EU have already committed to doing so, including the UK, Denmark, Norway, Ukraine, Ghana, Kenya, Nigeria, and Colombia. However, progress by G20 countries towards meeting even the less ambitious High Level Principles on Beneficial Ownership Transparency (adopted by the G20 in November 2014) has been poor.[16] GFI urges countries to commit to the creation of public registries of corporate beneficial ownership information and to engage with countries already in the process of implementing public registers to learn from their challenges and successes.

D. Automatic Exchange of Financial Information

All countries should actively participate in the global movement toward the automatic exchange of financial information. Ninety-six countries have committed to implementing the OECD/G20 standard for this exchange by the end of 2018, which represents some progress from this time last year, when only 89 countries had committed to the standard. Nonetheless, the OECD and G20 must ensure that developing countries, and especially the least developed countries, are included in the process. The system that has been established provides a necessary framework but allows countries to "choose" one another for actual information exchange. This has so far resulted in the exclusion of most developing countries from receiving information from partners. In addition, the system should allow for a phase-in period for developing countries during which they can receive information from other countries without needing to reciprocate right away. During this period, they could receive technical assistance to help adapt their information collection and processing systems to be able to provide the necessary information to their exchange partners.

E. Country-by-Country Reporting

All countries should require multinational corporations to publicly disclose their revenues, profits, losses, sales, taxes paid, subsidiaries, and staff levels on a country-by-country basis as a means of detecting and deterring abusive tax avoidance practices. As part of the Base Erosion and Profit Shifting (BEPS) initiative, the G20 countries and the OECD countries agreed in November 2015 to take the necessary measures to require their large, multinational companies to provide such reporting on a country-by-country basis. Unfortunately, the agreement only requires that the information be provided by the parent of the multinational company to its home tax authority. Other countries' tax authorities will be able to access the information only through official treaty requests, and therefore only where such treaties are in place. GFI strongly recommends that countries require companies over which they have relevant jurisdiction to provide public country-by-country

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16 "Just for Show? Reviewing G20 Promises on Beneficial Ownership" (Transparency International, November 12, 2015), https://www.transparency.org/whatwedo/publication/just_for_show_g20_promises.

reporting, so that the information can be analyzed by legislators responsible for fixing the profit-shifting problems that such reporting will help identify. Since legislators alone will not have enough qualified people to adequately analyze the information necessary to make informed policy changes, publicly available country-by-country reporting would also allow experts from academia, civil society, and the media to lend their analytical support to the problem.

F.   Curtailing Trade Misinvoicing

Trade misinvoicing accounts for a substantial majority of illicit flows over the time period of this study, averaging upwards of 87 percent of IFFs (or 12.4 percent of developing country trade) over the 2005-2014 period. Curbing trade misinvoicing must necessarily be a major focus for policymakers around the world.

Governments should significantly boost customs enforcement by providing appropriate training and equipment to better detect the intentional misinvoicing of trade transactions. One particularly important tool for stopping trade misinvoicing as it happens is access to the most recently available, commodity-level world market pricing information. This would allow customs officials to tell whether a particular good may be significantly mis-priced relative to prevailing world trade pricing for that good. This variance could then trigger further review for the transaction in some form, such as an audit. GFTrade™, a product of GFI, is a proprietary risk assessment tool designed to allow customs departments to do just that.

Given the greater potential for abuse, trade transactions with secrecy jurisdictions should be treated with the highest level of scrutiny by customs, tax, and law enforcement officials. Brazil is an excellent example on this point, subjecting transactions with secrecy jurisdictions and tax havens to a higher tax rate.[17]

G. Addis Tax Initiative

The Addis Tax Initiative (ATI), an agreement reached in 2015, attempts to focus the political will of several countries to address the illicit flows menace.[18] The ATI is the outcome of a side event at the most recent Financing for Development Conference; it directly links illicit financial flows to domestic resource mobilization, and in turn, to sustainable development.[19] The more than 30 countries and international organizations that have agreed to it thus far have acknowledged that curbing illicit flows is crucial to achieving the SDGs. Germany, the United States, the United Kingdom, and the Netherlands are among the developed governments taking part in the non-binding effort to seek ways to reduce IFFs. Ethiopia, Indonesia, the Philippines, and Tanzania, as well as other developing countries, have said they will strive to curb their losses of revenue (due to IFFs). GFI strongly encourages other countries to sign on to the Addis Tax Initiative and has entered into discussions with numerous governments to determine how the aspiration of the Addis Action Agenda, the SDGs, and the ATI can move to implementation.

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17 Walter Stuber, "Brazil: Tax Haven Jurisdictions - Haven or Hell?," *Mondaq*, January 8, 2013, http://www.mondaq.com/brazil/x/215184/
    Income+Tax/Tax+Haven+Jurisdictions+Haven+Or+Hell.

18 "Financing for Development Conference: The Addis Tax Initiative - Declaration" (Addis Ababa, Ethiopia: International Tax Compact,
    July 15, 2015), http://www.taxcompact.net/documents/Addis-Tax-Initiative_Declaration.pdf.

19 "Better Tax Systems Crucial for Development," [Press Release] (Addis Ababa, Ethiopia: International Tax Compact, July 15, 2015),
    http://www.taxcompact.net/documents/Addis-Tax-Initiative_Press-Release.pdf.

VI. Conclusions

The estimates presented in this report underscore the severity of the problem illicit financial lows present to the developing world. Illicit flows in and out of the developing world amounted to at least 13.8 percent of total trade (or $2 trillion) in 2014. The significant estimated propensities for illicit flows in the developing world have not declined appreciably over the 2005-2014 period. Propensities for nations to experience illicit financial outflows have been highest in Sub-Saharan Africa, while propensities for illicit inflows have been highest in Eastern Europe and Asia.

The numerical estimates are intended to illustrate the magnitude of the problem of illicit financial flows. Significant and persistent IFFs in and out of developing countries imply sizeable social costs falling on the governments and citizens of those countries. The IMF data underlying the estimates are the best available to GFI at this time. While GFI will continue to explore new data resources and update its methods, complete precision in such research is not achievable. GFI believes that identification of orders of magnitude more than establishes the need for policymakers to curtail those flows and reduce their social costs.

GFI recommends a number of policy measures to curtail illicit flows. Broadly, they are related to increasing transparency in the global financial system. Measures related to tax haven secrecy, anonymous companies, and money laundering techniques are of particular importance.

Specifically, GFI's major policy recommendations to world leaders include:

1. **Beneficial Ownership.** Governments should establish public registries of beneficial ownership information on all legal entities, and all gatekeepers to the financial system should know the true beneficial owner(s) of any account or client relationship they open.

2. **Anti-Money Laundering.** Government authorities should adopt and fully implement all of the Financial Action Task Force's (FATF) anti-money laundering recommendations; laws already in place should be strongly enforced.

3. **Country-by-Country Reporting.** Policymakers should require multinational companies to publicly disclose their revenues, profits, losses, sales, taxes paid, subsidiaries, and staff levels on a country-by-country basis.

4. **Tax Information Exchange.** All countries should actively participate in the worldwide movement towards the automatic exchange of tax information as endorsed by the OECD and the G20.

5. **Trade Misinvoicing.** Customs agencies should treat trade transactions involving a tax haven with the highest level of scrutiny. Moreover, governments should significantly boost their customs enforcement by equipping and training officers to better detect intentional misinvoicing of trade transactions, particularly through access to the most recently available world market pricing information at a detailed commodity level.

6. **Addis Tax Initiative.** Governments should sign on to the Addis Tax Initiative to further support efforts to curb illicit financial flows as a key component of the global development agenda.

Illicit financial flows must be curtailed if domestic resource mobilization initiatives are to stand any chance of succeeding. National and international policymakers must consider the outsized effect of illicit financial flows on development and implement appropriate policies. GFI has a strong track record of working with governments and stands ready to assist in this effort.

Appendix I. Tables

Full data sets are available in the online data appendix.

Appendix Table I-1. Geographical Regions

Sub-Saharan Africa (45)	Asia (25)	Developing Europe (24)	MENA+AP (22)	Western Hemisphere (33)	Advanced Economies (35)
Angola	Bangladesh*	Albania	Algeria*^	Antigua and Barbuda	Australia
Benin	Bhutan	Armenia, Republic of*	Afghanistan	Argentina*	Austria
Botswana†	Brunei Darussalam	Azerbaijan, Republic of*	Bahrain, Kingdom of	Aruba*	Belgium
Burkina Faso	Cambodia	Belarus*	Djibouti^	Bahamas, The	Canada
Burundi	China, P.R.: Mainland*	Bosnia and Herzegovina	Egypt*^	Barbados	Cyprus
Cabo Verde	Fiji	Bulgaria*	Iran, Islamic Republic of	Belize	Czech Republic
Cameroon	India*	Croatia*	Iraq	Bolivia	Denmark
Central African Republic	Indonesia*	Georgia*	Jordan*	Brazil*	Estonia
Chad	Kiribati	Hungary*	Kuwait	Chile*	Finland
Comoros	Lao People's Democratic Republic	Kazakhstan*	Lebanon	Colombia*	France
Congo, Dem. Rep. of	Malaysia*	Kosovo, Republic of	Libya^	Costa Rica*	Germany
Congo, Republic of	Maldives	Kyrgyz Republic	Morocco*^	Dominica	Greece
Cote d'Ivoire*	Mongolia	Macedonia, FYR	Mauritania^	Dominican Republic	Hong Kong
Equatorial Guinea	Myanmar	Moldova*	Oman*	Ecuador*	Iceland
Eritrea	Nepal	Montenegro	Pakistan	El Salvador*	Ireland
Ethiopia	Papua New Guinea	Poland*	Qatar*	Grenada	Israel
Gabon	Philippines*	Romania*	Saudi Arabia	Guatemala*	Italy
Gambia, The	Samoa	Russian Federation*	Sudan*^	Guyana	Japan
Ghana	Solomon Islands	Serbia, Republic of	Syrian Arab Republic	Haiti	Korea, Republic of
Guinea	Sri Lanka*	Tajikistan	Tunisia^	Honduras*	Latvia
Guinea-Bissau	Thailand*	Turkey*	United Arab Emirates	Jamaica*	Lithuania
Kenya	Timor-Leste, Dem. Rep. of	Turkmenistan	Yemen, Republic of	Mexico*	Luxembourg
Lesotho†	Tonga	Ukraine*		Nicaragua*	Malta
Liberia	Vanuatu	Uzbekistan		Panama*	Netherlands
Madagascar	Vietnam*			Paraguay*	New Zealand
Malawi				Peru*	Norway
Mali				St. Kitts and Nevis	Portugal
Mauritius*				St. Lucia	San Marino
Mozambique				St. Vincent and the Grenadines	Singapore
Namibia†				Suriname	Slovak Republic
Niger				Trinidad and Tobago	Slovenia
Nigeria				Uruguay	Spain
Rwanda				Venezuela, Republica Bolivariana de*	Sweden
Sao Tome and Principe					Switzerland
Senegal*					United Kingdom
Seychelles					United States
Sierra Leone					
Somalia					
South Africa					
Swaziland†					
Tanzania					
Togo*					
Uganda					
Zambia					
Zimbabwe					

* Denotes developing countries who report bilaterally to advanced countries (51 total)

^ Denotes North African countries, which, when combined with Sub-Saharan Africa, can generate estimates for the African Continent as a whole.

† Indicates a South African Customs Union country for which the trade misinvoicing calculation was estimated as a relative level of South Africa's trade misinvoicing outflows.

Note 1: Advanced economies are used a baseline for calculating trade misinvoicing estimates.

Note 2: Though it is possible to make a bilateral calculation using South African and Zambian data, this report makes a world aggregate calculation for those two economies, due to idiosyncratic destination reporting of gold and copper exports, respectively.

Source: IMF Direction of Trade Statistics

Appendix Table I-2. Estimated Ranges for Illicit Financial Flows, 2014
(Percent of total country trade, unless noted)

| Country | Illicit Financial Flows | | | | Trade Misinvoicing | | | | BOP Leakages | | Total Trade (millions of US $) |
| | Outflows | | Inflows | | Outflows | | Inflows | | | | |
	Low	High	Low	High	Low	High	Low	High	Outflows	Inflows	
Afghanistan, Islamic Republic of	5%	24%	35%	36%	5%	24%	0%	1%	0%	35%	8,300
Albania	0%	0%	6%	6%	0%	0%	1%	2%	0%	5%	7,661
Algeria*	7%	9%	13%	18%	6%	9%	13%	18%	0%	0%	121,336
Angola	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%	90,388
Antigua and Barbuda	.	.	.	.	.	.	.	.	.	.	578
Argentina*	2%	5%	4%	12%	2%	5%	4%	12%	0%	0%	132,673
Armenia, Republic of*	8%	22%	3%	9%	8%	21%	3%	9%	1%	0%	5,921
Aruba*	25%	92%	67%	84%	23%	89%	67%	84%	3%	0%	1,373
Azerbaijan, Republic of*	27%	37%	15%	30%	18%	27%	15%	30%	9%	0%	30,961
Bahamas, The	17%	66%	121%	182%	17%	66%	110%	171%	0%	11%	4,480
Bahrain, Kingdom of	13%	13%	7%	40%	0%	0%	7%	40%	13%	0%	34,430
Bangladesh*	9%	13%	6%	18%	7%	11%	6%	18%	2%	0%	70,069
Barbados	0%	3%	10%	18%	0%	3%	9%	17%	0%	1%	2,214
Belarus*	4%	15%	11%	40%	3%	14%	11%	40%	1%	0%	76,549
Belize	5%	9%	8%	18%	5%	9%	7%	16%	0%	2%	1,308
Benin	1%	4%	44%	114%	1%	4%	44%	114%	0%	0%	4,623
Bhutan	0%	0%	4%	4%	.	.	.	.	0%	4%	1,365
Bolivia	1%	4%	10%	14%	1%	4%	2%	6%	0%	8%	23,442
Bosnia and Herzegovina	0%	0%	1%	1%	.	.	.	.	0%	1%	15,408
Botswana	14%	21%	0%	1%	5%	11%	0%	1%	10%	0%	15,877
Brazil*	2%	5%	5%	11%	2%	5%	5%	11%	0%	1%	477,066
Brunei Darussalam	6%	6%	0%	0%	.	.	.	.	6%	0%	16,835
Bulgaria*	4%	5%	7%	13%	1%	2%	7%	13%	3%	0%	63,895
Burkina Faso	13%	24%	0%	0%	13%	24%	0%	0%	0%	0%	5,837
Burundi	11%	21%	2%	6%	4%	15%	2%	6%	7%	0%	892
Cabo Verde	6%	7%	18%	22%	2%	2%	18%	22%	4%	0%	769
Cambodia	0%	0%	4%	15%	0%	0%	4%	15%	0%	0%	24,300
Cameroon	0%	0%	1%	2%	0%	0%	1%	2%	0%	0%	12,753
Central African Republic	0%	0%	28%	28%	.	.	.	.	0%	28%	394
Chad	13%	24%	18%	19%	13%	24%	18%	19%	.	.	7,700
Chile*	3%	6%	5%	10%	2%	5%	5%	10%	0%	0%	147,763
China, P.R.: Mainland*	4%	6%	12%	20%	2%	3%	12%	20%	3%	0%	4,306,326
Colombia*	4%	9%	5%	10%	4%	9%	5%	10%	0%	0%	118,824
Comoros	.	.	.	.	.	.	.	.	.	.	242
Congo, Democratic Republic of	0%	0%	2%	9%	0%	0%	2%	9%	0%	0%	13,100

 * Indicates a developing country where sufficient bilateral goods trade data is reported for GFI to make a bilateral estimation of trade misinvoicing. "." Indicates missing data.

Note: Estimates of total trade default to the magnitude reported by that country's trade partners; if missing, the magnitude reported by each developing country is used. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

Country	Illicit Financial Flows				Trade Misinvoicing				BOP Leakages		Total Trade (millions of US $)
	Outflows		Inflows		Outflows		Inflows		Outflows	Inflows	
	Low	High	Low	High	Low	High	Low	High			
Congo, Republic of	5%	11%	0%	0%	5%	11%	0%	0%	0%	0%	14,814
Costa Rica*	35%	55%	2%	3%	34%	54%	2%	3%	1%	0%	28,436
Cote d'Ivoire*	3%	7%	6%	14%	3%	7%	6%	14%	0%	0%	23,879
Croatia*	4%	5%	8%	13%	2%	3%	8%	13%	2%	0%	36,196
Djibouti	5%	48%	43%	309%	2%	45%	43%	309%	3%	0%	932
Dominica	24%	57%	73%	121%	23%	56%	73%	121%	1%	0%	266
Dominican Republic	17%	23%	0%	0%	13%	19%	0%	0%	4%	0%	27,720
Ecuador*	4%	7%	4%	8%	4%	6%	4%	8%	0%	0%	53,237
Egypt*	6%	15%	11%	22%	6%	15%	9%	20%	0%	2%	94,881
El Salvador*	6%	12%	6%	9%	6%	12%	3%	6%	0%	3%	15,783
Equatorial Guinea	13%	19%	4%	4%	13%	19%	0%	0%	0%	4%	18,100
Eritrea	.	.	.	.	.	.	.	.	.	.	1,067
Ethiopia	8%	31%	5%	9%	8%	31%	4%	7%	0%	2%	23,460
Fiji	14%	17%	2%	5%	9%	12%	2%	5%	4%	0%	4,250
Gabon	0%	0%	8%	14%	0%	0%	8%	14%	0%	0%	12,071
Gambia, The	0%	0%	0%	0%	.	.	.	.	0%	0%	1,219
Georgia*	4%	13%	8%	28%	3%	12%	8%	28%	1%	0%	11,453
Ghana	1%	1%	4%	11%	0%	0%	4%	11%	1%	0%	27,230
Grenada	2%	19%	26%	60%	2%	19%	11%	45%	0%	15%	377
Guatemala*	7%	11%	1%	2%	5%	9%	1%	2%	2%	0%	28,932
Guinea	11%	20%	11%	47%	11%	20%	11%	47%	.	.	3,544
Guinea-Bissau	.	.	.	.	.	.	.	.	.	.	690
Guyana	9%	15%	1%	1%	9%	15%	0%	0%	0%	1%	2,940
Haiti	1%	1%	12%	30%	1%	1%	10%	28%	0%	1%	4,684
Honduras*	24%	39%	20%	36%	24%	39%	18%	34%	0%	2%	13,376
Hungary*	3%	4%	10%	14%	2%	3%	10%	14%	1%	0%	215,506
India*	1%	3%	5%	13%	1%	2%	5%	13%	0%	0%	778,246
Indonesia*	2%	4%	6%	12%	2%	3%	6%	12%	1%	0%	354,470
Iran, Islamic Republic of	0%	0%	7%	45%	0%	0%	7%	45%	.	.	142,369
Iraq	7%	11%	3%	6%	1%	5%	3%	6%	6%	0%	147,968
Jamaica*	6%	7%	7%	10%	2%	4%	7%	10%	3%	0%	7,272
Jordan*	2%	6%	14%	31%	2%	6%	9%	27%	0%	4%	30,182
Kazakhstan*	19%	25%	31%	47%	10%	16%	31%	47%	9%	0%	99,888
Kenya	1%	2%	11%	23%	1%	2%	7%	20%	0%	4%	23,862
Kiribati	0%	0%	22%	22%	.	.	.	.	0%	22%	100
Kosovo, Republic of	0%	0%	14%	14%	.	.	.	.	0%	14%	2,472
Kuwait	0%	0%	5%	9%	0%	0%	5%	9%	0%	0%	131,815
Kyrgyz Republic	0%	0%	11%	64%	0%	0%	5%	58%	0%	6%	7,629
Lao People's Democratic Republic	9%	30%	8%	71%	2%	24%	8%	71%	6%	0%	5,950
Lebanon	1%	1%	3%	6%	0%	0%	3%	6%	1%	0%	23,807

Appendix Table I-2. Estimated Ranges for Illicit Financial Flows, 2014 (cont)
(Percent of total country trade, unless noted)

Country	Illicit Financial Flows				Trade Misinvoicing				BOP Leakages		Total Trade (millions of US $)
	Outflows		Inflows		Outflows		Inflows				
	Low	High	Low	High	Low	High	Low	High	Outflows	Inflows	
Lesotho	3%	7%	1%	1%	3%	7%	0%	1%	0%	0%	3,133
Liberia	12%	25%	541%	693%	12%	25%	508%	660%	0%	33%	1,629
Libya	0%	0%	4%	5%	0%	0%	4%	5%	.	.	40,000
Macedonia, FYR	1%	1%	1%	2%	1%	1%	1%	2%	0%	0%	12,211
Madagascar	1%	1%	1%	2%	0%	0%	1%	2%	1%	0%	5,397
Malawi	7%	25%	4%	8%	5%	23%	4%	8%	2%	0%	4,116
Malaysia*	6%	10%	7%	13%	5%	9%	7%	13%	0%	0%	443,210
Maldives	15%	23%	0%	0%	6%	14%	0%	0%	8%	0%	2,137
Mali	7%	15%	9%	19%	4%	12%	9%	19%	3%	0%	6,056
Mauritania	1%	1%	0%	0%	.	.	.	.	1%	0%	6,515
Mauritius*	4%	9%	7%	16%	4%	9%	6%	14%	0%	1%	7,967
Mexico*	8%	9%	12%	15%	5%	7%	12%	15%	2%	0%	837,104
Moldova*	6%	14%	5%	15%	4%	13%	5%	15%	1%	0%	7,606
Mongolia	1%	1%	1%	7%	0%	0%	1%	7%	1%	0%	11,011
Montenegro	1%	3%	23%	29%	1%	3%	4%	10%	0%	19%	2,809
Morocco*	4%	6%	10%	15%	4%	6%	9%	14%	0%	2%	69,211
Mozambique	0%	1%	0%	0%	0%	1%	0%	0%	0%	0%	16,683
Myanmar	4%	39%	15%	35%	4%	39%	7%	27%	0%	8%	27,526
Namibia	6%	12%	0%	1%	4%	10%	0%	1%	2%	0%	14,148
Nepal	0%	0%	3%	16%	0%	0%	1%	14%	0%	2%	8,266
Nicaragua*	10%	16%	4%	14%	6%	12%	4%	14%	4%	0%	10,718
Niger	2%	4%	11%	18%	2%	4%	11%	18%	.	.	3,750
Nigeria	9%	9%	3%	8%	0%	0%	3%	8%	9%	0%	139,612
Oman*	4%	12%	4%	12%	3%	11%	4%	12%	2%	0%	82,526
Pakistan	0%	0%	4%	16%	0%	0%	4%	16%	0%	0%	72,140
Panama*	12%	20%	193%	422%	9%	16%	193%	422%	4%	0%	14,403
Papua New Guinea	2%	4%	5%	5%	2%	4%	0%	0%	0%	5%	15,865
Paraguay*	4%	14%	8%	38%	3%	13%	8%	38%	2%	0%	22,082
Peru*	4%	7%	4%	8%	3%	6%	4%	8%	1%	0%	84,965
Philippines*	5%	6%	18%	31%	2%	3%	18%	31%	3%	0%	132,772
Poland*	2%	2%	13%	17%	0%	1%	13%	17%	2%	0%	443,606
Qatar*	20%	36%	9%	17%	20%	36%	9%	17%	.	.	130,945
Romania*	1%	2%	8%	13%	1%	2%	8%	13%	0%	0%	147,460
Russian Federation*	7%	12%	16%	26%	7%	12%	15%	25%	0%	1%	783,458
Rwanda	2%	9%	4%	13%	2%	9%	3%	12%	0%	1%	2,370
Samoa	7%	7%	0%	0%	.	.	.	.	7%	0%	553
Sao Tome and Principe	18%	22%	49%	49%	18%	22%	1%	1%	0%	48%	189
Saudi Arabia	0%	0%	2%	4%	0%	0%	2%	4%	.	.	516,133

Country	Illicit Financial Flows				Trade Misinvoicing				BOP Leakages		Total Trade (millions of US $)
	Outflows		Inflows		Outflows		Inflows				
	Low	High	Low	High	Low	High	Low	High	Outflows	Inflows	
Senegal*	4%	9%	19%	40%	4%	9%	19%	40%	0%	0%	8,622
Serbia, Republic of	2%	5%	5%	8%	2%	5%	4%	7%	0%	1%	35,260
Seychelles	1%	2%	7%	8%	1%	2%	2%	3%	0%	5%	1,683
Sierra Leone	5%	22%	1%	1%	5%	22%	0%	0%	0%	1%	3,120
Solomon Islands	7%	22%	0%	0%	5%	21%	0%	0%	1%	0%	957
Somalia	0%	0%	0%	0%	.	.	.	.	0%	0%	2,837
South Africa	4%	11%	3%	3%	4%	11%	0%	1%	0%	2%	200,538
Sri Lanka*	1%	3%	8%	18%	1%	3%	7%	17%	0%	1%	30,110
St. Kitts and Nevis	12%	23%	73%	118%	12%	23%	73%	118%	0%	0%	320
St. Lucia	0%	0%	88%	289%	0%	0%	86%	287%	0%	2%	725
St. Vincent and the Grenadines	3%	15%	28%	54%	2%	14%	28%	54%	1%	0%	420
Sudan*	4%	52%	13%	26%	4%	52%	3%	15%	0%	11%	13,562
Suriname	13%	15%	0%	0%	3%	4%	0%	0%	10%	0%	4,095
Swaziland	0%	0%	2%	2%	.	.	.	.	0%	2%	4,051
Syrian Arab Republic	.	.	.	.	.	.	.	.	.	.	31,495
Tajikistan	4%	4%	0%	1%	0%	0%	0%	1%	4%	0%	6,170
Tanzania	0%	0%	7%	25%	0%	0%	5%	23%	0%	2%	17,044
Thailand*	2%	4%	5%	10%	2%	4%	5%	10%	0%	0%	453,190
Timor-Leste, Democratic Republic of	9%	9%	0%	0%	.	.	.	.	9%	0%	1,022
Togo*	2%	12%	26%	45%	2%	12%	26%	45%	0%	0%	14,872
Tonga	0%	0%	5%	11%	0%	0%	5%	11%	.	.	236
Trinidad and Tobago	25%	45%	0%	0%	18%	38%	0%	0%	7%	0%	20,350
Tunisia	0%	0%	4%	6%	0%	0%	4%	6%	0%	0%	41,583
Turkey*	1%	3%	6%	13%	1%	3%	6%	13%	0%	0%	399,787
Turkmenistan	.	.	.	.	.	.	.	.	.	.	22,194
Uganda	1%	6%	10%	17%	1%	6%	3%	11%	0%	7%	7,751
Ukraine*	3%	10%	3%	10%	3%	10%	3%	9%	0%	0%	108,293
United Arab Emirates	0%	0%	9%	23%	0%	0%	9%	23%	.	.	621,000
Uruguay	2%	7%	5%	18%	1%	7%	5%	18%	0%	0%	20,616
Uzbekistan	.	.	.	.	.	.	.	.	.	.	20,956
Vanuatu	24%	44%	46%	123%	14%	33%	46%	123%	11%	0%	363
Venezuela, Republica Bolivariana de*	5%	8%	5%	12%	2%	5%	5%	12%	3%	0%	126,972
Vietnam*	4%	4%	9%	17%	1%	2%	9%	17%	2%	0%	287,597
Yemen, Republic of	0%	0%	2%	2%	.	.	.	.	0%	2%	24,301
Zambia	2%	10%	10%	18%	2%	10%	10%	18%	0%	0%	19,400
Zimbabwe	1%	1%	4%	18%	0%	0%	4%	18%	1%	0%	7,638

Appendix Table I-3. Estimated Ranges for Illicit Financial Flows, 2005-2014
(Percent of total country trade, unless noted)

| Country | Illicit Financial Flows | | | | Trade Misinvoicing | | | | BOP Leakages | | Total Trade (millions of US $) |
| | Outflows | | Inflows | | Outflows | | Inflows | | | | |
	Low	High	Low	High	Low	High	Low	High	Outflows	Inflows	
Afghanistan, Islamic Republic of	6%	13%	40%	50%	3%	10%	7%	17%	3%	33%	52,858
Albania	1%	2%	6%	6%	1%	2%	1%	1%	0%	5%	59,414
Algeria*	7%	8%	10%	13%	5%	7%	10%	13%	1%	0%	1,014,401
Angola	1%	1%	3%	6%	0%	0%	3%	6%	1%	0%	692,223
Antigua and Barbuda	1%	1%	0%	0%	.	.	.	.	1%	0%	6,909
Argentina*	2%	6%	4%	11%	2%	5%	4%	11%	0%	0%	1,179,655
Armenia, Republic of*	9%	21%	6%	13%	7%	19%	6%	13%	2%	0%	47,697
Aruba*	155%	599%	22%	28%	154%	597%	21%	27%	2%	0%	12,917
Azerbaijan, Republic of*	25%	39%	20%	33%	21%	35%	20%	33%	4%	0%	270,611
Bahamas, The	32%	57%	150%	233%	30%	56%	145%	229%	2%	5%	35,989
Bahrain, Kingdom of	3%	4%	6%	34%	1%	2%	6%	34%	2%	0%	272,672
Bangladesh*	12%	17%	4%	12%	7%	12%	4%	12%	5%	0%	446,153
Barbados	3%	5%	6%	13%	2%	4%	5%	12%	1%	2%	21,167
Belarus*	4%	14%	14%	43%	4%	14%	13%	42%	0%	1%	645,999
Belize	9%	13%	11%	23%	8%	12%	11%	22%	1%	1%	10,637
Benin	1%	7%	64%	157%	1%	7%	62%	156%	0%	1%	27,869
Bhutan	3%	3%	2%	2%	.	.	.	.	3%	2%	12,323
Bolivia	4%	5%	6%	14%	0%	2%	4%	12%	3%	1%	136,309
Bosnia and Herzegovina	0%	0%	1%	1%	.	.	.	.	0%	1%	125,356
Botswana	8%	12%	3%	4%	5%	9%	1%	2%	3%	2%	112,427
Brazil*	3%	6%	5%	10%	3%	6%	5%	10%	0%	0%	3,782,733
Brunei Darussalam	26%	26%	0%	0%	.	.	.	.	26%	0%	135,237
Bulgaria*	4%	5%	7%	12%	1%	3%	6%	11%	2%	1%	504,309
Burkina Faso	11%	21%	3%	8%	11%	21%	3%	8%	0%	0%	36,864
Burundi	9%	18%	3%	5%	4%	13%	2%	3%	5%	1%	6,316
Cabo Verde	6%	6%	9%	10%	1%	1%	9%	10%	5%	0%	7,571
Cambodia	1%	1%	17%	39%	0%	1%	16%	38%	0%	1%	117,842
Cameroon	4%	7%	1%	2%	4%	6%	1%	2%	0%	0%	95,234
Central African Republic	6%	8%	24%	38%	2%	5%	21%	35%	4%	4%	3,400
Chad	11%	21%	20%	22%	9%	19%	16%	18%	2%	4%	60,279
Chile*	3%	5%	5%	9%	2%	4%	4%	9%	1%	0%	1,262,771
China, P.R.: Mainland*	4%	5%	12%	19%	2%	4%	11%	19%	1%	0%	29,071,507
Colombia*	3%	6%	6%	11%	3%	6%	6%	11%	0%	0%	843,891
Comoros	14%	28%	3%	4%	13%	27%	1%	3%	1%	2%	1,903
Congo, Democratic Republic of	1%	2%	7%	14%	1%	2%	4%	11%	0%	3%	91,170

* Indicates a developing country where sufficient bilateral goods trade data is reported for GFI to make a bilateral estimation of trade misinvoicing.
"." Indicates missing data.

Note: Estimates of total trade default to the magnitude reported by that country's trade partners; if missing, the magnitude reported by each developing country is used. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

| Country | Illicit Financial Flows | | | | Trade Misinvoicing | | | | BOP Leakages | | Total Trade (millions of US $) |
| | Outflows | | Inflows | | Outflows | | Inflows | | | | |
	Low	High	Low	High	Low	High	Low	High	Outflows	Inflows	
Congo, Republic of	7%	12%	2%	3%	6%	11%	2%	3%	0%	0%	117,209
Costa Rica*	34%	52%	4%	5%	32%	50%	3%	5%	1%	0%	240,643
Cote d'Ivoire*	6%	12%	8%	17%	5%	12%	8%	17%	0%	0%	183,977
Croatia*	8%	10%	11%	18%	4%	7%	11%	18%	4%	0%	342,447
Djibouti	10%	68%	66%	344%	3%	61%	61%	339%	7%	5%	5,820
Dominica	23%	50%	66%	106%	23%	49%	62%	103%	1%	4%	2,460
Dominican Republic	6%	8%	2%	3%	4%	6%	1%	2%	2%	0%	210,695
Ecuador*	4%	7%	4%	8%	4%	7%	4%	8%	0%	0%	377,210
Egypt*	9%	18%	13%	29%	7%	16%	13%	29%	2%	0%	713,513
El Salvador*	7%	13%	5%	7%	6%	11%	3%	6%	1%	2%	135,445
Equatorial Guinea	11%	16%	6%	8%	9%	14%	6%	7%	2%	1%	161,091
Eritrea	2%	2%	0%	0%	.	.	.	.	2%	0%	6,777
Ethiopia	11%	29%	8%	11%	6%	23%	3%	5%	5%	6%	110,603
Fiji	9%	11%	2%	3%	6%	8%	1%	3%	3%	1%	30,192
Gabon	11%	12%	8%	14%	1%	2%	8%	14%	10%	0%	104,142
Gambia, The	16%	30%	39%	154%	4%	18%	39%	154%	12%	0%	2,946
Georgia*	6%	20%	8%	26%	6%	19%	8%	26%	0%	0%	76,646
Ghana	3%	3%	13%	27%	0%	0%	13%	27%	3%	0%	184,175
Grenada	3%	16%	12%	26%	3%	16%	5%	19%	0%	7%	3,692
Guatemala*	6%	10%	2%	3%	5%	9%	1%	2%	1%	1%	226,821
Guinea	7%	16%	14%	39%	7%	16%	10%	35%	0%	4%	27,857
Guinea-Bissau	2%	20%	10%	21%	0%	18%	9%	20%	1%	1%	2,896
Guyana	10%	14%	2%	3%	6%	10%	1%	2%	4%	1%	23,324
Haiti	5%	6%	13%	32%	2%	2%	11%	30%	4%	2%	32,439
Honduras*	29%	44%	20%	39%	28%	43%	20%	38%	2%	1%	107,410
Hungary*	2%	3%	10%	13%	1%	2%	10%	13%	1%	0%	1,873,656
India*	2%	3%	6%	14%	1%	3%	6%	14%	0%	0%	5,500,744
Indonesia*	4%	6%	9%	16%	4%	6%	9%	16%	0%	0%	2,753,145
Iran, Islamic Republic of	5%	5%	8%	25%	0%	0%	8%	25%	5%	0%	1,427,791
Iraq	8%	14%	4%	7%	2%	8%	4%	6%	6%	0%	851,818
Jamaica*	5%	8%	8%	11%	4%	7%	6%	8%	1%	3%	77,871
Jordan*	2%	7%	12%	29%	2%	7%	10%	27%	1%	2%	228,169
Kazakhstan*	11%	19%	27%	43%	9%	17%	25%	42%	2%	2%	869,809
Kenya	0%	1%	6%	14%	0%	1%	4%	12%	0%	1%	168,124
Kiribati	5%	5%	7%	7%	.	.	.	.	5%	7%	886
Kosovo, Republic of	0%	0%	18%	18%	.	.	.	.	0%	18%	15,816
Kuwait	2%	2%	9%	13%	0%	0%	7%	12%	2%	2%	1,038,144
Kyrgyz Republic	2%	2%	15%	88%	0%	0%	12%	85%	2%	3%	53,042
Lao People's Democratic Republic	13%	24%	6%	53%	2%	12%	6%	53%	12%	0%	35,248
Lebanon	9%	10%	6%	8%	1%	2%	1%	3%	8%	5%	197,517

Appendix Table I-3. Estimated Ranges for Illicit Financial Flows, 2005-2014 (cont)
(Percent of total country trade, unless noted)

| Country | Illicit Financial Flows | | | | Trade Misinvoicing | | | | BOP Leakages | | Total Trade (millions of US $) |
| | Outflows | | Inflows | | Outflows | | Inflows | | | | |
	Low	High	Low	High	Low	High	Low	High	Outflows	Inflows	
Lesotho	4%	7%	2%	3%	4%	6%	1%	1%	1%	2%	26,272
Liberia	66%	100%	783%	1051%	50%	84%	771%	1040%	16%	12%	10,549
Libya	2%	2%	10%	14%	0%	0%	8%	12%	2%	1%	531,383
Macedonia, FYR	3%	5%	2%	4%	3%	5%	2%	4%	0%	0%	91,801
Madagascar	5%	10%	2%	4%	2%	8%	2%	3%	2%	0%	42,562
Malawi	7%	24%	4%	7%	5%	22%	2%	5%	2%	2%	30,455
Malaysia*	8%	12%	8%	13%	6%	10%	8%	13%	2%	0%	3,587,978
Maldives	6%	10%	6%	7%	4%	8%	1%	1%	2%	6%	14,159
Mali	4%	11%	11%	30%	3%	10%	11%	30%	1%	0%	48,121
Mauritania	1%	1%	1%	1%	.	.	.	.	1%	1%	46,965
Mauritius*	5%	9%	10%	18%	4%	9%	7%	15%	1%	3%	65,692
Mexico*	7%	9%	9%	11%	6%	7%	9%	11%	2%	0%	6,470,686
Moldova*	5%	16%	7%	18%	5%	15%	5%	17%	0%	1%	58,919
Mongolia	2%	2%	3%	11%	0%	0%	3%	11%	2%	0%	69,268
Montenegro	5%	6%	11%	13%	4%	5%	3%	6%	1%	7%	28,543
Morocco*	6%	8%	9%	15%	5%	7%	9%	14%	1%	0%	532,212
Mozambique	2%	3%	3%	7%	1%	3%	3%	7%	0%	0%	86,657
Myanmar	7%	14%	15%	42%	1%	7%	9%	36%	6%	5%	144,916
Namibia	6%	11%	3%	3%	5%	9%	1%	2%	2%	2%	107,679
Nepal	2%	10%	3%	10%	1%	9%	1%	8%	1%	2%	52,596
Nicaragua*	26%	47%	7%	21%	22%	43%	6%	20%	4%	0%	63,918
Niger	3%	6%	15%	20%	2%	5%	8%	12%	1%	8%	25,488
Nigeria	14%	15%	4%	7%	1%	2%	4%	7%	13%	0%	1,213,949
Oman*	3%	9%	4%	11%	3%	8%	4%	10%	1%	0%	587,430
Pakistan	1%	1%	4%	13%	0%	0%	4%	13%	1%	0%	589,547
Panama*	16%	23%	288%	667%	15%	22%	285%	665%	1%	2%	99,968
Papua New Guinea	4%	7%	12%	15%	3%	5%	9%	12%	2%	4%	79,749
Paraguay*	5%	24%	11%	52%	4%	23%	10%	51%	1%	1%	154,093
Peru*	4%	7%	7%	12%	3%	6%	7%	12%	1%	0%	655,481
Philippines*	7%	8%	14%	23%	5%	6%	14%	23%	2%	0%	1,088,202
Poland*	2%	2%	12%	16%	0%	0%	12%	16%	2%	0%	3,380,489
Qatar*	15%	25%	8%	13%	15%	25%	8%	13%	.	.	908,091
Romania*	2%	2%	8%	13%	1%	2%	8%	12%	0%	1%	1,158,071
Russian Federation*	10%	17%	16%	28%	9%	16%	16%	28%	1%	0%	6,334,767
Rwanda	6%	16%	3%	9%	5%	16%	2%	8%	1%	1%	15,818
Samoa	29%	48%	23%	37%	23%	43%	23%	37%	5%	0%	3,141
Sao Tome and Principe	19%	22%	14%	15%	11%	13%	3%	4%	8%	11%	1,215
Saudi Arabia	0%	0%	4%	6%	0%	0%	4%	6%	.	.	3,993,554

| Country | Illicit Financial Flows | | | | Trade Misinvoicing | | | | BOP Leakages | | Total Trade (millions of US $) |
| | Outflows | | Inflows | | Outflows | | Inflows | | Outflows | Inflows | |
	Low	High	Low	High	Low	High	Low	High			
Senegal*	4%	12%	22%	48%	4%	12%	22%	48%	0%	0%	68,714
Serbia, Republic of	6%	11%	6%	10%	6%	11%	5%	9%	0%	1%	277,978
Seychelles	2%	3%	9%	11%	1%	2%	5%	7%	1%	4%	13,914
Sierra Leone	6%	11%	5%	10%	3%	8%	4%	10%	4%	1%	15,869
Solomon Islands	7%	23%	2%	3%	6%	21%	1%	1%	2%	1%	6,471
Somalia	0%	0%	0%	0%	.	.	.	.	0%	0%	17,118
South Africa	5%	9%	2%	3%	4%	8%	1%	2%	1%	1%	1,709,543
Sri Lanka*	4%	7%	6%	11%	3%	6%	5%	11%	1%	0%	232,325
St. Kitts and Nevis	14%	18%	43%	81%	11%	16%	41%	79%	2%	2%	3,033
St. Lucia	4%	5%	42%	247%	3%	4%	42%	246%	1%	1%	7,590
St. Vincent and the Grenadines	20%	40%	50%	82%	19%	38%	49%	81%	1%	1%	3,750
Sudan*	13%	96%	13%	39%	11%	95%	9%	35%	1%	4%	163,201
Suriname	53%	73%	32%	57%	39%	59%	29%	54%	13%	3%	13,563
Swaziland	8%	12%	2%	3%	5%	9%	1%	1%	3%	1%	32,077
Syrian Arab Republic	4%	17%	9%	35%	2%	15%	8%	35%	2%	1%	206,290
Tajikistan	5%	5%	10%	28%	0%	0%	6%	24%	5%	4%	21,456
Tanzania	3%	3%	5%	13%	0%	0%	3%	11%	3%	2%	113,717
Thailand*	2%	4%	6%	10%	2%	4%	5%	10%	0%	1%	3,660,231
Timor-Leste, Democratic Republic of	18%	18%	0%	0%	.	.	.	.	18%	0%	3,394
Togo*	21%	167%	92%	190%	21%	167%	92%	189%	0%	0%	18,136
Tonga	4%	5%	59%	64%	3%	4%	5%	10%	2%	54%	1,778
Trinidad and Tobago	14%	22%	0%	0%	11%	19%	0%	0%	3%	0%	206,140
Tunisia	0%	0%	4%	5%	0%	0%	4%	5%	0%	0%	360,389
Turkey*	2%	4%	7%	14%	2%	4%	6%	13%	0%	1%	3,136,540
Turkmenistan	0%	0%	0%	0%	.	.	.	.	0%	0%	137,242
Uganda	4%	11%	9%	18%	3%	10%	5%	13%	1%	4%	63,135
Ukraine*	3%	10%	6%	17%	3%	10%	5%	17%	0%	0%	1,165,449
United Arab Emirates	0%	0%	9%	22%	0%	0%	9%	22%	.	.	4,108,215
Uruguay	3%	8%	6%	15%	2%	7%	4%	14%	1%	2%	148,686
Uzbekistan	.	.	.	.	.	.	.	.	.	.	152,112
Vanuatu	29%	87%	57%	99%	15%	72%	53%	95%	15%	3%	3,225
Venezuela, Republica Bolivariana de*	5%	8%	6%	12%	3%	6%	6%	12%	2%	0%	1,266,113
Vietnam*	4%	5%	7%	13%	2%	3%	7%	13%	2%	0%	1,652,055
Yemen, Republic of	0%	2%	5%	12%	0%	2%	2%	9%	0%	3%	153,056
Zambia	2%	7%	8%	15%	1%	6%	8%	15%	0%	0%	124,370
Zimbabwe	3%	6%	10%	23%	1%	4%	4%	16%	2%	7%	61,082

Appendix Table I-4. Estimated Ranges for the Components of Trade Misinvoicing, 2005-2014
(Percent of total country trade, unless noted)

Country	Import Misinvoicing				Export Misinvoicing				Misinvoicing Inflows (b+c)		Misinvoicing Outflows (a+d)		Total Trade (millions of US $)
	Over-invoicing (a)		Under-invoicing (b)		Over-invoicing (c)		Under-invoicing (d)						
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	
Afghanistan, Islamic Republic of	3%	10%	6%	15%	1%	2%	0%	0%	7%	17%	3%	10%	52,858
Albania	1%	2%	0%	0%	1%	1%	0%	0%	1%	1%	1%	2%	59,414
Algeria*	2%	2%	4%	6%	6%	8%	4%	5%	10%	13%	5%	7%	1,014,401
Angola	.	.	.	.	3%	6%	0%	0%	3%	6%	0%	0%	692,223
Antigua and Barbuda	.	.	.	.	.	.	.	.	.	.	.	.	6,909
Argentina*	1%	2%	3%	8%	1%	3%	1%	3%	4%	11%	2%	5%	1,179,655
Armenia, Republic of*	6%	18%	3%	7%	3%	5%	1%	1%	6%	13%	7%	19%	47,697
Aruba*	5%	6%	21%	27%	0%	0%	149%	591%	21%	27%	154%	597%	12,917
Azerbaijan, Republic of*	1%	2%	6%	13%	14%	20%	20%	33%	20%	33%	21%	35%	270,611
Bahamas, The	0%	0%	145%	229%	0%	0%	30%	56%	145%	229%	30%	56%	35,989
Bahrain, Kingdom of	1%	2%	3%	6%	3%	28%	0%	0%	6%	34%	1%	2%	272,672
Bangladesh*	1%	4%	3%	11%	1%	1%	6%	8%	4%	12%	7%	12%	446,153
Barbados	1%	2%	4%	11%	0%	1%	1%	2%	5%	12%	2%	4%	21,167
Belarus*	2%	10%	2%	11%	11%	31%	1%	4%	13%	42%	4%	14%	645,999
Belize	0%	0%	11%	22%	0%	0%	8%	12%	11%	22%	8%	12%	10,637
Benin	0%	0%	61%	149%	1%	6%	1%	7%	62%	156%	1%	7%	27,869
Bhutan	.	.	.	.	.	.	.	.	.	.	.	.	12,323
Bolivia	0%	2%	1%	2%	3%	10%	0%	0%	4%	12%	0%	2%	136,309
Bosnia and Herzegovina	.	.	.	.	.	.	.	.	.	.	.	.	125,356
Botswana	1%	1%	0%	1%	0%	1%	4%	8%	1%	2%	5%	9%	112,427
Brazil*	1%	2%	3%	6%	1%	3%	2%	4%	5%	10%	3%	6%	3,782,733
Brunei Darussalam	.	.	.	.	.	.	.	.	.	.	.	.	135,237
Bulgaria*	1%	1%	3%	5%	3%	6%	1%	1%	6%	11%	1%	3%	504,309
Burkina Faso	6%	15%	0%	0%	3%	8%	4%	6%	3%	8%	11%	21%	36,864
Burundi	4%	13%	0%	0%	2%	3%	0%	0%	2%	3%	4%	13%	6,316
Cabo Verde	0%	0%	8%	10%	0%	0%	1%	1%	9%	10%	1%	1%	7,571
Cambodia	0%	0%	14%	36%	2%	2%	0%	1%	16%	38%	0%	1%	117,842
Cameroon	1%	2%	1%	2%	0%	0%	3%	5%	1%	2%	4%	6%	95,234
Central African Republic	0%	1%	19%	31%	2%	4%	2%	4%	21%	35%	2%	5%	3,400
Chad	9%	19%	0%	0%	16%	18%	0%	0%	16%	18%	9%	19%	60,279
Chile*	1%	2%	3%	6%	2%	3%	1%	2%	4%	9%	2%	4%	1,262,771
China, P.R.: Mainland*	1%	1%	8%	14%	3%	5%	2%	3%	11%	19%	2%	4%	29,071,507
Colombia*	1%	1%	4%	7%	2%	4%	2%	4%	6%	11%	3%	6%	843,891
Comoros	5%	15%	1%	3%	0%	0%	8%	12%	1%	3%	13%	27%	1,903
Congo, Democratic Republic of	1%	2%	1%	3%	3%	7%	0%	0%	4%	11%	1%	2%	91,170

* Indicates a developing country where sufficient bilateral goods trade data is reported for GFI to make a bilateral estimation of trade misinvoicing.
"." Indicates missing data.

Note: Estimates of total trade default to the magnitude reported by that country's trade partners; if missing, the magnitude reported by each developing country is used. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

Country	Import Misinvoicing				Export Misinvoicing				Misinvoicing Inflows (b+c)		Misinvoicing Outflows (a+d)		Total Trade (millions of US $)
	Over-invoicing (a)		Under-invoicing (b)		Over-invoicing (c)		Under-invoicing (d)						
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	
Congo, Republic of	1%	3%	1%	2%	0%	1%	5%	9%	2%	3%	6%	11%	117,209
Costa Rica*	3%	4%	2%	3%	1%	2%	30%	46%	3%	5%	32%	50%	240,643
Cote d'Ivoire*	3%	7%	2%	7%	6%	10%	3%	5%	8%	17%	5%	12%	183,977
Croatia*	3%	5%	7%	11%	4%	7%	1%	2%	11%	18%	4%	7%	342,447
Djibouti	0%	0%	61%	339%	0%	0%	3%	61%	61%	339%	3%	61%	5,820
Dominica	0%	0%	62%	103%	0%	0%	23%	49%	62%	103%	23%	49%	2,460
Dominican Republic	2%	4%	0%	0%	1%	2%	2%	3%	1%	2%	4%	6%	210,695
Ecuador*	1%	2%	2%	5%	2%	3%	3%	5%	4%	8%	4%	7%	377,210
Egypt*	1%	2%	12%	27%	1%	2%	6%	14%	13%	29%	7%	16%	713,513
El Salvador*	5%	9%	2%	3%	1%	2%	1%	2%	3%	6%	6%	11%	135,445
Equatorial Guinea	9%	14%	0%	0%	6%	7%	0%	0%	6%	7%	9%	14%	161,091
Eritrea	.	.	.	.	.	.	.	.	.	.	.	.	6,777
Ethiopia	6%	23%	0%	0%	3%	5%	0%	0%	3%	5%	6%	23%	110,603
Fiji	6%	7%	0%	0%	1%	3%	0%	1%	1%	3%	6%	8%	30,192
Gabon	0%	0%	2%	3%	6%	11%	1%	1%	8%	14%	1%	2%	104,142
Gambia, The	0%	0%	39%	154%	0%	0%	4%	18%	39%	154%	4%	18%	2,946
Georgia*	1%	4%	8%	24%	1%	2%	4%	15%	8%	26%	6%	19%	76,646
Ghana	0%	0%	6%	15%	7%	12%	0%	0%	13%	27%	0%	0%	184,175
Grenada	0%	0%	5%	19%	0%	0%	3%	16%	5%	19%	3%	16%	3,692
Guatemala*	3%	5%	1%	1%	0%	1%	2%	4%	1%	2%	5%	9%	226,821
Guinea	0%	0%	10%	35%	0%	0%	7%	16%	10%	35%	7%	16%	27,857
Guinea-Bissau	0%	0%	9%	20%	0%	0%	0%	18%	9%	20%	0%	18%	2,896
Guyana	1%	3%	1%	2%	0%	0%	5%	8%	1%	2%	6%	10%	23,324
Haiti	0%	0%	11%	30%	0%	0%	2%	2%	11%	30%	2%	2%	32,439
Honduras*	1%	1%	19%	37%	0%	1%	27%	42%	20%	38%	28%	43%	107,410
Hungary*	1%	1%	4%	5%	6%	8%	1%	1%	10%	13%	1%	2%	1,873,656
India*	0%	1%	4%	10%	2%	4%	1%	2%	6%	14%	1%	3%	5,500,744
Indonesia*	1%	1%	8%	15%	1%	1%	3%	4%	9%	16%	4%	6%	2,753,145
Iran, Islamic Republic of	0%	0%	4%	14%	4%	11%	0%	0%	8%	25%	0%	0%	1,427,791
Iraq	2%	8%	0%	0%	4%	6%	0%	0%	4%	6%	2%	8%	851,818
Jamaica*	3%	5%	2%	3%	4%	5%	2%	2%	6%	8%	4%	7%	77,871
Jordan*	1%	2%	9%	26%	0%	2%	1%	5%	10%	27%	2%	7%	228,169
Kazakhstan*	2%	5%	2%	4%	24%	38%	7%	11%	25%	42%	9%	17%	869,809
Kenya	0%	0%	4%	11%	0%	1%	0%	1%	4%	12%	0%	1%	168,124
Kiribati	.	.	.	.	.	.	.	.	.	.	.	.	886
Kosovo, Republic of	.	.	.	.	.	.	.	.	.	.	.	.	15,816
Kuwait	0%	0%	0%	0%	7%	11%	0%	0%	7%	12%	0%	0%	1,038,144
Kyrgyz Republic	0%	0%	10%	77%	1%	8%	0%	0%	12%	85%	0%	0%	53,042
Lao People's Democratic Republic	0%	0%	6%	53%	0%	0%	2%	12%	6%	53%	2%	12%	35,248
Lebanon	1%	2%	1%	2%	0%	2%	0%	0%	1%	3%	1%	2%	197,517

Appendix Table I-4. Estimated Ranges for the Components of Trade Misinvoicing, 2005-2014 (cont)
(Percent of total country trade, unless noted)

Country	Import Misinvoicing				Export Misinvoicing				Misinvoicing Inflows (b+c)		Misinvoicing Outflows (a+d)		Total Trade (millions of US $)
	Over-invoicing (a)		Under-invoicing (b)		Over-invoicing (c)		Under-invoicing (d)						
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	
Lesotho	1%	2%	0%	1%	0%	0%	3%	5%	1%	1%	4%	6%	26,272
Liberia	0%	0%	771%	1040%	0%	0%	50%	84%	771%	1040%	50%	84%	10,549
Libya	0%	0%	5%	8%	3%	4%	0%	0%	8%	12%	0%	0%	531,383
Macedonia, FYR	2%	5%	0%	0%	2%	4%	0%	0%	2%	4%	3%	5%	91,801
Madagascar	2%	6%	1%	2%	1%	1%	1%	1%	2%	3%	2%	8%	42,562
Malawi	5%	22%	0%	0%	2%	5%	0%	0%	2%	5%	5%	22%	30,455
Malaysia*	2%	3%	7%	12%	1%	1%	4%	7%	8%	13%	6%	10%	3,587,978
Maldives	2%	5%	1%	1%	0%	0%	2%	3%	1%	1%	4%	8%	14,159
Mali	3%	10%	0%	0%	11%	30%	0%	0%	11%	30%	3%	10%	48,121
Mauritania	.	.	.	.	.	.	.	.	.	.	.	.	46,965
Mauritius*	3%	7%	4%	11%	3%	4%	2%	2%	7%	15%	4%	9%	65,692
Mexico*	3%	4%	3%	5%	5%	6%	3%	3%	9%	11%	6%	7%	6,470,686
Moldova*	2%	8%	4%	13%	1%	4%	2%	8%	5%	17%	5%	15%	58,919
Mongolia	0%	0%	2%	6%	1%	5%	0%	0%	3%	11%	0%	0%	69,268
Montenegro	3%	4%	2%	4%	2%	3%	0%	1%	3%	6%	4%	5%	28,543
Morocco*	2%	3%	6%	11%	3%	4%	3%	4%	9%	14%	5%	7%	532,212
Mozambique	0%	1%	2%	5%	1%	2%	1%	2%	3%	7%	1%	3%	86,657
Myanmar	0%	0%	8%	28%	1%	8%	1%	7%	9%	36%	1%	7%	144,916
Namibia	1%	1%	0%	1%	0%	1%	4%	8%	1%	2%	5%	9%	107,679
Nepal	1%	9%	0%	6%	1%	2%	0%	0%	1%	8%	1%	9%	52,596
Nicaragua*	2%	5%	6%	20%	0%	0%	21%	37%	6%	20%	22%	43%	63,918
Niger	2%	5%	0%	0%	7%	12%	0%	0%	8%	12%	2%	5%	25,488
Nigeria	1%	2%	1%	3%	3%	4%	0%	0%	4%	7%	1%	2%	1,213,949
Oman*	0%	1%	3%	7%	1%	3%	2%	7%	4%	10%	3%	8%	587,430
Pakistan	0%	0%	3%	9%	2%	4%	0%	0%	4%	13%	0%	0%	589,547
Panama*	0%	0%	285%	664%	1%	1%	15%	22%	285%	665%	15%	22%	99,968
Papua New Guinea	0%	0%	8%	11%	0%	0%	3%	5%	9%	12%	3%	5%	79,749
Paraguay*	3%	13%	8%	43%	2%	8%	1%	9%	10%	51%	4%	23%	154,093
Peru*	1%	3%	2%	4%	5%	8%	1%	2%	7%	12%	3%	6%	655,481
Philippines*	0%	0%	11%	19%	3%	4%	4%	6%	14%	23%	5%	6%	1,088,202
Poland*	0%	0%	6%	9%	6%	7%	0%	0%	12%	16%	0%	0%	3,380,489
Qatar*	1%	1%	3%	6%	5%	8%	14%	23%	8%	13%	15%	25%	908,091
Romania*	1%	1%	3%	4%	5%	8%	1%	1%	8%	12%	1%	2%	1,158,071
Russian Federation*	1%	2%	6%	11%	10%	16%	8%	15%	16%	28%	9%	16%	6,334,767
Rwanda	5%	16%	0%	0%	2%	8%	0%	0%	2%	8%	5%	16%	15,818
Samoa	8%	10%	20%	33%	3%	3%	15%	33%	23%	37%	23%	43%	3,141
Sao Tome and Principe	8%	10%	2%	3%	1%	1%	2%	3%	3%	4%	11%	13%	1,215
Saudi Arabia	0%	0%	0%	0%	4%	6%	0%	0%	4%	6%	0%	0%	3,993,554

| Country | Import Misinvoicing | | | | Export Misinvoicing | | | | Misinvoicing Inflows (b+c) | | Misinvoicing Outflows (a+d) | | Total Trade (millions of US $) |
| | Over-invoicing (a) | | Under-invoicing (b) | | Over-invoicing (c) | | Under-invoicing (d) | | | | | | |
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	
Senegal*	2%	4%	20%	42%	2%	6%	2%	9%	22%	48%	4%	12%	68,714
Serbia, Republic of	6%	11%	0%	0%	5%	9%	0%	0%	5%	9%	6%	11%	277,978
Seychelles	1%	2%	1%	3%	3%	4%	0%	0%	5%	7%	1%	2%	13,914
Sierra Leone	2%	4%	3%	6%	1%	4%	1%	3%	4%	10%	3%	8%	15,869
Solomon Islands	1%	1%	1%	1%	0%	0%	5%	20%	1%	1%	6%	21%	6,471
Somalia	.	.	.	.	.	.	.	.	.	.	.	.	17,118
South Africa	1%	1%	0%	1%	0%	1%	4%	7%	1%	2%	4%	8%	1,709,543
Sri Lanka*	2%	5%	3%	7%	2%	4%	1%	2%	5%	11%	3%	6%	232,325
St. Kitts and Nevis	0%	0%	41%	79%	0%	0%	11%	16%	41%	79%	11%	16%	3,033
St. Lucia	0%	0%	40%	242%	1%	4%	3%	4%	42%	246%	3%	4%	7,590
St. Vincent and the Grenadines	0%	0%	49%	81%	0%	0%	19%	38%	49%	81%	19%	38%	3,750
Sudan*	3%	11%	8%	27%	1%	8%	8%	84%	9%	35%	11%	95%	163,201
Suriname	1%	1%	29%	54%	0%	0%	39%	58%	29%	54%	39%	59%	13,563
Swaziland	1%	1%	0%	1%	0%	1%	4%	7%	1%	1%	5%	9%	32,077
Syrian Arab Republic	0%	0%	8%	35%	0%	0%	2%	15%	8%	35%	2%	15%	206,290
Tajikistan	0%	0%	2%	11%	5%	13%	0%	0%	6%	24%	0%	0%	21,456
Tanzania	0%	0%	1%	4%	2%	7%	0%	0%	3%	11%	0%	0%	113,717
Thailand*	1%	2%	3%	6%	2%	4%	1%	2%	5%	10%	2%	4%	3,660,231
Timor-Leste, Democratic Republic of	.	.	.	.	.	.	.	.	.	.	.	.	3,394
Togo*	3%	7%	90%	179%	2%	11%	18%	160%	92%	189%	21%	167%	18,136
Tonga	0%	0%	5%	10%	0%	0%	3%	3%	5%	10%	3%	4%	1,778
Trinidad and Tobago	2%	3%	0%	0%	0%	0%	9%	16%	0%	0%	11%	19%	206,140
Tunisia	0%	0%	2%	3%	2%	2%	0%	0%	4%	5%	0%	0%	360,389
Turkey*	1%	2%	5%	10%	1%	3%	1%	2%	6%	13%	2%	4%	3,136,540
Turkmenistan	.	.	.	.	.	.	.	.	.	.	.	.	137,242
Uganda	3%	10%	0%	0%	5%	13%	0%	0%	5%	13%	3%	10%	63,135
Ukraine*	1%	3%	4%	12%	1%	5%	2%	6%	5%	17%	3%	10%	1,165,449
United Arab Emirates	0%	0%	2%	3%	7%	18%	0%	0%	9%	22%	0%	0%	4,108,215
Uruguay	0%	0%	4%	14%	0%	0%	2%	7%	4%	14%	2%	7%	148,686
Uzbekistan	.	.	.	.	.	.	.	.	.	.	.	.	152,112
Vanuatu	0%	0%	53%	95%	0%	0%	15%	72%	53%	95%	15%	72%	3,225
Venezuela, Republica Bolivariana de*	1%	1%	3%	7%	3%	5%	3%	4%	6%	12%	3%	6%	1,266,113
Vietnam*	0%	1%	6%	11%	1%	2%	2%	2%	7%	13%	2%	3%	1,652,055
Yemen, Republic of	0%	0%	2%	7%	0%	2%	0%	2%	2%	9%	0%	2%	153,056
Zambia	1%	6%	0%	0%	8%	15%	0%	0%	8%	15%	1%	6%	124,370
Zimbabwe	0%	1%	0%	3%	3%	13%	1%	2%	4%	16%	1%	4%	61,082

Appendix II: Methods

This report provides estimates of IFFs due to trade misinvoicing using the standard scaled-up methodology employed in *Illicit Financial Flows from Developing Countries: 2004-2013*. We provide full documentation of that methodology in Section A. Section B describes adjustments to the scaled-up "high" estimates to provide for a separate set of "low" narrow-basis estimates. Section C discusses several refinements made to both the high and low estimates, such as the inclusion of Swiss precious metals data in the calculation. Section D concludes with information on the estimates of leakages from the balance of payments.

A.   High Estimates

The high estimates are calculated using a mixed approach, dependent on data availability. When comprehensive bilateral trade data with advanced economies are available for the full 10 years of covered in this report, the bilateral advanced economies calculation is employed. However, when such bilateral trade data are not available for the full 10-year period, the world aggregate calculation is substituted.

Trade Misinvoicing: Bilateral Advanced Economies Calculation

Trade misinvoicing is calculated by comparing a country's reported trade statistics with those of its "advanced economy" trading partners (as designated by the IMF). This approach was first implemented by Bhagwati[20] and is carried out in two steps. First, import c.i.f. data are converted to an f.o.b. basis using a freight and insurance factor of 10 percent ($r=1.1$ in the equations below), a standard factor used by the IMF's Direction of Trade Statistics (DOTS).[21] Once the conversion factor has been applied, the import and export discrepancies (ID and ED, respectively) are calculated using the following equations:

$$ID_{jp,t} = I_{jt}/r - X_{pt}$$

$$ED_{jp,t} = I_{pt}/r - X_{jt}$$

where:

I_{jt} : Imports by the developing country j from the partner country p at time t

I_{pt} : Partner country p's imports from the developing country j at time t

X_{jt} : Developing country j's exports to partner country p at time t

X_{pt} : Partner country p's exports to developing country j at time t

A negative value of $ID_{jp,t}$ indicates import under-invoicing (illicit inflows), and a positive value shows import over-invoicing (illicit outflows). Similarly, a negative value of $ED_{jp,t}$ represents export over-invoicing (illicit inflows), while a positive value shows export under-invoicing (illicit outflows).

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20 Jagdish N. Bhagwati, "On the Underinvoicing of Imports," in *Illegal Transactions in International Trade*, ed. Jagdish N. Bhagwati (Amsterdam: North-Holland Publishing Company, 1974), 138–47.
21 International Monetary Fund, "Direction of Trade Statistics (DOTS)," [Online Database].

When data for countries are available that permits this calculation—51 developing countries in this report, marked with one or two asterisks in Table A-I—GFI estimates makes this estimation using bilateral trade data with individual advanced economies from the IMF's Direction of Trade Statistics (DOTS) to arrive at a total of misinvoicing vis-à-vis advanced countries. This is the point the calculation stops for bilateral reporters for the "low estimate" (see Subsection B of this appendix).

Appendix Table II-1. Regional Breakdown of Comprehensive Bilateral Reporters

	Sub-Saharan Africa	Asia	Developing Europe	MENA+AP	Western Hemisphere	All Developing Countries
Bilateral Reporters	4	9	14	7	17	51
Total Countries	45	25	24	22	33	149
Percent Reporting Bilaterally	9%	36%	58%	32%	52%	34%
Percent of Total IFFs from Bilateral Reporters, 2014 (Low Estimate)	16%	99%	99%	50%	94%	90%
Percent of Total Trade from Bilateral Reporters, 2014	6%	99%	97%	25%	96%	82%

Note: Estimates of total trade were calculated as an average of the magnitude reported by each developing country and the magnitude reported by that country's trade partners. Total trade is defined as the total exports plus imports for developing countries as provided by the compilers of the IMF's Direction of Trade Statistics.

For the high estimates, this total misinvoicing vis-à-vis advanced countries figure is then scaled up to a world level, using the ratio at which the developing country traded with these economies as compared to the world, under the assumption that traders misinvoice with other developing countries at the same rate they misinvoice with advanced economies.

Trade misinvoicing estimates are adjusted for entrepôt trade through Hong Kong, using re-export statistics from the Hong Kong Census and Statistics Department.[22] This adjustment reduces trade gaps between countries and prevents the mechanism of shipping goods through Hong Kong from appearing as misinvoicing. Unfortunately, we are not aware of disaggregated re-export data from any other major trade entrepôt (e.g. Singapore, Dubai) at this time.

22 The Government of Hong Kong Special Administrative Region, Census and Statistics Department, "Re-Export Trade Data, 2000-2014," 2015.

Trade Misinvoicing: World Aggregate Calculation

For many countries, sufficient bilateral trade data with a substantial number of advanced economies renders the above approach impossible. For these countries, an alternate but related method is employed to estimate trade misinvoicing, using the same 10 percent factor for r:

$$ID_{jw,t} = I_{jt}/r - X_{wt}$$

$$ED_{jw,t} = I_{wt}/r - X_{jt}$$

where:

I_{jt} : Imports by the developing country j from the world w at time t

I_{wt} : The world w's imports from the developing country j at time t

X_{jt} : Developing country j's exports to the world w at time t

X_{wt} : The world w's exports to developing country j at time t

Just as in the bilateral advanced economy calculation, a negative value of $ID_{jw,t}$ indicates import under-invoicing (illicit inflows), and a positive value shows import over-invoicing (illicit outflows). Similarly, a negative value of $ED_{jw,t}$ represents export over-invoicing (illicit inflows), while a positive value shows export under-invoicing (illicit outflows). Estimates are still adjusted for entrepôt trade through Hong Kong, using re-export statistics from the Hong Kong Census and Statistics Department.[23]

Similarly, trade data continues to be sourced from the IMF's Direction of Trade Statistics. However, in the case of y- or v-flagged data, indicating consolidated data estimated from partner country totals, I_{jt} and/or X_{jt} are replaced with comparable data from the IMF's International Financial Statistics[24] database. This method continues to be used for the same set of countries in the low estimates, though the result is scaled down by the amount of trade the countries have with advanced countries, derived from partner country information (see Subsection B for a fuller discussion of the low estimates).

Despite its usefulness in drastically expanding the number of countries for which a trade misinvoicing calculation can be made, this method has its drawbacks. For one thing, it implicitly treats developing country partner trade data as having the same level of accuracy as advanced country partner trade data, due to the fact that other developing countries are inherently present in the aggregated world mirror trade. This could lead to errors in calculation. Secondly, and more importantly, it is subject to erratic swings in magnitude, seemingly random drops to zero, and

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23 Ibid.
24 International Monetary Fund, "International Financial Statistics (IFS)," [Online Database].

general understatement. This is due to an aggregation problem. If, for example, there are high levels of import under-invoicing outflows to Germany, an even higher level of import over-invoicing inflows with the United Kingdom would completely swamp out the outflows to Germany. This situation would register zero illicit outflows due to import over-invoicing in that year, though import over-invoicing did indeed occur with Germany (and likely many other countries). Given that nearly two-thirds of the countries in this report had trade misinvoicing calculated in this manner, it is yet another reason to treat the estimates presented in this report as conservative.

B.   Low Estimates

In this report, we also present low estimates of trade misinvoicing, which follow the same basic logic of what have been GFI's standard estimates in previous reports (referred to in this report as the high estimates). The low estimates are intended to present the volume of illicit financial flows strictly between developing countries and advanced countries; that is, the low estimates exclude that part of measurable IFFs moving between developing countries. *At the individual country level, the higher, scaled-up estimates may be interpreted as an accurate estimate of that country's misinvoicing propensity in all of its trade.* However, because these scaled-up estimates include trade gaps between developing countries, adding the misinvoicing estimates for any two developing countries may lead to overcounting in the total, with the likelihood of overcounting rising as the number of countries being aggregated increases. By the same token, the lower estimate deliberately excludes misinvoicing in trade between developing countries and, therefore, is likely to underestimate trade misinvoicing at the individual country level.

This is to avoid double-counting of flows between developing countries upon summing the totals of developing country IFFs to create a total world figure.

The standard estimates are scaled downwards as follows. For bilateral reporters, we simply do not adjust the figure upwards to a world level. In other words, the trade misinvoicing calculation is complete once a country's estimates of misinvoicing vis-à-vis advanced countries are summed. For world reporters, the process is less direct. The totals from the standard estimates are scaled downwards based on estimated partner-country DOTS data on the propensity of that country to trade with advanced countries. For example, if a world reporter is estimated to conduct 70 percent of its trade with advanced countries, the "high estimate" trade misinvoicing figure is multiplied by 0.7.

C. Comparison with Estimates in Illicit Financial Flows from Developing Countries: 2004-2013[25]

For the high estimates of trade misinvoicing, several new adjustments have been made since GFI's last global estimation of illicit financial flows. These methodological adjustments are also applied to the low estimates.

Swiss Bilateral Gold & Precious Metals Data

In order to accurately estimate trade misinvoicing, we aim to close all legitimate gaps in trade statistics not due to deliberate misinvoicing. We recently became aware that Swiss import and export statistics in the IMF's Direction of Trade Statistics are not inclusive of gold and other precious metal trade prior to 2012.[26] However, those missing data are available from the Federal Customs Administration of the Swiss Confederation.[27] In this report, the Swiss data is used to supplement DOTS statistics, reducing trade gaps on many bilateral routes.

Countries Classified as "Bilateral Reporters"

For a country to be treated as a "bilateral reporter," it must report to at least 30 advanced economies for each of the 10 years estimated in this report. Countries meeting these criteria are calculated using the bilateral advanced economies method, save for exceptions in Southern Africa noted below. These exceptions, along with changes in data coverage, have led to slight shifts in which countries are classified as bilateral reporters and which are not.

Zambia and South African Customs Union (SACU) Countries

Due to bilateral data availability, Zambia and South Africa (along with the SACU countries, for which the trade misinvoicing calculation is estimated as a relative level of South Africa's trade misinvoicing) were calculated in our most recent report using the bilateral advanced economies method.[28] However, irreconcilable issues in the destination reporting of Zambia's copper exports[29] and South Africa's gold exports[30] distort bilateral estimates of misinvoicing to such a degree that bilateral estimations of misinvoicing for these countries are of little practical use. To mitigate this

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25 Dev Kar and Joseph Spanjers, *Illicit Financial Flows from Developing Countries: 2004-2013* (Washington, DC: Global Financial Integrity, 2015).

26 GFI is grateful for helpful communications with India's Directorate of Revenue Intelligence and the Swiss Directorate General of Customs regarding this issue.

27 "Trade in Gold, Silver and Coins," [Online Database], *Federal Customs Administration, Swiss Confederation*, (March 3, 2015), http://www.ezv.admin.ch/themen/04096/04101/05233/05672/index.html?lang=en.

28 Kar and Spanjers, *IFFs: 2004-2013*, 27.

29 Alex Cobham, "Tax Havens and Illicit Flows," in *Draining Development? Controlling Flows of Illicit Funds from Developing Countries*, ed. Peter Reuter (Washington, DC: The World Bank, 2012), 363, https://openknowledge.worldbank.org/bitstream/handle/10986/2242/66815 0PUB0EPI0067848B09780821388693.pdf; Mwanda Phiri and Shebo Nalishebo, "Do Zambia's Copper Exports Disappear into Thin Air?," The ZIPAR Quarterly (Lusaka, Zambia: Zambia Institute for Policy Analysis & Research (ZIPAR), April 2015), http://www.zipar.org.zm/publications/zipar-quarterly-magazine/34-zipar-quarterly-april-2015.

30 Kathy Nicolaou-Manias and Yuchen Wu, "Illicit Financial Flows Estimating Trade Mispricing and Trade-Based Money Laundering For Five African Countries," GEG Africa Discussion Paper (Global Economic Governance Africa, October 2016), 42–43, http://www.gegafrica.org/publications/66-illicit-financial-flows-estimating-trade-mispricing-and-trade-based-money-laundering-for-five-african-countries; Léonce Ndikumana, "Trade Misinvoicing in Primary Commodities: The Cases of Chile, Côte d'Ivoire, Nigeria, South Africa and Zambia" (UNCTAD, December 2016), 1–4, http://unctad.org/en/PublicationsLibrary/suc2016d2_en.pdf.

destination reporting issue, we have decided to treat these countries as world reporters and apply the world aggregate method. Utilizing this method, which is not distorted by issues in destination reporting, we can have greater confidence that our trade misinvoicing estimates for these countries are indeed conservative.

D. Balance of Payments Leakages

Leakages from the balance of payments are the Net Errors and Omissions (NEO) term in the IMF's Balance of Payments Statistics[31] (BOP) database. In economic research, those leakages (when indicating an unaccountable outflow from developing to advanced countries) have been regularly associated with capital flight (often termed "hot money narrow"). GFI assumes that those unreported leakages (here representing potential inflows as well as outflows) represent unrecorded and presumably illicit transactions. However, the BOP leakages to some extent also represent legitimate reporting errors in the compilation of the BOP accounts. Even so, because the BOP leakages are typically only a small fraction of total IFFs estimated by GFI, variations on that assumption are not likely to appreciably affect the overall estimates presented here.

When there are missing values for NEO in the BOP database, GFI attempts to fill the gaps with net errors and omissions data from various IMF country reports and the hard copy 2011 and 2012 Balance of Payments Yearbooks, converted at the appropriate exchange rate[32] if necessary. NEO values for Saudi Arabia, the United Arab Emirates, and Qatar are omitted due to potential overstatement related to idiosyncratic accounting for sovereign wealth funds in those countries.

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31 International Monetary Fund, "Balance of Payments Statistics (BOPS)," [Online Database].

32 Period average exchange rate to U.S. dollars, using: International Monetary Fund, "International Financial Statistics."

Glossary

ATI:	Addis Tax Initiative.
BOPS:	Balance of Payment Statistics, an IMF database that measures the balance of payments between countries. The Net Errors and Omissions line is used to adjust for when the other components of the balance of payments to not sum to zero.
DOTS:	Direction of Trade Statistics, an IMF database with that measures countries' external accounts.
EU:	European Union.
FATF:	Financial Action Task Force.
FfD:	Financing for Development Conference.
G20:	Group of 20 largest economies in the world.
GDP:	Gross Domestic Product.
GFI:	Global Financial Integrity.
IFFs:	Illicit Financial Flows, illegal movements of money or capital from one country to another. GFI classifies this movement as an illicit flow when the funds are illegally earned, transferred, and/or utilized.
IFS:	International Financial Statistics, an IMF database with a variety of financial statistics, including reporting IMF-member countries exports to and imports from the world as a whole.
Illicit Inflow:	The gross amount of money or capital entering a country illicitly.
Illicit Outflow:	The gross amount of money or capital exiting a country illicitly.
IMF:	International Monetary Fund.
MENA+AP:	Middle East, North Africa, Afghanistan, and Pakistan.
NEO:	Net Errors and Omissions, representing leakages from the balance of payments.
OECD:	Organization for Economic Cooperation and Development.
Re-Exports:	Goods imported and then quickly exported to their final destination.
SDGs:	Sustainable Development Goals.
Trade Entrepôt:	A major trading zone and intermediary (e.g. Hong Kong, Singapore, Dubai).
Trade Misinvoicing:	A method for moving money illicitly across borders which involves deliberately misreporting the value of a commercial transaction on an invoice submitted to customs.
UN:	United Nations.

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About

Founded in 2006, Global Financial Integrity (GFI) is a non-profit, Washington, DC-based research and advisory organization, which produces high-caliber analyses of illicit financial flows, advises developing country governments on effective policy solutions, and promotes pragmatic transparency measures in the international financial system as a means to global development and security.

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