

Measuring Illicit Financial Flows: New Data and Methods

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Abstract

A major source of illicit financial flows (IFFs) out of developing countries accrues from the under-invoicing of commodity exports. This erodes the tax base of resource-rich developing countries, and hence their capacity to mobilise domestic resources for development. The Sustainable Development Goals (SDGs), adopted in 2015, specifically call on states to reduce IFFs and enhance domestic resource mobilisation. Yet a weak capacity to assess the magnitude and drivers of the phenomenon has limited the ability of developing countries to effectively curb IFFs. This has been compounded by a lack of consensus over IFF definitions together with poor data and weak methods. Drawing on six years of interdisciplinary research into commodity trade-related IFFs, this chapter examines novel data sources and recent methodological advances that researchers and regulators can draw upon to better capture and eventually reduce IFFs. It situates such advances within the fast-expanding literature on domestic resource mobilisation, taxation and IFFs, focusing on three major channels; namely, trade mispricing, abusive transfer pricing and tax evasion through wealth offshoring. The chapter concludes by discussing the scope for improved data collection and evidence generation. This, together with global taxation reform, can greatly contribute to effectively enhancing domestic resource mobilisation in developing countries.

1 Introduction

Trillions of dollars are urgently needed to preserve global public goods and address the global challenges of our times, not least in relation to climate change and nature conservation. Official development assistance (ODA) and climate finance remain marginal, covering only a tiny fraction of funding needs. Developing countries must thus significantly enhance domestic revenue mobilisation whereby tax-to-GDP ratios typically range between 10 and 15 per cent, which is significantly lower than in advanced economies (30 per cent and above). An additional challenge is that public finance has come under

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renewed strain across the global South following the COVID-19 pandemic and the disruption of global food and energy markets following the escalation of the armed conflict between the Russian Federation and Ukraine.

In this context, illicit financial flows (IFFs) have been highlighted as a significant challenge hampering domestic revenue mobilisation in lower- and middle-income countries (LMICs). A rapidly expanding literature has sought to better understand and measure IFFs. This chapter focuses on the three channels that stand out as major IFF conduits: trade mispricing, abusive transfer pricing (between related business entities) and tax evasion and avoidance involving tax havens and offshore financial centres that attract wealthy individuals and multinational firms (Alstadsæter, Johannesen and Zucman, 2019; Andersen et al., 2017; Fisman, Moustakerski and Wei, 2008; Fisman and Wei, 2004; Johannesen, 2014; Ndikumana, Boyce and Ndiaye, 2015; Zucman, 2014).

The term IFFs refers to cross-border financial flows whose origin, transfer, and/or end use violate the letter—and many would argue also the spirit—of the law. They may include firms shifting taxable earnings from higher-tax to low-tax jurisdictions, or individuals hiding wealth in offshore financial centres. Regarding the latter, estimates based on macroeconomic statistics made available by the mid-2010s—including bilateral banking data released by the Bank for International Settlements (BIS)—hinted at the equivalent of 10 per cent of the world's GDP being held by individuals in tax havens (Alstadsæter, Johannesen and Zucman, 2018). The introduction of the automatic exchange of bank information by the mid-2010s has been found to have significantly contributed to reducing offshore tax evasion. While overall financial wealth held offshore remained relatively stable between 2013 and 2022, varying between 10 and 14 per cent of the world's GDP (about USD 12 trillion was reported in 2021), the share of undeclared wealth was reduced significantly, from some 90 per cent of the wealth held offshore prior to the 2010s to slightly above a quarter of the total amount by 2022 (following a 'central scenario'; see EU Tax Observatory, 2023, 27–30).

Trade-related IFFs have been singled out as a major source of tax base erosion in commodity-dependent countries, weakening their ability to mobilise domestic resources for development (Carbonnier and Mehrotra, 2018; OECD, 2014; Reuter, 2012). Rigorous estimates of the magnitude of trade-related IFFs have been constrained by a lack of reliable, disaggregated data and by methodological weaknesses. For instance, estimating trade mispricing through asymmetries in aggregate mirror-trade statistics has long been standard practice despite serious flaws highlighted in the literature (Carbonnier and Zweynert de Cadena, 2015). The ensuing guesstimates have been challenged by business

and governmental actors, giving rise to inconclusive debates between policy-makers, civil society and business advocates.

To address such deficiencies, researchers have increasingly drawn on disaggregated, transaction-level customs microdata, as well as on tax records and business registries that provide detailed, sector-specific information on production quantity, quality and market prices for specific goods and commodities (see, e.g., Cristea and Nguyen, 2016; Fuest, Hugger and Neumeier, 2021; Liu, Schmidt-Eisenlohr and Guo, 2020; Vicard, 2015). It has been recognised that better data and stronger methods are needed to elevate policy debates and sharpen advocacy campaigns aimed at improving global tax governance and enhancing domestic resource mobilisation (GFI, 2017; UN, 2020).

Tax differentials have been highlighted as a driver of abnormal trade pricing in that a one-percentage-point increase in this tax rate differential leads to a 0.27 per cent to 0.32 per cent increase in abnormal pricing in the case of commodity imports in Switzerland (Carbonnier and Marur, 2024). Researchers using new databases covering the activities of multinational firms have found that a 1 percentage point increase in the average corporate tax rate (CTR) applied to subsidiaries abroad is associated with an average drop in reported profits of 0.8–1.0 per cent (Heckemeyer and Overesch, 2017). Such findings hint at profit shifting, reinforcing the need to identify and close loopholes in the global tax system. Specific anti-IFF measures have proved effective in reducing tax evasion in the case of high-income countries (Pomeranz, 2015; Luttmer and Singhal, 2014; Keen and Slemrod, 2016). Additional evidence is required on what works in LMICs.

The EU Tax Observatory estimates, in its 2024 report, that about a trillion US dollars of corporate profits were shifted to tax havens in 2022, the equivalent of a third of total corporate profits earned by multinational companies abroad. The revenue losses for states amount to some 10 per cent of global corporate tax revenues (EU Tax Observatory, 2023, 37–42). Contrary to what happened when the automatic exchange of banking information on undeclared wealth offshore was introduced, it seems that the base erosion and profit shifting (BEPS) process launched in 2015 has had no significant discernible impact globally to date. This confirms that corporate profit shifting remains a major issue for domestic revenue mobilisation and deserves greater scrutiny.

Drawing on economics, law and political science, this chapter focuses first on new data sources and methods to measure IFFs. It then turns to the implications for policymakers and regulators in developing countries as well as in major global trading and financial hubs, identifying research and data gaps in the rigorous capture of IFF volumes. The chapter discusses selected policy and regulatory measures to reduce such flows, and draws on contributions from a

North–South interdisciplinary research consortium that has researched commodity trade–related IFFs over the past six years (see chapter 1, this volume). We situate these contributions in the broader literature on trade and transfer mispricing by corporate actors, as well as on tax evasion and capital flight.

2 Evolving IFF Definitions

SDG Target 16.4.1 sets the objective of significantly reducing IFFs by 2030. The aim of establishing indicators to track progress has spurred a vivid debate on the definition and measurement of IFFs. Conceptually, the IFF literature distinguishes between narrowly defined illegal activities commonly agreed to constitute IFFs and legal but normatively reprehensible activities. This can, for example, be illustrated by how we differentiate between illegal tax evasion and legal, but socially harmful, tax avoidance. Recent regulatory advances related to transfer-pricing rules and general anti-avoidance regulations are blurring these boundaries, with implications for both the measurement of IFFs and effective policy approaches. Properly defining IFFs has a bearing on accurately capturing the magnitude of such flows and devising effective policy and regulatory responses. Table 2.1 lists IFF definitions from a variety of stakeholders in chronologic order. A majority of these definitions refer to IFFs as cross-border flows of funds whose origin, transfer or use violates relevant legislation.

Other organisations and researchers have used similar definitions, converging around the notion of cross-border financial transfers involving illegal activity yet debating the extent to which illicit activities should be included. For example, Forstater (2017) distinguishes between (i) a ‘narrow’ definition, whereby IFFs are directly generated by illegal activities such as money laundering, drug trafficking, bribery, terrorism finance, misreporting of international transactions to evade taxes, and capital flight in contravention of capital controls, and (ii) a wider definition, which is not limited to illegality but includes ‘illicit’ flows that result from legal activities—until successfully challenged by relevant authorities—such as aggressive tax avoidance, abusive transfer pricing and profit shifting or thin capitalisation. Eriksson (2017) adds other points of contention: (i) the precise scope of transfers, considering selected or any assets with a financial value, (ii) assessing the legality of the origin, the international transfer method, or the final use of funds, and (iii) the legal references to domestic or international legal instruments (which may not have been ratified in particular jurisdictions), or additional widely accepted normative principles and standards.

TABLE 2.1 Illicit financial flows as defined by various stakeholders

Source	Definition
OECD (2014, 16)	IFFs include flows 'generated by methods, practices and crimes aiming to transfer financial capital out of a country in contravention of national or international laws'.
High Level Panel on Illicit Financial Flows from Africa (2015, 9)	'Money that is illegally earned, transferred, or utilized. These funds typically originate from three sources: commercial tax evasion, trade misinvoicing, and abusive transfer pricing; criminal activities, including the drug trade, human trafficking, illegal arms dealing, and smuggling of contraband; and bribery and theft by corrupt government officials.'
World Bank (2016, 2)	'Money illegally earned, transferred, or used that crosses borders.'
Global Financial Integrity (GFI, 2017, 1)	'Illegal movements of money or capital from one country to another', or, in other words, funds crossing an international border that are illegally earned, transferred, and/or utilised.
Picciotto (2018, 1), for the Tax Justice Network	'[Components of IFFs] include: the concealment of the proceeds of crime or corruption; tax evasion; tax avoidance and tax planning; hiding wealth from public agencies, business associates, or family members.'
International Monetary Fund (IMF, 2020)	'The movement of money across borders that is illegal in its source, its transfer, or its use.'

SOURCE: THE AUTHORS (SEE TABLE FOR FURTHER INFORMATION)

Musselli and Bürgi Bonanomi (2020) note that the reach of the law is being gradually extended into the area of tax avoidance, blurring the lines that separate it from illegal tax evasion. Two developments are worth highlighting in

this respect: the enactment of specifically targeted anti-avoidance legislation, and the introduction of general anti-abuse rules (GAARS). Several countries have introduced specific legislation to close regulatory loopholes that provide multinational firms with opportunities for regulatory arbitrage, as in the case of abusive transfer pricing, which includes thin capitalisation, interest deductibility and controlled foreign company rules, etc. Going a step further, several advanced economies have enacted or are considering more stringent measures, typically in the form of GAARS to rein in financial transactions designed

TABLE 2.2 Illicit financial flows definitions: Legal implications and measurement challenges

Illustration 1: Is abusive transfer pricing included in IFFS?

Developing countries such as Laos lack appropriate regulatory frameworks to govern the taxation of multinational firms. As a result, abusive transfer pricing does not formally violate the law. Such countries need to adopt and implement up-to-date transfer-pricing methods, interest deductibility and thin capitalisation rules, controlled foreign company rules, and anti-hybrid rules, as well as double taxation agreements, all to address abusive transfer pricing. Yet under a broad definition of IFFS, even if no law is being violated abusive transfer pricing is deemed normatively unacceptable and therefore falls into the category of IFFS (Musselli and Bürgi Bonanomi, 2020).

Illustration 2: How do GAARS influence IFFS?

As more countries regulate tax avoidance, the distinction between tax evasion and aggressive tax avoidance is increasing being blurred. In this context, GAARS are considered provisions of last resort, to be invoked by tax authorities in the case of tax avoidance practices that otherwise comply with the terms and statutory interpretation of ordinary tax law. Arrangements that satisfy the relevant provisions of a given tax code yet simultaneously undermine its intention are potential targets for GAARS, allowing tax administrations to make the case that specific tax avoidance practices must be punished. New evidence indicates that the adoption of GAARS is associated with an economically significant reduction in tax avoidance in OECD countries (Cowx and Kerr, 2023).

SOURCE: THE AUTHORS (SEE TABLE FOR FURTHER INFORMATION)

to avoid tax (Musselli and Bürgi Bonanomi, 2020). Table 2.2 illustrates how evolving legal frameworks influence definitions of IFFs, which in turn influence the type of data and methods required to measure IFFs.

3 New Data and Methods

Different empirical approaches and data sources have been used to estimate the magnitude of IFFs in the form of trade-related flows, profit shifting, and wealth offshoring. The most robust of these methods require accessing both governmental databases that are often not readily available to researchers and detailed transaction- and firm-level data, which is often proprietary and equally difficult to obtain, although access may be secured through ad hoc arrangements involving confidentiality agreement or hefty payments.

3.1 *Trade-Based IFFs*

The term trade-based IFFs refers to misinvoicing that occurs when importers and exporters manipulate shipment values on customs invoices in order to transfer financial capital abroad for private gain or to reduce corporate tax liabilities and customs duties. Abusive transfer pricing occurs when such mispriced transactions are recorded between affiliates of the same multinational group. As highlighted in Table 2.1, the mispricing of international trade transactions has been identified as a prominent channel for IFFs, be it between unrelated or related (arm's-length) firms. Developing countries are especially at risk due to limited administrative and oversight capacities.

There is a whole range of specific challenges related to poor data when measuring trade-based IFFs (Carbonnier and Mehrotra, 2024). The latter requires considering both IFF definitions and assumptions about the true value or fair price for each transaction, with due regard to the quantity and quality of the good and/or service being traded. A limiting factor here is that the heterogeneity of traded goods cannot be fully captured by broad customs classifications, be it those of the Harmonized Commodity Description and Coding System (HS), the North American Industry Classification System (NAICS) or the Standard International Trade Classification (SITC). As a result, generating the relevant data to estimate trade-based IFFs is often an intensive undertaking that combines multidisciplinary insights to capture both the specific features of traded goods, thus ensuing fair price ranges, and whether trading partners are related or unrelated.

Early attempts in this area focused on mirror-trade statistics—that is to say, asymmetries in matched, partner trade statistics, or price anomalies in transaction-level data. Bhagwati (1964; 1967) and Bhagwati, Krueger and Wibulswasdi (1974) provided the first analysis, based on partner-country trade. This methodology is based on the principle of double counting in international trade, whereby the exporting country's statistics are compared to the importing partner's corresponding customs data—hence, mirror statistics. Economists have assumed that advanced countries' trade statistics are reliable and that any unexplained asymmetries are an indication of developing countries' statistical weaknesses or of trade-based IFFs. Estimates based on mirror trade have been dismissed as inaccurate, and it has been argued that they provide bloated IFF data given that they do not account for multiple legitimate drivers of asymmetries, such as *entrepôt* trade, shipping costs, etc. (De Wulf, 1981; Reuter, 2012; Hong, Pak and Pak, 2014; Nitsch, 2016; Hong and Pak, 2017).

Price filter analysis emerged as an alternative method and relies on a single country's transaction-level trade data to identify a unit price range of normally priced transactions for a specific good over a given time period. Many studies have used the price filter methodology, analysing millions of import and export transactions to estimate the extent of trade mispricing (e.g. de Boyrie, Pak and Zdanowicz, 2005; Cathey, Hong and Pak, 2017; Pak, Zanakis and Zdanowicz, 2003; Hong, Pak and Pak, 2014). A weakness of price filter analysis is that 'normal price ranges' do not adequately account for product heterogeneity. Taking the example of gold, varying levels of gold content, ranging from 2 per cent to over 90 per cent, fall under the same HS customs category, while the ensuing normal or fair price should vary greatly according to the gold's purity level. One way of addressing this has been to consider the average gold content of shipments at the mine-site level (Carbonnier and Mehrotra, 2018).

Most of the recent empirical literature relies on limited-access administrative microdata at the firm-transaction level to address such limitations. Confidentiality requirements often bind researchers who are using such data when it is sold by commercial actors or shared by public authorities. Such data includes:

1. *Customs microdata* systematically recorded by customs authorities based on mandatory shipping declarations submitted by importers and exporters. The data is collected for the purposes of tariff duties, statistical reporting and tax or transfer-pricing audits. Such confidential data can be made available to researchers with a view to identifying and measuring abnormally priced transactions.

Example 1—The United States

The US Longitudinal Firm Trade Transaction Database (LFTTD) links individual trade transactions to firms, thereby enabling research on abusive transfer pricing in international trade by US-based multinational firms. This data set has two components:

- It includes all US transaction-level trade data, including product classification, value, quantity, shipment date, destination (or source), transport mode and, crucially, whether the transaction takes place at ‘arm’s length’ or between related parties or constitutes intra-firm trade, the last of these referring to shipments between US companies and their foreign subsidiaries as well as trade between US subsidiaries of foreign companies and their affiliates abroad.
- The second component is the Longitudinal Business Database (LBD) from the US Census Bureau, which includes annual information for US firms at the establishment level.

SOURCE: AUTHORS BASED ON US CENSUS BUREAU ([HTTPS://WWW.CENSUS.GOV](https://www.census.gov)).

Example 2—Switzerland

Switzerland provides a useful counterexample to the US where the data required to estimate trade mispricing exists across different departments, requiring researchers to seek both access and permission to merge and analyse relevant data from different offices. The Federal Customs Administration maintains the Swiss-Impex Database, which contains all recorded international trade transactions conducted by firms domiciled in Switzerland, including product classification, value, quantity, shipment date, destination (or source), transport mode and names of trading partners. However, this database does not match this data with firm characteristics, and nor does it distinguish transactions between related and unrelated parties. Additional data sources thus have to be considered, such as Business Enterprise Registers and International Firm-level Databases.

SOURCE: AUTHORS BASED ON SWISS-IMPEX DATABASE ([HTTPS://WWW.GATE.EZV.ADMIN.CH/SWISSIMPEX/](https://www.gate.ezv.admin.ch/swissimpex/)).

Major trading and financial hubs like the Netherlands, Singapore, Switzerland, the United Arab Emirates, the United Kingdom or the United States have a special responsibility to enhance transparency regarding cross-border trade and financial flows. In the Swiss case, our research highlights specific shortcomings in the lack of disaggregation of customs data on commodity trade, especially with regard to quality, product heterogeneity and price, as well as regarding the non-disclosure of whether trade occurs between related or unrelated parties. Triangulating information from multiple sources including industry reports and commodities exchanges has allowed significant levels of abnormal pricing to be uncovered, and has led to calls for enhanced transparency in customs microdata (Mehrotra and Carbonnier, 2021).

2. *Firm registers and international firm networks databases.* These allow identify trading partners to then determine applicable tax rules and identify transfer-pricing risks between related firms, as explained earlier.

Example 1—Switzerland

In Switzerland, the Business and Enterprise Register (BER) contains all enterprises domiciled and exercising an economic activity in Switzerland. The Federal Statistical Office (FSO) maintains the BER as the register for statistical data collection on businesses. It includes the following information: name and address of the enterprise, municipality code, BER number (a non-significant 8-digit registration number), a UID (enterprise identification number), number of employees, type of economic activity, legal form, date of entry into or cancellation from the trade register, date of opening or closing and capitalisation.

SOURCE: SWISS FEDERAL STATISTICAL OFFICE ([HTTPS://WWW.BFS.ADMIN.CH/](https://www.bfs.admin.ch/)).

Example 2—ORBIS database

For global firm-level information, the Orbis global database from Bureau van Dijk (BvD) is the largest cross-country database that combines national business censuses and financial reporting by publicly listed companies, including financial statements, employment and investment, and detailed information on firms' location, as well as domestic and foreign owners and subsidiaries, all of which allows researchers to detect the effective degree to which firms are related or not.

SOURCE: ORBIS, BUREAU VAN DIJK ([HTTPS://WWW.BVDINFO.COM/](https://www.bvdinfo.com/)).
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Johannesen and its co-authors use the Orbis data set, with information on approximately 210,000 corporations in 142 countries, to investigate whether tax avoidance by multinational firms is more prevalent in less-developed countries. Their results consistently show that reported profits are more sensitive to profit-shifting incentives, including higher corporate tax rates, in developing countries with lower levels of economic and institutional development.

3. *Specialised, industry-specific market and prices data* offers the detailed information on product characteristics and value chains required to set fair or arm's-length price ranges for specific commodities. This process can be especially demanding for trade in extractive and agricultural commodities, whose values can vary widely due to traded good quality or storage, insurance and transportation costs, as well as to rapid price fluctuations. Thus, detailed information on product characteristics and relevant international benchmark prices from commodity exchanges are required. The illustrations below provide examples for gold.

Studies have focused in particular on US data linking customs transactions with firm-level information to study abusive transfer pricing in related party trade (Bernard, Jensen and Schott, 2006). Since mobilising domestic resources is a priority for lower-income countries, it is important to strengthen customs and tax administrations and generate the data required to address loopholes. Ahene-Codjoe, Alu and Mehrotra (2022) highlight that customs data limitations in Ghana have restricted the country's ability to trace the origin of significant abnormally priced gold exports totalling approximately USD 4 billion in the period 2011–2017. Triangulating aggregate customs data with

Example 1—Metals Focus Gold Doré Flows Service database

The reliable valuation of precious metal ores requires information on purity levels and the composition of additional metals. The Metals Focus Gold Doré database provides mine-level information on historical, current and forecasted doré production by mining company and by location. It contains information on the current refining location, historical production costs, and current mineral reserves and resources, as well as on the gold/silver split of doré production. The database covers 652 mining companies across 77 countries.

SOURCE: THE AUTHORS; SEE ALSO, METALS FOCUS LTD ([HTTPS://WWW.METALSFOCUS.COM/](https://www.metalsfocus.com/)).

Example 2—Commodity exchanges prices

The London Bullion Market Association (LBMA) Gold and Silver prices are used to set the global benchmark prices for unallocated gold and silver traded worldwide and delivered in London. Precious metals including gold, silver, platinum and palladium are traded by LBMA with price auctions taking place daily in London. The relevant prices are published on the day they are set; real-time prices are also available. This price data allows the setting of reliable arm's-length price ranges for individual transactions of precious metals.

SOURCE: THE AUTHORS; SEE ALSO LONDON BULLION MARKET ASSOCIATION ([HTTPS://WWW.LBMA.ORG.UK/](https://www.lbma.org.uk/)).

mine-level information on gold production and purity grades, the researchers are able to detect IFF risks in the Ghanaian gold trade by mine site and export destination.

Turning to trading hubs, Mehrotra and Carbonnier (2021) draw on the Swiss-Impex Database to compare trade transaction prices with arm's-length price ranges based on high-frequency commodity price data from commodities exchanges and industry-specific data, including on mine-level gold production and purity levels. Focusing on Swiss precious metals and agricultural imports, their paper overcomes previous data limitations and estimates that 4.5 per cent of total gold doré imports—amounting to CHF 21.5 billion—were abnormally underpriced between 2011 and 2017.

3.2 *Profit Shifting*

Profit shifting takes place when a multinational group seeks to transfer profits among its affiliates in order to minimise its overall tax liabilities. This can be done by having affiliates located in high-tax jurisdictions buy goods and services, or obtain loans, at a relatively high price from affiliates in low-tax jurisdictions. The group shifts profits into lower-tax jurisdictions, from where its after-tax profits can be channelled back to investors or reinvested in the company, for example by lending more money to its affiliates in high-tax jurisdictions.

The literature on profit shifting via abusive transfer pricing employed by multinational firms has provided empirical evidence to policy initiatives seeking to establish fairer global tax rules, such as the OECD/G20 BEPS initiative.

An important limitation here is the lack of systematic, comparable data collected at the firm-affiliate level, particularly in developing countries. Given that the majority of international commodity trading firms are not publicly listed, they are not required to report detailed financial data for all affiliates. In this context, advances are being made towards stronger data collection and dissemination, as detailed below.

To capture the extent of profit shifting, researchers generally rely on indirect evidence by studying the overall profitability of affiliates, as it is more challenging to gather direct evidence by analysing profit-shifting mechanisms—including abusive transfer prices and interest rates for loans between affiliates—themselves. The basic methodology used in the profit-shifting literature is based on the work of Grubert and Mutti (1991) and Hines and Rice (1994), and assumes that the observed pre-tax income of an affiliate represents the sum of 'true' income and 'shifted' income (the latter being either positive or negative). True income is generated by the affiliate using capital and labour inputs. Thus, measures of these capital and labour inputs used by the affiliate (such as fixed tangible assets and employment compensation) are included in the analysis of the true level of income.

Shifted income is driven by the tax incentive to move income into or out of affiliates. In the simplest scenario, this incentive would be the tax rate difference between the parent's and the affiliate's jurisdictions. However, the recent literature also takes into account the overall pattern of tax rates faced by all the affiliates of a multinational firm. Income reported by a low-tax affiliate that cannot be accounted for by the affiliate's own labour and capital inputs is therefore attributed to income shifting.

In order to derive estimates of profit-shifting behaviour, researchers use country-level or, more recently, firm-level data to study where there is a significant relationship between the reported pre-tax profits of affiliates (i.e. the tax base) and the difference in tax rates between the affiliate and parent company. Most often, this relationship is reported in terms of semi-elasticities—that is to say, the percentage change in pre-tax income associated with a 1 percentage point change in tax differentials between the parent company and its foreign affiliate. In a meta-analysis of the widely varying magnitudes of the estimates generated in the relevant literature, Heckemeyer and Overesch (2013) identify a 'consensus' estimate—a semi-elasticity of approximately 0.8. This means that a 10 per cent increase in the tax rate difference between an affiliate and its parent company increases the pre-tax income reported by the affiliate by 8 per cent (see Dharmapala, 2014, for an early review of relevant methodological approaches).

Given the potential magnitude and policy relevance of this phenomenon, rapid advances are being made in establishing legal and statistical frameworks to improve the collection of data on the characteristics and activities of multinational firms across all jurisdictions, including:

1. *Foreign affiliates statistics (FATS)*: In recent years, national statistical agencies across the world have started collecting and publishing detailed statistics on the activities of foreign firms operating within their territory, including information on assets, sales, employees, wages and profits. This disaggregated information allows better analysis of profit shifting between firms at an aggregate level. Tørsløv, Wier and Zucman (2023) propose new advances by combining firm-affiliate level data with balance-of-payments statistics to decompose multinational firms' real profits vs. profit shifting, before apportioning their 'above-normal profits' made in tax havens to the countries in which they hypothetically would have been reported in a world without CTR differentials. Using this new FATS data, the authors find that almost 40 per cent of the profits generated by multinational enterprises (MNEs) outside the host country of their parent company are shifted to tax havens. A major limitation, here again, is that this data does not yet provide high quality information for least developed countries, which are not covered in the analyses.
2. *Country-by-country reporting (CbCR) by multinational firms*: Following the OECD's BEPS initiative, approximately 100 countries have implemented CbCR requirements for multinational firms domiciled in their jurisdiction, with key financial information reported by country of operation. Currently, only 19 countries have agreed to publicly share this information in an aggregated form, with some allowing reporting at the regional rather than the country level due to concerns over proprietary and business-sensitive information. Garcia-Bernardo and Janský (2022) use this CbCR information to estimate profit shifting based on the available aggregate data, which allows researchers to observe revenues, profits, and the taxes paid by large multinational firms domiciled in CbCR-compliant countries in other, previously uncovered jurisdictions, including in least developed countries. While this new data source remains preliminary since not many countries have gathered and released CbCR information, the authors offer some initial insights into the profit-shifting behaviour of large MNEs. Their findings suggests that USD 1 trillion of profits worldwide was shifted to tax havens in 2016, resulting in a tax revenue loss of USD 300 billion. Low- and middle-income countries are estimated to lose

proportionally more as a share of their total tax revenues. Methods such as those employed by the authors will produce significantly improved estimates as the underlying data published by national statistical institutions improves.

3. *Phantom vs. real foreign direct investment (FDI) data:* FDI flows make up an economically significant category of overall international financial flows, and are usually interpreted as being related to investments in enterprises conducting legitimate business activities. Damgaard, Elkjaer, and Johannesen (2019), however, highlight that FDI can be channelled through tax havens to minimise tax liabilities and shift the taxable profits of multinational actors. The researchers define ‘phantom FDI’ as investment flows passed through a tax haven in order to benefit from advantageous tax breaks before being invested abroad. Luxembourg has been cited as a prominent tax haven, and records inward FDIs of USD 4 trillion (similar in magnitude to the United States), equivalent to its outward FDIs, suggesting that Luxembourg is only a transit stop for such financial flows. The authors compile detailed FDI data from the IMF, OECD, and Orbis databases and build a database of phantom FDIs vs. real FDIs, further narrowing down real FDIs to the nationality of their ultimate rather than their immediate owner in the case of countries disposing of sufficient data coverage.¹ This new data source highlights that FDI channelled through tax havens and tax secrecy jurisdictions represents a significant medium for IFFs.

3.3 *Offshore Wealth*

Policymakers have demanded more robust evidence on global stocks of hidden offshore wealth held in tax havens, their aim being to focus their efforts on closing regulatory loopholes and repatriating illegally transferred assets through multilateral agreements such as the World Bank’s Stolen Asset Recovery programme (World Bank, 2023). Consequently, empirical research has recently focused on foreign bank deposits and on client data leaked by whistle-blowers.

Offshore wealth is simply understood as the sum of assets booked in a jurisdiction in which the ultimate owner has no legal residence or tax domicile. While there are several legitimate economic reasons for holding offshore

¹ Niels Johannesen website (n.d.) <https://nielsjohannesen.net/FDI/database/> (accessed on 6 February 2024).

wealth, the practice also facilitates tax evasion by high-net-worth individuals and money laundering by criminal actors.

Previous research has mainly relied on balance-of-payments accounting identities to approximate the magnitude of unexplained international flows driven by capital flight and their contribution to the accumulation of offshore wealth. The *sources-and-use* method distinguishes between explained and unexplained financial flows, while the *hot money narrow* method refines the approach by controlling for portfolio investment and bank deposit flows, focusing only on the net errors and omissions component of balance-of-payments accounts.

There is a consensus that current aggregate data sources and macroeconomic methods lack the granularity and sophistication required to distinguish between licit financial flows and illicit financial flows from tax evasion, questionable tax optimisation and money laundering. More granular data and stronger methods have therefore been developed, relying notably on

1. *International bank transfer data*: International pressure to address the most egregious forms of IFFs led the Financial Action Task Force (FATF) to issue, in 2012, binding policy recommendations to tackle international money laundering. These channels for IFFs are linked to offshore wealth transfers by high-net-worth individuals, but also increases the risk of criminal activity and terrorist financing (Collin, Cook and Soramaki, 2016) These FATF standards increased pressure on international banks to refuse to execute transactions and to close the accounts of customers who are either based in high-risk countries or attempt to send money to them. Collin, Cook and Soramaki (2016) use novel SWIFT banking transactions data to investigate the impact on cross-border payments after the inclusion of countries on the FATF's internationally recognised list of high-risk jurisdictions. Their results suggest that countries added to the FATF list experience a 10 per cent decline in such payments, especially when they originate in countries with weak anti-money laundering institutions. Somewhat unsurprisingly, the authors find that developing countries with weak institutions are more likely to be placed on FATF watch lists. More recent analyses using cross-border bank transfer data for Nordic-Baltic countries demonstrate how such data can be combined with machine learning algorithms to identify suspicious transactions involving risks of money laundering and terrorism financing (IMF, 2023).

Sanctioned jurisdictions often are fragile and conflict-affected settings where the need for humanitarian assistance looms large. Aid

organisations have expressed concerns about how de-risking and over-compliance by financial intermediaries impacts their own operational ability to provide life-saving assistance. This has led to the adoption of specific humanitarian exemptions and carve-outs in sanction regimes, including the landmark UN Security Council Resolution 2664, adopted in December 2022, which foresees humanitarian exemptions to asset freezes under UN sanction regimes.

2. *International portfolio and bank deposit ownership data:* Zucman (2014) attempts to estimate the overall stock value of wealth that is held offshore. Unreported wealth drives a wedge into international portfolio statistics, and asset positions of source countries tend to be systematically under-reported as the owners of assets held offshore may not declare them. Since tax havens tend to record the magnitude of their liabilities correctly, this results in gaps between aggregate worldwide assets and liabilities. Zucman (2014) combines international investment position data from the IMF's Coordinated Portfolio Investment Survey containing hidden offshore assets with data on cross-border bank deposits provided by the BIS and finds that of the 8 per cent of total household wealth held overseas, 80 per cent is unreported in source countries. One limitation to this approach is that, similar to earlier balance-of-payment estimates, it relies on deviations in aggregate data that could also be explained by measurement errors. Zucman (2014) also provides evidence that unreported wealth stocks are largest in tax haven jurisdictions and minimal otherwise. Follow-up research by Alstadsæter, Johannesen and Zucman (2019) uses more detailed, updated BIS bilateral bank deposit statistics to allocate the estimates of hidden offshore wealth to source countries. Their key finding is that hidden offshore wealth is positively correlated with the level of economic development in the source country—that is to say, most offshore wealth can be attributed to residents of rich countries.
3. *Financial data leaks concerning high-net-worth individuals:* The past decade has witnessed multiple leaks of financial data, including on the clients of wealth advisory firms specialising in tax optimisation and avoidance schemes domiciled in tax havens. Due to the partial nature of the leaked information, one cannot draw solid conclusions about total hidden wealth. These leaks may, however, contain suggestive evidence of how stocks of offshore wealth respond to regulatory changes, especially in relation to efforts to combat tax evasion in source countries. Leaked data from banks and law firms has also been used to examine whether the risk

of cross-border tax evasion varies with source country characteristics. Omartian (2016) analyses data leaked from Mossack Fonseca (the so-called Panama Papers) and finds that adoption of the OECD's automatic exchange of tax information rules led to a reduction in reported offshore assets held in tax havens. Alstadsæter, Johannesen and Zucman (2019) match detailed data leaked from HSBC Switzerland and from Mossack Fonseca to estimate the incidence of undeclared wealth and the use of offshore shell companies across wealth distribution in Denmark, Norway and Sweden. The authors find evidence of tax evasion in that, for example, 95 per cent of the Swiss accounts were undeclared, and also uncover the frequent use of shell companies by ultra-high-net-worth individuals. These findings led to Scandinavian authorities introducing audit procedures to enhance IFF detection. Using a similar method, Londoño-Vélez and Ávila-Mahecha (2021) find that offshore wealth linked to Colombian taxpayers increased with hikes in wealth taxes. Their estimates show that taxpayers reduced their asset declarations by 11 per cent on average after opening an offshore account.

Example 1—Offshore Leaks database

The International Consortium of Investigative Journalists (ICIJ) compiled the Offshore Leaks database, which includes the Bahamas Leaks, Panama Papers, and Paradise Papers, and covers more than 720,000 individuals and firms across the world.

SOURCE: THE AUTHORS; SEE ALSO [HTTPS://OFFSHORELEAKS.ICIJ.ORG/](https://offshoreleaks.icij.org/).

Example 2—Swiss Leaks project

The Swiss Leaks project is based on HSBC Switzerland data, released by a whistle-blower, covering over 100,000 accounts across over 200 countries. The confidential bank files, now held by the ICIJ, contain detailed information on account balances linked with secretive offshore firms.

SOURCE: THE AUTHORS; SEE ALSO [HTTPS://PROJECTS.ICIJ.ORG/SWISS-LEAKS/](https://projects.icij.org/swiss-leaks/).

Several offshore financial centres, including Switzerland and Singapore, are also major commodity trading hubs. Mechanisms and incentives that encourage wealth offshoring and tax evasion are intertwined with those that facilitate profit shifting through trade and transfer mispricing. More research is required to capture the extent to which enhancing transparency and addressing loopholes related to offshore financial centres would contribute to limiting the scope for profit shifting involving trade-related IFFs, and to identify the most effective avenues via which to prevent tax base erosion.

4 Concluding Remarks: Policies to Measure and Reduce IFFs

This chapter has presented and discussed a variety of avenues via which academics and policymakers may address gaps and enable a global response that curbs commodity trade-related IFFs and benefits developing countries as well. Advances that can be adopted in the short term revolve around enhanced transparency, data disaggregation and the use of new technologies to better track trade and related financial flows. Longer-term solutions involve tax governance reforms that benefit lower-income countries with weaker customs and tax administrations.

Low hanging fruit includes the strengthening of statistical infrastructure to collect and disseminate disaggregated firm-level and transaction-level data, helping regulators to detect and curb abnormally priced transactions. Better information on the quality of traded commodities is required to determine normal or 'arm's-length' price ranges and detect abnormal pricing for the purposes of tax evasion or avoidance. Reining in abusive transfer prices requires greater transparency on trade transactions between related parties. Regularly updated business registers would help in identifying the beneficial owners of all registered companies within a given jurisdiction, benefiting both advanced and developing economies. Other measures have proven beneficial in developing countries, such as the strengthening of tax administrations including via the adoption of transfer-pricing rules, together with evidence-based risk assessments and audits to detect tax evasion.

Research shows that enhanced transparency can work, as the impact of the introduction of the automatic exchange of banking information reveals. The next step is to ensure states can mobilise domestic resources in a progressive manner, which requires setting a threshold for minimal tax rates globally (akin to what has been done for multinational corporations) and closing the many loopholes that remain, loopholes that currently result in billionaires paying virtually no tax on income or wealth.

With regard to trade-related IFFs, regulators in advanced economies have moved towards greater financial disclosure and more stringent documentation requirements. For example, multinational firms have to provide information on how they adhere to the arm's-length principle with regard to transfer pricing, and must set limits on the amount of deductible interest payments carried out among group affiliates. Tax authorities are also acquiring the right to challenge potential tax avoidance under GAARs. Findings to date indicate that such measures have not yet had a significant impact at the global level. In developing countries, these instruments remain either unavailable or partly ineffective, not least because of a lack of disaggregated data with which to identify IFF sources and evaluate the effectiveness of various policy options. Beyond OECD-led taxation reform, developing countries demand a stronger voice in shaping global tax governance reform, and that such negotiations be brought under the auspices of the United Nations. Regional fora are also essential, as illustrated by the African Tax Administration Forum, via which African states can coordinate their positions and their work on tax matters. This is critical to efforts to carve out the policy space required for alternative, simplified taxation methods that are more suitable for countries with weaker administrative capabilities, and to the creation of unilateral or regional taxation solutions in the absence of the readily available data required to properly administer current taxation rules and regulations.

References

- Ahene-Codjoe, A. A., A. A. Alu and R. Mehrotra (2022) 'Abnormal pricing in international commodity trading: Evidence from Ghana', *International Economics*, 172, pp. 331–348, DOI: 10.1016/j.inteco.2022.01.002.
- Alstadsæter, A., N. Johannesen and G. Zucman (2018) 'Who owns the wealth in tax havens? Macro evidence and implications for global inequality', *Journal of Public Economics*, 162, pp. 89–100, DOI: 10.1016/j.jpubeco.2018.01.008.
- Alstadsæter, A., N. Johannesen and G. Zucman (2019) 'Tax Evasion and Inequality', *American Economic Review*, 109(6), pp. 2073–2103, DOI: 0.1257/aer.20172043.
- Andersen, J. J., N. Johannesen, D.D. Lassen and E. Paltseva (2017) 'Petro Rents, Political Institutions, and Hidden Wealth: Evidence from Offshore Bank Accounts', *Journal of the European Economic Association*, 15(4), pp. 818–860, DOI: 10.1093/jeea/jvw019.
- Bernard, A. B., J.B. Jensen and P.K. Schott (2006) *Transfer Pricing by U.S.-Based Multinational Firms*, Working Paper 12493, National Bureau of Economic Research., DOI: 10.3386/w12493.

- Bhagwati, J. (1964) 'On the Underinvoicing of Imports', *Bulletin of the Oxford University Institute of Economics & Statistics*, 27(4), pp. 389–397, DOI: 10.1111/j.1468-0084.1964.mp27004007.x.
- Bhagwati, J. (1967) 'Fiscal Policies, the Faking of Foreign Trade Declarations, and the Balance of Payments', *Bulletin of the Oxford University Institute of Economics & Statistics*, 29(1), pp. 61–77, DOI: 10.1111/j.1468-0084.1967.mp29001004.x.
- Bhagwati, J. N., Krueger, A., and C. Wibulswasdi (1974) 'Capital flight from LDCs: A statistical analysis', in *Illegal transactions in international trade* (Amsterdam: North-Holland), pp. 148–154.
- Carbonnier, G. and R. Mehrotra (2024) 'Trade in the Shadows: Empirical Challenges in Measuring Illicit Financial Flows', *World Economics*, 24(1), pp. 1–8, <https://www.world-economics-journal.com/Papers/Trade-in-the-Shadows.aspx?ID=915> (accessed on 16 April 2024).
- Carbonnier, G., and A. Zweynert de Cadena (2015) 'Commodity Trading and Illicit Financial Flows', *International Development Policy | Revue internationale de politique de développement*, DOI: 10.4000/poldev.2054.
- Carbonnier, G., and R. Mehrotra (2018) *Trade-related Illicit Financial Flows: Conceptual Framework and Empirical Methods*, R4D-IFF-WP01-2018, <https://curbingiffsdotorg.files.wordpress.com/2019/12/r4d-iff-wp01-2018-dec2019.pdf> (accessed on 29 January 2024).
- Carbonnier, G., and S. Marur (2024) 'Drivers of Abnormal Pricing in Switzerland's Commodity-Trade', Working Paper No. R4D-IFF-WP01-2024, <https://curbingiffsdotorg.files.wordpress.com/2024/03/r4d-iff-wp01-2024.pdf> (accessed on 4 March 2024).
- Cathey, J., K.P. Hong and S.J. Pak (2017) 'Estimates of undervalued import of EU Countries and the U.S. from the Democratic Republic of Congo during 2000–2010', *The International Trade Journal*, 0(0), pp. 1–13, DOI: 10.1080/08853908.2017.1377650.
- Collin, M., S. Cook and K. Soramaki (2016) *The impact of anti-money laundering regulation on payment flows: Evidence from SWIFT Data*, Center for Global Development Working Paper, (445).
- Cowx, M., and J.N. Kerr (2023) *The General Anti-Avoidance Rule*, SSRN Scholarly Paper 3485084, DOI: 10.2139/ssrn.3485084.
- Cristea, A. D., and D.X. Nguyen (2016) 'Transfer Pricing by Multinational Firms: New Evidence from Foreign Firm Ownerships', *American Economic Journal: Economic Policy*, 8(3), pp. 170–202, DOI: 10.1257/pol.20130407.
- Damgaard, J., T. Elkjaer and N. Johannesen (2019) 'What Is Real and What Is Not in the Global FDI Network?' *IMF Working Papers*, 2019(274), DOI: 10.5089/9781513521527.001.A001.

- de Boyrie, M. E., S.J. Pak and J.S. Zdanowicz (2005) 'Estimating the magnitude of capital flight due to abnormal pricing in international trade: The Russia–USA case', *Accounting Forum*, 29(3), pp. 249–270, DOI: 10.1016/j.accfor.2005.03.004.
- De Wulf, L. (1981) 'Statistical analysis of under- and overinvoicing of imports', *Journal of Development Economics*, 8(3), pp. 303–323, DOI: 10.1016/0304-3878(81)90018-3.
- Dharmapala, D. (2014) 'What Do We Know about Base Erosion and Profit Shifting? A Review of the Empirical Literature', *Fiscal Studies*, 35(4), pp. 421–448. DOI: 10.1111/j.1475-5890.2014.12037.x.
- Eriksson, F. (2017) 'Illicit Financial Flows Definitions: Crucial Questions', *U4 Anti-Corruption Research Centre*, <https://medium.com/u4-anti-corruption-resource-centre/iff-definitions-3f3d0ba106c3> (accessed on 29 January 2024).
- EU Tax Observatory (2023) *Global Tax Evasion Report 2024* (Paris: EU Tax Observatory), <https://www.taxobservatory.eu/publication/global-tax-evasion-report-2024/> (accessed on 29 January 2024).
- Fisman, R., and S.-J. Wei (2004) 'Tax Rates and Tax Evasion: Evidence from "Missing Imports" in China', *Journal of Political Economy*, 112(2), pp. 471–500.
- Fisman, R., P. Moustakierski and S.-J. Wei (2008) 'Outsourcing Tariff Evasion: A New Explanation for Entrepôt Trade', *The Review of Economics and Statistics*, 90(3), pp. 587–592.
- Forstater, M. (2017) *Illicit Flows and Tax Avoidance: Agendas at a Crossroads* (Washington D.C.: Center for Global Development).
- Fuest, C., F. Hugger and F. Neumeier (2021) 'Corporate Profit Shifting and the Role of Tax Havens: Evidence from German Country-By-Country Reporting Data', *CESifo Working Paper Series* 8838, https://ideas.repec.org/p/ces/ceswps/_8838.html (accessed on 29 January 2024).
- Garcia-Bernardo, J., and P. Janský (2022) 'Profit Shifting of Multinational Corporations Worldwide', *arXiv.Org*, <https://arxiv.org/abs/2201.08444v1> (accessed on 29 January 2024).
- GFI (Global Financial Integrity) (2017) *Illicit Financial Flows to and from Developing Countries: 2005–2014*, (Washington D.C.: Global Financial Integrity) <http://www.gfin.org/report/illicit-financial-flows-to-and-from-developing-countries-2005-2014/> (accessed on 29 January 2024).
- Grubert, H., and J. Mutti (1991) 'Taxes, Tariffs and Transfer Pricing in Multinational Corporate Decision Making', *The Review of Economics and Statistics*, 73(2), 285–293, DOI: 10.2307/2109519.
- Heckemeyer, J. H., and M. Overesch (2017) 'Multinationals' profit response to tax differentials: Effect size and shifting channels', *Canadian Journal of Economics/Revue Canadienne d'économique*, 50(4), pp. 965–994, DOI: 10.1111/caje.12283.

- Heckemeyer, J., and M. Overesch (2013) *Multinationals' Profit Response to Tax Differentials: Effect Size and Shifting Channels*, SSRN Scholarly Paper ID 2303679, Social Science Research Network, <https://papers.ssrn.com/abstract=2303679>.
- Hines, J. R. and E.M. Rice (1994) 'Fiscal Paradise: Foreign Tax Havens and American Business', *The Quarterly Journal of Economics*, 109(1), pp. 149–182. <https://doi.org/10.2307/2118431>.
- Hong, K. P. and S.J. Pak (2017) 'Estimating Trade Misinvoicing from Bilateral Trade Statistics: The Devil is in the Details', *International Trade Journal*, 31(1), pp. 3–28. <https://doi.org/10.1080/08853908.2016.1202160>.
- Hong, K., C.H. Pak and S.J. Pak (2014) 'Measuring abnormal pricing—an alternative approach: The case of US banana trade with Latin American and Caribbean Countries', *Journal of Money Laundering Control*, 17(2), pp. 203–218. DOI: 10.1108/JMLC-11-2013-0043.
- IMF (International Monetary Fund) (2023) *Nordic-Baltic Technical Assistance Project Financial Flows Analysis, AML/CFT Supervision, and Financial Stability* (Washington D.C.: IMF) <https://www.imf.org/en/Publications/CR/Issues/2023/09/01/Nordic-Baltic-Regional-Report-Technical-Assistance-Report-Nordic-Baltic-Technical-538762> (accessed on 29 January 2024).
- IMF (2020) *The IMF and the Fight Against Illicit Financial Flows* (Washington D.C.: IMF). <https://www.imf.org/en/About/Factsheets/Sheets/2023/Fight-against-illicit-financial-flows> (accessed on 29 January 2024).
- Johannesen, N. (2014) 'Tax evasion and Swiss bank deposits', *Journal of Public Economics*, 111, pp. 46–62.
- Keen, M. and J. Slemrod (2016) *Optimal Tax Administration*, Working Paper 22408, (Cambridge M.A.: National Bureau of Economic Research), DOI: 10.3386/w22408.
- Liu, L., T. Schmidt-Eisenlohr and D. Guo (2020) 'International Transfer Pricing and Tax Avoidance: Evidence from the Linked Tax-Trade Statistics in the UK', *The Review of Economics and Statistics* 102 (4): 766–778, DOI: 10.1162/rest_a_00871.
- Londoño-Vélez, J. and J. Ávila-Mahecha (2021) 'Enforcing Wealth Taxes in the Developing World: Quasi-experimental Evidence from Colombia', *American Economic Review: Insights*, 3(2), pp. 131–148, DOI: 10.1257/aeri.20200319.
- Luttmer, E. F. P. and M. Singhal (2014) *Tax Morale*, Working Paper 20458, National Bureau of Economic Research, DOI: 10.3386/w20458.
- Mehrotra, R. and G. Carbonnier (2021) 'Abnormal pricing in international commodity trade: Empirical evidence from Switzerland', *Resources Policy*, 74, 102352. DOI: 10.1016/j.resourpol.2021.102352.
- Musselli, I. and E. Bürgi Bonanomi (2020) 'Illicit Financial Flows: Concepts and Definition', *International Development Policy | Revue Internationale de Politique de Développement* (12.1), DOI: 10.4000/poldev.3296.

- Ndikumana, L., J.K. Boyce and A.S. Ndiaye (2015) 'Capital flight from Africa: Measurement and drivers', in I. Ajayi and L. Ndikumana (eds), *Capital Flight from Africa: Causes, Effects and Policy Issues*, (Oxford: Oxford University Press), pp. 15–54.
- Nitsch, V. (2016) *Trade Misinvoicing in Developing Countries*, CGD Policy Paper, 103.
- OECD (Organisation for Economic Co-operation and Development) (2014) *Illicit Financial Flows from Developing Countries: Measuring OECD Responses*. (Paris: OECD Publishing).
- Omartian, J. (2016) 'Tax Information Exchange and Offshore Entities: Evidence from the Panama Papers', *SSRN Electronic Journal*, DOI: 10.2139/ssrn.2836635.
- Pak, S. J., S.H. Zanakis and J.S. Zdanowicz (2003) 'Detecting Abnormal Pricing in International Trade: The Greece-USA Case', *Interfaces*, 33(2), pp. 54–64. DOI: 10.1287/inte.33.2.54.14473.
- Picciotto, S. (2018) *Illicit financial flows and the tax haven and offshore secrecy system* (Brussels: Tax Justice Network), <https://globaltaxjustice.org/libraries/illlicit-financial-flows-and-the-tax-haven-and-offshore-secrecy-system/> (accessed on 25 January 2024).
- Pomeranz, D. (2015) 'No Taxation without Information: Deterrence and Self-Enforcement in the Value Added Tax', *American Economic Review*, 105(8), pp. 2539–2569., DOI: 10.1257/aer.20130393.
- Reuter, P. (2012) *Draining Development? Controlling Flows of Illicit Funds from Developing Countries* (Washington, D.C.: World Bank). <https://elibrary.worldbank.org/doi/pdf/10.1596/978-0-8213-8869-3> (accessed on 30 January 2024).
- Tørsløv, T., L. Wier, and G. Zucman (2023) The Missing Profits of Nations. *The Review of Economic Studies*, 90(3), pp. 1499–1534, DOI: 10.1093/restud/rdac049.
- UN (United Nations) (2020) *High-level Panel on International Financial Accountability, Transparency and Integrity for Achieving the 2030 Agenda*, (New York: UN) <https://www.factipanel.org/> (accessed on 25 January 2024).
- Vicard, V. (2015) *Profit Shifting Through Transfer Pricing: Evidence from French Firm Level Trade Data* (SSRN Scholarly Paper ID 2614864) Social Science Research Network, <https://papers.ssrn.com/abstract=2614864> (accessed on 25 January 2024).
- World Bank (2016) *The World Bank Group's response to illicit financial flows: A stocktaking*, 104568, pp. 1–29 (Washington D.C.: The World Bank), <http://documents.worldbank.org/curated/en/502341468179035132/The-World-Bank-Group-s-response-to-illlicit-financial-flows-a-stocktaking> (accessed on 29 January 2024).

- World Bank (2023) *StAR—Addressing Anti-Corruption, Money Laundering & Asset Recovery*. (Washington DC: World Bank), <https://star.worldbank.org/> (accessed on 25 January 2024).
- Zucman, G. (2014) 'Taxing across Borders: Tracking Personal Wealth and Corporate Profits', *Journal of Economic Perspectives*, 28(4), pp 121–148, DOI: 10.1257/jep.28.4.121.