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**HIDDEN INEQUALITY:  
HOW MUCH DIFFERENCE WOULD ADJUSTMENT FOR ILLICIT FINANCIAL  
FLOWS MAKE TO NATIONAL INCOME DISTRIBUTIONS?**

Abstract: A recent innovation in measuring inequality is the incorporation of adjustments to top incomes using data from tax authorities, revealing higher inequality. The thesis of this paper is that the incorporation of estimates of income from illicit financial flows, reflecting *untaxed* capital, may be as significant to national inequality - but with greater variation across countries. We propose a method of adjusting national inequality data for illicit flows, and present preliminary results. These estimates suggest that untaxed illicit flows could be as important as (taxed) top incomes to estimates of inequality – highlighting the importance of improving estimates of underlying illicit flows.

**Keywords:** income inequality, tax, illicit financial flows, income distribution

**JEL:** D31, H26

## 1. INTRODUCTION

In his 1954 presidential address to the American Economic Association, ‘Economic growth and income inequality’, Simon Kuznets (1955, p.1) noted the “unusual scarcity of data” plaguing this field of study. He went on to lay out five specifications of data that would be valuable, but noted that it began “to look like a statistical economist’s pipe dream” (p.2). In recent years, that pipe dream has begun to look rather more like an achievable aim – but important problems remain. These form a critical part of the broader problem of uncounted inequality (Cobham, 2015), in which marginalized groups tend to be further excluded by their omission from surveys and other policy-sensitive data collation, while elites are able to exert and extend their power by excluding themselves from data collation processes that might give rise to policy implications – such as the taxation of offshore incomes.

While this ‘uncounted’ extends to all aspects of human development, this paper focuses on income in particular. At the bottom of the distribution, Carr-Hill (2013) argues that there are systematic omissions from survey data, estimated to extend potentially to some 250 million people worldwide or 3.5% of the world population. This is perhaps a small enough proportion that if it were spread evenly across the distribution it need not be a major cause for concern; but the groups in question are likely to be overwhelmingly those at the bottom end of national income distributions.

At the top end of the distribution in household surveys, meanwhile, there is the well-known evidence of non-response from high-income groups. Korinek et al. (2005) survey a range of literature on overall non-response, showing it to be often as high as 30%. For US data, their model implies that upward corrections of the Gini index during the sample years 1998-2004 should range from 3.39 to 5.74 percentage points (raising the Gini from around 0.45 to 0.49-0.50). Atkinson, Piketty & Saez (2011) use tax data on top incomes to generate

similar US results, finding for 2006 a Gini 4.9 percentage points higher, at 0.519 as opposed to the original calculation of 0.470.<sup>1</sup> Two main approaches have been pursued for *international* analyses of missing top incomes, and we discuss these in the following section. There is as yet no international analysis focusing specifically on untaxed income – and above all that which is deliberately hidden. Since the early 2000s, a growing ‘tax justice’ movement has highlighted the importance of undeclared assets and income streams held offshore, and of parallel patterns of profit-shifting by multinational companies (Seabrooke & Wigan, 2013). Various scholars (e.g. Zucman, 2013) have sought to uncover elements of the broader phenomenon that we may consider under the label of ‘illicit financial flows’.

This paper considers how estimates of national inequality are different if adjusted for such flows. The paper is structured as follows. In section 2, we review the literature on illicit financial flows and tax evasion in particular, including questions of definition and critically evaluating different estimation approaches. In section 3, we set out a range of approaches reflecting different inequality measures and different assumptions about the attribution of illicit incomes, and present our preliminary estimates. Section 4 concludes with discussion of the avenues of future research needed in order to improve such estimates.

Our key finding on the basis of our preliminary estimates is that this particular aspect of hidden or uncounted income inequality may be of equivalent scale to that revealed by the inclusion of top incomes tax data. However, we note that current estimates of illicit flows are unlikely to offer the granularity or degree of confidence to construct robust adjusted series, and we therefore highlight a number of proposals for financial transparency measures that could support better adjustments.

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<sup>1</sup> The underlying World Top Incomes Project aims to track, through tax records, the incomes of the richest 10 per cent, 5 per cent, 1 per cent, 0.1 per cent and 0.01 per cent and other fractiles in 30, largely but not entirely, Organisation for Economic Co-operation and Development (OECD) countries with available tax data (see Alvaredo et al., 2014). While the bulk of data currently available relate to higher income countries, work is underway to include additional developing countries.

## 2. ILLICIT FINANCIAL FLOWS AND IMPLICATIONS FOR NATIONAL INCOME DISTRIBUTION

This section is divided into three parts. First, we consider the nature and definition of illicit financial flows (IFF), with a view to considering the reasonableness of attributing this to undeclared top incomes. Second, we discuss methodological issues and availability of the leading IFF estimates. Finally, we compare briefly the two main approaches taken in international work aiming to combine top incomes tax data with household survey data, as the basis for our own estimates in section 3.

### *Illicit financial flows*

The Sustainable Development Goals, adopted by the United Nations in 2015, include a global goal to curtail illicit financial flows. However, there is no agreed indicator. This reflects in part the relatively recent emergence of IFF as a major policy issue, and in part the difficulties of definition and of measurement.

The definition of ‘illicit’ is broader than simple illegality, encompassing that which is forbidden by rules, law or custom.<sup>2</sup> The defining feature of illicit financial flows (IFF) is therefore that they are *hidden*, rather than necessarily illegal, and where either the illicit origin of capital or the illicit nature of transactions undertaken is deliberately obscured. For example, aggressive corporate profit-shifting (often through the manipulation of transfer pricing) may well be legal (or at least, there may be a near-zero prospect of its being proved

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<sup>2</sup> This discussion draws on that in Cobham (2014); the definition of illicit is that of the Oxford English Dictionary.

to be illegal evasion by a tax authority with very limited capacity); but because the extent of the behaviour would be seen as in opposition to social expectations of paying a ‘fair share’ of tax, the activity may still be hidden through use of subsidiaries in more opaque jurisdictions. The most well-known classification of IFF stems from Baker (2005), who popularized the term, and disaggregates IFF into three elements: commercial tax evasion (estimated at up to two thirds of the total), the laundering of the proceeds of crime (up to a third), and corrupt payments and the theft of state assets (3-5% of the total). Table 1 provides a broader overview of the transaction types, which can be clustered into four main types by motivation (see final column): 1 - market/regulatory abuse, 2 - tax abuse, 3 - abuse of power, including the theft of state funds and assets, and 4 - proceeds of crime. All four IFF types are likely to result in reductions in both state funds and institutional strength. The typology is unlikely to be comprehensive because there is potential to engineer an illicit flow in any transaction, and the range of potential illicit motivations is wide indeed; but nonetheless demonstrates the breadth of IFF phenomena.

There is substantial overlap in the mechanisms used for IFF, regardless of motivation. The opportunity to hide, where it exists, is likely to be exploited for multiple purposes – so that identifying illicit flows in a particular mechanism will tend to be insufficient to specify the type of IFF in action. This raises two particular issues for research into income distributional impacts. First, IFFs include income that would not exist if all laws applied – namely the proceeds of crime, and the tax component of tax evading flows. Our concern here is not with the legal, or otherwise appropriate income distribution, but rather with the *actual* distribution, and so it is reasonable to allocate even illegal IFF income accordingly.

The second issue is that a major type of IFF, that related to multinationals’ profit-shifting, will in the great majority of cases accrue to people outside the particular country in question – and so should not be allocated to the national income distribution. Usefully, profit-

shifting by multinationals is one area of IFFs where the estimation is largely separable – and so we are able to use estimates which (largely) reflect other IFFs. To the extent that full separation is impossible, however, note that this creates some risk of over-allocating income domestically in what follows.

Table 1: A typology of illicit financial flows

Flow	Manipulation	Illicit motivation	IFF type	
Exports	Over-pricing	Exploit subsidy regime	2	
		(Re)patriate undeclared capital	1	
	Under-pricing	Shift undeclared (licit) income/profit	2	
		Shift criminal proceeds out	4	
		Evade capital controls (including on profit repatriation)	1	
Imports	Under-pricing	Evade tariffs	2	
		(Re)patriate undeclared capital	1	
	Over-pricing	Shift undeclared (licit) income/profit	2	
		Shift criminal proceeds out	4	
		Evade capital controls (including on profit repatriation)	1	
	Inward investment	Under-pricing	Shift undeclared (licit) income/profit	2
			Shift criminal proceeds out	4
Over-pricing		Evade capital controls (including on profit repatriation)	1	
		(Re)patriate undeclared capital	1	
		Anonymity	Hide market dominance	1
Outward investment		Anonymity	Hide political involvement	3
		Under-pricing	Evade capital controls (including on profit repatriation)	1
	Over-pricing	Shift undeclared (licit) income/profit	2	
		Shift criminal proceeds out	4	
Public lending	Anonymity	Hide political involvement	3	
		Public asset theft (illegitimate allocation of state funds)	3	
	(If no expectation of repayment, or if under-priced)	Public asset theft (illegitimate creation of state liabilities)	3	
Public borrowing	(If state illegitimate, or if over-priced)	Public asset theft (illegitimate creation of state liabilities)	3	
Related party lending	Under-priced	Shift undeclared (licit) income/profit	2	
Related party borrowing	Over-priced	Shift undeclared (licit) income/profit	2	
Public asset sales	Under-pricing	Public asset theft	3	
	Anonymity	Hide market dominance	1	
	Anonymity	Hide political involvement	3	
Public contracts	Over-pricing	Public asset theft	3	
	Anonymity	Hide market dominance	1	
	Anonymity	Hide political involvement	3	
Offshore ownership transfer	Anonymity	Corrupt payments	3	

Source: Cobham (2014). IFF type: 1 - market/regulatory abuse; 2 - tax abuse; 3 - abuse of power, including the theft of state funds and assets; 4 - proceeds of crime.



### *Leading IFF estimates*

As noted, we do not here focus on multinational profit-shifting since the likely implications for national income distribution are limited. That literature (see e.g. Crivelli et al., 2015, and Cobham & Janský, 2015) is largely self-contained, drawing variously from data on multinationals' balance sheets and/or survey and Foreign Direct Investment (FDI) data to identify anomalies in the distribution of the international corporate tax base. Most IFF approaches focus instead on anomalies in the capital account (unrecorded capital movements) and in the current account (via mispriced trade, which is assessed to be dominated by unrelated party transactions rather than multinationals' intra-group profit shifting).

For capital account anomalies, the two most commonly used methods are the World Bank Residual Method (WBR) and the Hot Money 'Narrow' Method (HMN). Both these methods rely on anomalies in the Balance of Payment (BoP) identity:

$$A + B + C + D + E + F + G + H = 0$$

Where:

*A*: current account balance

*B*: net equity flows (including net FDI and Foreign Portfolio Investment)

*C*: other short-term capital of other sectors

*D*: Foreign Portfolio Investment (FPI) involving other bonds

*E*: change in deposit-moneybanks' foreign assets

*F*: change in reserves of the central bank

*G*: net errors and omissions (NEO)

*H*: change in external debt

The World Bank residual method (WBR) captures the difference between recorded inflows and recorded uses, which is given by the (negative) sum of the current account balance, net

equity flows, change in reserves of the central bank and change in external debt and by the Balance of Payments (BoP) identity:

$$-(A + B + F + H) = C + D + E + G$$

Of the components on the right-hand side, however,  $C+D+E$  are licit: composed of other short-term capital of other sectors, FPI involving other bonds, and the change in deposit-money banks' foreign assets. As such, the WBR method is likely to exhibit a substantial upwards bias as an estimator of IFF.

The main alternative, the Hot Money 'Narrow' method (HMN), is given by the remaining right-hand side component,  $G$ : net errors and omissions.  $G$  is simply the balancing residual constructed to maintain the BoP identity, and so serves as an indicator of error – and possibly of illicitness – in the overall capital account. The most well-known estimates, produced by Global Financial Integrity, have shifted from using the WBR method (e.g. Kar & Cartwright-Smith, 2010) to the HMN (e.g. Kar & Freitas, 2011).

The longest-standing series of estimates, although published for African countries only, are those of Ndikumana & Boyce (e.g. 2010). These authors also contrast sources and uses of foreign exchange in the capital account, but adjust for exchange rate fluctuations on the value of external debt, for debt writeoffs and for under-reported remittances (the latter on the basis of discrepancies between UN IFAD estimates and BoP data).

Both Global Financial Integrity and Boyce & Ndikumana also include a trade-related IFF component as the second part of their flow estimates. While this may include some transfer mispricing by multinationals for the purpose of profit-shifting, trade misinvoicing is a more crude approach to tax reduction than those challenged in the OECD Base Erosion and Profit Shifting action plan, the major international attempt to curtail the activity. Instead, these anomalies are more likely to reveal unrelated party transactions that aim to shift part of one party's income into a different jurisdiction.

In both approaches, the authors use national trade data to establish anomalies in the declared values of total exports and imports, on the basis that these reveal illicit shifts of value. On one view, these estimates are rather conservative. They pick up only one form of trade misinvoicing, which occurs via re-invoicing. The data does not pick up, for example, trade transactions where the misinvoicing is incorporated in the same invoice exchanged between exporter and importer. In addition their data does not pick up misinvoicing of services and intangibles.

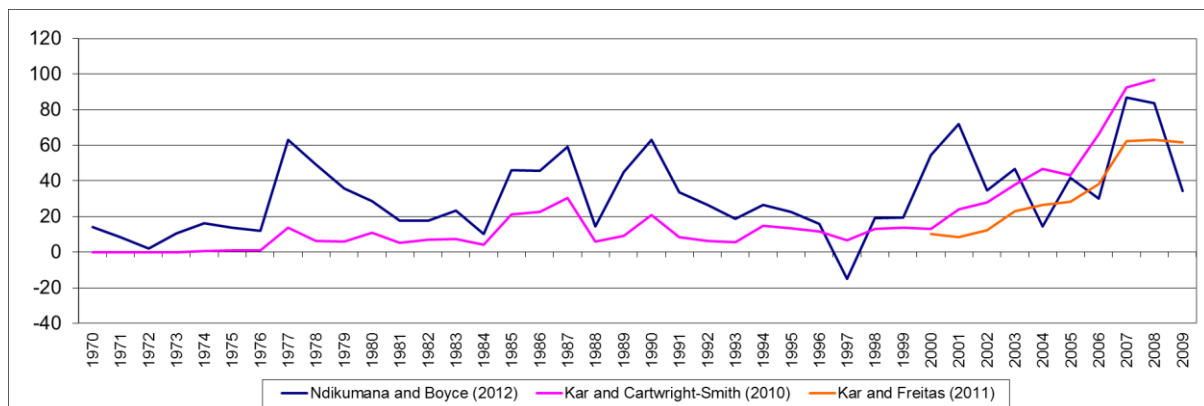
Within the same broad approach type are more detailed trade studies, such as those carried out by Pak and Zdanowicz (1994; 2005) and UNECA (2012), and these may suggest a need for some caution. Greater confidence is possible in estimates such as the latter which are based on more granular data – at detailed commodity level at least, and ideally at transaction level. The difficulties in obtaining consistent, high-quality data of this type mean that the leading global estimates at present rely instead on national-level data – and serious criticisms, including of the GFI approach, have been raised (Johannesen & Pirttilä, 2016; Hong & Pak, 2016; Nitsch, 2016). An important difference in approach between Boyce & Ndikumana and GFI is that the former net off their estimates of illicit inflows, to obtain a more conservative (and also more volatile) series, while GFI argue that because there is no such thing as net crime it makes sense to consider gross outflows.

While illicit inflows could be considered to counteract detrimental effects of illicit outflows by increasing available capital resources, this position is questionable (see UNECA (2012) and AUC-UNECA (2015) for a more detailed discussion) because the damage of IFF to governance may be more important than the net resource effect. The benefits to the economy of illicit financial inflows to the economy may well be less than those of licit inflows, since the illicit inflows may themselves be going to fund the illicit economy (e.g. repatriation of profits by transnational organized criminal organizations may be used to fund

expansion of activities in the country in question; the flows could also represent financing of terrorism); or be circumventing regulation or taxation designed to ensure fair competition. For our purposes in this paper, illicit financial inflows seem just as likely as illicit outflows to be distributed as or more unequally than funds in the licit economy, and so our primary interest is in estimates that do not 'net out' illicit financial inflows.

Figure 1 shows a comparison for estimates of total African IFF, between GFI methodology with WBR and HMN – Kar & Cartwright-Smith (2010), and Kar & Freitas (2011), respectively – and the Ndikumana & Boyce approach. Note that differences between the series frequently exceed the total value of the lowest estimate. Ndikumana & Boyce demonstrates greater volatility, as would be expected given in particular their use of net rather than gross trade mispricing. At the aggregate level, GFI’s updated (HMN) methodology tends to produce the more conservative estimates.

**Figure 1: Comparison of illicit financial outflow estimates for Africa, US\$ billion**



These differences provide an important illustration of the sensitivity of estimates to assumptions. Note, too, that these are shown at the aggregate level; disaggregated, there are examples of quite different country patterns over time.

Ndikumana and Boyce have generally focused more on the stock of capital held outside African countries, than on the annual outflows. Similarly, Henry (2012) produces global estimates with a largely common methodology, scaling up from outflows to estimates

stocks of capital held offshore. The alternative approach here is to use data on international asset and liability positions in order to establish anomalies in the position of particular jurisdictions. Zucman (2013) follows this line of approach, focusing on a group of pre-determined ‘tax haven’ jurisdictions and the potential undeclared wealth held there. Henry’s estimate, reflecting a wider set of asset types and without the limitation on jurisdictions holding assets, is unsurprisingly much larger: in the range of \$21 trillion to \$32 trillion, compared to around \$8 trillion for Zucman.<sup>3</sup> It is possible to estimate the income streams that may accrue on offshore assets.

Both Henry (2012) and Zucman (2013) estimate an offshore income stream of around \$190 billion annually (Henry assumes a much more cautious rate of his return, on his much higher estimated stock). When country-level estimates are available, this may provide an alternative source of hidden income data to include in national distribution analysis. However, the additional extrapolations (from outflows to stocks, and then to potential income streams) inevitably add a higher degree of uncertainty. For that reason, we focus here on estimated outflows only, treating these directly as hidden (domestic) income.

We recognize that there are reasons to be cautious about the GFI estimates. In particular, further work is needed on the capital account component, to explore the implications of varying other assumptions and parameters than those in the WBR vs HMN comparison which has large effects on the results. In addition, it is clear that trade analyses based on more granular data are likely to yield more accurate findings, and this should be pursued.

For the present analysis, however, in which we are primarily interested in considering the potential importance of the phenomenon in relation to national inequality – not, for

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<sup>3</sup> Piketty (2014) argues that Zucman’s estimate, implying that undeclared financial assets in tax havens may amount to nearly 10% of world GDP, may well be ‘a lower bound’ (p.466).

example, in tracking levels year on year – the GFI estimates are the most appropriate. Table 2 below shows the share of illicit financial outflows (using GFI estimates) in developing countries' GDP, sorted in descending order based on the share of illicit financial outflows in GDP for 2013 (the latest year for which estimates are available from GFI).

For many countries, IFF can be well above the accounting threshold for materiality of 5%. For some, often developing countries with smaller economies, that threshold is surpassed many times over. Some of the largest IFF in absolute value, however, relate to larger economies such as Argentina, China, Nigeria and South Africa where the intensity of IFF to GDP is lower.

**Table 2: Estimated illicit outflow by country (leading countries only), % share of GDP**

Country	2013	Average 2004-13	Country	2013	Average 2004-13
Nicaragua	45%	36%	Mexico	6%	5%
Costa Rica	43%	32%	Haiti	6%	2%
Togo	34%	73%	Mali	6%	5%
Honduras	30%	35%	Bangladesh	6%	5%
Djibouti	28%	38%	Panama	6%	8%
Liberia	28%	103%	Russian	5%	7%
Cambodia	26%	13%	Hungary	5%	4%
Equatorial Guinea	26%	15%	Mauritania	5%	1%
Vanuatu	25%	39%	Nigeria	5%	6%
Trinidad and Tobago	24%	17%	Guatemala	5%	6%
Azerbaijan	20%	24%	South Africa	5%	7%
Samoa	19%	26%	Libya	5%	2%
Suriname	17%	22%	India	4%	4%
Armenia	17%	11%	Tunisia	4%	4%
Belarus	15%	17%	Croatia	4%	6%
Malawi	15%	12%	Fiji	4%	8%
Solomon Islands	15%	21%	Venezuela,	4%	7%
Malaysia	15%	19%	Morocco	4%	5%
Lao PDR	15%	10%	Dominican	4%	3%
Comoros	15%	10%	Bulgaria	4%	6%
Paraguay	14%	26%	Chile	4%	3%
The Gambia	14%	11%	Peru	3%	3%
Rwanda	14%	7%	Turkey	3%	2%
Zambia	13%	19%	Poland	3%	2%
Moldova	13%	19%	Papua New	3%	4%
Maldives	12%	5%	Philippines	3%	6%
Chad	12%	11%	Argentina	3%	2%
Lesotho	11%	19%	China	3%	3%
Oman	11%	8%	Uruguay	3%	3%
Guyana	11%	14%	Cabo Verde	3%	3%
Kazakhstan	11%	15%	Sri Lanka	3%	5%
Grenada	11%	7%	Kuwait	3%	2%
Vietnam	10%	9%	Qatar	2%	5%
Kiribati	10%	4%	FYR	2%	6%
Sao Tome and Principe	10%	8%	Jamaica	2%	5%
Jordan	10%	7%	Ecuador	2%	5%
Namibia	10%	14%	Romania	2%	2%
Burundi	9%	5%	Guinea-	2%	8%
Sierra Leone	8%	22%	Niger	2%	3%
Botswana	8%	12%	Madagascar	2%	8%
Belize	8%	10%	St. Lucia	2%	1%
Thailand	8%	6%	Mozambique	2%	2%
Ukraine	8%	8%	Indonesia	2%	3%
El Salvador	8%	9%	Barbados	2%	3%
Mauritius	7%	7%	Uganda	1%	4%
Georgia	7%	16%	Ghana	1%	1%
Bolivia	7%	3%	Egypt	1%	3%
Guinea	7%	8%	Brazil	1%	1%
Ethiopia	7%	9%	Mongolia	1%	2%
Burkina Faso	7%	5%	Cameroon	1%	4%
Senegal	7%	7%	Saudi Arabia	1%	1%
Iraq	7%	7%	Benin	1%	2%
Republic of Congo	7%	19%	Sudan	1%	2%
Swaziland	6%	16%	Timor-Leste	1%	0%
Serbia	6%	12%	Tanzania	1%	2%
Côte d'Ivoire	6%	11%	Algeria	0%	1%

Source: Authors' calculations based on Kar and Spanjers (2015) and International Monetary Fund (2016).

### *International adjustments to national income distributions*

Two main approaches have been taken in international work to adjust national distributions. That of Lakner & Milanovic (2013) is in part based on Banerjee & Piketty's (2010) finding that the discrepancy between Indian national accounts and survey data can be somewhat explained by underreporting by top income earners. Lakner & Milanovic therefore allocate the gap between household final consumption in national accounts and household surveys (where the former is larger) to the top 10%, assuming a Pareto distribution. In effect, this assumes that national accounts are able to pick up total income more accurately than surveys which are subject to individual under-reporting, and that the great bulk of this can be attributed to the top decile. As the authors note, this "should be seen as an approximate first step, in the absence of a more careful analysis using unit-record data" (p.15). While Anand & Segal (2014) criticize the use of national account means in this way. The broad choice of allocating missing income to the top 10% although not ideal is useful as a method.

The second approach is that of Anand and Segal (2014) themselves, who draw on the taxation data from the World Top Incomes Project, and assume that very rich households are simply excluded from surveys:

*[W]e assume that the survey data in the Milanovic dataset represent only the bottom 99% of the population in each country. Accordingly we multiply the population in each income group in the surveys by 0.99, and append the top percentile with its income share from the tax data (assuming that its share of 'control' income is equal to its share of survey income).*

Data on top incomes is only available for 30 countries, of which Anand and Segal found that only 18 to 23 had applicable data for any individual year in their analysis. To extrapolate



other data Anand and Segal estimate a relationship between the share of the top 10% and the survey mean in the national survey distribution and that of the top 1% in the income tax data. The limitations of the Gini measure are evident in the results. The biggest change found occurs in 2005 and is 4 percentage points, whereas Theil's T shows a dramatically greater equivalent change of 22 percentage points. As noted in Cobham & Sumner (2013), the Gini becomes increasingly unresponsive at higher levels of inequality, and this is well seen here. It is well known the Gini is over-responsive to changes in the middle relative to changes at the top and bottom of the distribution (Cowell, 2000; 2007). As a result, we provide estimates in the following section using both the Gini and the Palma (2011) ratio, which has been proposed as an alternative inequality measure that is both more sensitive to the extremes of the distribution and more responsive at higher levels of inequality (Cobham, Schlogl & Sumner, 2015).

### **3. ADJUSTING NATIONAL DISTRIBUTION DATA FOR ILLICIT FINANCIAL FLOWS: APPROACH AND PRELIMINARY RESULTS**

It is inevitable that flow-to-stock approaches capture IFF that reflect activities other than tax-evading or tax-avoiding incomes. However, it is reasonable on the basis of Table 1 to argue that all the hidden *outflows* reflect hidden incomes, be the motivation related to tax or criminality. In addition, the bulk of multinational company tax avoidance (the type which the OECD Base Erosion and Profit Shifting initiative seeks to address) are hard to detect by these approaches, so the probability of picking up *foreign* income in this way is relatively small.

Nonetheless, many IFF transactions will involve at least some payment, or effective sharing of the illicit income offshore, so it may not make sense to take the entire estimate as national income. Finally, there remain broad concerns that estimation approaches based on anomalies

in what is inevitably imperfect data may include ‘false positives’ and so overstate the problem; along with some specific concerns about e.g. whether highly aggregated trade data will produce results consistent with those based on transaction-level analysis; or whether, for example, remittance data is well captured.

For these reasons then, we consider a hypothetical case in which the main flow-to-stock estimates of GFI are considered to represent illicit income, but where they are deflated arbitrarily by 50% to allow for the possibilities of overstatement of IFF, and of IFF representing foreign rather than home income.

Having adjusted flows to 2005 dollars, we combine with similarly adjusted household final consumption expenditure from national accounts. Following Lakner and Milanovic (2013), we allocate the estimate of undeclared income to the top 10% in its entirety.<sup>4</sup> We present estimates for the Gini, and for the Palma Ratio (see Palma 2011) which is simply the income share of the richest decile, divided by that of the poorest four deciles. All country level estimates are provided in the annex table A1. Table 3 below shows the summary statistics for the full sample and restricted sample (most recent). Table 4 shows the largest changes at country level by absolute change of the Gini (more than 2 points). The mean and median Gini are 0.41 in the full sample. Palma ratios from original survey data are 2.59 and 2.09 respectively for the mean and median in the full sample. The adjustment for illicit flows adds 0.03 or 0.02 to the Gini to bring it to 0.44 (mean) and 0.43 (median).

This is a not insignificant adjustment in the sense that it is approximately the same amount of absolute change as top incomes adjustment makes in the Anand and Segal (2014)

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<sup>4</sup> It may be thought unlikely that the entire domestic component of IFF income can be attributed to the top 10%. However, it seems a reasonable simplifying assumption in the case of tax-motivated flows, especially in lower-income countries where direct taxation (be it of labour or investment income, or capital gains etc) tends to have a very narrow base. The likelihood of cross-border flows relating to the corruption of public officials seems small outside of high earners (i.e. those in a position of sufficient power to be worth a large bribe). For the component of IFF relating to transnational organized crime, data are scarce but some survey research suggests that the gains tend to concentrate on those at the top of criminal organizations; for example, Collier (2007) cites research showing that people join criminal gangs not because they receive good starting pay, but because they will become immensely rich if they manage to reach the top of the organization.

estimates cited earlier. The adjustment adds 0.1 to the Palma Ratio on average taking it to 3.07 (mean) and 2.42 (median). Again this is not an insignificant amount. Africa and East and Central Europe have the largest individual country adjustments, but beyond this no clear pattern dominates. The four largest adjustments, both relative and absolute, occur for Liberia and Chad (from Palma ratios below 2, to ratios near 2.5), and the more equal Belarus and Tajikistan (from around 1 to around 1.5).

We also consider a case in which illicit financial flows accrue in their entirety to those receiving the top 1 % of income.<sup>5</sup> In this case, the mean absolute difference in the Gini measure rises to 0.08 and the median difference rises to 0.06. This is now over double the absolute change in inequality that the top incomes adjustment makes in Anand and Segal (2014). Table 5 below presents the results of this exercise.

**Table 3: Summary statistics**

	Original survey		With adjustment		Absolute difference		Relative difference	
	Palma	Gini	Palma	Gini	Palma	Gini	Palma	Gini
Full sample								
Mean	2.59	0.41	3.07	0.44	-0.55	-0.03	-24%	-8%
Median	2.09	0.41	2.42	0.43	-0.26	-0.02	-12%	-5%
Max	14.67	0.64	15.34	0.71	0.00	0.00	0%	0%
Min	0.80	0.24	0.81	0.24	-10.36	-0.34	-612%	-92%
Obs	252	252	252	252	252	252	252	252
Restricted Sample								
Mean	2.32	0.40	2.83	0.43	-0.54	-0.03	-26%	-8%
Median	1.88	0.39	2.31	0.43	-0.21	-0.02	-11%	-3%
Max	7.05	0.61	12.05	0.71	0.00	0.00	0%	0%
Min	0.80	0.24	0.81	0.24	-10.36	-0.34	-612%	-93%
Obs	77	77	77	77	77	77	77	77

Source: Authors' estimates. Absolute and relative differences are reported as negative values, i.e. they reflect the degree of potential understatement in income distribution data that does not adjust for illicit incomes.

<sup>5</sup> We are grateful to an anonymous referee for this suggestion.

**Table 4. Estimates of Palma Ratio and Gini, with and without IFF adjustment, selected countries with absolute change in Gini > 0.02**

Country	Year	Original survey		With adjustment		Absolute difference		Relative difference	
		Palma	Gini	Palma	Gini	Palma	Gini	Palma	Gini
Albania	2008	1.44	0.33	1.48	0.34	-0.04	0.00	-0.03	-0.01
Belarus	2011	0.92	0.26	2.12	0.40	-1.20	-0.14	-1.30	-0.54
Bhutan	2007	1.68	0.37	2.54	0.44	-0.86	-0.07	-0.51	-0.18
Bulgaria	2007	1.00	0.28	1.24	0.31	-0.24	-0.03	-0.24	-0.12
Burundi	2006	1.35	0.32	1.61	0.35	-0.26	-0.03	-0.20	-0.09
Cameroon	2007	1.76	0.38	2.02	0.40	-0.25	-0.02	-0.14	-0.06
Chad	2002	1.85	0.39	4.68	0.55	-2.83	-0.16	-1.53	-0.42
Congo, Rep.	2005	2.76	0.46	4.16	0.53	-1.40	-0.07	-0.51	-0.15
Costa Rica	2009	3.33	0.49	5.34	0.57	-2.01	-0.08	-0.60	-0.16
Dominican Republic	2010	2.75	0.46	3.22	0.49	-0.48	-0.03	-0.17	-0.06
Fiji	2008	2.17	0.41	2.61	0.45	-0.44	-0.03	-0.20	-0.08
Gabon	2005	2.02	0.40	2.42	0.43	-0.40	-0.03	-0.20	-0.08
Guinea	2007	1.80	0.38	2.41	0.43	-0.60	-0.05	-0.33	-0.12
Honduras	2009	5.21	0.55	6.93	0.60	-1.73	-0.04	-0.33	-0.08
Latvia	2009	1.42	0.34	1.80	0.38	-0.38	-0.04	-0.27	-0.11
Lesotho	2002	3.87	0.51	5.69	0.57	-1.82	-0.06	-0.47	-0.12
Liberia	2007	1.69	0.37	12.05	0.71	-10.36	-0.34	-6.12	-0.93
Macedonia, FYR	2010	2.26	0.43	2.58	0.45	-0.32	-0.02	-0.14	-0.05

Source: Authors' estimates. Absolute and relative differences are reported as negative values, i.e. they reflect the degree of potential understatement in income distribution data that does not adjust for illicit incomes.

**Table 5: Adjustments for IFF, attributing all to top 1%, Gini**

	Original survey	With adjustment	Absolute difference	Relative difference
Full sample				
Mean	0.41	0.49	-0.08	-20%
Median	0.41	0.49	-0.06	-15%
Max	0.64	0.78	-0.02	-7%
Min	0.24	0.26	-0.41	-112%
Obs	252	252	252	252
Restricted Sample				
Mean	0.40	0.49	-0.08	-22%
Median	0.39	0.47	-0.07	-17%
Max	0.61	0.78	-0.03	-8%
Min	0.26	0.31	-0.41	-112%
Obs	61	61	61	61

## 4. CONCLUSIONS

There is growing interest in extending income distribution data, typically based on household surveys, to allow for taxable income declarations of the highest earners. No attempt has been made thus far in allowing for undeclared taxable income, or more broadly for adjusting income distribution data to allow for illicit financial flows. Making such an adjustment, even

for countries with relatively robust survey and tax data, requires a number of contentious assumptions – though arguably less heroic than adjustment for top income – because tax data are lacking for many developing countries. The purpose is thus, as with top income adjustment, intended as illustrative rather than exacting. In short, it is possible to use existing illicit flow estimates in combination with survey distribution data, to consider the potential implications for - here national - income inequality across a wide range of countries.

There are at least three major issues to be considered for any future work. First, what IFF estimates are appropriate to use, and what proportion (e.g. 50% as here, or the entire estimate?). Second, to what part of the income distribution (e.g. top 10% or top 1%) should the adjustment be made? And third, what inequality measure/s are most appropriate to evaluate the adjustment? Our findings here are consistent in the central point. We use the most common IFF estimates but discount by 50%, consider both the Palma ratio and Gini inequality measures, and explore allocating illicit income to the top 10% and the top 1%. In every case, the adjustment to inequality is at least of a level with that found when adjusting for top incomes using tax data. The ‘uncounted’ inequality due to illicit financial flows is likely in many cases to be material, in an accounting sense, in relation to our understanding of national income distributions. Our central conclusion is therefore that there is an avenue of research, not least on the three questions above, in order to extend estimates of national income distributions in light of IFF. Finally, these suggestive findings point to the value of greater financial transparency in a number of areas: from continuing international cooperation by tax authorities with the World Top Incomes Tax Database to improve coverage (both geographic and across time), to better data to estimate (and indeed to curtail) IFF - redoubled international commitment to public registers of beneficial ownership, perhaps building towards the global financial registry that Zucman (2015) and Piketty (2014) propose, and a step change in the collection and open publication of bilateral data on the holdings of

international asset stocks that would underpin much closer estimates of undeclared overseas income streams. Finally, work on methodologies and estimates will be required for the UN Sustainable Development not only to generate a target but to track it.

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## ANNEX

Table A1: Estimates of Palma Ratio and Gini with and without adjustment for Illicit Financial Flows (full sample)

Country	Year	Original survey		With adjustment		Absolute difference		Relative difference	
		Palma	Gini	Palma	Gini	Palma	Gini	Palma	Gini
Albania	2005	1.301	0.162	1.333	0.164	-0.032	-0.002	-0.024	-0.011
Albania	2008	1.436	0.167	1.476	0.169	-0.040	-0.002	-0.028	-0.013
Bangladesh	2005	1.348	0.162	1.382	0.164	-0.034	-0.002	-0.025	-0.012
Bangladesh	2010	1.272	0.156	1.347	0.161	-0.075	-0.005	-0.059	-0.029
Belarus	2002	1.108	0.147	1.725	0.182	-0.616	-0.036	-0.556	-0.242
Belarus	2004	0.908	0.129	1.538	0.170	-0.630	-0.041	-0.694	-0.321
Belarus	2005	0.986	0.137	1.551	0.172	-0.565	-0.035	-0.573	-0.257
Belarus	2006	1.025	0.141	1.710	0.181	-0.685	-0.041	-0.668	-0.289
Belarus	2007	1.041	0.141	1.958	0.193	-0.917	-0.052	-0.881	-0.371
Belarus	2008	0.955	0.133	2.081	0.198	-1.126	-0.065	-1.180	-0.488
Belarus	2009	0.990	0.136	1.788	0.184	-0.798	-0.049	-0.806	-0.358
Belarus	2010	0.982	0.136	1.653	0.177	-0.671	-0.041	-0.683	-0.305
Belarus	2011	0.918	0.130	2.116	0.200	-1.198	-0.070	-1.305	-0.540
Benin	2003	1.752	0.188	1.808	0.190	-0.056	-0.003	-0.032	-0.014
Bhutan	2007	1.684	0.186	2.541	0.220	-0.856	-0.034	-0.508	-0.184
Bolivia	2002	6.294	0.290	7.153	0.299	-0.859	-0.010	-0.137	-0.033
Bolivia	2005	5.328	0.280	5.661	0.285	-0.333	-0.005	-0.062	-0.016
Bolivia	2006	4.882	0.273	4.964	0.274	-0.082	-0.001	-0.017	-0.005
Bolivia	2007	4.997	0.277	5.073	0.278	-0.076	-0.001	-0.015	-0.004
Bosnia and Herzegovina	2007	1.517	0.178	1.532	0.178	-0.014	-0.001	-0.009	-0.004
Brazil	2002	5.737	0.287	5.893	0.289	-0.157	-0.002	-0.027	-0.007
Brazil	2003	5.587	0.284	5.782	0.287	-0.194	-0.003	-0.035	-0.009
Brazil	2004	5.151	0.278	5.363	0.281	-0.212	-0.003	-0.041	-0.011
Brazil	2005	4.986	0.277	5.152	0.279	-0.166	-0.003	-0.033	-0.009
Brazil	2007	4.617	0.270	4.639	0.270	-0.021	0.000	-0.005	-0.001
Brazil	2008	4.386	0.266	4.511	0.269	-0.126	-0.002	-0.029	-0.008
Brazil	2009	4.302	0.264	4.425	0.266	-0.123	-0.002	-0.029	-0.009
Bulgaria	2003	1.071	0.143	1.437	0.166	-0.366	-0.023	-0.342	-0.162
Bulgaria	2007	0.997	0.138	1.241	0.154	-0.244	-0.016	-0.245	-0.116
Burkina Faso	2003	1.844	0.192	1.933	0.196	-0.089	-0.004	-0.049	-0.021
Burkina Faso	2009	1.859	0.193	2.078	0.202	-0.219	-0.009	-0.118	-0.049
Burundi	2006	1.347	0.162	1.610	0.177	-0.263	-0.015	-0.195	-0.092

Cambodia	2004	2.062	0.202	2.336	0.213	-0.274	-0.011	-0.133	-0.054
Cambodia	2007	2.332	0.214	2.355	0.215	-0.022	-0.001	-0.010	-0.004
Cambodia	2008	1.691	0.184	1.708	0.184	-0.016	-0.001	-0.010	-0.004
Cambodia	2009	1.543	0.175	1.546	0.175	-0.003	0.000	-0.002	-0.001
Cameroon	2007	1.763	0.190	2.016	0.201	-0.253	-0.011	-0.143	-0.057
Central African Republic	2003	2.264	0.213	2.306	0.214	-0.042	-0.001	-0.019	-0.007
Chad	2002	1.848	0.194	4.681	0.276	-2.832	-0.082	-1.533	-0.422
Chile	2003	4.052	0.263	4.113	0.265	-0.061	-0.001	-0.015	-0.005
Chile	2006	3.478	0.251	3.552	0.252	-0.074	-0.002	-0.021	-0.007
Colombia	2004	5.295	0.281	5.411	0.283	-0.116	-0.002	-0.022	-0.006
Colombia	2008	4.999	0.276	5.004	0.277	-0.005	0.000	-0.001	0.000
Congo, Rep.	2005	2.765	0.230	4.163	0.265	-1.399	-0.035	-0.506	-0.151
Costa Rica	2002	3.359	0.246	4.143	0.263	-0.784	-0.017	-0.233	-0.069
Costa Rica	2003	3.195	0.242	4.318	0.266	-1.123	-0.024	-0.351	-0.100
Costa Rica	2004	2.985	0.237	4.389	0.268	-1.404	-0.031	-0.470	-0.133
Costa Rica	2005	2.773	0.232	4.201	0.266	-1.428	-0.034	-0.515	-0.147
Costa Rica	2006	3.040	0.239	4.488	0.271	-1.448	-0.032	-0.476	-0.135
Costa Rica	2007	3.039	0.239	4.311	0.268	-1.271	-0.029	-0.418	-0.123
Costa Rica	2008	2.979	0.237	4.389	0.270	-1.410	-0.032	-0.473	-0.137
Costa Rica	2009	3.333	0.247	5.344	0.286	-2.011	-0.039	-0.603	-0.159
Croatia	2004	1.053	0.142	1.163	0.149	-0.110	-0.007	-0.105	-0.051
Croatia	2008	1.356	0.164	1.506	0.172	-0.149	-0.008	-0.110	-0.051
Dominican Republic	2002	3.256	0.243	3.377	0.246	-0.121	-0.003	-0.037	-0.012
Dominican Republic	2003	3.561	0.252	4.020	0.262	-0.460	-0.010	-0.129	-0.040
Dominican Republic	2004	3.553	0.251	3.779	0.256	-0.226	-0.005	-0.064	-0.020
Dominican Republic	2005	3.405	0.248	3.471	0.249	-0.067	-0.002	-0.020	-0.006
Dominican Republic	2006	3.532	0.251	3.661	0.254	-0.129	-0.003	-0.037	-0.012
Dominican Republic	2007	2.984	0.236	3.025	0.237	-0.041	-0.001	-0.014	-0.005
Dominican Republic	2008	3.019	0.237	3.133	0.240	-0.114	-0.003	-0.038	-0.013
Dominican Republic	2009	2.998	0.237	3.418	0.248	-0.420	-0.011	-0.140	-0.046
Dominican Republic	2010	2.746	0.230	3.224	0.243	-0.478	-0.013	-0.174	-0.057
Ecuador	2005	4.099	0.262	4.309	0.266	-0.210	-0.004	-0.051	-0.015
Ecuador	2008	3.273	0.245	3.850	0.259	-0.576	-0.013	-0.176	-0.054
Ecuador	2009	3.102	0.240	3.117	0.240	-0.015	0.000	-0.005	-0.002
El Salvador	2002	4.033	0.258	4.426	0.265	-0.393	-0.007	-0.097	-0.027
El Salvador	2003	3.455	0.247	3.653	0.251	-0.198	-0.004	-0.057	-0.017

El Salvador	2004	3.076	0.239	3.252	0.243	-0.177	-0.004	-0.057	-0.018
El Salvador	2005	3.354	0.245	3.637	0.251	-0.283	-0.006	-0.084	-0.026
El Salvador	2006	2.597	0.224	2.790	0.230	-0.193	-0.006	-0.074	-0.026
El Salvador	2007	2.702	0.228	2.906	0.234	-0.204	-0.006	-0.075	-0.026
El Salvador	2008	2.661	0.227	2.828	0.232	-0.166	-0.005	-0.062	-0.021
El Salvador	2009	2.951	0.235	3.165	0.241	-0.215	-0.006	-0.073	-0.024
Fiji	2002	2.735	0.229	3.418	0.246	-0.683	-0.018	-0.250	-0.077
Fiji	2008	2.170	0.207	2.608	0.223	-0.438	-0.016	-0.202	-0.077
Gabon	2005	2.024	0.201	2.424	0.217	-0.400	-0.015	-0.198	-0.076
Georgia	2002	1.902	0.197	2.154	0.207	-0.253	-0.010	-0.133	-0.051
Georgia	2003	1.906	0.197	2.280	0.211	-0.374	-0.014	-0.196	-0.072
Georgia	2005	1.979	0.200	2.262	0.211	-0.283	-0.011	-0.143	-0.053
Georgia	2006	1.988	0.200	2.355	0.214	-0.367	-0.014	-0.185	-0.069
Georgia	2007	1.806	0.192	1.991	0.200	-0.185	-0.008	-0.102	-0.040
Georgia	2008	2.011	0.202	2.321	0.213	-0.310	-0.011	-0.154	-0.057
Georgia	2009	2.052	0.203	2.255	0.211	-0.203	-0.007	-0.099	-0.037
Georgia	2010	2.094	0.206	2.224	0.210	-0.130	-0.005	-0.062	-0.023
Guinea	2003	1.899	0.195	2.272	0.210	-0.373	-0.015	-0.196	-0.078
Guinea	2007	1.805	0.192	2.408	0.216	-0.603	-0.024	-0.334	-0.123
Honduras	2002	6.005	0.285	8.778	0.313	-2.773	-0.028	-0.462	-0.099
Honduras	2003	5.678	0.284	8.186	0.312	-2.508	-0.028	-0.442	-0.098
Honduras	2004	5.582	0.283	8.115	0.311	-2.533	-0.028	-0.454	-0.101
Honduras	2005	6.139	0.289	8.847	0.316	-2.708	-0.027	-0.441	-0.095
Honduras	2006	5.354	0.279	7.784	0.307	-2.430	-0.029	-0.454	-0.103
Honduras	2007	4.651	0.272	6.599	0.300	-1.948	-0.028	-0.419	-0.102
Honduras	2008	6.919	0.295	9.246	0.317	-2.328	-0.021	-0.336	-0.072
Honduras	2009	5.209	0.276	6.934	0.298	-1.725	-0.021	-0.331	-0.077
Hungary	2004	1.121	0.147	1.202	0.152	-0.081	-0.005	-0.072	-0.035
Hungary	2007	1.197	0.152	1.208	0.153	-0.012	-0.001	-0.010	-0.005
India	2004	1.355	0.162	1.451	0.167	-0.097	-0.006	-0.071	-0.035
India	2009	1.392	0.164	1.488	0.170	-0.096	-0.006	-0.069	-0.034
Indonesia	2002	1.135	0.145	1.353	0.159	-0.218	-0.014	-0.192	-0.099
Indonesia	2005	1.400	0.165	1.566	0.174	-0.166	-0.009	-0.119	-0.057
Indonesia	2008	1.393	0.166	1.629	0.179	-0.236	-0.013	-0.169	-0.077
Indonesia	2010	1.486	0.174	1.511	0.175	-0.025	-0.001	-0.017	-0.007
Jamaica	2002	14.669	0.318	15.340	0.321	-0.672	-0.003	-0.046	-0.009

Jamaica	2002	14.669	0.235	3.086	0.239	-0.169	-0.005	-0.012	-0.020
Jamaica	2004	2.503	0.221	2.687	0.227	-0.183	-0.006	-0.073	-0.027
Jordan	2002	1.768	0.189	1.814	0.191	-0.046	-0.002	-0.026	-0.011
Jordan	2006	1.676	0.183	1.720	0.185	-0.044	-0.002	-0.026	-0.012
Kazakhstan	2003	1.344	0.166	1.476	0.173	-0.132	-0.007	-0.098	-0.043
Kazakhstan	2004	1.247	0.158	1.349	0.164	-0.102	-0.006	-0.082	-0.038
Kazakhstan	2006	1.176	0.150	1.377	0.163	-0.201	-0.012	-0.171	-0.083
Kazakhstan	2007	1.178	0.151	1.333	0.161	-0.155	-0.010	-0.132	-0.064
Kazakhstan	2008	1.092	0.143	1.329	0.159	-0.237	-0.015	-0.217	-0.108
Kazakhstan	2009	1.066	0.142	1.101	0.145	-0.035	-0.002	-0.033	-0.017
Kenya	2005	2.810	0.230	2.870	0.232	-0.060	-0.002	-0.021	-0.008
Kyrgyz Republic	2002	1.209	0.155	1.254	0.158	-0.046	-0.003	-0.038	-0.018
Kyrgyz Republic	2004	1.421	0.170	1.449	0.172	-0.028	-0.001	-0.020	-0.009
Kyrgyz Republic	2007	1.352	0.163	1.626	0.179	-0.275	-0.015	-0.203	-0.094
Kyrgyz Republic	2009	1.525	0.177	1.592	0.180	-0.066	-0.003	-0.044	-0.018
Kyrgyz Republic	2010	1.555	0.178	1.589	0.180	-0.034	-0.002	-0.022	-0.009
Kyrgyz Republic	2011	1.327	0.163	1.494	0.172	-0.168	-0.009	-0.126	-0.057
Latvia	2007	1.533	0.177	2.040	0.200	-0.507	-0.023	-0.331	-0.130
Latvia	2008	1.561	0.179	2.035	0.200	-0.474	-0.021	-0.304	-0.119
Latvia	2009	1.417	0.170	1.795	0.189	-0.378	-0.019	-0.267	-0.109
Lesotho	2002	3.870	0.256	5.686	0.286	-1.816	-0.030	-0.469	-0.119
Liberia	2007	1.692	0.185	12.055	0.357	-10.363	-0.172	-6.125	-0.928
Macedonia, FYR	2002	1.745	0.189	1.904	0.196	-0.160	-0.007	-0.092	-0.036
Macedonia, FYR	2003	1.766	0.190	1.971	0.199	-0.205	-0.009	-0.116	-0.045
Macedonia, FYR	2004	1.748	0.189	1.990	0.200	-0.243	-0.010	-0.139	-0.054
Macedonia, FYR	2005	1.771	0.192	2.078	0.204	-0.308	-0.012	-0.174	-0.064
Macedonia, FYR	2006	2.173	0.209	2.371	0.216	-0.198	-0.007	-0.091	-0.033
Macedonia, FYR	2008	2.339	0.215	2.834	0.231	-0.495	-0.016	-0.212	-0.074
Macedonia, FYR	2009	2.216	0.211	2.507	0.221	-0.291	-0.010	-0.131	-0.046
Macedonia, FYR	2010	2.261	0.213	2.579	0.224	-0.318	-0.010	-0.140	-0.048
Madagascar	2005	2.642	0.223	2.925	0.232	-0.283	-0.010	-0.107	-0.043
Madagascar	2010	2.329	0.214	2.381	0.216	-0.052	-0.002	-0.022	-0.008
Malawi	2004	1.790	0.189	1.984	0.198	-0.194	-0.009	-0.108	-0.046
Malawi	2010	2.301	0.213	2.679	0.226	-0.378	-0.013	-0.165	-0.060
Malaysia	2004	1.666	0.186	2.952	0.234	-1.286	-0.048	-0.772	-0.259
Malaysia	2007	2.592	0.225	4.208	0.265	-1.616	-0.040	-0.623	-0.179

Malaysia	2009	2.627	0.226	4.036	0.261	-1.410	-0.035	-0.537	-0.156
Maldives	2004	1.612	0.183	2.003	0.200	-0.391	-0.017	-0.243	-0.093
Mali	2006	1.777	0.190	1.940	0.197	-0.163	-0.007	-0.092	-0.037
Mali	2010	1.294	0.162	1.720	0.185	-0.426	-0.023	-0.329	-0.139
Mexico	2002	3.533	0.251	3.824	0.257	-0.291	-0.006	-0.082	-0.026
Mexico	2002	3.533	0.247	3.411	0.254	-0.266	-0.007	-0.075	-0.030
Mexico	2004	3.361	0.247	3.674	0.255	-0.313	-0.008	-0.093	-0.032
Mexico	2004	3.361	0.242	2.873	0.249	-0.273	-0.008	-0.081	-0.033
Mexico	2005	3.417	0.244	3.759	0.254	-0.342	-0.010	-0.100	-0.040
Mexico	2006	3.161	0.232	3.477	0.240	-0.316	-0.009	-0.100	-0.038
Mexico	2006	3.161	0.240	3.171	0.247	-0.295	-0.007	-0.093	-0.028
Mexico	2008	3.290	0.223	3.705	0.231	-0.416	-0.008	-0.126	-0.037
Mexico	2008	3.290	0.233	3.264	0.241	-0.373	-0.008	-0.113	-0.035
Mexico	2010	2.812	0.233	3.130	0.243	-0.318	-0.010	-0.113	-0.044
Mexico	2010	2.812	0.228	3.041	0.237	-0.307	-0.009	-0.109	-0.039
Montenegro	2005	1.117	0.148	2.396	0.213	-1.279	-0.065	-1.146	-0.441
Montenegro	2006	1.064	0.144	1.545	0.173	-0.482	-0.029	-0.453	-0.201
Montenegro	2007	1.145	0.151	1.710	0.182	-0.565	-0.032	-0.493	-0.209
Montenegro	2008	1.115	0.147	1.388	0.164	-0.273	-0.017	-0.245	-0.115
Montenegro	2009	1.132	0.148	1.330	0.160	-0.198	-0.012	-0.175	-0.083
Montenegro	2010	1.020	0.140	1.208	0.152	-0.188	-0.012	-0.184	-0.088
Mozambique	2002	2.679	0.226	2.895	0.233	-0.215	-0.007	-0.080	-0.030
Namibia	2003	6.693	0.304	6.843	0.306	-0.149	-0.002	-0.022	-0.006
Nepal	2003	2.272	0.211	2.463	0.218	-0.191	-0.007	-0.084	-0.034
Nepal	2010	1.298	0.160	1.697	0.182	-0.399	-0.022	-0.307	-0.136
Nicaragua	2005	3.655	0.252	4.734	0.274	-1.079	-0.022	-0.295	-0.086
Nicaragua	2005	3.655	0.197	2.670	0.225	-0.753	-0.028	-0.206	-0.141
Nigeria	2009	3.015	0.237	3.884	0.258	-0.869	-0.021	-0.288	-0.089
Nigeria	2011	1.840	0.194	2.006	0.201	-0.165	-0.007	-0.090	-0.035
Pakistan	2005	1.321	0.158	1.327	0.159	-0.005	0.000	-0.004	-0.002
Panama	2003	4.835	0.273	6.338	0.294	-1.502	-0.021	-0.311	-0.076
Panama	2004	4.494	0.267	5.966	0.289	-1.472	-0.022	-0.328	-0.082
Panama	2005	4.199	0.263	6.187	0.293	-1.988	-0.030	-0.473	-0.115
Panama	2006	4.465	0.267	6.843	0.300	-2.378	-0.033	-0.533	-0.124
Panama	2009	3.615	0.252	5.722	0.290	-2.107	-0.038	-0.583	-0.149
Panama	2010	3.627	0.252	5.197	0.281	-1.570	-0.029	-0.433	-0.116



Paraguay	2002	4.886	0.273	6.279	0.293	-1.393	-0.020	-0.285	-0.072
Paraguay	2003	4.751	0.274	6.916	0.304	-2.165	-0.030	-0.456	-0.110
Paraguay	2004	3.970	0.260	5.809	0.291	-1.839	-0.032	-0.463	-0.121
Paraguay	2005	3.658	0.253	5.787	0.291	-2.130	-0.038	-0.582	-0.149
Paraguay	2006	4.255	0.264	6.594	0.300	-2.340	-0.036	-0.550	-0.136
Paraguay	2007	3.816	0.256	5.793	0.291	-1.976	-0.035	-0.518	-0.135
Paraguay	2008	3.574	0.251	5.533	0.287	-1.959	-0.036	-0.548	-0.145
Paraguay	2009	3.441	0.247	5.480	0.285	-2.039	-0.038	-0.593	-0.154
Paraguay	2010	3.730	0.253	6.150	0.294	-2.419	-0.042	-0.649	-0.164
Peru	2006	3.416	0.247	3.447	0.248	-0.031	-0.001	-0.009	-0.003
Peru	2007	3.609	0.251	3.619	0.251	-0.010	0.000	-0.003	-0.001
Peru	2008	3.086	0.238	3.093	0.238	-0.007	0.000	-0.002	-0.001
Peru	2009	3.099	0.239	3.131	0.239	-0.032	-0.001	-0.010	-0.003
Philippines	2003	2.370	0.217	2.778	0.230	-0.408	-0.013	-0.172	-0.060
Philippines	2006	2.309	0.215	2.682	0.227	-0.373	-0.012	-0.161	-0.057
Philippines	2009	2.183	0.210	2.338	0.215	-0.155	-0.006	-0.071	-0.027
Poland	2002	1.373	0.167	1.390	0.167	-0.018	-0.001	-0.013	-0.006
Poland	2005	1.429	0.170	1.439	0.171	-0.010	-0.001	-0.007	-0.003
Poland	2007	1.373	0.166	1.407	0.168	-0.034	-0.002	-0.025	-0.011
Poland	2008	1.389	0.167	1.492	0.173	-0.104	-0.006	-0.075	-0.034
Poland	2009	1.378	0.166	1.482	0.172	-0.104	-0.006	-0.076	-0.034
Poland	2010	1.352	0.165	1.454	0.171	-0.101	-0.006	-0.075	-0.034
Poland	2011	1.282	0.160	1.363	0.165	-0.081	-0.005	-0.063	-0.029
Romania	2002	1.186	0.154	1.245	0.157	-0.059	-0.004	-0.050	-0.023
Romania	2003	1.165	0.152	1.180	0.153	-0.016	-0.001	-0.014	-0.007
Romania	2007	1.245	0.157	1.274	0.159	-0.029	-0.002	-0.024	-0.011
Romania	2008	1.171	0.152	1.211	0.155	-0.041	-0.003	-0.035	-0.016
Romania	2010	0.802	0.119	0.805	0.119	-0.003	0.000	-0.004	-0.002
Russian Federation	2002	1.479	0.175	1.848	0.192	-0.369	-0.017	-0.250	-0.099
Russian Federation	2003	1.614	0.182	2.103	0.204	-0.489	-0.021	-0.303	-0.117
Russian Federation	2004	1.598	0.182	2.014	0.200	-0.417	-0.018	-0.261	-0.101
Russian Federation	2005	1.634	0.184	2.042	0.201	-0.409	-0.018	-0.250	-0.097
Russian Federation	2006	2.094	0.205	2.546	0.221	-0.452	-0.016	-0.216	-0.078
Russian Federation	2007	2.277	0.212	2.722	0.227	-0.445	-0.015	-0.196	-0.071
Russian Federation	2008	2.110	0.205	2.545	0.221	-0.435	-0.016	-0.206	-0.077
Russian Federation	2009	1.885	0.195	2.502	0.219	-0.618	-0.024	-0.328	-0.123

Rwanda	2005	3.621	0.253	3.754	0.257	-0.133	-0.003	-0.037	-0.013
Rwanda	2010	3.216	0.243	3.598	0.253	-0.382	-0.010	-0.119	-0.042
Senegal	2005	1.791	0.191	1.792	0.191	-0.001	0.000	-0.001	0.000
Serbia	2002	1.285	0.159	2.219	0.206	-0.934	-0.047	-0.727	-0.292
Serbia	2003	1.290	0.160	2.343	0.211	-1.053	-0.051	-0.816	-0.317
Serbia	2004	1.295	0.161	2.529	0.219	-1.235	-0.057	-0.953	-0.355
Serbia	2005	1.321	0.163	2.114	0.202	-0.793	-0.039	-0.600	-0.238
Serbia	2006	1.087	0.145	1.635	0.178	-0.548	-0.032	-0.504	-0.223
Serbia	2007	1.077	0.144	1.404	0.164	-0.327	-0.020	-0.303	-0.141
Serbia	2008	1.012	0.138	1.025	0.139	-0.014	-0.001	-0.014	-0.007
Serbia	2009	0.984	0.137	1.401	0.163	-0.416	-0.027	-0.423	-0.197
Serbia	2010	1.081	0.145	1.307	0.160	-0.226	-0.014	-0.209	-0.098
Sierra Leone	2003	2.133	0.207	2.344	0.215	-0.211	-0.008	-0.099	-0.038
Sierra Leone	2011	1.484	0.172	1.728	0.185	-0.244	-0.013	-0.164	-0.073
South Africa	2008	7.052	0.306	7.907	0.314	-0.855	-0.009	-0.121	-0.028
Sri Lanka	2006	1.905	0.195	1.921	0.196	-0.016	-0.001	-0.008	-0.004
Sudan	2009	1.447	0.173	1.745	0.187	-0.297	-0.014	-0.205	-0.083
Swaziland	2009	3.513	0.250	3.600	0.252	-0.087	-0.002	-0.025	-0.008
Syrian Arab Republic	2004	1.514	0.174	1.954	0.196	-0.440	-0.021	-0.291	-0.123
Tajikistan	2003	1.272	0.160	1.543	0.175	-0.271	-0.015	-0.213	-0.094
Tajikistan	2004	1.344	0.164	1.628	0.180	-0.284	-0.015	-0.211	-0.093
Tajikistan	2007	1.259	0.159	1.540	0.175	-0.281	-0.016	-0.224	-0.099
Tajikistan	2009	1.155	0.151	2.012	0.197	-0.857	-0.046	-0.742	-0.302
Tunisia	2005	2.021	0.202	2.025	0.202	-0.004	0.000	-0.002	-0.001
Turkey	2002	2.163	0.207	2.176	0.208	-0.014	-0.001	-0.006	-0.002
Turkey	2006	1.902	0.197	1.904	0.197	-0.002	0.000	-0.001	0.000
Uganda	2002	2.513	0.220	2.583	0.223	-0.070	-0.002	-0.028	-0.011
Uganda	2005	2.148	0.207	2.472	0.219	-0.323	-0.012	-0.151	-0.057
Uganda	2009	2.332	0.214	2.756	0.228	-0.424	-0.015	-0.182	-0.068
Ukraine	2002	1.016	0.139	1.090	0.144	-0.074	-0.005	-0.073	-0.037
Ukraine	2003	1.012	0.137	1.072	0.142	-0.060	-0.004	-0.059	-0.030
Ukraine	2007	1.091	0.145	1.104	0.146	-0.013	-0.001	-0.012	-0.006
Uruguay	2006	2.755	0.230	2.797	0.231	-0.042	-0.001	-0.015	-0.005
Uruguay	2007	2.819	0.232	3.012	0.237	-0.192	-0.005	-0.068	-0.023
Uruguay	2010	2.470	0.221	2.719	0.229	-0.249	-0.008	-0.101	-0.035
Vietnam	2002	1.654	0.183	1.764	0.188	-0.109	-0.005	-0.066	-0.029

Vietnam	2004	1.585	0.180	1.662	0.184	-0.077	-0.004	-0.049	-0.021
Vietnam	2008	1.489	0.174	1.538	0.176	-0.048	-0.003	-0.032	-0.014
Zambia	2010	4.768	0.276	4.769	0.276	-0.002	0.000	0.000	0.000

Source: Authors' estimates.