

Towards a Statistical
Framework for the measurement
of tax and commercial
Illicit Financial Flows



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Moreover, this technical paper is grounded on the *Conceptual Framework for the Statistical Measurement of Illicit Financial Flows* developed by UNCTAD and UNODC in consultation with an International Task Force on the Statistical Measurement of Illicit Financial Flows¹ and other partners. This work has benefitted from the joint capacity building efforts undertaken with regional partners, particularly the United Nations Economic Commission for Africa (ECA), Economic Commission for Latin America and the Caribbean (ECLAC), Economic and Social Commission for Asia and the Pacific (ESCAP), and Economic and Social Commission for Western Asia (ESCWA). Projects in Latin America, Africa and Asia have contributed to the conceptual and methodological developments reflected in the paper. The methods to measure tax and commercial illicit financial flows (IFFs) were pilot tested by Angola, Benin, Burkina Faso, Egypt, Gabon, Ghana, Kyrgyzstan, Mozambique, Namibia, Nigeria, Senegal, South Africa, Uzbekistan and Zambia. The collaboration with member States and partner organizations has shaped the *Conceptual Framework* and the methodologies to measure IFFs.

This technical paper shares the results of the work carried out under the auspices of UNCTAD and UNODC as custodians of the Sustainable Development Goals (SDG) indicator 16.4.1 on the *total value of inward and outward illicit financial flows* with a particular focus on tax and commercial flows.

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1

INTRODUCTION

1.1 ILLICIT FINANCIAL FLOWS AND SDGS

Every year organized crime and trade in illegal goods (such as drug trafficking or trafficking in firearms) and illegal or illicit tax and commercial practices generate billions of dollars in illicit flows. Proceeds of crime may be channelled abroad, often to safe havens. They may also be laundered and reinvested in legal markets. Illicit financial flows (IFFs) stemming from illegal activities such as crime and corruption, as well as large-scale organized crime erode the functioning of criminal justice systems, reduce state revenues, erode the tax base and weaken state institutions. Other IFFs originating in the legal economy may also divert resources for development, by discouraging public and private investment and depriving the licit economy of crucial resources for sustainable development and economic growth.

The 2030 Development Agenda defines 17 Sustainable Development Goals (SDGs) to achieve equitable and sustainable development for all, leaving no one behind. It further identifies the reduction of IFFs as a priority area, as reflected in target 16.4: “by 2030, significantly reduce illicit financial flows and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organised crime”. IFFs were also identified as a global priority in the Addis Ababa Action Agenda (United Nations, 2015) on financing for development which calls for a redoubling of efforts to substantially reduce IFFs, with a view to eventually eliminating them.

Regardless of its importance, data on SDG indicator 16.4.1, “total value of inward and outward illicit financial flows”, are not yet comprehensively reported (United Nations, 2017b). The world needs comparable and reliable statistics on IFFs to shed light on the activities, sectors and channels most prone to illicit finance, pointing to where actions should be undertaken as a priority to curb these flows. In 2017, when the United Nations General Assembly adopted the SDGs global indicator framework, the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Office on Drugs and Crimes (UNODC), the two co-custodians of indicator 16.4.1, started methodological work and broad consultations on the development of statistical definitions and methods to measure IFFs.

1.2 STATISTICAL CHALLENGES

There are many statistical challenges with the measurement of IFFs. These challenges can be conceptual, methodological and practical (such as data limitations). As the *Conceptual Framework for the Statistical Measurement of Illicit Financial Flows* (UNCTAD and UNODC, 2020) (thereafter, the *Conceptual Framework*) points out, the lack of consistent statistics on IFFs causes uncertainty about the size of and trends in illicit flows, their origin and impact on development. IFFs can markedly differ across countries and regions, and the lack of a common framework makes their measurement impossible.

While the *Conceptual Framework* successfully addresses several of the conceptual challenges, primarily by providing the first-ever definition of IFFs for the statistical measurement of SDG indicator 16.4.1, varying conceptual approaches and coverages applied in different studies limit consolidation of IFFs for aggregation into a single number and comparability in space and time. Some types of IFFs may exhibit overlaps and/or borderline cases, e.g., between trade misinvoicing and trade-based money laundering; tax evasion and borderline practices, including aggressive tax avoidance, even if conceptually clear as per the *Conceptual Framework*. This inhibits reliable evidence base and hampers policy action to combat IFFs in the national context and to agree on common policy goals at the international level.

IFFs are deliberately hidden and, as they take many forms and use varying channels, they are difficult to track. The challenges of measuring IFFs differ across countries. Consequently, the practices for and approaches to measuring the illegal, non-observed or other economic activities that may generate IFFs differ. Therefore, space for country-specific solutions and the flexible application of methods in line with a common framework is important. While measurement of IFFs, due to their hidden nature, cannot be

processed by directly observing the phenomenon, we can instead focus on the traces these activities leave in the economy and related data.

Regardless of data gaps, national statistical systems (NSSs) already collect some of the data needed for the measurement of IFFs, but the data to track IFFs are typically scattered across a range of authorities. IFFs are also intertwined and overlapping, for instance bribery related to drug trafficking or trade mispricing, and this hampers distinctive measurement of IFFs. To avoid duplication, separate accounting for income generation and income management is needed that is consistent with national accounts and other statistical practices. In addition, statistics should be based on exclusive statistical classifications. National statistical offices (NSOs) usually act as the coordinator of the NSS to facilitate collaboration and interoperability of data, and develop joint practices with statistical classifications, methods and frameworks. They also act as the focal point for coordinating the compilation of SDG indicators and can bring the necessary stakeholders together to measure IFFs.

It is difficult, if not impossible to track and curb IFFs without reliable estimates to target policy efforts effectively. Data on IFFs can inform action by policymakers, feed research and analysis, and empower the civil society and governments to build a more inclusive and just future. Without reliable data efforts may be wasted in disagreement about priorities and misunderstandings about the IFFs affecting a country, thus risking inadequate formulation and evaluation of policies designed to curb these flows. With the concepts and methods developed by UNCTAD and UNODC, countries can make the best of the data they have and use their full analytical capacity for tracking IFFs for better policy.

1.3 UNCTAD AND UNODC MEASUREMENT SUPPORT

As co-custodians of SDG indicator 16.4.1, UNCTAD and UNODC lead global methodological work to develop statistical concepts and methods to support member States in measuring IFFs for the monitoring of progress towards target 16.4. UNCTAD leads methodological work and enhances national statistical capacities to measure tax and commercial IFFs, and UNODC focuses on crime-related IFFs. To date, 22 countries across three continents have tested the measurement of IFFs according to the proposed methodologies. The experience shows that, while estimating IFFs is challenging, it can be done, and the first official estimates of crime-related IFFs were published in the Global SDG Indicator Database (United Nations, 2023) in early 2023.

To date, 14 countries, 12 in Africa and two in Asia, have tested methods to measure selected types of tax and commercial IFFs using datasets available to customs or tax and revenue authorities. Several countries prepared preliminary unofficial estimates of IFFs from trade misinvoicing by analysing asymmetries in customs reporting between countries or abnormal prices in transaction-level customs data using UNCTAD *Methodological Guidelines to Measure Tax and Commercial IFFs* (UNCTAD, 2021) (thereafter, the *Methodological Guidelines*). First measurement activities reveal that trade misinvoicing affects trade in various commodities: for example, beverages, petroleum, ore in Burkina Faso; precious metals and stones, electrical machinery in South Africa (UNCTAD, 2023a). While values indicate billions of IFFs, it is noteworthy that differences in time and spatial coverage (trading partners) render direct comparison unwarranted. Relative measures, such as the percentage of IFFs of total (recorded) trade, show that these values are far from insignificant: IFFs may reach even a half of officially recorded trade in some countries.

To enable national measurement, UNCTAD and UNODC held 21 expert meetings, including meetings held within the UNCTAD-UNODC Task Force for the Statistical Measurement of IFFs (thereafter the Task Force), to develop concepts and methods to measure IFFs, between 2017 and 2023. This collaborative effort to enable estimating of progress towards SDG 16.4.1 has involved over 500 experts. Additionally, UNCTAD organised sessions at 11 international events (with 868 participants) to raise awareness on concepts and methods on tax and commercial IFFs, often accompanied by UNODC to discuss crime-related IFFs. Between 2021 and June 2023, UNCTAD and its regional partners, ECA and ESCAP, held 39 national workshops to measure tax and commercial IFFs in Africa and Asia. In total, 1 919 participants

were trained, of whom 29 per cent women. Repeated requests for national and country-specific training have been voiced, indicating the need for further support to member States.

This need for continued capacity strengthening and support through the technical expertise from custodian agencies UNCTAD and UNODC, and partners including United Nations Regional Commissions and their experts, has been voiced in its latest resolution adopted in December 2022 by the United Nations General Assembly (United Nations, 2022), calling for concerted actions and effort, both at national and international levels to train and report on SDG indicator 16.4.1 using the recommended methodology and to work in coordination with UNCTAD and UNODC.

Supported by the Task Force, the co-custodians continue to enhance standardized methodologies to measure IFFs, addressing their alignment with other relevant frameworks, such as the System of National Accounts (SNA) and the Balance of Payments (BoP) to increase IFF statistics applicability and add value in pursuing sustainable development for all. Such developments (seen from the angle of tax and commercial IFFs) are explored, and partly addressed in this technical paper. Further practical studies and applications in countries will be needed to consolidate suitable and robust aggregation methods in the future. The upcoming work under the new UN Development Account project *Measuring and curbing illicit financial flows*² (2023-2026) continues custodians' efforts and methodological support, with partner agencies, to member States to comprehensively measure IFFs.

1.4 STRUCTURE OF THE TECHNICAL PAPER

This technical paper focuses on efforts by custodians of SDG indicator 16.4.1, UNCTAD and UNODC, and their partners, the United Nations Regional Commissions and other experts within the Task Force, to support national authorities in their statistical measurement of IFFs. The concepts are presented for all types of IFFs, and the methodological parts focus on tax and commercial IFFs. By reviewing and assessing conceptual and methodological developments³ the *Towards a Statistical Framework for the measurement of tax and commercial IFFs* provides comprehensive and practical guidance for the application of measurement methodologies in differing national settings to compile official statistics on IFFs towards reporting of data on SDG indicator 16.4.1. As such, the document is a basis for pilot testing and further refinement based on results from its application in pilot countries within the United Nations Development Account project on *Tracking and Curbing Illicit Financial Flows*, led by ECA. The project is methodologically supported by UNCTAD and UNODC, and implemented by United Nations Regional Commissions, ECA, ECLAC, ESCAP, ESCWA, with the support of ECE in 2023-2026.

The technical paper is structured as follows: Chapter 2 reviews the main conceptual elements of IFFs and addresses the transition towards a statistical framework. While it starts off at the level of all type of IFFs, tax and commercial and crime-related IFFs, it then narrows down the focus to tax and commercial IFFs only, providing conceptual elements and linkages to existing statistical frameworks to support measurement of tax and commercial IFFs; Chapter 3 offers practical guidance to national authorities to measure tax and commercial IFFs; Chapter 4 details the methodologies to measure tax and commercial IFFs; Chapter 5 addresses aggregation of various estimates into a single value to report on SDG indicator 16.4.1, predominantly from the perspective of tax and commercial IFFs; and Chapter 6 concludes with identifying the need for further work and research. Annexes supplement conceptual and methodological parts of the text with practical tools and guidance, including step-by-step guidance for method application, themselves in several instances linked to downloadable contents in the online annexes with *Methodological Guidelines* (UNCTAD, 2021: Background documents) for direct use by national authorities.

² <https://unctad.org/project/measuring-and-curbing-illicit-financial-flows>

³ Based on the *Conceptual Framework* (UNCTAD and UNODC, 2020) and on draft version of *Methodological Guidelines* (UNCTAD, 2021).

2

FROM CONCEPTUAL TO STATISTICAL FRAMEWORK TO MEASURE TAX AND COMMERCIAL IFFS

2.1 STATISTICAL DEFINITION OF ILLICIT FINANCIAL FLOWS

The *Conceptual Framework* was endorsed by UN member States at the 53rd Session of the United Nations Statistical Commission in March 2022 (UNSC, 2022). It provides a statistical definition of IFFs as “*financial flows that are illicit in origin, transfer or use, that reflect an exchange of value and that cross country borders.*”

Thus, IFFs have the following features:

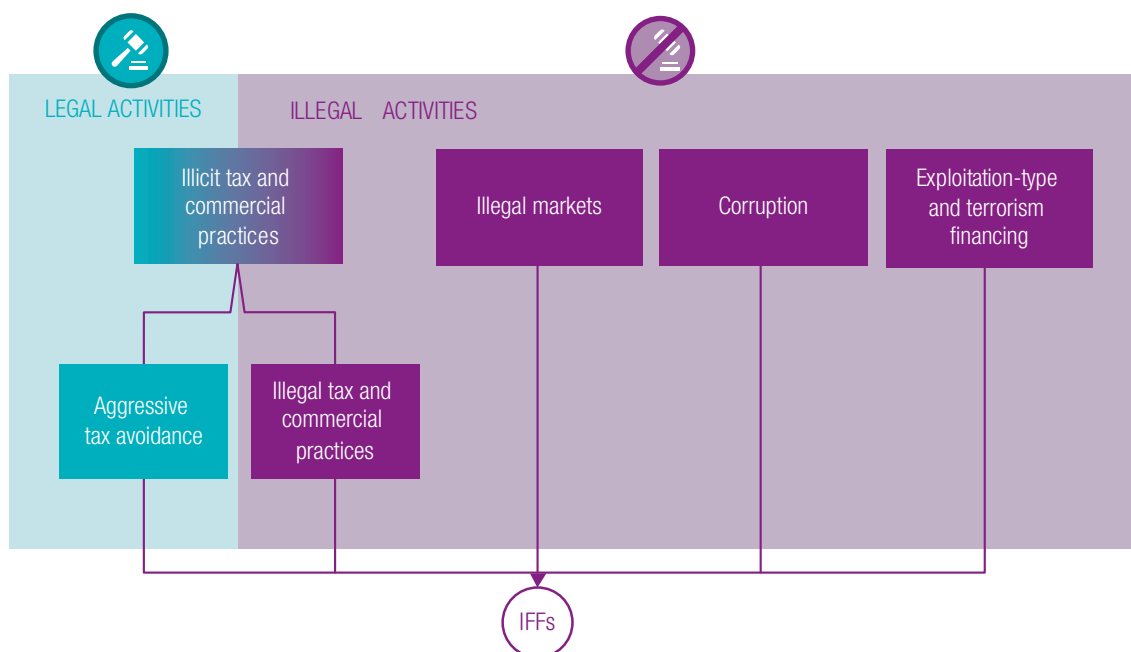
- **Illicit in origin, transfer or use.** A flow of value is considered illicit if it is illicitly generated (e.g. originates from criminal activities or tax evasion), illicitly transferred (e.g. violating currency controls) or illicitly used (e.g. for financing terrorism). The flow can be legally generated, transferred or used, but it must be illicit in at least one of these aspects. Some flows that are not strictly illegal may fall within the statistical definition of IFFs; for example, cross-border tax avoidance, which erodes the tax base of a country where that income was generated.
- **Exchange of value,** comprising more than purely financial transfers. Exchange of value includes exchange of goods and services, and financial and non-financial assets. For instance, illicit cross-border bartering, meaning the illicit exchange of goods and services for other goods and services, is a common practice in illegal markets and is considered as an illicit financial flow.
- IFFs measure a **flow of value over a given time** – as opposed to a stock measure, which would be the accumulation of value.
- **Flows that cross a border.**⁴ This includes assets that cross borders and assets where the ownership changes from a resident of a country to a non-resident, even if the assets remain in the same jurisdiction.

IFFs originating from illegal economic activities can be laundered so that subsequent transactions appear legal. While flows of capital of illegal origin should be considered as IFFs when crossing a border, since the origin is in illicit activities, it is challenging to determine the illicit origin of certain financial flows as the distance from the illicit origin increases. IFFs can also originate from legal economic activities but become illicit when managed or transferred illicitly; for instance, to evade taxes or finance illegal activities.

IFFs can be classified from many angles: sources, channels, impacts, actors involved and motives. A useful typology should prioritize a perspective that enables effective policy action and thus a link to the activities from which the IFFs arise. Figure 1, therefore, looks at the underlying activities that may generate IFFs rather than at IFFs themselves.

⁴ The proposed bottom-up measurement approach described below considers domestic illicit financial flows as part of the illegal economy as well. These flows would not fall under the definition of IFFs for SDG 16.4.1, but are of high relevance to the understanding of organized cross-border illicit flows.

Figure 1 Categories of activities that may generate illicit financial flows



Source: UNCTAD and UNODC (2020)

According to this typology, four main categories of IFFs are distinguished.

- **Illicit tax and commercial IFFs.** These include illicit practices by legal entities, as well as arrangements and individuals with the objective of concealing revenues and reducing tax burden through evading controls and regulations. This category can be divided into two components:
 - **Illegal tax and commercial IFFs.** These include illegal practices such as tariff, duty and revenue offences, tax evasion, competition offences and market manipulation amongst others, as included in the International Classification of Crime for Statistical Purposes (ICCS) (UNODC, 2015). Most of these activities are non-observed, hidden or part of the “shadow economy”,⁵ the underground economy⁶ or the informal⁷ economy that may generate IFFs.
 - **IFFs from aggressive tax avoidance.** Illicit flows can also be generated from legal economic activities through aggressive tax avoidance (for more detail, see box below). This can take place through the manipulation of transfer pricing, strategic location of debt and intellectual property, tax treaty shopping and the use of hybrid instruments and entities. These flows need to be carefully considered, as they generally arise from legal business transactions and only the illicit part of the cross-border flows belongs within the scope of IFFs.

⁵ According to the IMF, “the shadow economy includes all economic activities which are hidden from official authorities for monetary, regulatory, and institutional reasons” (Medina and Schneider, 2018: 4).

⁶ In the SNA, underground production consists of activities that are productive in an economic sense and quite legal (provided certain standards or regulations are complied with), but which are deliberately concealed from public authorities for the following reasons: a) to avoid the payment of income, value added or other taxes; b) to avoid payment of social security contributions; c) to avoid meeting certain legal standards such as minimum wages, maximum hours, safety or health standards, etc; or d) to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms (United Nations et al., 2009).

⁷ The IMF (2019) uses the following working definition of informal economy: “[T]he informal economy comprises (i) the production of goods and market services of households; and (ii) the activities of corporations (illegal; underground) that may not be covered in the regular data collection framework for compiling macroeconomic statistics. This scope of the informal economy considers not only the domestic activities, but also the cross-border transactions of resident units [...]”.

- **IFFs from illegal markets.** These include trade in illicit goods and services when the corresponding financial flows cross borders. The focus is on criminal activities where income is generated through the exchange (trade) of illegal goods or services. Such processes often involve a degree of criminal organization aimed at creating profit. They include any type of trafficking in goods, such as drugs and firearms, or services, such as smuggling of migrants. IFFs emerge from transnational trade in illicit goods and services, as well as from cross-border flows from managing the illicit income from such activities.
- **IFFs from corruption.** The ICCS, on the basis of the United Nations Convention against Corruption (2004), identifies a broad range of criminal acts to be considered as corruption. These include bribery, embezzlement, abuse of functions, trading in influence, illicit enrichment and other acts. IFFs related to corruption take place when the economic returns from these acts, directly or indirectly, generate cross-border flows and when financial assets are transferred across borders to commit these crimes.
- **IFFs from exploitation-type activities and financing of crime and terrorism.** Exploitation-type activities are illegal activities that entail a forced and/or involuntary transfer of economic resources between two actors.⁸ Examples include slavery and exploitation, extortion, trafficking in persons and kidnapping. In all such cases, the focus is on the financial benefit that an individual (or a group) gains by exploiting somebody else and/or depriving somebody of some of his/her assets. In addition, terrorism financing and financing of crime are illicit, voluntary transfers of funds between two actors with the purpose of funding criminal or terrorist actions. When the related financial flows cross country borders, they constitute IFFs.

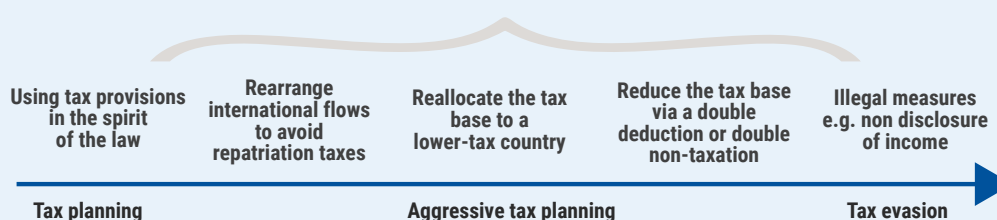
⁸ In the SNA framework, these activities are considered as non-productive as there is no mutual agreement between involved actors (United Nations et al., 2009).

Box 1 Challenges of aggressive tax avoidance and illicit financial flows

A specific conceptual challenge is to specify what kinds of activities should be designated as illicit or licit. It is noteworthy that SDG target 16.4 refers to 'illicit' instead of 'illegal' financial flows. Aggressive tax avoidance, including by multinational enterprise groups (MNEs), although usually legal, can drain resources and be considered illicit. The inclusion of tax avoidance in the definition of IFFs creates some challenges.

First, it blurs the line between legal and illegal activities. Noting that the boundary between legal and illegal tax practices may be unclear, the European Commission (2017) described the continuum of activities from legal tax planning to illegal tax evasion (see Figure 2). In this context, aggressive tax planning is described as "taking advantage of the technicalities of a tax system or of mismatches between two or more tax systems for the purpose of reducing tax liability."

Figure 2. Aggressive tax avoidance/planning



Source: European Commission (2017)

Second, stemming from this underdefined (legal) barrier, caution is required when comparing various workstreams from different organizations. OECD, for example, focuses work on IFFs on illegal aspects only, but as members of the Task Force recognize that within the *Conceptual Framework*, aggressive tax avoidance plays an important developmental element and is as such to be considered within the 2030 Development Agenda and within SDG indicator 16.4.1. Moreover, OECD's work includes base erosion and profit shifting (BEPS) activities through interest payments, strategic location of intangible assets, abuse of tax treaties, artificial avoidance of permanent establishment and transfer pricing manipulation, which constitute the aggressive tax avoidance as defined here (refer also to chapter 2.2).

The third challenge directly associated with this is the poor data availability, their interoperability and comprehensiveness. This requires methodologies proposed to assume certain behaviours and patterns by entities, in turn rendering them less methodologically sounds for statistical measurement of IFFs (see Chapter 4). International data sources are increasingly allowing more detailed and robust analysis, exploring, for example the Country-by-country reporting statistics that are released publicly in an aggregated and anonymised form and can be analysed at the microdata level by country authorities (see Bratta et al., 2021; Fuest et al., 2021, 2022), or national tax authority tax-returns microdata (e.g., Reynolds and Wier, 2016; Wier and Reynolds, 2018).

Finally, challenges may arise from purely linguistic aspect: during pilot testing within United Nations Development Account project in Asia and the Pacific⁹, it has been revealed that official translation of IFFs into Russian (official language of the United Nations) uses the word for illegal, as a direct word for illicit – and as such it cannot be applied in the context. Deliberations are being made by custodian agencies and ESCAP to provide sufficient guidance to Russian-speaking member States in addressing the issue from legal and statistical aspects (i.e., ensuring proper and sufficient coverage of the IFFs phenomenon in their measurement efforts).

⁹ <https://unctad.org/project/statistics-and-data-measuring-illicit-financial-flows-asia-pacific-region>

2.2 ILLICIT TAX AND COMMERCIAL PRACTICES

Tax and commercial IFFs, as per Figure 1, can be generated from illegal commercial activities and tax evasion, and from legal economic activities through aggressive tax avoidance. Tax and commercial IFFs may originate in the illegal economy, such as criminal activities or corruption, while they can also originate in legal economic activities but become illicit when the financial flows are managed or transferred illicitly; for instance, to evade taxes or exchange controls or when they are used to finance illegal activities. The challenge of specifying what kinds of activities should be considered illicit or licit are particularly evident in the area of tax avoidance – see Box 1.

Tax and commercial IFFs can include practices by legal entities, as well as arrangements by individuals. The actors whose actions may generate IFFs and need to be measured include (1) individuals (citizens), and (2) entities, comprising domestic firms and MNEs as well as trusts and foundations. Several studies focus on MNEs only, due to their opportunities to participate in, but also because of their sheer size or scale of conducted IFFs. Please note that distinction between whether actors come from developed or developing countries is not relevant as both developing and developed countries are affected by tax and commercial IFFs¹⁰.

Given the complexity of differing national laws and practices, and with the measurement of IFFs being a statistical exercise rather than an audit or judicial one, it is not possible to define the scope of activities for measurement in terms of their legality. The indicator is, therefore, constructed based on a typology of behaviours, events and activities that may generate IFFs. For illegal activities, we apply the ICCS (UNODC, 2015), which provides a statistical classification and definition of activities, many of which may generate IFFs, such as exploitation-type activities and terrorism, trafficking, and corruption, as well as many activities related to tax and commercial malpractices.

For illicit tax and commercial practices, activities are broken down into two categories, namely IFFs from illegal commercial and tax practices and from aggressive tax avoidance. Table 1 provides an indicative list of tax and commercial activities that may generate IFFs and identifies types of flows.

Identifying the main types of flows¹¹ that carry IFFs helps to set up a measurement framework and identify relevant data sources. Knowing the types of flows can help to identify traces of IFFs in the official economy.

¹⁰ As IFFs are closely linked to development questions within the 2030 Agenda, significant amount of empirical research on tax and commercial IFFs has focused on developing or less developed, low-income countries (e.g., Carbonnier and Mehrotra, 2018; Ahene-Codjoe et al., 2020; Nolintha et al., 2020; WCO, 2018; Global Financial Integrity, 2019). This interest is most prominent in trade misinvoicing methods to estimate IFFs which focus on commodity trade. According to Khan et. al. (2019) countries at early stages of industrialisation are 'structurally vulnerable' to trade-related IFFs.

¹¹ Referred to in some texts as channels or means.

Table 1 Activities that may generate tax and commercial illicit financial flows and types of flows

Categories	Activities	Flows
A. IFFs from illegal commercial and tax activities	A1 Acts against public revenue provisions [08041] A2 Acts against commercial or financial regulations [08042] A3 Market manipulations or insider trading [08045] A4 Acts of commercial fraud [07019] A5 Other illegal commercial and tax acts [08049+]	F1 Transfer of wealth to evade taxes, i.e., flows related to undeclared offshore wealth <ul style="list-style-type: none"> ◦ Outright undeclared (concealed e.g., in secrecy jurisdictions) ◦ Undeclared via instruments (Phantom corporations or shell companies, tax havens) F2 Misinvoicing <ul style="list-style-type: none"> ◦ Under/over pricing ◦ Multiple invoicing ◦ Over/under reporting of quantities ◦ Misclassification of tariff categories
B. IFFs from aggressive tax avoidance	B1 Acts departing from the arm's length principle B2 Acts related to strategic location of debt, assets, risks, or other corporate activities B3 Other acts of aggressive tax avoidance	F3 Transfer mispricing F4 Debt shifting <ul style="list-style-type: none"> ◦ Intracompany loans ◦ Interest payments F5 Assets and intellectual property shifting <ul style="list-style-type: none"> ◦ Strategic location of intellectual property ◦ Strategic location of other assets ◦ Cost-sharing agreements ◦ Royalty payments

Source: UNCTAD (2021)

Note: Activities in category A are based on level-3 categories of the ICCS (with corresponding codes in brackets).

The table focuses on transfers rather than sources or uses of IFFs that are of interest when describing the value chain related to the generation and management of IFFs. A more exhaustive listing of activities will be provided once a classification is developed for IFFs from aggressive tax avoidance. Money laundering, for instance, is classified under acts involving the proceeds of crime, and is, therefore, covered in methods for the measurement of IFFs from crime.¹² Similarly, IFFs from illegal markets where illegal goods and services are traded, fall under IFFs from crime. They can also make use of legal trading and banking systems.

The ICCS describes the actions and behaviours relating to each category and provides examples of the types of activities concerned. The following may generate IFFs related to tax and commercial activities:

- **A1** Acts against public revenue provisions (08041): Acts against Customs, taxation and other public revenue provisions. Included are tax evasion and corporate offences, such as tariff, taxation, duty and revenue offences and failure to register for value added taxation or Customs, or failure to remit, if these lead to cross-border flows of illicit finance. Example: IFFs from misinvoicing by entities or flows related to undeclared assets by individuals fall under this category.
- **A2** Acts against commercial or financial regulations (08042): Acts against commercial, industrial or financial regulations, including competition and fraudulent insolvency; import/export offences; acts against trade regulations, restrictions or embargoes; evasion of capital controls or exchange regulations; investment or stock/shares offences (not amounting to fraud). Example: A denial of an export license application could turn a legal exporter into an illegal exporter due to fears of financial loss and, thus, generate an IFF.

¹² Money laundering is considered here as the service offered for the laundering of proceeds of crime.

- **A3** Market manipulations¹³ or insider trading¹⁴ (08045): Unlawful market manipulation or insider trading, including trading financial products based on inside information (insider dealing); improper disclosure of market-relevant information; misuse of market-relevant information; and price fixing in so far as they generate commercial or tax IFFs and lead to flows of wealth to offshore locations (F1) or mispricing (F2) flows. Example: Market manipulation and insider trading may be linked to mispricing.
- **A4** Acts of commercial fraud (07019): insofar as these are not part of A1-A3, included are use of false weights for measure; false accounting; hiding or destroying money; and unlicensed/unregistered practice in a trade or profession in so far as they generate commercial or tax IFFs and lead to flows of wealth to offshore locations (F1) or mispricing (F2) flows. Example: False accounting could aim at hiding undeclared offshore wealth or evade taxes. Excluded: tax fraud is covered under A1 (08041).
- **A5** Other illegal commercial and tax acts: in line with ICCS includes other acts against public administration and regulatory provisions (08049) and any illegal commercial activities and tax evasion not listed above.

Two main flows related to the above acts are identified: first, the transfer of wealth out of a country by individuals to evade taxes leading to concealed or undeclared offshore wealth (F1) e.g., in secrecy jurisdictions or tax havens.¹⁵ Such flows might also be concealed using instruments, like shell companies, where borderline between categories A and B is blurred. Second, trade misinvoicing flows (F2) comprising mispricing, wrong reporting of imported or exported quantities, or misclassifying tariff categories of traded goods or services¹⁶. Trade mispricing may involve over or under pricing that wrongly states the true price in import or export documentation.

The identification of activities and flows related to IFFs from aggressive tax avoidance for the purposes of pilot testing is indicative and based on previous work, for instance on informal economy (IMF, 2019), non-observed economy (OECD, 2002), corporate tax avoidance (Beer et al., 2018), aggressive tax planning (European Commission, 2017) and base erosion and profit shifting (BEPS) (OECD, 2013, 2015). Base erosion refers to lowering the tax base of a company, thus reducing its taxes paid, whereas profit shifting refers to shifting profits away from the jurisdictions where the activities creating those profits take place (OECD, 2013). According to OECD (2013) activities considered as aggressive tax avoidance can include interest payments, strategic location of intangible assets, abuse of tax treaties, artificial avoidance of permanent establishment and transfer pricing manipulation.

Similar to ICCS, UNCTAD defines initial activities for category B, IFFs related to aggressive tax avoidance, presented in Table 1, as:

- **B1** Acts departing from the arm's length principle: Under the current international tax architecture, transactions between related parties should be conducted on an arm's length prices basis. According to OECD (2017), transactions should be valued as if they had been carried out between unrelated parties, each acting in their own best interest. Where firms engage in transfer mispricing among the

¹³ Market manipulation is defined as entering into a transaction, placing an order to trade or any other behaviour which gives a false or misleading signal as to the supply of, demand for, or price of, a financial instrument or a related spot commodity contract; or secures the price of one or several financial instruments or a related spot commodity contract at an abnormal or artificial level (UNODC, 2015).

¹⁴ Insider trading is defined as possessing inside information and using that information by acquiring or disposing of, for its own account or for the account of a third party, directly or indirectly, financial instruments to which that information relates (UNODC, 2015). It is used synonymously with insider dealing as in European Union (2014).

¹⁵ According to Murphy (2016), secrecy jurisdictions intentionally create regulation for the primary benefit and use of non-residents and create a deliberate, legally backed veil of secrecy.

¹⁶ Relationship between the real and financial economy needs to be carefully considered, as they do not necessarily flow in opposite directions: IFF inflows do not automatically mean outflows (export) of goods or services. Rather, exports of goods can create either inflows or outflows of IFFs. Underpriced export of goods from country A to country B represents IFF outflows for country A (and IFF inflows for country B); when the same export is overpriced, IFF inflows into country A are being generated (and IFFs outflows for country B).

units of an MNE (with differing corporate tax rates), they depart from the arm's length principle with a view to shifting profits to avoid taxes.

- **B2** Acts related to strategic location of debt, assets, risks, or other corporate activities: These can include strategic location of debt as noted by OECD (2013) to inappropriately reduce the earnings base of the issuer. To this end, interest costs are deducted from generated turnover reducing tax base (European Commission, 2017). This group also includes the shifting of intellectual property to locations (MNE units) with higher income tax rates, thereby reducing their tax base via royalty payments. Direct investment relationship through equity or debt leverages FDI links to profit shifting (UNCTAD, 2015).
- **B3** Other acts of aggressive tax avoidance. This category includes any other acts with the purpose of aggressive tax avoidance that are not described or classified in categories B1-B2.

The above acts of aggressive tax avoidance can lead to several types of flows, including transfer mispricing (F3) which may involve stretching or violating the arm's length principle; flows related to debt shifting (F4) through intracompany loans and related interest payments which can manifest as excessive borrowing in high-tax countries and lending to low-tax countries; flows resulting from the strategic location of intangible assets, such as intellectual property (F5) to low-tax countries to reduce taxes on associated income and capital gains and shifting profits e.g., through royalty payments or cost-sharing agreements¹⁷.

Different types of strategies or settings can further support shifting profits and generating above-mentioned flows of IFFs (see Beer et al., 2018), such as tax treaty shopping¹⁸ or transfers via hybrid instruments and entities (e.g., phantom corporations¹⁹, shell companies²⁰, special purpose entities (SPEs)²¹, corporate inversions²²).

Three main types of flows can be identified from the above. First, the transfer of undeclared wealth to offshore locations by individuals (F1); second, trade misinvoicing by entities (F2); and third, aggressive tax avoidance or profit shifting by MNEs (F3-F5) (Figure 3).

¹⁷ A cost-sharing agreement is a contract between related parties specifying how they will share the costs of developing intangible assets, and how they will arrange the rights to exploit the intangible assets once developed (Dyreg and Markle, 2015).

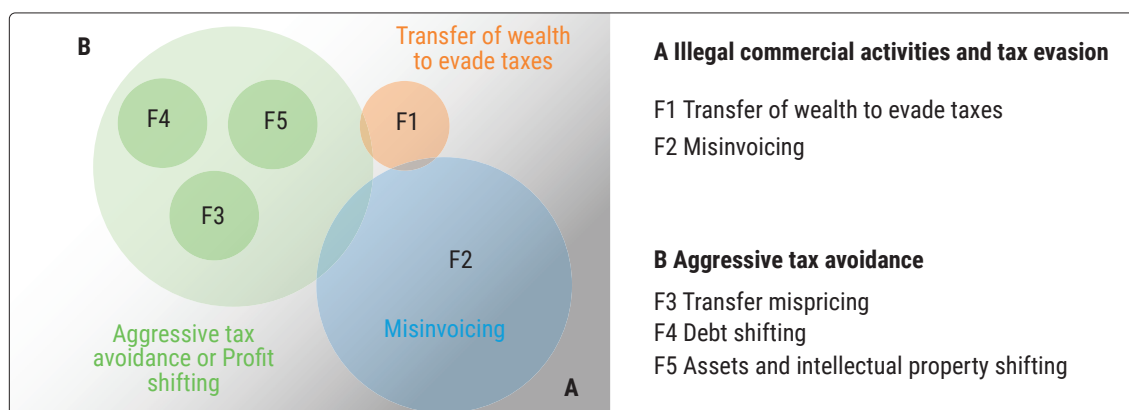
¹⁸ With tax treaty shopping, entities, including MNEs, have access to a broader range of (potentially mismatching) tax systems and pairs of bilateral tax treaties, creating scope for 'treaty abuse', as noted by OECD (2015). Tax treaty shopping involves the improper use of a double taxation agreements (DTAs), whereby a (legal) person acts through an entity created in another state with the main or sole purpose of obtaining treaty benefits which would not be available directly to such a person (HM Revenue and Customs of the United Kingdom, 2016).

¹⁹ There is no commonly agreed definition of phantom firms. ONE (2013) defines them as "secretive companies or trusts used by *international criminals and corrupt businesses to hide money, rip off governments and siphon off cash that could be used to pay for health care, education or vital infrastructure investment.*"

²⁰ EPRS (2018) states that shell companies in a country "have no (or few) employees and/or no (or little) production and/or no (or little) physical presence". The study however, notes that a clear definition does not exist; rather, it is research-driven, and identifies three types of shell companies, SPE being one of the types of shell companies.

²¹ IMF (2018) defines SPE as "a *formally registered and/or incorporated legal entity recognized as an institutional unit, with no or little employment up to maximum of five employees, no or little physical presence, and no or little physical production in the host economy.*"

²² Corporate inversions can take the form of a merger with a foreign entity, which then results in the former domestic parent becoming a subsidiary of the new foreign parent (even though the shareholders of the original domestic company may retain more than 50 per cent of the shares in the new corporation) (Beer et al., 2018).

Figure 3 Main types of tax and commercial illicit financial flows

Source: UNCTAD (2021)

It may be useful to attempt in-depth measurement of different types of profit shifting flows (F3-F5), for feasibility, however, this document proposes an aggregated estimate of profit shifting.

2.3 MEASURING ILLICIT FINANCIAL FLOWS WITHIN EXISTING STATISTICAL FRAMEWORKS

Integrating the measurement of IFFs in existing statistical frameworks is important for consistency, exhaustiveness, and the overall quality of estimates. Using existing statistical concepts and definitions also enables reusing data of statistical authorities, thus reducing compilation costs and burden to respondents. It can also enrich the analytical power of IFF estimates if they can be linked with other statistical data to assess their impacts, e.g., the economic or social consequences. Aligning with current statistical practice helps countries absorb the measurement of IFFs and promotes international comparability. Two frameworks are of particular importance: the SNA and the BoP.

The 2008 SNA (United Nations et al., 2009) defines a transaction as “an economic flow that is an interaction between institutional units by mutual agreement”²³. In the SNA, each transaction that satisfies the principle of “mutual agreement” between parties is to be included within the production boundary, i.e., as a productive activity, whether or not it is legal. The European Commission (2018) emphasizes that all economic phenomena irrespective of whether they are legal or illegal should be included in macroeconomic statistics. While only productive activities generate value added, non-productive activities can also transfer value from one actor to another.

The indicator on IFFs should measure all IFFs whether they are considered productive activities or not, and even in cases where there is no mutual agreement, for instance in the case of embezzlement or theft. According to the European Commission (2018), there is no mutual agreement between the tax evader and the tax administration. Tax evasion is outside of the SNA production boundary. However, transactions taking place between the evader and its counterpart (e.g., through misinvoicing, undeclaring of assets through tax havens) are mutually agreed and may originate in legal economic activities. To link IFFs with the SNA and the BoP, it is important to know which activities are already covered in the accounts and

²³ Note that, as also observed in chapter 2.3, economic action differs from economic transaction, the latter implying mutual agreement.

which ones are not. Some flows, like the exploitation type²⁴, that fall outside of the SNA production boundary, could still be accounted for in the national accounts and BoP statistics as 'other flows'²⁵.

Many illicit activities are intertwined, such as bribery related to trade mispricing. Separate accounting of income generation and income management can help to avoid some of the potential overlaps and to be consistent with the SNA, BoP and other statistical frameworks (UNCTAD and UNODC, 2020)²⁶:

- **Illicit income generation** includes the set of cross-border transactions that are either performed in the context of the production of illicit goods and services or generate illicit income for an actor during a non-productive illicit activity; and
- **Illicit income management** refers to cross-border transactions that use illicit income to invest in financial and non-financial assets or to consume goods and services.

Income generation can be represented by three main aggregates: gross output, intermediate expenditure (or intermediate costs) and value added (which also represents the net income for the actors).

- **(Illicit) gross output** refers to the value of the illicit goods or services produced in a given period. The value is determined as quantity-times-price (where the price is, for example, the retail price in the domestic market, or the export price if goods are exported).
- **(Illicit) intermediate expenditure** refers to the value of (licit and illicit) inputs acquired to produce illicit goods and services over a given period. The value of inputs is determined as quantity-per-price (where the price is, for example, the domestic price if the goods are bought from a resident, or the import price if the goods are bought from a non-resident).

(Illicit) value added/(illicit) net income is the economic result of the productive process. It is determined as gross output-minus-intermediate expenditure. It also represents the net income (income after accounting for costs) earned by all actors carrying out the illicit activity.

2.3.1 *Income generation/income management framework for tax and commercial illicit financial flows*

This section applies the concepts of income generation and income management to illicit tax and commercial practices, which is also helpful for linking with international statistical standards (i.e., SNA and BoP).

IFFs are generated by cross-border transactions carried out by individuals and/or corporations (i.e., economic agents) in which the exchanged resources (i.e., commodities, goods, services, financial and non-financial assets) are illicit in origin and/or use or when, though licit in their origin and use, the modality of the transfer is illicit.

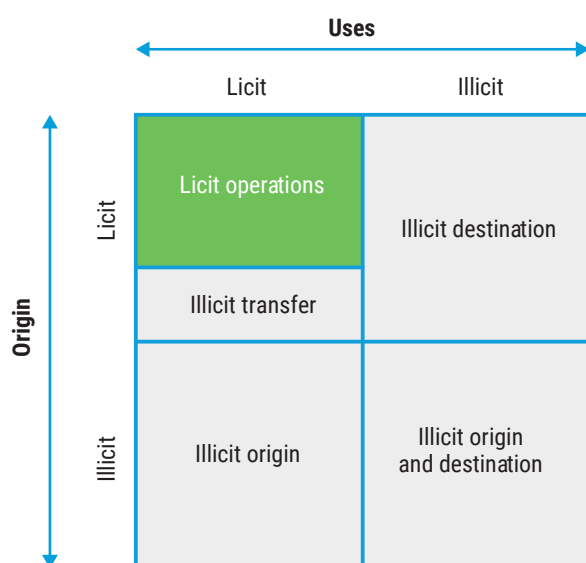
The origin/use matrix in Figure 4 conceptualises the generation of IFFs. Excluding the green part of the upper-left corner, other types of transactions generate IFFs as they involve resources that are illicit in origin and/or destination or that, though licit, are exchanged in an illicit way. This scheme can be used as a first step to interpret transactions and classify them into the scope of IFFs identification and measurement.

²⁴ Exploitation-type activities are illegal activities that entail a forced and/or involuntary transfer of economic resources between two actors. They fall outside the scope of the SNA, since there is no mutual agreement between parties (UNCTAD and UNODC, 2020).

²⁵ European Commission (2018) defines other flows as "*genuine economic phenomena and capture changes in assets and liabilities between opening and closing positions that are not due to transactions*", which is in line with 2008 SNA definition of other flows.

²⁶ While this technical paper in this and the following chapter addresses the issue, further methodological work will provide its comprehensive linkage to and integration with standards such as SNA and BoP.

Figure 4 Origin/use framework and the generation of IFFs



Source: UNCTAD (2021)

Transactions may involve different kind of resources and rationales: goods and services may be acquired in order to either carry out production processes (i.e., intermediate consumption) or to be consumed (i.e., final consumption) or invested (i.e., investments), where investments may in turn involve either financial or non-financial assets.

Transactions may be classified by economic agent, object, function etc. Clustering transactions by function allows for grasping the rationale for the economic operations generating IFFs and presenting them coherently within the origin/destination scheme.

The operations that economic agents (e.g., individuals, corporations, public administrations) carry out contribute, on one hand, to determining the amount of income they have at their disposal and, on the other hand, determining how this disposable income is spent in either final consumption or investments (savings).

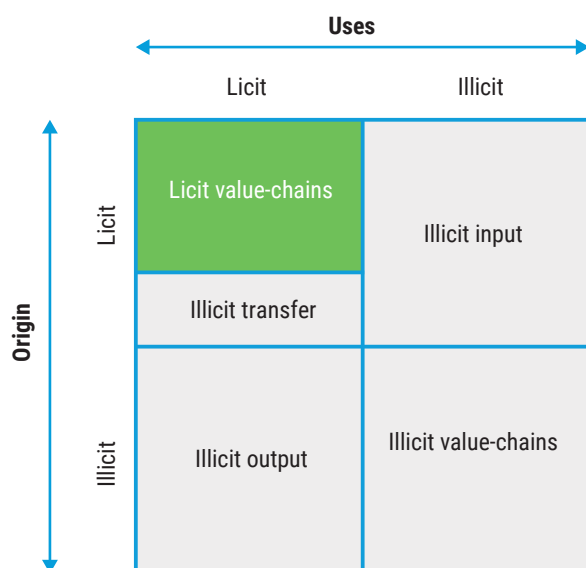
Taking this perspective, transactions can be classified into income generation operations (IGOs) and income management operations (IMOs) according to the finality (i.e., determination of disposable income or definition of the use of the disposable income) of the transaction.

In particular:

- IGOs include all transactions (and transfers) that generate the income of individuals or corporations (e.g., intermediate consumption, production, salaries, interests and dividends);
- IMOs include all transactions involving the use of the disposable income (e.g., consumption of goods and services, acquisition and disposal of financial and non-financial assets).

Matching the definition of IGOs and IMOs with the origin/destination framework shown in Figure 4, two different matrices can be derived to interpret the type of transactions that may generate IFFs. Figure 5 shows IGOs in the origin/use framework.

Figure 5 Origin/use framework and income generation operations (IGOs)



Source: UNCTAD (2021)

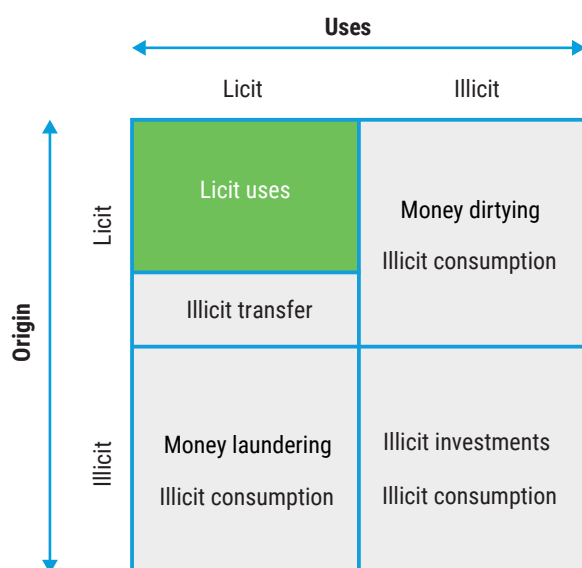
Five types of IGOs may emerge:

- Licit value chains, when both the activity that produces the output and the one that uses the good/ service as input are licit;
- Illicit transfers, when, though both activities are licit, the exchange is carried out in an illicit way;
- Illicit value chains, when both activities are illicit;
- Illicit output, when the activity that produces the output is illicit whereas the one that uses the good/ service as input is licit;
- Illicit input, when the activity that produces the output is licit whereas the one that uses the good/ service as input is illicit;

Figure 6, in turn, shows IMO in the origin/use framework and here five types of operation may emerge:

- Licit uses, when both the origin of the income (the productive and distributive actions) and its use (the goods/services consumed and the assets acquired) are licit;
- Illicit transfers, when, though both the origin of the income and the use are licit, the transaction is carried out in an illicit way;
- Illicit investments/illicit consumption, when both the origin of the income and its use are illicit;
- Money “dirtying”/illicit consumption, when the origin of income is licit whereas the use is illicit;
- Money laundering/illicit consumption, when the origin of income is illicit whereas the use is licit;

Figure 6 Origin/use framework and income management operations (IMOs)



Source: UNCTAD (2021)

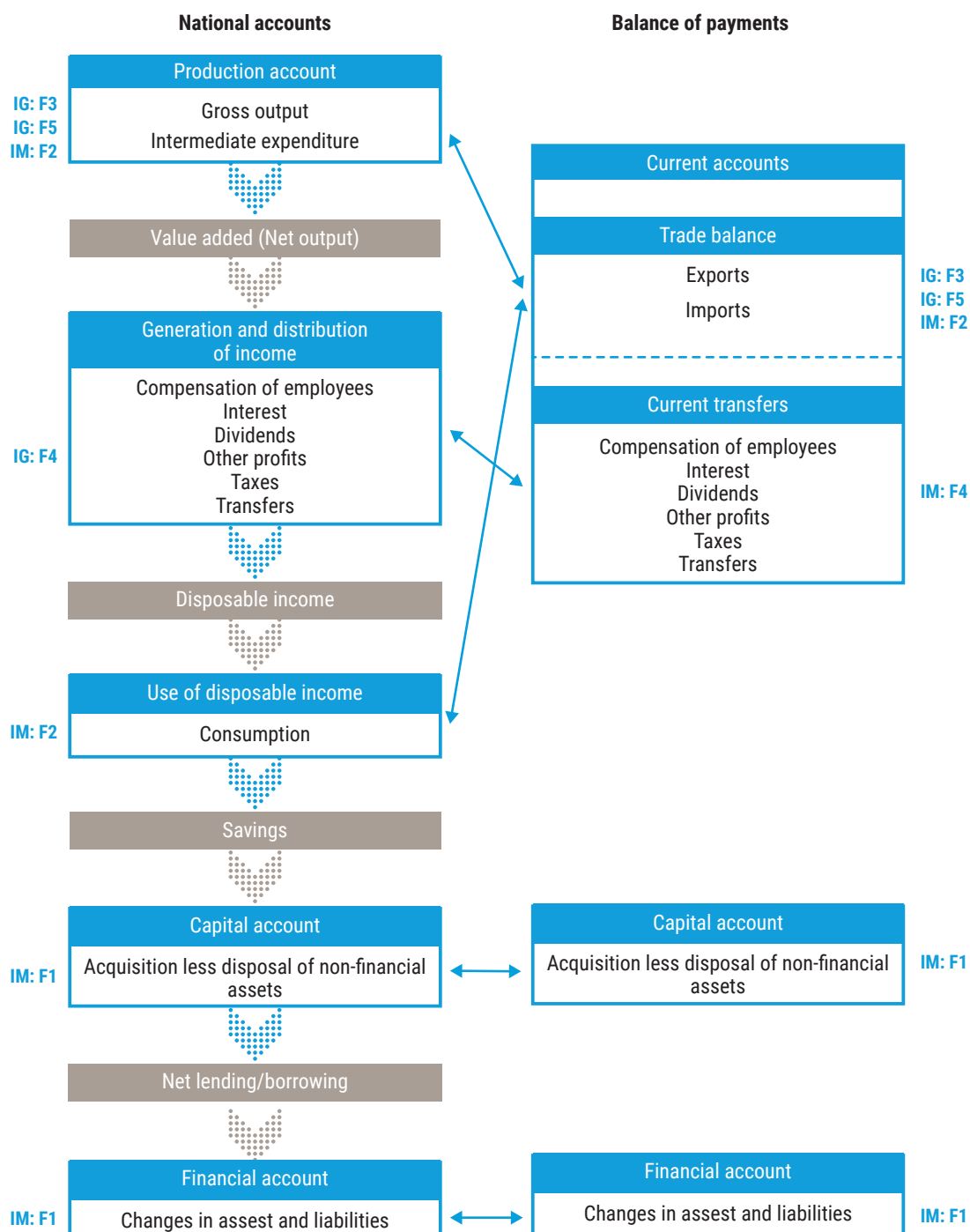
Each type of (licit or illicit) practices that generates IFFs can be classified and interpreted. They generate flows that may be included in the taxonomy according to the characteristics of the given practices and the nature of the transaction in terms of object (i.e., licit/illicit goods/services/assets) and function (i.e., production, distribution, consumption, investments).

2.3.2 *Income generation and income management in the sequence of national accounts and balance of payments*

This IGO/IMO matching between SNA/BoP and the statistical framework for measuring IFFs allows tracking down how and where IFFs are (or should be) included in the SNA and the BoP. Furthermore, this also allows defining how the different practices generating IFFs are (or should be) conceptually positioned in the sequence of accounts.

As Figure 7 shows, the SNA takes the form of a sequence of accounts representing the way in which value added is generated, distributed and used by resident agents (also considering the interaction with non-resident ones) in order to modify the net position of an agent (or a country) with respect to the rest of the world. IGO or IMO, as well as related flows (as defined in Table 1) are clearly marked in the figure.

Figure 7 Sequence of accounts and main items in the national accounts and balance of payments



Source: UNCTAD (2021)

In particular, production account represents the generation of value added as the result of the production of an output starting from a set of inputs. The generation and distribution of income account shows in turn how the value added is distributed among the factors of production as compensation of employees and different kinds of profits (e.g., interests, dividends, withdrawals, mixed income) in order to generate

the primary income of agents. A second level of distribution of income relates to taxation and current transfers, which contribute to modify the allocation of income among agents defining their disposable income. This amount of resources can be consumed or saved, and the choice between the two uses is represented in the use of income account. Savings contribute to fund the net acquisition of non-financial assets (acquisition less disposal), represented in the capital account. In this context, if savings are higher than the amount of resources needed for the net acquisition of non-financial assets then a positive financial position emerges (net lending). Conversely, if savings are lower than the given amount, then a negative financial position emerges (net borrowing). A positive or negative position of agents involves a change in the stock of their assets and liabilities registered in the financial account: the net change (assets less liabilities) has to be equal in amount and coherent in sign with respect to the net position resulting from the capital account.

This sequence of accounts can be compiled for each resident agent (normally by institutional sector, which includes residents by typology), also taking into account their interaction with non-residents. In this respect, the BoP is a complement of SNA, considering the relationships between residents and non-residents along the whole sequence of accounts. Indeed, as Figure 7 shows, BoP takes the form of an analogous sequence of accounts with respect to SNA, representing the way in which residents in the given country interacts with the rest of the world.

Current account of BoP includes all the operations that relate to production, generation and distribution of income, and the use of disposable income. In particular, trade balance (exports net imports) includes the operations connected with production account (e.g., export of output and import of intermediate inputs), and the use of disposable income (e.g., imported consumption). Current transfers include cross-border (inward and outward) flows linked to the generation and distribution of income (e.g., compensation of non-resident workforce, remittances, payments of dividends or interests to non-residents). Capital account of BoP registers cross-border flows connected with the acquisition and disposal of non-financial assets, contributing to define the final position of a country as net borrower or net lender. Finally, financial account of BoP registers financial operations aimed at balancing the real position of the given country with respect to the rest of the world.

In this framework, cross-border movement of resources (current, capital or financial) have to be registered in order to define the relative position of a given country with respect to the rest of the world. Current and capital accounts of BoP define the way in which cross-border flows contribute to generate the final position of the country (as net lender or net borrower). Financial account of BoP stresses the way in which a negative position (net borrowing) is financed by selling (financial) assets abroad or, symmetrically, a positive position (net lending) finances the acquisition of foreign (financial) assets.

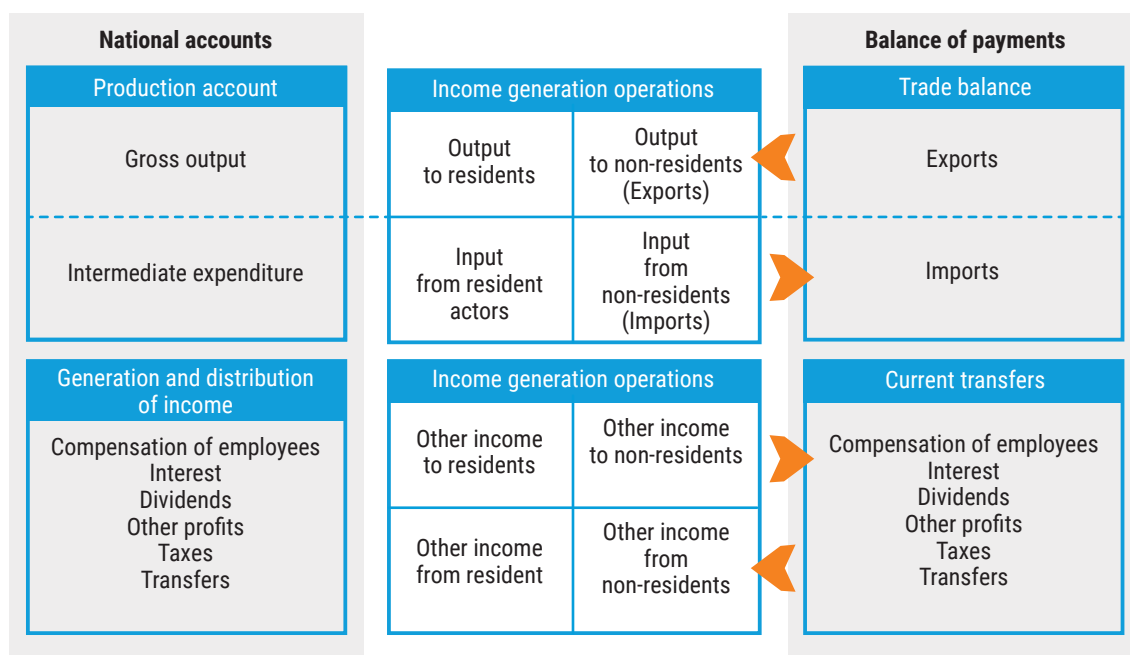
The SNA and BoP compose therefore a combined framework permitting to register any flow of resources in both a domestic and a cross-border perspective. In particular, the SNA contains the information included in BoP and represents the general framework from a country perspective. The structure of this combined framework also permits to define the final position of each resident agent (or country, as the whole set of residents), taking into account their interaction with non-resident agents (or foreign country, as the set of non-residents residing other countries).

Looking first at income generation in the SNA and BoP, IGOs refer to transactions related to productive and distributive operations. In particular, IGOs include transactions related to production processes (e.g., selling out goods and services, acquisition of productive inputs) and to the formation and distribution of income (e.g., pay/receive interest and dividends or other form of profits, compensation of employees, other transfers including those with Public Administration).

Taking into account the sequence of accounts presented in the preceding paragraph, therefore, IGOs can be split into two sub-categories: productive and distributive operations. In this context, Figure 8 shows where different sub-categories of IGOs are included in SNA and BoP.

Transactions related to production processes are included in the production account in SNA (i.e., gross output, intermediate consumption) and, where involving an exchange with non-resident agents in the trade balance of BoP (i.e., imports, exports). Concerning IFFs (orange arrows in Figure 8), only cross-border operations are considered and the direction of flows (inward or outward) is the opposite with respect to the one of the good/service traded (i.e., imports generate outward IFFs, exports generate inward IFFs).²⁷

Figure 8 IGOs and the sequence of accounts of the national accounts and balance of payments



Source: UNCTAD (2021)

Transaction referred to distributive actions are instead included in the generation and distribution of income account in the SNA (according to the type and direction of flow, e.g., dividends, interests) and, where involving an exchange with non-resident agents in the current transfers in the BoP (according to the type and direction of flow, e.g., dividends, interests). Also in this case, only cross-border operations fall into the scope of IFFs (orange arrows in Figure 8) and the direction of flows (inward or outward) follows the one of the related transfer (e.g. payment of interest generates outward IFFs, receiving dividends generates inward IFFs).

As for income management within the SNA and the BoP, IMOs refer to transactions related to the use of disposable income. They include transactions related to consumption (i.e., acquisition of goods and services) and investments (i.e., acquisition and disposal of financial and non-financial assets).

IMOs can be split into two sub-categories, in this case according to the nature of the object of the operation (i.e., goods/services and non-financial assets or financial assets). Figure 9 shows where different sub-categories of IMOs are included in the SNA and the BoP.

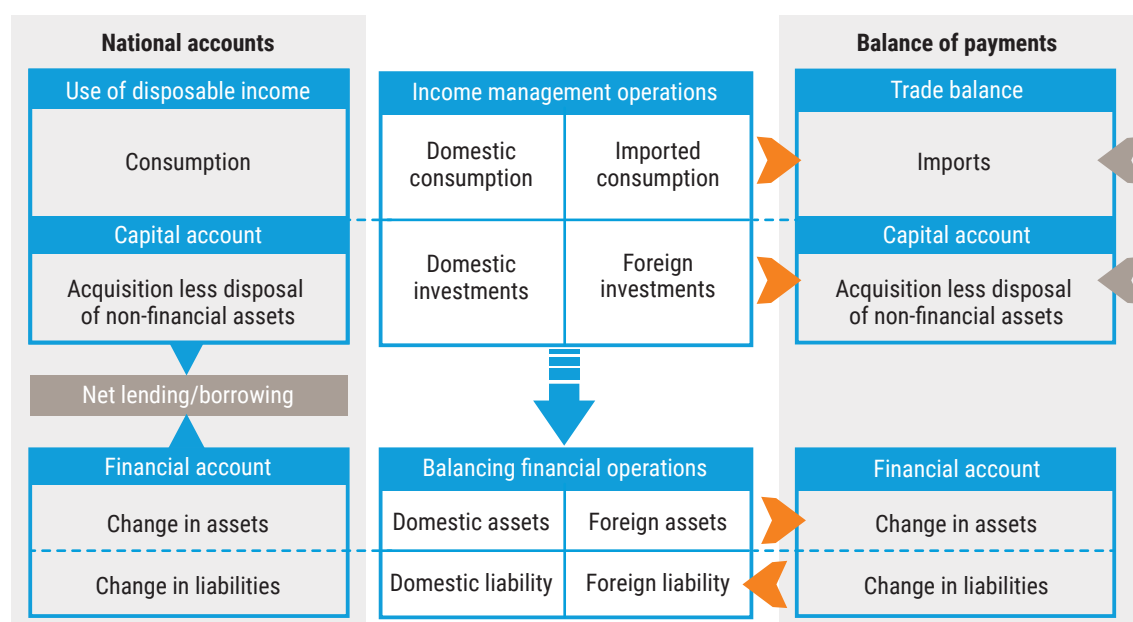
Transactions related to goods/services and non-financial assets fall in the use of disposable income account (i.e., consumption of goods and services) or into the capital account (i.e., acquisition or disposal

²⁷ The opposite direction of goods/services and financial flows is to be intended as a general rule that may be reversed in case of peculiar type of fraud such as misinvoicing in international trade (see below). Indeed, exports under-invoicing generates outward IFFs (even though exports generally involve inward financial flows), while imports over-invoicing generates inward IFFs (even though imports generally involve outward financial flows).

of non-financial assets) in the SNA. If the exchange involves non-resident agents, the transaction should also be registered in the trade balance (i.e., consumption of goods and services) or in the capital accounts (acquisition of non-financial assets) in the BoP.

In the case of IFFs, where only cross-border operations are under analysis, the use of income (as consumption or investments) generate outward IFFs (orange arrows in the upper part of Figure 9). Inward IFFs (grey arrows in the upper part of Figure 9) are instead generated when non-resident agents use their illicit income in order to buy goods/services produced in the given country or when they acquire non-financial assets (which are disinvested by the given country).

Figure 9 IMO and the sequence of accounts of the national accounts and balance of payments



Source: UNCTAD (2021)

Transactions related to financial assets fall into the financial account in both the SNA and the BoP (as changes in assets and liabilities). Operations on financial assets and liabilities are the financial counterpart of the whole set of real operations carried out by residents (also with non-residents), and have also the role of balancing their final position in terms of net borrowing/lending. Cross-border operations on financial assets generate IFFs according to the direction of the transaction (i.e., inward IFFs when liabilities (assets) increase (decrease), outward IFFs when liabilities (assets) decrease (increase)).²⁸

2.3.3 How to interpret different tax and commercial IFFs in income-generation/income-management-operations framework

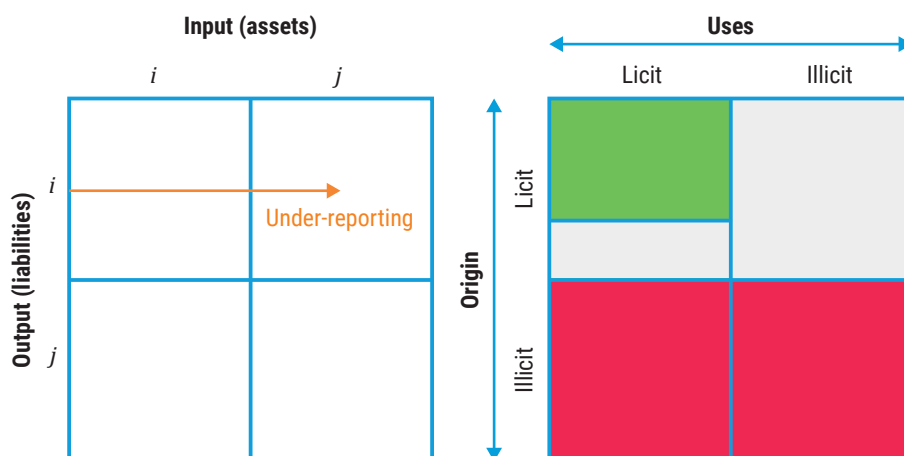
This section describes how different illicit tax and commercial practices generating IFFs (as defined in Table 1) can be classified and interpreted in the IGO/IMO framework and where the relative flows can be (or already are) registered in SNA and BoP. Five flows are analysed under the following headings.

²⁸ Exogenous changes in the value of assets and liabilities (e.g., capital gains, change in the value of bonds) are not taken into account in this treatment.

Undeclared offshore wealth (F1)

Undeclared offshore wealth refers to misreporting of non-financial and/or financial assets with the aim of under-reporting the wealth which is held by resident of higher taxation countries (country i) in countries with lower taxation or less transparent financial systems (country j). The left-hand side of Figure 10 provides an input/output representation of undeclared offshore wealth.

Figure 10 Undeclared offshore wealth (F1)



Source: UNCTAD (2021)

The under-reporting of financial and/or non-financial assets refers to transactions in which those resources have been acquired by residents in country i as a way to use their income, and the related flow falls therefore in IMOs. Referring to the taxonomy in Figure 6, under-reporting of offshore wealth may fall in different categories according to the nature of both the income and the investment.

Undeclared assets could be in principle both licit and illicit, while the income that finances their acquisition is illicit by definition (otherwise there was no incentive to under-report). Consequently, undeclared offshore wealth can be included in the two lower portions of the classification matrix of IMOs (see the right-hand side of Figure 10): money laundering (when the undeclared asset being invested in is licit) or criminal investments (when the undeclared asset is illicit). In terms of direction of flows, undeclared offshore wealth generates inward IFFs for country j (the country that sells the asset) and outward IFFs for country i (the country that acquires the asset).

Transactions behind undeclared wealth are linked to the acquisition and disposal of financial and/or non-financial assets. Therefore, from a SNA perspective they should be registered in capital account or financial account according to whether non-financial or financial assets are involved, and the same holds for BoP.

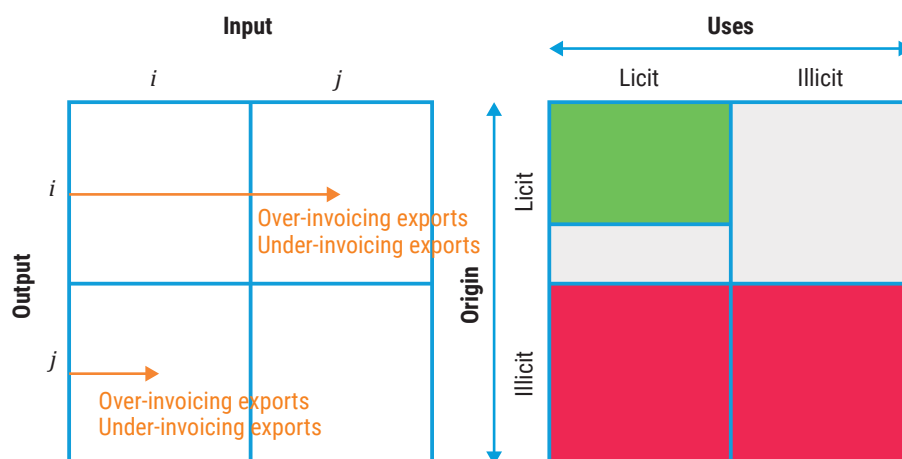
Trade misinvoicing (F2)

Trade misinvoicing occurs when licit transactions between trading partners are misreported to fiscal and control authorities in order to shift money among countries (or evade custom duties). In particular, taking countries i and j , four scenarios can be distinguished based on the characteristics of the possible asymmetries in mirror invoicing:

- $IMP_i > EXP_j$ (import over-invoicing)
- $EXP_i < IMP_j$ (export under-invoicing)
- $IMP_i < EXP_j$ (import under-invoicing)
- $EXP_i > IMP_j$ (export over-invoicing)

From the perspective of country i , over-invoicing imports and under-invoicing exports may generate IFFs aimed at retaining or moving resources abroad (outward IFFs). Under-invoicing imports and over-invoicing exports can be associated with custom fraud (on duties or export credits respectively) and involve inward IFFs for country i . The left-hand side of Figure 11 provides an input/output representation of trade misinvoicing.

Figure 11 Trade misinvoicing (F2)



Source: UNCTAD (2021)

Though relating to imports and exports of goods and services, trade misinvoicing cannot be included in productive operations. Indeed, the misevaluation does not involve the value of the good/service (as in the case of transfer mispricing or assets shifting) but only the registration. The practice, therefore, would not be connected with the shifting of costs and revenues but it would seem more related to the possibility of shifting money to be used from one country to another, thus falling in the class of IMOs. The case of custom fraud is an exception to this conceptualization: in this case, trade misinvoicing can be considered as part of productive operations and would fall in the class of IGOs.

Trade misinvoicing may generate different types of IMOs according to whether the origin and destination of income are licit or illicit (right-hand side of Figure 11). Indeed, an income of licit origin can be shifted abroad to be used in illicit ways (i.e., money “dirtying” as defined in Figure 6, the upper right portion of the matrix also in Figure 11), while an income of illicit origin can be shifted abroad to be used in both licit (i.e., money laundering, the lower left portion of the matrix) or illicit (i.e., criminal investments, the lower right portion of the matrix) ways.

Flows connected with trade misinvoicing should be registered as imports/exports in the production account of SNA (and in the use of income account in the balance of current cross-country operation item) and in the trade balance of BoP.

Transfer mispricing and assets shifting (F3 and F5)

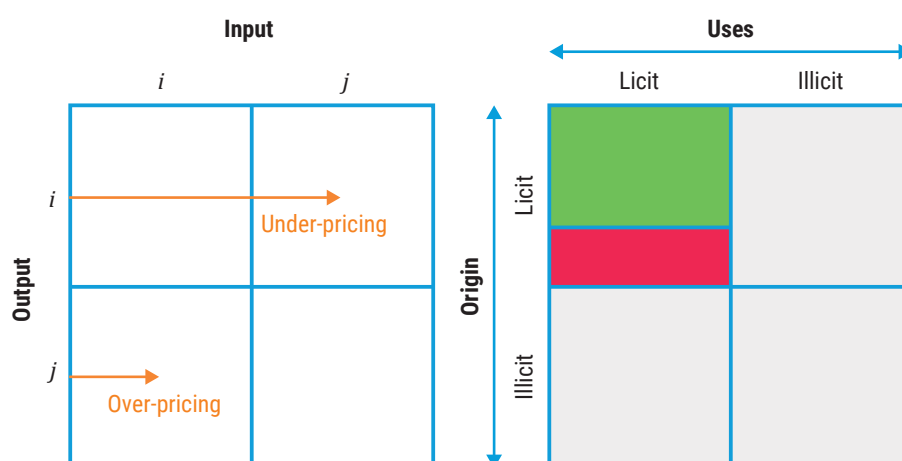
Transfer mispricing and assets shifting are finalised to shift profits among different units of a MNE group by under/over pricing productive inputs (e.g., components) or assets (e.g., intellectual property products) with the aim of distributing intra-group costs and revenues to let the bulk of profits emerge in the country with lower taxation.

The left part of Figure 12 provides an input/output representation of both transfer mispricing and assets shifting. Let i be a country with higher taxation than country j . Transfer pricing/assets shifting takes the form of either an overpricing of the input (output) acquired (sold) by the business unit resident in country i

(country j) or an underpricing of the input (output) acquired (sold) by the business unit resident in country j (country i).

Both practices relate to production processes and should therefore be included in the IGOs framework. In particular, referring to the taxonomy in Figure 5, transfer pricing/assets shifting refer to licit output used as input in licit production processes while the transaction is carried out in an illicit way (the red portion of the upper-left portion of the classification matrix show in the right part of Figure 12). In this context, IFFs generated by transfer pricing and assets shifting are normally inward (outward) for the country that receive the over (under) payment.

Figure 12 Transfer mispricing and assets shifting (F3 and F5)



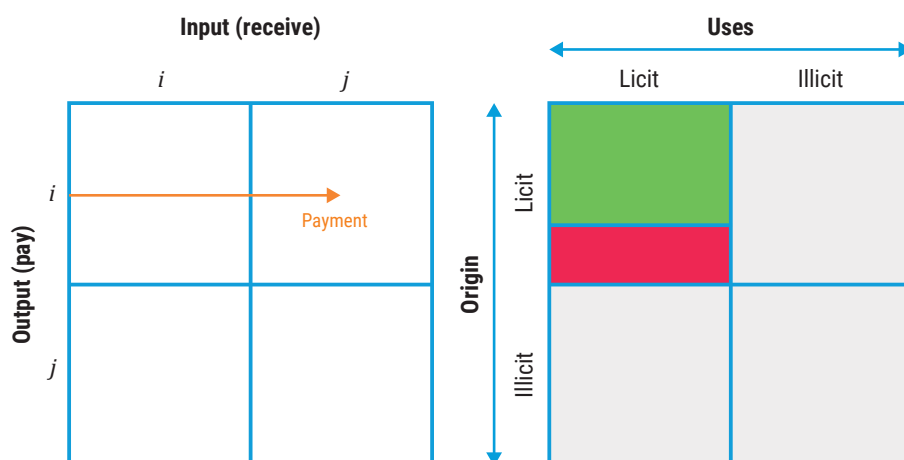
Source: UNCTAD (2021)

Transactions associated with transfer mispricing and assets shifting should be included in the production account of SNA (as output or intermediate costs according to the direction of the transaction) and in the trade balance of BoP (as import or export of goods/services according to the direction of the transaction).

Debt shifting (F4)

Debt shifting relates to intra-MNE borrowing/lending of financial resources that allows multinational groups for distributing negative financial position in countries characterised by higher taxation levels. The payment of interest reduces the tax base for determining the taxation of income. Indeed, the flow of interests represents a cost for the business unit in country i (the country with higher taxation level) and a revenue for the business units in country j . The left part of Figure 13 provides an input/output representation of debt shifting.

The flow of interests (the repayment of the debt) involved in debt shifting contributes to determine the income of agents and should therefore be included in IGOs. In particular, referring to the taxonomy of IGOs in Figure 5, debt shifting refers to a licit payment of interest by the borrower (output) which is licitly received by the lender (input) while the transaction is carried out in an illicit way. The practice is therefore included in the box highlighted in red in Figure 13. In this context, IFFs generated by debt shifting are normally inward (outward) for the country that receive (pays) the flow of interest.

Figure 13 Debt shifting (F4)

Source: UNCTAD (2021)

Transactions connected with debt shifting (the flow of interests) should be included in the generation and distribution of income account of SNA (as paid or received interests according to the direction of the transaction) and in the current transfer of BoP (as paid or received interests according to the direction of the transaction).

Based on the definitions provided in the preceding paragraphs, illicit tax and commercial activities can be qualified and taxonomized to obtain a comprehensive interpretative framework.

In this regards, Table 3 shows, for each tax and commercial IFFs, the type of flow involved, the function of the operation, how they can be classified into income generation/income management classification and how they are included in SNA and BoP.

Table 2 Characteristics of tax and commercial IFFs

Flow	Type	Object of the flow	Function of the operation	SNA		BoP		
				IG/IM taxonomy	Account	Item	Account	Item
Transfer mispricing	F3	Goods/ Services	Production	IGOs	Production account	Output, Intermediate costs	Trade balance	Imports, Exports
Assets shifting	F5	Goods/ Services	Production	IGOs	Production account	Output, Intermediate costs	Trade balance	Imports, Exports
Debt shifting	F4	Interests	Distribution of income	IGOs	Generation and distribution of income account	Pay/Receive interests	Current transfer	Pay/ Receive interests
Undeclared offshore wealth (non-financia) assets)	F1	Financial assets	Use of income	IMOs	Financial account	Acquisition less disposal of financial assets	Financial account	Acquisition less disposal of financial assets

Flow	Type	Object of the flow	Function of the operation	SNA		BoP		
				IG/IM taxonomy	Account	Item	Account	Item
Undeclared offshore wealth (Financial assets)	F1	Non-financial assets	Use of income	IMOs	Capital account	Acquisition less disposal of non-financial assets	Capital account	Acquisition less disposal of non-financial assets
Trade misinvoicing (general)	F2	Goods/ Services	Use of income	IMOs	Production account, Use of income account	Output, Intermediate costs, balance of current cross-country operations	Trade balance	Imports, Exports
Trade misinvoicing (evasion of custom duties)	F2	Goods/ Services	Production	IGOs	Production account	Output, Intermediate costs	Trade balance	Imports, Exports

Source: UNCTAD (2021)

2.3.4 Other aspects of linking to statistical frameworks

The measurement of IFFs also follows the concept of residence, as defined in the Balance of Payments and International Investment Position Manual, 6th edition (BPM6)²⁹: “The residence of each institutional unit is the economic territory with which it has the strongest connection, expressed as its centre of predominant economic interest” (IMF, 2009: 70).

Valuation is done in line with the 2008 SNA and BPM6, i.e., goods and services (and other categories, such as assets and labour) are valued at market prices when exchanged. The concept of market prices is important when trying to estimate IFFs by identifying abnormal prices. Market prices are the actual price agreed upon by the transactors. In the case of non-market transactions, valuation is made according to costs incurred or by reference to market prices for analogous goods or services.

The change of ownership principle requires that imports and exports related to processing without a change of ownership are excluded from trade statistics, even if they cross country borders. This principle may be challenging for countries to follow and can contribute to trade asymmetry – one of the many issues to be considered when estimating IFFs based on trade data. All financial flows crossing borders, on the other hand, are included when estimating IFFs irrespective of ownership change.

The activities that generate IFFs need to be analysed carefully and placed in a framework so that statisticians can identify the various components that need to be accounted for. This calls for a discrete, exhaustive, and mutually exclusive statistical classification aligned with existing statistical frameworks and principles. IFFs are, therefore, compiled based on the classification and definitions provided by the ICCS (UNODC, 2015) for illegal activities, and an extension will be built using a similar logic for the aggressive tax avoidance part, not covered by the ICCS.

Early work on the non-observed economy sets the basis for improving the exhaustiveness of national accounts and balance of payments statistics to cover activities and flows generated therein (e.g., OECD, 2002; Eurostat, 2005, and 2018). As these concepts are methodologically and conceptually more advanced, observing the relationship between IFFs and non-observed economy may support the

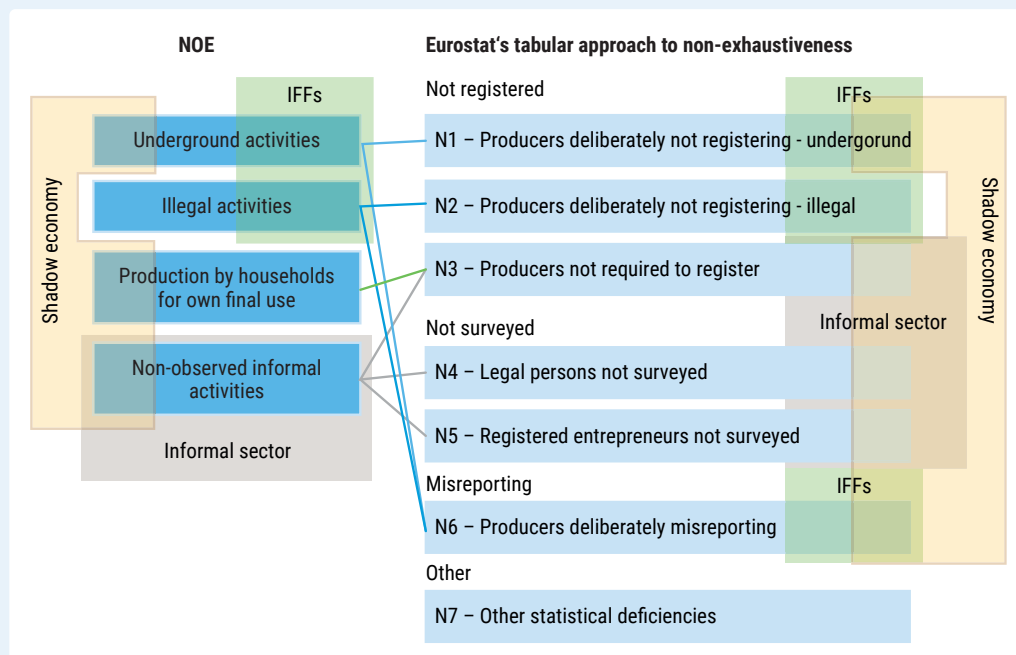
²⁹ When referring to either of the statistical frameworks, their most recent versions are meant, i.e., 2008 SNA and BPM6, respectively.

measurement of IFFs, and ensure their alignment with existing statistical frameworks. One such attempt is presented in Box 2.

Box 2 Linking concepts related to illicit financial flows

Many concepts partially overlap with the scope of IFFs. The figure links four related concepts to IFFs, namely the non-observed economy³⁰, Eurostat’s tabular approach to fight non-exhaustiveness of the national accounts, informal sector³¹ and shadow economy³². Non-observed economy and Eurostat’s tabular approach to non-exhaustiveness are taken as the basis to which the other concepts are linked. Informal sector plays an important role in many developing economies, yet ILO (2015), by definition, excludes illicit activities from the informal economy. Shadow economy (and closely related concepts, such as underground economy) lacks a clear statistical definition. Only IFFs delineate their scope by a focus on cross border flows. The figure considers the four main types of IFFs, not only IFFs from commercial and tax practices.

Figure 14 Links of illicit financial flows to related concepts



Source: UNCTAD (2021)

Throughout 2024-2026, UNCTAD and UNODC, together with the Task Force, will continue the work to link the IFF concepts and definitions with the national accounts and balance of payments statistics to support their interoperability. This would be particularly useful for understanding the flows within global value chains, and interaction with data and statistics on special purpose entities, factoryless goods

³⁰ “The scope of activities covered by the non-observed economy (NOE) includes (i) the production of goods and market services of households and (ii) the activities of corporations (illegal; underground) that may not be covered in the regular data collection framework for compiling macroeconomic statistics. This scope of the informal economy considers not only the domestic activities, but also the cross-border transactions of resident units [...]”.

³¹ IMF (2019) uses the following working definition of informal economy: “[T]he informal economy comprises (i) the production of goods and market services of households and (ii) the activities of corporations (illegal; underground) that may not be covered in the regular data collection framework for compiling macroeconomic statistics. This scope of the informal economy considers not only the domestic activities, but also the cross-border transactions of resident units [...]”.

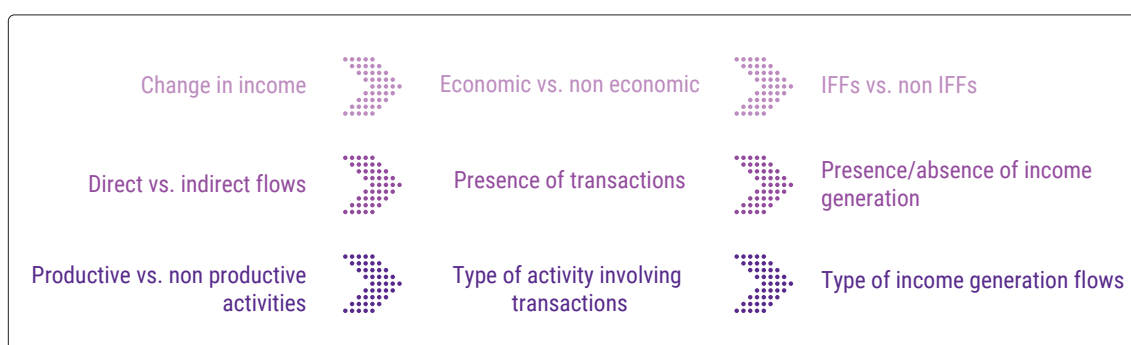
³² According to Medina and Schneider (2018) the shadow economy includes all economic activities which are hidden from official authorities for monetary, regulatory, and institutional reasons.

2.4 DECISION TREE AND DASHBOARD TO LINK TAX AND COMMERCIAL PRACTICES TO TYPOLOGIES OF IFFS

According to the definition provided in previous sections, IFFs are cross-border flows that are illicit in origin, transfer or use and that reflect an exchange of value. IFFs are associated with economic flows that result from, are used by, or are transferred through illicit actions, which can pertain to either criminal activities (including illegal market, corruption and exploitation-type/terrorism financing activities) or illicit tax and commercial practices. The *Conceptual Framework* (UNCTAD and UNODC, 2020) provides a taxonomy for classifying IFFs according to the characteristics of the economic transactions in terms of object (e.g., intermediate and/or final goods and/or services, financial and/or non-financial assets) and purpose (e.g., producing or using income). Furthermore, this taxonomy also links IFFs to standard accounting frameworks, such as SNA and BoP.

This section aims to establish a conceptual link between illicit actions and economic transactions generating IFFs. In this sense, the decision tree presented below offers a new perspective to determine whether an illicit action leads to IFFs and, consistently with the *Conceptual Framework*, which typology of IFFs may be involved. In a subsequent step, based on the outcome from the decision tree, a dashboard is derived for the classification of illicit tax and commercial practices. The decision tree incorporates three classification layers, outlining the stages required to identify the links between illicit actions and IFFs typologies. The three layers are presented in Figure 15.

Figure 15 Classification layers



Source: Authors' deliberations

The first classification layer distinguishes illicit actions based on whether they produce a change in income of the actor or not. This determines if the illicit action can be considered an economic operation and, thus, can potentially generate IFFs. The second layer considers whether the economic flow generated by economic operations directly or indirectly affects the income of the actor. Only direct flows are associated with transactions that can result in income generation IFFs. Finally, the third layer classifies illicit action between productive and non-productive economic activities. According to whether the activity is productive or non-productive, different types of income generation IFFs are involved.³³

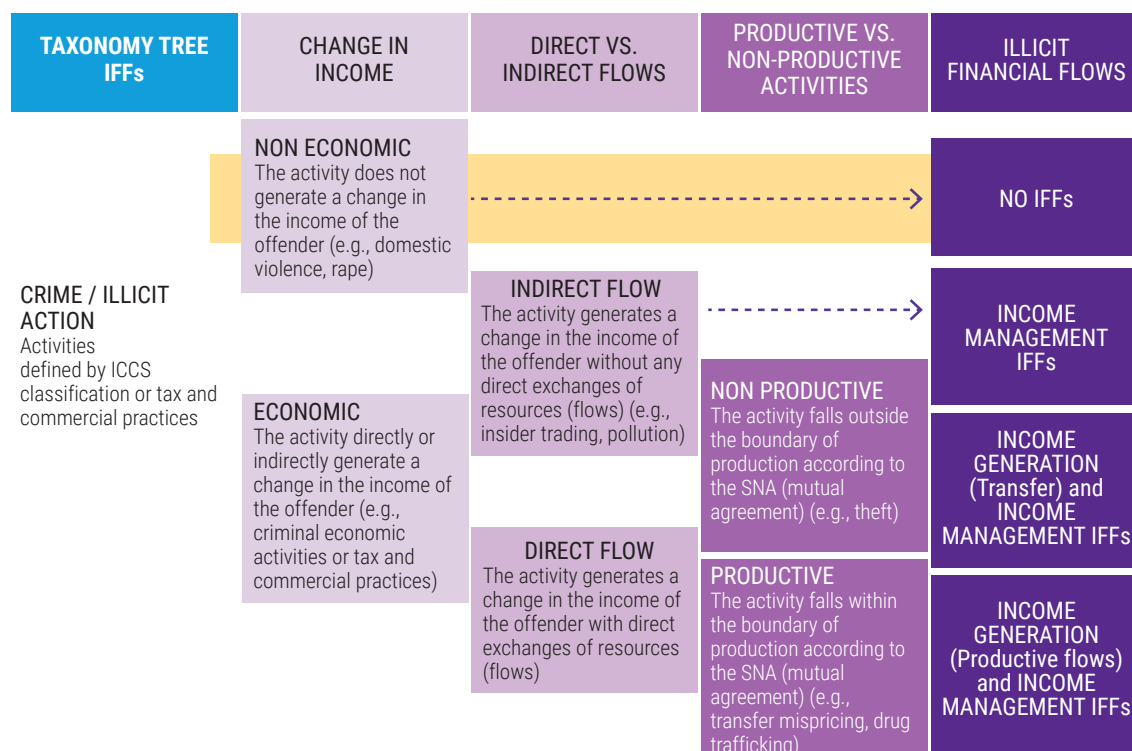
Figure 16 illustrates how the various layers are nested and how they link illicit actions to IFFs typologies. Classification layers are shown by column, while different typologies of actions are represented by row.

As mentioned, in the first layer illicit actions are classified according to whether they produce a change in the income of the actor or not. If a variation of income occurs (e.g., in tax and commercial practices, theft, or in drug trafficking), the illicit action is categorized as economic. Conversely, if the illicit action does not involve any change in the income of the actor (e.g., domestic violence, rape), it is considered as non-economic. In this context, it is important to note that non-economic illicit actions, as indicated by the area

³³ It needs to be noted that although separating productive and non-productive activities is crucial in identifying subsequent IFFs, based on whether a mutual agreement or consensus is present, special care is further needed in identifying the object of economic transaction, where human beings cannot be classified as such in the case of trafficking in persons. For more, please refer to UNODC (2023). These conceptual elements are essential to properly identify and classify activities generating IFFs for measurement.

highlighted in yellow in Figure 16, cannot, by definition, lead to the generation of IFFs, whereas economic actions can potentially generate different typologies of IFFs.

Figure 16 Decision tree linking illicit actions and typologies of IFFs



Source: Deliberations by the Task Force

The second layer is aimed at classifying economic actions according to whether they lead to a direct or indirect modification in the income of the actor. Direct flow includes economic actions in which the change in income is generated by a direct exchange of resources (e.g., in transactions related to drug trafficking or trade mis-invoicing). Conversely, indirect flows include economic actions that affect the income of the actor without involving a direct exchange of resources (e.g., pollution or insider trading).

The typology of IFFs that can be generated by the given action depends on whether the change in income is generated through direct or indirect flows. In case of indirect flows, only income management IFFs can be produced, as the generation of the illicit income does not involve any transactions. Conversely, in case of direct flows, where the generation of the illicit income involves an exchange of resources, both income generation and income management IFFs are produced.

Finally, narrowing down the focus to direct flows, the third classification layer determines the typology of income generation IFFs associated to the illicit action. Notably, direct flows can emerge from both productive and non-productive activities.

In productive activities³⁴, the illicit actions involving a direct flow are aimed at carrying out a production process. This is the case of transnational drug trafficking or overpricing of goods or services in international trade to shift the profits derived from productive activities. In this context, income generation IFFs relate to

³⁴ Productive activities are those falling into the production boundary as defined in the SNA. According to par. 6.18 of SNA 2008 (United Nations et al., 2009), "the production boundary includes the production of all individual or collective goods or services that are supplied to units other than their producers, or intended to be so supplied, including the production of goods or services used up in the process of producing such goods or services."

aggregates (such as imports/exports, value added, output, intermediate costs) that are directly associated with production processes and the generation of value added (see Figure 7 linking IFFs to national accounts framework).

In non-productive activities, the illicit action involving a direct flow does not imply the production of goods or services, but the transfer of (physical and/or monetary) resources, such in the case of theft or extortion. In this context, income generation IFFs relate to aggregates (transfers) connected with the distribution of income (Figure 7), in which only individual income is altered, with no creation of “new” value added within the economic system. As an example, trafficking in persons does not meet the criteria of economic transaction as there is no mutual agreement; also, human beings cannot be treated as objects in transaction.

The dashboard presented in Table 3 provides guidance on how to define the economic characteristics and the typologies of IFFs generated by tax and commercial practices³⁵, as identified above: (F1) transfer of wealth; (F2) trade misinvoicing; (F3) transfer mispricing; (F4) debt shifting; (F5) assets and intellectual property shifting.

³⁵ The same integrated classification system can be also used for IFFs related to illegal markets, corruption, and terrorism financing.

Table 3 Dashboard of tax and commercial IFFs

Flow coding	Definition of activities	Taxonomy of activities				Existence of IFFs	Statistical framework typologies			
		Change in income	Indirect flow	Direct flow			Income generation	Income management	Type of flows in IG-IM framework consistent with SNA and BoP	Presence
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11
F1	Transfer of wealth	YES	YES	NO	NO	YES	NO	YES	IG: imports	NO
									IG: exports	NO
									IG: value added / income	NO
									IG: transfers	NO
									IM: non-financial assets	YES
									IM: financial assets	YES
									IM: consumption (imports and exports)	YES
F2	Misinvoicing	YES	NO	YES	NO	YES	YES	YES	IG: imports	YES
									IG: exports	YES
									IG: value added / income	YES
									IG: transfers	NO
									IM: non-financial assets	YES
									IM: financial assets	YES
									IM: consumption	YES
F3	Transfer mispricing	YES	YES	YES	NO	YES	YES	YES	IG: imports	YES
									IG: exports	YES
									IG: value added / income	YES
									IG: transfers	NO
									IM: non-financial assets	YES
									IM: financial assets	YES
									IM: consumption	YES
F4	Debt shifting	YES	YES	YES	NO	YES	YES	YES	IG: imports	YES/NO
									IG: exports	YES/NO
									IG: value added / income	YES/NO
									IG: transfers	NO
									IM: non-financial assets	YES
									IM: financial assets	YES*
									IM: consumption	YES
F5	Assets and intellectual property shifting	YES	YES	YES	NO	YES	YES	YES	IG: imports	YES
									IG: exports	YES
									IG: value added / income	YES
									IG: transfers	NO
									IM: non-financial assets	YES
									IM: financial assets	YES
									IM: consumption	YES

Source: Authors' deliberations

Columns 3 to 7 of the dashboard allow to define the position of tax and commercial IFFs along the different classification layers (economic nature, direct vs. indirect flow, productive vs. non-productive activity) of the decision tree. Columns 8 to 11, considering the statistical framework (see next section for further details), allow to determine the type of IFFs (income management and income generation) and the aggregates (according to SNA definition) for a specific activity or type of flow identified in the dashboard. Looking at each of the flows F1 to F5 separately, the following is noted:

(F1) Transfer of wealth is aimed to evade tax and to conceal flows related to undeclared offshore wealth.

According to the first classification layer of the decision tree, transfer of wealth is considered as an economic action as it involves a modification in the income of the offender generated by the reduction in tax payment. Considering the second layer, transfer of wealth is included in indirect flows. The transfer does not involve any exchange of resources and the change in income occurs because of the mechanics of the illicit transfer. As a consequence, considering the statistical framework in the *Methodological Guidelines*, transfer of wealth involve only income management IFFs associated to different uses of the transferred income, ranging from consumption to the acquisition of financial and non-financial assets.

(F2) Trade misinvoicing in international trade is typically associated either to the misreporting of the actual value of imports and exports with the aim of transferring resources from one country to another, or to the misclassification of the traded goods in order to avoid (or reduce) the payment of custom duties and other tariffs.

Considering the first layer, both the first and the second practice are economic, since the income of the offender is affected. Being cross-border transactions in goods and services involved, both types of mis-invoicing are classified as direct flows along the second classification layer. Finally, considering the third classification layer, they fall into the productive category. Both practices modify the final price of intermediate inputs with respect to their actual value, generating an under (over) reporting of costs, and accordingly, a symmetric modification of the value added.

Misinvoicing is thus associated with both income generation and income management IFFs. In particular, considering income generation, it involves IFFs linked to either imports or exports of goods or services (according to the direction of the related transaction)³⁶. Furthermore, being a productive activity, also value added is affected. Considering income management, the value added generated by misinvoicing may be used for different purposes, ranging from consumption to the acquisition of financial and non-financial assets.

(F3) Transfer mispricing mainly relates to intra-MNEs transactions in which traded goods are over (under) priced compared to the arms-length value to generate an outflow (inflow) of resources. Typically, traded goods are intermediate inputs of a production process.

As for the first classification layer, transfer mispricing is an economic action, as the practice modifies the income of the actor. As for the second classification layer, the action implies a direct flow represented by the cross-border transaction. Finally, being the action carried out within a production process, the activity is productive.

Transfer mispricing consequently generates both income generation and income management IFFs. Considering income generation, it involves IFFs associated to either imports or exports of goods (according to the direction of the related transaction). Furthermore, value added is affected by the alteration of the costs of intermediate inputs. Considering income management, the value added generated by transfer mispricing implies different types of use, ranging from consumption to the flow of financial and non-financial assets.

³⁶ Refer to section 2.3.3 on how imports or exports can generate both, inward and outward IFFs.

(F4) Debt shifting relates to intra-MNEs loans, in which intermediation fees and interest payment are set outside the arms-length principle, typically over-priced to channel profits towards the financial unit of the MNE (normally referred to as “captive” unit).

Considering the first classification layer, debt shifting is an economic action as the income of the offender changes. It is also categorized as direct flow since the financial intermediation services involves an exchange of financial assets between the captive and the other units of the group. As for the third classification layer, debt shifting is a productive activity. Debt shifting is thus associated with both income generation and income management IFFs. Considering income generation, however, affected aggregates differ according to whether intermediation fees or interest payment are taken into account.

In case of intermediation fees, the transaction directly modifies intermediate costs of the business units, thus generating a change in value added. In case of interest payment, the transaction does not impact the value of intermediate costs, thereby keeping the value added of business units unchanged. However, it does alter the amount of profits after deducing interest payment, which represent a component of the income. In the first case, therefore, income generation IFFs relate to exports and imports of service (the intermediation fee) and value added. In the second case, income generation IFFs relate to income and financial assets (see the asterisk in Table 3), while exports and imports are not affected.

Considering income management, the value added (or the profits after deducing interest payment) generated by debt shifting may imply different types of use, ranging from consumption to the acquisition of financial and non-financial assets.

(F5) Assets and intellectual property shifting shows similar characteristics compared to transfer mispricing. It relates to intra-MNE transactions in which the value associated with the use of specific assets and intellectual property products is over (under) priced with respect to the arms-length value in order generate an outflow (inflow) of resources. Typically, assets and intellectual property products are intermediate inputs of a production process.

Assets and intellectual property shifting is an economic action, as the practice modifies the income of the offender. The practice can generate one or more direct flow(s), directly linked to the cross-border transactions for the purchase and sale of rights to use some assets and/or intellectual property product(s). Finally, being the action carried out within a production process, the activity is productive.

As a result, assets and intellectual property shifting generates both income generation and income management IFFs. In the first case (income generation), it involves IFFs linked to either imports or exports of services (according to the direction of the related transaction). Furthermore, value added is affected by the alteration of the costs of intermediate inputs. In the second case (income management), the value added generated by assets and intellectual property shifting may imply different types of use, ranging from consumption to the acquisition of financial and non-financial assets.

This section details the basis for classifying activities that may generate IFFs. As a practical tool, the classification of these activities is discussed in chapter 3.2.

3

BUILDING CAPACITY TO MEASURE ILLICIT FINANCIAL FLOWS

3.1 KEY DATA SOURCES

There are some traces of IFFs in official economies residing across a variety of datasets. The challenge is to identify, access and pool these data for IFF estimation. The selection of data sets depends also on what IFF flows need to be estimated. National authorities are best placed to estimate IFFs using datasets they already have or can access.³⁷ The IFF estimate could be compiled by the NSO using either their own data, or in parts based on data available to other stakeholders within the NSS, such as the Customs, the Central Bank, Tax Authority etc. The following list provides examples of data sources and statistics that could be available in a country, but there are large country differences.

Tax data are reported by individuals, corporations and other entities covering a range of activities subject to taxes, including corporate tax, income tax and social security contributions, tax rates on consumption, and other, specific taxes, such as environmental taxes. While the data are collected for other than statistical purposes, Tax or Revenue offices often have a statistical unit. Tax data provide the basis for measuring the amount of taxes paid, taxable income, effective tax rates and tax gap, which are useful for IFF estimation.

Tax audits are also valuable data sources for IFFs estimation. Leakage data may also provide relevant new information. Tax authorities may also have access to third-party data, for example banks' transactions and credit card transactions data etc. Tax authorities can also exchange information with other countries.

Data from voluntary disclosure programmes, which are a related avenue whereby taxpayers can correctly state their tax obligations to avoid criminal prosecutions or receive reduced penalties for potential noncompliance

Crime and criminal justice data, including data from criminal investigations, prosecutions and convictions provide a relevant source of information to complement the IFF-relevant data sources in this sphere.

International trade in goods statistics measure the value and quantity of goods traded between countries broken down by types of goods and by partner countries. These statistics are compiled by a specialised statistical unit of the Customs or Revenue offices, sometimes by the NSO based on microdata on individual cross-border goods flows. Trade in goods statistics provide a key source to measure tax and commercial IFFs.

International trade in services statistics measure trade in services broken down by service categories and partner countries. The statistics are compiled from a country's balance of payments which capture transactions that take place between an economy's residents and non-residents. A wide range of source data can be used, such as enterprise surveys, administrative data, the international transactions reporting system, data from international organizations, information obtained from partner countries, household surveys, credit card and mobile phone data. These statistics are compiled often by the NSO or the statistical unit of the Central Bank. Services are an increasingly important carrier of IFFs, but these statistics are typically based on a sample and are conceptually challenging to measure.

Customs data pertain to detailed Customs record of imports and export to and from a country. They cover variables such as trading partners, flows, price, value, quantity, product, date, mode of transport, and similar. Data sources contain individual transactions as reported in Customs declarations and reviewed by the Customs authorities. These data are compiled by statistical units within Customs or similar agencies. The data are used to compile trade in goods statistics, and could be a key source for IFF statistics calculation, e.g., to estimate IFFs from mispricing. Customs also collect records on law enforcement seizures. WCO data sources, including the data collected within the Customs Enforcement Network (CEN) Suite, may provide relevant insights and information.

³⁷ Carbonnier and Mehrotra (2018) note that data on IFFs arising from legal activities are usually recorded systematically by the administrative service.

Financial transactions data include records of financial transactions domestically and flows crossing borders, financial assets and liabilities and related categories, data on currencies and exchange and interest rates. Banks' transactions data would be valuable for the analysis of IFFs, especially those related to from the cross-border laundering of proceeds of crime, but also to identify deviations between real and financial transactions for tax and commercial IFFs. In many countries, Central Banks have access to banking transactions data also for analytical and statistical purposes. Financial Intelligence Units (FIUs) typically receive information from banks and other obliged entities on transactions that are suspicious to be able to analyse and follow-up. Banking statistics can also be of interest, including on debt and derivatives, liquidity indicators etc.

Financial statistics are compiled by financial institutions, including FIUs, foreign exchange banks and Central Banks using the above and additional data sources. These authorities can also have access to transaction-level data. The aggregated statistics can be compared with other sources and analysed in mirror exercises to inform the estimation of tax and commercial IFFs.

Price statistics measure changes in the prices of goods and services from the perspectives of consumers or producers or focus on import and export prices or provide international market prices. Price statistics are based on the use of multiple microdata sources and collect prices based on transactions in the markets. Price statistics can be a useful source of information for identifying reference prices (and thus detecting abnormal prices) to determine IFFs channelled via mispricing. NSOs have access to very detailed data, while publicly available price information may be too aggregated for IFF estimation. Moreover, product heterogeneity can cause large variations in prices and if improperly used, fail at identifying IFFs.

Structural business statistics, compiled by NSOs, describe the performance of businesses based on firm's financial and balance sheet information by economic activity. They include information on turnover, value added, profitability, number of employees and wages and salaries etc. at the unit level. These data are useful in determining characteristics of and identifying tax-avoiding behaviours among companies, thus supporting the measurement of IFFs. Availability of business identifiers can greatly improve the possibility to integrate these data with other data sources.

Statistical business registers, usually maintained by NSOs, play a central role in the production of business statistics as they provide a sampling frame for all business statistics and key classification information on businesses. Business registers include important data for IFF estimation, such as data on the locations of units, type of economic activity, business identifiers, enterprise group structures, ownership and affiliates, as well as key statistics such as employment and turnover.

Short-term statistics, compiled by NSOs, describe the most recent developments of the business sector on quarterly or monthly frequency by economic activity, including monthly observations on production, turnover, prices, number of persons employed, wages and salaries etc., all relevant for IFF measurement. Some countries compile business statistics annually only.

National accounts aim at providing a consistent set of macroeconomic indicators for the analyses of the structure of economies and development over time. They can include:

- Quarterly national accounts: GDP and its main components (gross value added, final consumption, gross fixed capital formation, exports and imports of goods and services, income accounts, etc.) and employment.
- Quarterly sector accounts: production, generation, use and distribution of income, as well as financial and non-financial accumulation. Data is divided into sectors (households and non-profit institutions serving households, non-financial corporations, financial corporations, government, rest of the world).
- Government finance statistics: government economic activities: revenue, expenditure, deficit/surplus, financing, other economic flows and balance sheets.

National accounts are compiled most often by the NSO or the Central Bank, and they provide the contextual framework for the measurement of IFFs.

Balance of payments (BoP) statistics summarise all economic transactions of an economy with the rest of the world; provide harmonised information on international transactions which are part of the current account (goods, services, income, current transfers) and of the capital and financial account, including foreign assets and liabilities. Balance of payments statistics are compiled from a variety of sources, such as international trade in goods and services statistics, international passenger surveys, foreign direct investment surveys, financial data and inquiries etc. The statistical unit of the Central Bank, or sometimes other agencies, compile these statistics. BoP statistics are used e.g., to identify asymmetries that might be due to IFFs and include information on financial flows related to goods and services, interests, royalties. Analysis of the underlying microdata can provide a basis for developing more accurate IFF estimates.

Foreign affiliates statistics (FATS) are compiled by some countries, such as EU and OECD countries, and provide information that can be used to assess the impact of foreign-controlled enterprises. Inward FATS describe the activity of foreign affiliates resident in the compiling country, and in particular measure the impact of foreign control on employment, wages, and productivity. Outward FATS describe the activity of foreign affiliates abroad controlled by the compiling country, and in particular measure the turnover, activity, number of persons employed, and number of foreign affiliates controlled by the compiling country. A range of data sources are used, from registers, surveys, or administrative sources. FATS are compiled typically by the NSO or the statistical unit of the Central Bank. FATS is a highly useful source for estimating IFFs due to the information on MNEs and their affiliates but is not compiled by many countries yet.

Some NSOs have organised the work related to the MNE data and respondent relations to a **large cases unit (LCU)** (see ECE, 2021). LCU is a team of experts dealing with all statistical aspects of MNEs in countries where they are significant. LCU may prove essential in ensuring high-quality national statistics, in particular correctness of MNE data and coherence of their treatment across statistics. LCUs can provide valuable expertise on MNEs and carry out mappings of MNE global structures and role of units which can benefit the measurement of IFFs.

New data sources and big data will, potentially, play an important role in the measurement of IFFs in the future. The *Methodological Guidelines* seek to find the common denominator across countries, hence new data sources are, for the time being, left aside until more experience is gained. However, NSOs and other statistical authorities are encouraged to experiment on the use of new data sources, as IFFs are difficult to capture, and data held by private data holders have the potential to reveal significant structures and characteristics of IFFs and contribute to the compilation of more reliable estimates.

Commercial global data sources can be used to estimate some types of IFFs and to complement national data, but these include also proprietary databases (e.g., External Wealth of Nations Mark II database, Orbis database by Bureau van Dijk, Taxes Explorer by IBFD, databases from Bloomberg or Thomson Reuters). Statistical quality and compatibility should be checked as global data are not usually as representative of national conditions as data collected by national statistical authorities.

Global Groups Register (GGR), is being developed by the United Nations Statistics Division (UNSD), building on the existing content and processes of the EuroGroups Register. The GGR would significantly help in mapping the structures and links among enterprises in different countries and how control is exercised throughout the global value chain. UNSD is developing a GGR from publicly available information and exploring possibilities to create an automated mechanism to update the GGR directly with NSOs. In this context, ECE (2021) recommends the development of a central repository of key data on MNEs for use by NSOs which would be useful for measuring certain IFFs too.

United Nations International Trade Statistics Database (United Nations Comtrade) provides statistics on international trade in goods and services, disaggregated by partners (countries), classifications and commodities, and trade flows, with monthly and annual frequencies. Values and quantities of trade flows are available for longer time series. Data are as reported by countries, i.e., data are not being

estimated by the United Nations to populate the database. Hence, missing data are present, specifically in more recent months, limiting its applicability in these periods. United Nations Comtrade provides a valuable data source to measure tax and commercial IFFs through misinvoicing.

IMF Direction of Trade Statistics (DOTS) also provides international trade data. Specifically, value of merchandise exports and imports are reported, disaggregated according to country's primary trading partners. IMF DOTS applies their estimates to supplement reported data when these are not available or current. Primarily IMF member countries are covered, with annual, and when available also quarterly and monthly series. Limitations of the data source are in the absence of detailed commodity-level international trade. Nevertheless, this data source is useful with initial and exploratory analysis of trade misinvoicing to measure IFFs.

OECD Balanced International Merchandise Trade dataset (BIMTS) provides a process reconciling asymmetries observed in merchandise trade statistics. In three steps (adjusting for several reasons driving observed asymmetries in trade statistics), it arrives at reconciled figures at 6-digit HS 2017 products to better align with subsequent use and links to other statistical framework, such as the SNA.

Global Transport Costs Dataset for International Trade by UNCTAD, the World Bank, and Equitable Maritime Consulting is a new dataset that provides mode-specific transport costs based on the Comtrade Plus data. It covers all commodities and countries that report bilateral trade data to Comtrade. Based on cost, insurance and freight (CIF), free on board (FOB) and quantity data, the dataset displays the related transport costs (including insurance costs). The dataset offers better data on the CIF-FOB ratio (see chapter 4.1) for enhanced estimates of trade misinvoicing.

OECD International Transport and Insurance Costs of Merchandise Trade (ITIC) database combines the cross-country sample of official national statistics on explicit CIF-FOB margins with estimates from an econometric gravity model, and uses a novel approach to pool product codes across the Harmonized Commodity Description and Coding System (HS) vintages. The database provides potential new insights on how distance, natural barriers such as mountain ranges, and inadequate infrastructure, shape regional (and global) value chains.

OECD Country-by-Country Reporting (CbCR) data provide global information on MNEs' activities, with data on MNE employees, related and unrelated party revenues, profits and taxes paid. Data are geographically disaggregated by jurisdiction of tax residence. National governments will have access to the granular (and not anonymised) CbCR data which can be very useful for assessing certain IFFs. MNEs with consolidated revenues above €750 million are required to file their CbCR one year after the closing date of their fiscal year according to a common reporting template. As the threshold is high, many countries will not have any MNE units in the dataset. However, the CbCR data provide a complete coverage of large MNEs headquartered in jurisdictions where CbCR filing is mandatory, less so for countries where this reporting is voluntary. In the first group, over 70 per cent of the total worldwide corporate profits of firms above the CbCR threshold was covered.

OECD Analytical Database on Individual Multinationals and Affiliates (ADIMA) is a four-component database offering comprehensive view of each of the included 500 MNE and its subsidiaries. The database covers (i) a physical register listing MNEs and their subsidiaries; (ii) digital register with a list of MNE websites; (iii) harmonised indicators, such as number of affiliates, number of jurisdictions declared in annual reporting, number of jurisdictions with a physical presence, or the Herfindahl–Hirschman Index (HHI) provided at global level of MNE for headquarters and affiliates and by jurisdictions; and (iv) events which may correspond to large company restructurings and, so, providing early warnings of potential significant changes to estimates of trade, GDP and foreign direct investments (FDI). ECE (2021) recommends developing an "ADIMA extension for statistics" to include confidential data for exchange between national statistical authorities only.

OECD Activity of Multinational Enterprises (AMNE) database presents detailed data on the activities of foreign affiliates in OECD countries (inward and outward activity of MNEs). It provides data on foreign

affiliates' production, employment, value added, research and development, labour compensation and exports in host countries. The database contains 17 variables broken down by country of origin (inward investment) or location (outward investment) and by economic activity. AMNE is based on data reported to OECD and Eurostat in the framework of annual surveys on the activities of foreign-controlled enterprises and foreign affiliates abroad controlled by residents of the compiling country.

The locational banking statistics from the Bank of International Settlements (BIS) provide detailed statistics on debt and derivatives, liquidity indicators etc. by location of reporting bank, by residence and sector of counterparty and by nationality of the reporting bank. BIS statistics are compiled in cooperation with Central Banks and other national authorities to inform analysis of financial stability, international monetary spillovers and global liquidity. The limitations relate to coverage, confidentiality restrictions and difficulty to distinguish between individuals and entities. BIS has increased details it publishes about banks' balance sheet linkages with non-bank counterparties which has alleviated this deficiency (Luna and Hardy, 2019). These data are a useful source for estimating IFFs, specifically the flows related to undeclared offshore wealth.

Key data sources for measuring tax and commercial IFFs are inevitably a combination of various national and international sources depending on the type of IFFs to be measured. Compilation and use of such a variety of sources, however, opens up a range of statistical considerations and these challenges need to be addressed properly. They are considered in Chapter 3.4.6.

3.2 PRACTICAL GUIDANCE FOR STATISTICAL AUTHORITIES

Effective policies to curb IFFs require reliable and granular IFF statistics, tailored to national circumstances. This section provides concrete and operational recommendations for national statistical authorities, NSOs and other compilers of official statistics for the measurement of tax and commercial IFFs. It provides guidance on steps to take to start compiling estimates of tax and commercial IFFs. First, it suggests a consideration of national circumstances, information needs and prominent types of IFFs (subsection 3.4.1). These can also help identify relevant stakeholders, as it is important to map out the national system of relevant authorities (3.4.2) to organize the necessary collaboration to measure IFFs. It may also be useful to identify the relevant authorities and stakeholders before conducting an IFF risk assessment to seek their input on the assessment from the outset. Subsections 3.4.1 and 3.4.2 are, therefore, not necessarily steps 1 and 2, but could be reversed, intertwined, or processed in iterations. This enables the review of data availability (subsection 3.4.3) and selection of data sources across agencies to capture the most prominent types of tax and commercial IFFs.

A tier classification of methods (3.4.4) considers national set up and capacity, existing data sources and related methods used in official statistics, legal and regulatory frameworks, and other criteria. This guides the selection of method to measure IFFs. Often an operational definition of IFFs (3.4.5) is needed to meet the national data needs and ensure feasibility considering available data, methodology and capacity. The definition is influenced by which method is used (again, also the reverse holds, these processes being intertwined, running in parallel, and/or in iterations). Compilation and dissemination of IFFs statistics (3.4.6) require some consideration due to the requirements of SDG reporting. Finally, we give a listing of practical recommendations to NSOs in their work in coordinating and/or compiling tax and commercial IFFs (subsection 3.4.7). Several practical tools, referred to in the section and supporting the work at national level to measure IFFs are placed in the online annexes with *Methodological Guidelines* (UNCTAD, 2021: Background documents) for direct use by national authorities.

3.2.1 Identifying illicit financial flow risks and information needs

As countries differ, so does their exposure to IFFs. This refers not only to the level of IFFs affecting a particular country, but also to the types of IFFs prominent in a country. The IFF categories, activities,

or types of flows vary across countries, including the direction of flows, inflows or outflows, as well as partners. Different IFFs require different data and methods for their measurement. Moreover, different starting points reflected by specific national circumstances also influence the approach to measuring tax and commercial IFFs.

A useful first step would be to carry out a preliminary **IFF risk assessment** to collate and review information already available about IFFs in the country and the conditions enabling them. It can help to get to know the national circumstances related to IFFs. It aims at identifying what IFF activities may take place in the country and what the prominent types of IFFs that should be measured are. The risk assessment can use available studies carried out by government officials (e.g., Anti-money laundering (AML) national risk assessment and mutual evaluation reports, tax compliance reports...), literature, information from the private sector, academia and think tanks, and can be complemented by interviews with relevant government officials. The review can be conducted by the NSO or another statistical authority in the country, while others may form an inter-agency working group to oversee and contribute to the review process.

The IFF risk assessment should take as a starting point work accomplished to date in **official statistics**, including the existing national information on illegal activities, informal economy and the non-observed economy in the SNA and BoP statistics.

Review of relevant research, studies and literature comprises not only academic research, but also practical studies conducted by tax or Customs inspectors and other experts. Journalists and reporters often carry out investigations for the **media** to reveal malpractice also related to IFFs.

In the absence of nationally conducted or country-specific research on IFFs, the work of international organisations can be helpful. Country-specific information can also be found from some international sources, including investigative reporting, such as the International Consortium of Investigative Journalists, documents from Swiss Leaks, Panama and Paradise Papers (see European Commission, 2019). Lack of national data can also be supplemented by regional studies or by identifying a benchmark country with similar national conditions.

Interviews with government experts can provide important insights into major areas of IFFs in the country and shed light on policy information needs and data gaps. The private sector may also provide essential input to the risk assessment with their specialised knowledge and information sources:

- **Financial institutions and banks** may have conducted risk assessments of their own, especially related to money laundering, and can contribute with their knowledge to the assessment of prominent IFFs and their measurement. They have valuable information on the structure, organisation, and size of IFFs they have reviewed, and features and characteristics of particular financial products to determine IFF risks.
- **Trade and industry associations** may provide aggregated statistics on transaction volumes and types of manufactured and traded products, and related vulnerabilities and risks.
- **Researchers, criminologists and IFF experts** can provide their perspectives, for example, on what constitutes tax and commercial IFFs. They may have produced reports and analysis related to IFFs or developed risk assessment methods as part of their (scientific) research.
- **Offenders** could also be a valuable source of information, e.g., to explain the reasons why one sector or product or transaction or (more broadly) *modus operandi* was chosen rather than another. While it may be difficult to obtain such information from them directly, there may be indirect methods such as research papers, court reports, sentencing and transcript records.

Issue that could be covered in an IFF risk assessment address the identification of how the economic and regulatory environment of a country influences the prominence and types of IFFs. For this purpose, the IFF risk assessment should reflect on issues, such as the formal and informal economy, the financial system and its vulnerabilities, major trade and investment flows and partner countries as well as the conditions for

tax collection and the current tax gap. For instance, major trade discrepancies can be identified using the United Nations Comtrade data and can signal potential areas with increased risk of IFFs (products, trading partners, flows) that merit further investigation. The analysis can also be performed at a specific-activity level by conducting the so-called value chain risk maps tracking commodity through all levels of its value chain, identifying IFFs-prone parts of the value chain and identify also critical stakeholders. Brugger and Engebretsen (2019) case study for coffee in Lao People's Democratic Republic can be found in UNCTAD (2021: Background documents - case studies).

Furthermore, the IFF risk assessment should aim at identifying main categories of IFFs present in the country using the UNCTAD and UNODC *Conceptual Framework*. The above-mentioned data sources can help to do an early assessment of activities and flows at risk of tax and commercial IFFs and to pinpoint commodities and service categories that may be most prone to IFFs. The IFF risk assessment can also collate available information on the potential enablers of IFFs, for instance weaknesses of the national framework, share varying estimates on the likelihood and magnitude of IFFs and consider their effects on the economy, government finances and development. Finally, the idea is to identify priorities for the statistical measurement of IFFs. These phases and contents are roughly in line with the guidance, developed by the Financial Action Task Force (FATF, 2013), for the assessment of national threats and vulnerability to money laundering and terrorist financing. A self-assessment questionnaire in UNCTAD (2021: Background documents) supports comprehensive and systematic collection of relevant information from national stakeholders.

The early analysis of prominent IFF types and data needs is important for identifying priorities for statistical measurement. It makes sense to focus the measurement on prominent types of IFFs and the pressing data needs to curb those IFFs. It is also likely that the attempt to collect existing information for the IFF risk assessment will highlight gaps and challenges to be addressed in further work.

3.2.2 Mapping of the national system of agencies

Properly addressing IFFs requires the relevant stakeholders to be, first, identified, and second, involved in the process of IFF risk assessment³⁸, data collection and/or measurement. The mapping of the relevant agencies provides a review of the institutional system that needs to be considered when measuring IFFs. The agencies are likely to focus on different aspects of IFFs from the policy or statistical perspective, and the measurement of all tax and commercial IFFs is likely to require data and capacity pooling between agencies.

The stakeholders³⁹ that may have a role to play in the collection, provision or compilation of data related to IFFs include, for instance:

- **National statistical authorities:** The NSO is a key player as it has the coordinating role of the NSS and holds a lot of relevant data, e.g., on businesses and individuals and often compiles the national accounts for the country. Important unit within the NSO is the LCU, with expertise and integrated data on MNEs from various statistical domains within NSS. The statistical units of Customs hold trade transactions data which are essential for analysing the commercial IFFs, including trade misinvoicing. The statistical units of Central Banks are typically in charge of compiling the balance of payments statistics and other financial and government statistics. Statistical units dealing with relevant data may also be hosted by the ministries of finance, justice, foreign trade, economy etc.
- **Policy-making bodies:** Policy-making bodies should, where relevant, be included in the mapping – not as providers of information, but as the principal users – in order to ensure that statistical

³⁸ Remember that steps in this and the previous chapter can be reversed, joined, or processed in iterations until all relevant stakeholders are identified and the IFF risk assessment finalised.

³⁹ The list of stakeholders has been selected and extended by UNCTAD based on FATF (2013).

development considers high-level questions that require data. They have a role to play in expressing data needs but cannot participate in methodological decisions.

- **Tax and other regulatory and supervisory authorities** gain a unique knowledge and data basis of transactions related to income, tax, types of institutions, products, sectors and associated customers, and have expertise on related policies, procedures and controls. They can provide views on particular risks and how to adequately identify those. Tax authorities typically possess large data sets for assessing the tax gap, part of which consists of IFFs crossing country borders, and they can engage in international data exchange, as necessary.
- **FIUs and intelligence and/or security services:** FIUs are ideally placed to identify threats and vulnerabilities based on suspicious transaction reports and other information and analysis they collect. They can also advise on analysis techniques, methods and trends, and may have access to databases on specific products or transaction types. Intelligence agencies have specialised expertise on intelligence analysis and can review or validate risk and vulnerability assessments.
- **Law enforcement and prosecution authorities** include police, Customs/border control, and criminal intelligence agencies, public prosecutors' offices, asset recovery offices and anti-corruption bodies where appropriate. These authorities may be able to provide information on specific cases, share substantive knowledge and assist in data provision. They may have relevant statistics on investigations, prosecutions and convictions, assets seized, confiscated, repatriated etc. or hold information about criminals' *modus operandi* obtained in their investigations. They may also be able to provide information on new trends and risks, and assist in identifying vulnerabilities.
- **Ministries of foreign affairs and trade, chambers of commerce** etc. may hold relevant information on trade-related IFF risks, exporters and importers, trade flows and the related international collaboration and initiatives.
- **International and foreign partners** may or may not be relevant in the national mapping of agencies. However, they provide useful guidance, e.g., the materials related to SDG indicator 16.4.1 by UNCTAD and UNODC. FATF-style regional bodies of which a country is a member may be a useful source of information on risk and on work carried out elsewhere in the region to identify and understand IFFs. Similarly, foreign partners, such as statistical and other authorities from other countries, may also be a potential source of information.

The identification of relevant agencies can draw on agencies involved in carrying out or informing existing research, reports and studies collated for the IFF risk assessment. Furthermore, the identification process can be supported by a few questions:

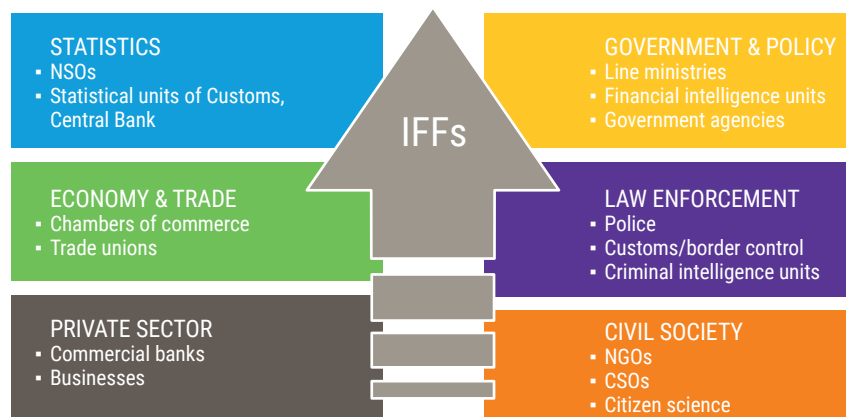
1. Which national institutions cover the identified prominent IFF types, in terms of regulatory or policy work (work, environment, consumers, etc.), monitoring of operations, financial support?
2. Which national institutions collect the data relevant for IFFs as part of their administrative or statistical work?
3. Which national institutions produce impact assessments of policy proposals or other analytical studies of IFFs, e.g., macroeconomic research units, unions, etc.?
4. Which stakeholders and institutions are affected by IFFs directly or indirectly?⁴⁰

The mapping needs to consider the economy and society at large, including the government units, but also major stakeholders in the economy, services, legal side and the private sector and the effects on them. Financial institutions and banks, non-governmental organisations (NGOs), citizen-science projects, individual experts, trade and industry associations, law associations, civil society organisations (CSOs),

⁴⁰ Direct impact refers to, for example, Customs, as they are affected by trade misinvoicing in their work. Indirect impact could be the reduced quality of key statistics due to the effect of IFFs that is not quantified.

etc. can contribute to the understanding of IFFs, as mentioned in the previous chapter. A proposal on how to ensure the comprehensive identification of agencies and stakeholders with their mapping by area is shown in Figure 17. Sometimes such mapping is needed at a more detailed level.

Figure 17 Identification of area-wise relevant institutions to measure IFFs



Source: UNCTAD (2021)

Once the identification is done, a mapping of how the entities relate to each other and form a national system is due to take place. As countries differ significantly in their regulatory and institutional setup, a universal solution cannot be offered. However, regardless of the composition, the relevant stakeholders should be brought to the same table to establish a good collaboration. A tool for mapping of national agencies and their roles is presented in the online annex at UNCTAD (2021: Background documents).

All agencies are not equally involved in specific IFF types. The mapping of agencies should identify their roles, such as:

- **Lead agency** (or agencies) leading the measurement of IFFs. The NSO is usually tasked with the coordination of the NSS and is thus central to the process. In some member states another agency could be the assigned leader, e.g., Customs, Central Bank or Tax office. The lead agency should have the statistical expertise and data or access to them, but it is not necessarily the agency that carries out the calculations; and
- **Supporting agencies** providing administrative data, methodological or substantive expert, infrastructural (field, IT), legal, administrative, or other support. These agencies can also include relevant private sector representatives.
- **Other stakeholders** are agencies that can be affected by IFFs or the related work, whose input and feedback can be essential or who have substantive knowledge and insights into specific IFFs.

Role of agencies can further be defined by their involvement in the statistical process, hence identified as:

- **Compiling agencies** may vary depending on the country. The NSO may be tasked with the compilation of tax and commercial IFFs or the entire SDG indicator 16.4.1 with all its subcomponents based on data received from the other agencies. Alternatively, several agencies (e.g., Customs, Tax, Central Bank, NSO) could compile indicators of different IFFs to be aggregated into one index by one agency, such as the NSO. Whatever the solution, the results should be internationally comparable and fully aligned with the Fundamental Principles of Official Statistics (United Nations, 2014) as required for the global SDG reporting; or

- **Data-providing agencies** are those who provide source data for the calculations that they collect or possess to carry out their mandate. Their involvement is essential as they pose expert knowledge on the data and behaviours they deal with.

Mandate of the agencies should be considered when assigning task and expected outputs. Some of the agencies' mandates may be statistical, while others have a more administrative mandate. Their interlinkages and communication need to be established for a stable supporting environment for the undertaking of measurement of IFFs in a country.

Operating procedures define the roles and interactions among all involved agencies or other stakeholders. Setting up a technical working group, or an expert group, with a clear mandate to measure IFFs is essential. Regardless of the agency, preferably its statistical unit would serve as a focal point.

3.2.3 Data availability review and selection

The IFF risk assessment and the mapping of agencies provide a good basis for assessing what data are available in the national system of agencies on the most prominent IFFs and to see where the gaps are. Statistical work relies on good data, even more so for IFFs where significant gaps exist. OECD's (2015) concern about BEPS indicators, is true for IFFs in general: "Having a proper understanding of the available data and its limitations is a fundamental issue for the development of indicators...". Limitations often lie in data availability, granularity and accuracy, i.e., whether they truly measure IFFs or measure other factors in combination with IFFs. Data availability and accuracy will always be problematic when measuring IFFs as they are hidden by nature.

Data availability will inherently affect the selection of method(s). Therefore, it is carried out first. The first step is to see what data are available, the second is to assess their usefulness and quality. The review of data availability should consider practical questions such as:

- Who (which agency) has the data?
- What variables are available and which acts generating IFFs they cover?
- In what frequency (annual, quarterly, monthly) are the data?
- What format the data are in?
- What is the quality of the data in terms of the six quality aspects?
- What are the limitations of and gaps in the data?
- What regulatory frameworks need to be considered to access the data? (while the statistical law typically provides access to all data needed for statistical purposes)
- What procedures are required for accessing the data?
- Who is best placed to compile aggregates from the data?
- What are the potential overlaps with other data?

It will also be useful to consider if there are international data sources that could be used. They can provide better international comparability, but mainly supplement national data where gaps exist and enable access to data from other countries, e.g., for mirror trade statistics. A list of potential international sources is provided in Part IV of the *Methodological Guidelines* (UNCTAD, 2021).

The data availability review can focus on data needed for the IFFs to be measured according to the priorities identified in the IFF risk assessment unless new priorities come up. A table providing a generic listing of possible national datasets that could be included in the review may need to be adjusted to national context and the relevant IFFs (and selected methodology) in question. Similar tables by each suggested

method to measure IFFs are proposed among tools in the background documents at dedicated website (UNCTAD, 2021: Background documents).

Source data can be reviewed with respect to six quality aspects, namely: timeliness, availability, fit-for-purpose, coverage, granularity and interoperability. Almost all data relevant for the measurement of IFFs are collected and intended for other purposes than the measurement of IFFs. It may be useful to assess if and how their fit-for-purpose could be improved, e.g., by adding or adjusting a question in an existing data collection or other means.

Table 6 Assessing the quality of source data under the IFF quality assessment framework

Category	No.	CRITERIA	CRITERIA explained
Source data	9	Timeliness	What is the delay of data becoming available after reference period?
	10	Availability	Are data required to measure types of IFFs available within national settings? Are these available in many/most countries?
	11	Accessibility	How accessible are existing data sources to statistical authorities? Are these data confidential?
	12	Fit for purpose	Do these data provide information on IFFs, directly or indirectly? Which IFFs do they address?
	13	Coverage	Do the data cover the issues to be measured? Which IFFs are covered? What are the gaps and overlaps?
	14	Granularity	How detailed are the data? Frequency.
	15	Interoperability	Can the data be integrated with other data? Does the dataset include identifiers and classifiers?

Source: UNCTAD (2021)

Note: Column No. refers to numbering in the quality assessment framework (UNCTAD, 2021: Background documents).

It will also be useful to consider what estimates or indicators of IFFs or similar issues exist in the country, compiled by the government or the private sector. What is the quality and availability of these indicators: Are they regularly produced or one-off exercises? Are they presented in scientific research papers, official government reports or other releases? Are any of them already applying a method recommended in the *Methodological Guidelines* (UNCTAD, 2021) or could they provide input to new indicators on IFFs?

3.2.4 Tier classification and the use of methods

The *Methodological Guidelines* focus on methods, selected considering not only methodological and data quality aspects, but also applicability to varying national circumstances. The criteria used in the evaluation framework are divided into three categories with several subcategories in each (UNCTAD, 2021: Background documents). Table 7 looks into the category soundness of methods.

Table 7 Assessing the soundness of methods under the IFF quality assessment framework

Category	No.	CRITERIA	CRITERIA explained
Soundness	1	Relevance of scope	Content validity – What is measured? Which IFFs does it cover?
	2	Clarity of concepts	Construct validity – Does it measure what it is supposed to? Is it clearly defined? Is a classification used? Is it discrete, exhaustive, and mutually exclusive (are there gaps or overlaps)?
	3	Alignment to the UN Conceptual Framework	To what extent is the method aligned to the UNCTAD-UNODC Conceptual Framework for the Statistical Measurement of IFFs ?
	4	Robustness	How stable are the results produced by the method? Will a repetition lead to similar results? What if conditions change?
	5	Transferability	How easy it is for someone else to use the method? Availability of empirical research or application of the method
	6	Equivalence	Does the method yield similar results when compared to other (sound) methods?
	7	Statistical alignment	Is the method similar to those applied in official statistics? Are the concepts and classifications aligned with official?
	8	Capacity requirements	How much resources and capacity are required for using the method?

Source: UNCTAD (2021)

Note: Column No. refers to numbering in the quality assessment framework (UNCTAD, 2021: Background documents).

The methods suggested for measuring tax and commercial IFFs (see chapter 4 for more details; and method fact sheets in UNCTAD (2021: Background documents), designed to further enable easier comparison of methods in their selection process) are to be tier-classified applying the IFF quality assessment framework to support statistical authorities in the selection of methods. However, the quality of estimates is also affected by the availability and quality of national source data and the quality of resulting estimates. The tier-classification is based on a generic assessment of the country-specific items and is, therefore, indicative only. The assessment can guide the selection of methods together with considerations on available source data and statistical capacity.

A **three-tier classification** is proposed. Tier 1 is the method that is preferred, scoring highest, while tier 2 is proposed as a fallback option, if tier 1 method cannot be applied. If neither are applicable, a tier 3 method could be used. Tier 1 method scores 40 or more points (of the 66 maximum); tier 2 for 30 or more (and less than 40 points); and tier 3 methods less than 30 points. Generic results of the classification exercise of the suggested six methods are presented in full details of the evaluation in online background documents at UNCTAD (2021: Background documents).

Recommendations with respect to the use of methods are as follows:

- Use **tier 1 method**, whenever possible
- If possible, crosscheck results with **another method** to allow for triangulation – of methods, data sources, as well as IFFs activities and/or types of flows.
- If resources do not allow for multiple methods to be applied, apply the following:
 - Select a **base year** and use tier 1 method for it, perhaps in combination with additional data collection to address gaps and seek more information.
 - Use simpler methods to estimate **dynamics in between base years**.

It may prove useful to triangulate methods by applying more than one method for compiling certain IFFs to check robustness of results. In case of uncertainties, it may be useful to produce a range of estimates or

a confidence interval to guide users. It is also a good practice to be transparent about expected revisions. Results are to be presented on an annual level, while base year studies can provide more structural detail at regular intervals.

3.2.5 *Operational definition of tax and commercial illicit financial flows for statistics*

But what does that mean in practice that IFFs are “Financial flows that are illicit in origin, transfer or use, that reflect an exchange of value and that cross country borders”? In practice, an exhaustive measure of all IFFs will be challenging to achieve. Data availability or lack of it may dictate measurement choices. As explained in Part II, one method can only cover some IFFs, e.g., the partner country method, and there is a risk of overlap with some data and methods, e.g., flows of undeclared wealth by individuals is likely to capture some IFFs that originate in the illegal economy. Some data sources may not be fully reliable for various reasons, such as underreporting. All these limit measurement possibilities and call for an operational definition of IFFs.

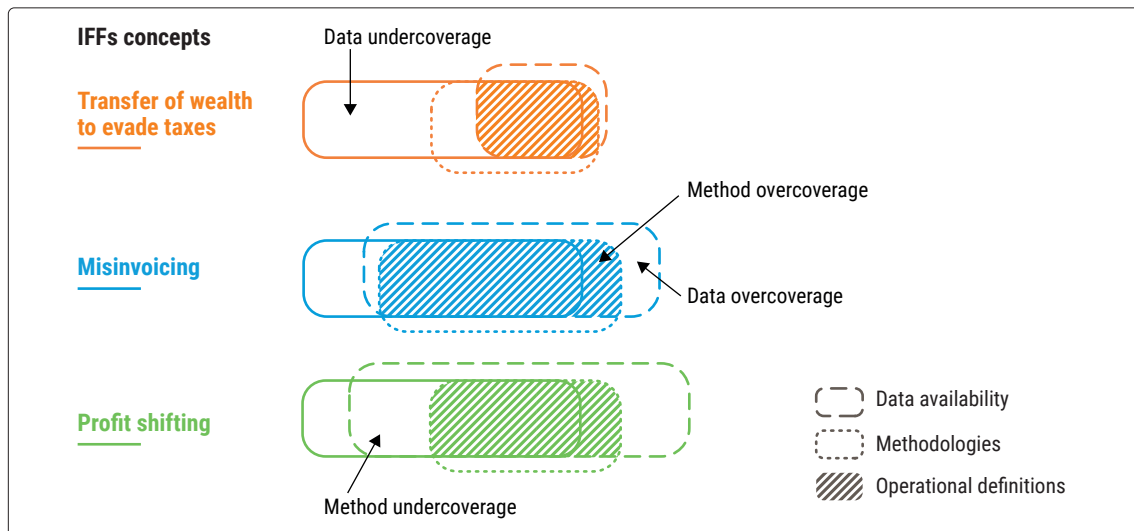
The measurement of tax and commercial IFFs aims to contribute to the overall indicator 16.4.1, total value of inward and outward illicit financial flows (in current United States dollars). Therefore, their measurement should be as internationally comparable as possible. Thus, the starting point has to be the definition of IFFs for SDG 16.4.1 or its elements. However, feasibility should be a key consideration. If certain types of IFFs are not significant in a country, it is not cost-efficient to try and measure those regularly⁴¹. Instead, measurement can focus on prominent types of IFFs and the most pressing data needs, as long as the selected methods follow international recommendations. Operational definition is not a policy decision on which IFFs should be measured and which ones should not be measured. The operational definition of IFFs is to be drafted in full professional independence by statistical authorities. The statistical authorities can consult experts and stakeholders to seek input. The IFF risk assessment provides a good basis for drafting an operational definition.

An operational definition is a clear, concise and detailed description of what an indicator at hand is attempting to capture. For tax and commercial IFFs, it could be, for instance, an indicator of IFFs from illegal commercial and tax activities, and IFFs from aggressive tax avoidance, excluding a part of IFFs that is difficult to measure in the country, e.g., due to lack of data. Deviations from the scope of IFFs, as defined by UNCTAD and UNODC (2020), and their reasons are transparently documented. The measure could exclude IFFs that are not typical to the country. For instance, some countries are recipients of aggressive tax avoidance inflows, while others experience outflows. In summary, the operational definition covers the prominent IFFs for which data and methods are available. In Figure 18 their overlap, i.e., the operational definition is shown with a pattern.

The operational definition will inevitably differ based on the choice of method to measure IFFs, for instance inward IFFs cannot be currently compiled using methods for transfer of wealth to evade taxes by individuals. In the case of misinvoicing, the operational definition of IFFs will exclude cases where discrepancies are not captured (e.g., some cases of collusion between both importer and exporter); on the other hand, transactions not classified as IFFs could be included (e.g., errors in statistical coverage, or mistakes due to heterogeneity of products), referred to as method overcoverage. Profit shifting is likewise prone to deviation of coverage due to method overcoverage, e.g., productivity differences could be mistakenly interpreted as IFFs; but also method undercoverage when, for example, only tax incentives comparing a domestic MNE unit to other units within an MNE are considered. The operational definition should clearly state the limitations of scope brought by the available data and selected method.

⁴¹ At the same time dedicated policies might not be a priority if the phenomenon is limited.

Figure 18 Operational definition as a mapping of main illicit financial flow concepts, available data and feasible methods



Source: UNCTAD (2021)

Note: Scales are not indicating true relations, simply presented for illustrative purposes.

As the goal is to capture the most significant flows at country level a certain level of international comparability can be achieved (if countries manage to cover significant IFFs only leaving less important IFFs out of scope), and country differences in coverage can be partially seen in available aggregates. A gradual process of improving the exhaustiveness of the IFF measures is expected, following the model of measuring illegal economic activities and the non-observed economy in the BoP and SNA.

3.2.6 Compilation and dissemination of tax and commercial illicit financial flows estimates

This technical paper and the *Methodological Guidelines* aim to support national authorities in compiling statistics on tax and commercial IFFs and their dissemination, however suited to national capacities and needs. Regardless of their comprehensiveness, even partial estimates, i.e., estimates of selected IFF (sub) types can provide valuable information for policy action to curb IFFs.

In the longer term, tax and commercial IFFs comprise part of SDG indicator 16.4.1 selected to the SDG global indicator framework, adopted by the General Assembly resolution A/RES/71/313 (2017a). While the indicator framework only requires an aggregate index to be published, i.e., total value of inward and outward IFFs, a more granular measurement of IFFs helps to identify the main sources and types of IFFs to guide interventions. At the indicator level, i.e., covering both tax and commercial and crime-related IFFs, UNCTAD and UNODC recommend a disaggregation of the index by relevant types of IFFs, as a minimum to publish separately the following four elements (see also chapter 5.2):

- IFFs from illicit commercial and tax practices,
- IFFs from illegal market activities,
- IFFs from corruption, and
- IFFs from exploitation-type and financing of crime and terrorism.

In addition, member States may decide to disaggregate the IFF indicator, where relevant, by:

- type of payment method (cash / trade flows / crypto currencies)

- resulting assets (offshore wealth / real estate etc.)
- actors (characters of individuals / types of businesses etc.)
- industries, commodities or service categories

Countries are affected by different types of IFFs. Therefore, it is suggested that the main types of IFFs to be published are defined at country level following the operational definition. Concerning tax and commercial IFFs, a division into and dissemination by three groups of flows is recommended:

- Transfer of wealth to evade taxes (F1),
- Misinvoicing (F2),
- Profit shifting (F3-F5).

In the context of adopting the SDG global indicator framework, the General Assembly resolution A/RES/71/313 (2017a) stressed that all activities of the global statistical system must be conducted in full adherence to the Fundamental Principles of Official Statistics (United Nations, 2014).

IFFs are a particularly difficult phenomenon to interpret and a sensitive issue to many stakeholders. It is, thus, important that IFF releases are published in a sufficiently comprehensive form, accessible to all citizens and presented in such a way that the main results are understood with no need for specialised statistical knowledge.

The first Principle requires official statistics to be compiled and made available on an impartial basis to honour citizens' entitlement to public information. Statistical releases should be presented according to scientific standards on the sources, methods and procedures to facilitate a correct interpretation (Principle 3). All releases should be accompanied by comprehensive metadata explaining limitations of use and guiding interpretation, and including information related to data sources, methods, missing data and exhaustiveness of the indicator.

Some IFF estimates are on the borderline of licit and illicit activities. The underlying datasets are highly sensitive which should also be considered in the planning of publications. The underlying individual data, on natural or legal persons, are to be strictly confidential (Principle 6). A confidentiality breach and even very detailed aggregates could be stigmatizing for statistical units or for an industry. Importantly, statistical agencies are entitled to comment on erroneous interpretation and misuse of statistics (Principle 4).

Historical time series would be useful for the analysis of development over time. Feasibility of constructing historical time series data will need to be reviewed by national statistical authorities. It may be possible only for certain IFFs for which suitable data sources exist.

Considering the wide range of source data needed, compilers will have to strike a balance between exhaustiveness and timeliness when setting a dissemination date. In practice, the data sources that become available with the longest delay, influence the timeliness of the indicator. One option is also to apply a revision strategy by releasing a preliminary estimate before more comprehensive datasets become available. The potentially preliminary or experimental status of the indicator should be clearly communicated to the public. It is good to review the IFF estimates against the quality criteria and ensure transparent communication about the quality of released figures.

Table 8 Assessing the quality of results under the IFF quality assessment framework

Category	No.	CRITERIA	CRITERIA explained
Results	16	Relevance for use	Are the results helpful for assessing IFFs or curbing different types of IFFs? How many uses are there for these results?
	17	Accuracy	Do the results describe what is intended? Are there large revisions?
	18	Timeliness	How quickly will the results be available? Are they available on time to help solve problems?
	19	Clarity	How easy are the results to use and interpret?
	20	Comparability	How comparable are the results in different conditions, across time and countries?
	21	Coherence	How coherent are the results internally? Can they be used together with other IFF estimates?
	22	Compatibility	To what extent can results already be reported as SDG indicator 16.4.1?

Source: UNCTAD (2021)

Note: Column No. refers to numbering in the quality assessment framework (UNCTAD, 2021: Background documents).

Better international comparability of IFF estimates may be achieved, especially in the beginning, by reporting at more disaggregated level(s), rather than only with a single, top-level aggregated value for all types of IFFs. Approaches combining various values into a single representation, such as dashboard approach (OECD, 2015) or scoreboards (European Commission, 2020) may be a possible solution for publishing different IFFs nationally.

3.2.7 Recommendations on the pilot compilation of tax and commercial illicit financial flows

These recommendations are aimed at supporting national efforts by the statistical systems to compile statistics on tax and commercial IFFs.

1. **Dedicate resources to the measurement of IFFs.** When significant, IFFs can distort key economic statistics in a way that may lead to wrong policy conclusions. Sufficient resources are needed not only to measure IFFs, but also to improve the quality of key indicators, such as GDP and the exhaustiveness and accuracy of the SNA and BoP. The results of the pilot testing can help inform these efforts and mobilise resources for the purpose to increase the efficiency of interventions to curb IFFs.
2. **Pool national and international expertise on IFFs.** Successful measurement of IFFs requires collaboration across disciplines as illicit phenomena cut across the society. Data exist but are scattered among many government and private organisations. IFFs cannot be monitored or captured fully using a single data source. It is important to map the roles of organisations and identify key partners to measure tax and commercial IFFs. Identification of key stakeholders can go hand in hand with IFF risk assessment (recommendation 4). Clear organisation of national work into a working group or a task force is likely to increase efficiency. Bilateral and international collaboration of statistical authorities of other countries to advance methodological development and address asymmetries (in, e.g., trade or declared wealth) is more efficient than working in isolation.
3. **Involve official statisticians in a leading role.** Official statistics and the NSO play a crucial role in the measurement of IFFs, as part of the SDG global indicator framework. The General Assembly resolution A/RES/71/313 (2017a) “stresses that official statistics and data from NSSs constitute the basis needed for the global indicator framework, ..., and stresses the role of National Statistical

Offices as the coordinator of the national statistical system.” Measurement of the many types of IFFs in a coherent way can only be done in close collaboration within the NSS and with data providers. The statistical expertise and professional independence of the NSO is a key enabler of the compilation of tax and commercial IFFs as an impartial statistical activity in line with the Fundamental Principles of Official Statistics.

4. **Assess IFF risks and data availability.** Countries’ exposure to IFF risks differs. The IFF categories, activities and flows typical to a country vary, including whether there are inflows or outflows, and what are the destination or origin countries of IFFs. Different IFFs require different data and methods for their measurement. There is no one size fits all model. A useful first step is to carry out an IFF risk assessment to collate information already available about IFFs in the country to identify prominent types of IFFs and who has relevant data to enable measurement. The *Methodological Guidelines* offer tools and approaches for IFF risk assessment and a data availability review with partner agencies (see Part III, Chapters 1, 2 and 3).
5. **Conduct an in-depth study of IFFs for the base-year.** Statisticians need to strike a balance between accuracy and cost-effectiveness. Therefore, we recommend a more thorough study of IFFs to be carried out for the base-year at the start, and at regular intervals, focusing on all aspects of IFFs, as feasible, activities, flows, actors, destinations and origins etc. This involves mobilising relevant agencies, identifying possible data sources and resources, including administrative data, and relying on available expertise and experience across disciplines. The in-depth study produces a so-called base-year structure for tax and commercial IFFs in the country.
6. **Narrow down the scope of focus.** National circumstances dictate not only the resources availability and statistical capacity, but also which IFFs activities and/or flows are prevalent in the economy. With the aim of maintaining comparability in space and time, the IFFs compilation should aim at exhaustiveness. Given the nature of IFFs and national circumstances, however, identifying the significant flows (e.g., certain commodities or types of IFFs) to represent national IFFs, may prove to be a good trade-off in producing reliable and robust IFFs statistics over time. If the national statistical capacity and data availability are limited, less resource-intensive methods to produce estimates of IFFs in between base years can be applied.
7. **Publish IFF estimates clearly and transparently.** IFFs are a particularly difficult phenomenon to interpret and a sensitive issue to many stakeholders. It is up to each country to decide whether to release results to the public. Even experimental releases can be very informative for policy action in an area that lacks statistics. IFF releases, like official statistics, should be published in a sufficiently comprehensive form, accessible to all citizens and presented in such a way that the main results are understood with no need for specialised statistical knowledge. It is important to highlight the main findings, but also limitations. Metadata should inform users transparently about the data sources, methods and quality of estimates. A dashboard approach, i.e., presenting a set of results can be helpful to shed light on the complex phenomenon.
8. **Share, learn and improve.** More insight into country circumstances, IFF activities, flows and other features will be obtained as experience with statistical measurement accumulates. Sharing of findings and lessons learned from pilots in the national and international context is important for learning. National training of experts, e.g., customs officers, financial investigators, official statisticians can be useful; sharing of outcomes in international seminars and webinars can help learn from other countries’ experience to replicate best practices. Data exchange within a safe statistical environment, where possible, or an exchange of resulting estimates can be crucial for learning and improvement.
9. **Spill-over effects on other statistics and statistical frameworks.** Better information on IFFs can help improve the accuracy of other statistics, including key economic statistics. In addition, as IFFs are hidden and they are often measured indirectly through traces they leave in other statistics, there may also be opportunities to enhance the quality of IFF estimates by making small changes

to data available from other statistics, e.g., merchandise trade statistics, trade in services, the SNA and BoP statistics, price statistics, etc.

3.3 CLASSIFICATION FOR THE MEASUREMENT OF ILLICIT FINANCIAL FLOWS

IFFs need to be classified using a discrete, exhaustive and mutually exclusive statistical classification aligned with existing statistical frameworks and principles. The ICCS (UNODC, 2015) is a good starting point for identifying the activities that could generate IFFs. The ICCS does not cover all tax and commercial activities that may generate IFFs, for instance IFFs related to aggressive tax avoidance. Therefore, the classification of IFFs needs to be broadened. A more exhaustive classification is being developed, where each activity is being analysed considering three aspects from chapter 2.4.

This technical paper focuses on tax and commercial IFFs and the following Table 4 presents deliberations of the Task Force on classifying activities generating tax and commercial IFFs. Note that the classification starts off from the ICCS, but expands it for classifying elements that are not illegal. Tax and commercial IFFs are generated by tax and commercial practices that involve economic action by individuals or corporations. Those illicit economic acts can be traced back to some acts classified in the ICCS for the illegal (only) elements of tax and commercial IFFs.

The ICCS, a statistical classification framework for crimes, has the main structure composed of different types of acts grouped into 11 level 1 categories (2 digits), each of them being in turn broken down in sub-levels (level 2: 4 digits, level 3: 5 digits; level 4: 6 digits). The level 1 code '08' 'Acts against public order, authority and provision of the state', in particular its level-3 code '08041' 'Acts against revenue provisions' seems to fit well with the aim of classifying tax and commercial IFFs-related economic action starting from the ICCS. Other codes that may potentially contain some tax and commercial IFFs-generating practices may be found in code '07019' 'Other acts of fraud'. However, the classification explicitly excludes tax fraud from that code (referring instead to code '08041').

Building on this, code '08041' includes tariff, taxation, duty and revenue offence, while excluding social welfare and tax fraud, deception and corruption, which is included in the code '07' 'Acts involving fraud, deception and corruption'. Moreover, choosing code '08041' excludes from the statistical measurement of tax and commercial IFFs other codes within its higher-level code '0804', which relate to financial regulations ('08042'), betting regulations ('08043'), smuggling of goods ('08044'), market manipulation ('08045') and the miscellaneous acts against the public administration or regulatory provisions ('08049').

Tax and commercial IFFs can be therefore classified by "creating a new" set of codes at level 4 starting from the level-3 code '08041' of the ICCS, including the different channels of tax and commercial IFFs stressing the economic action (the act) that generate the related IFFs. These are presented in Table 4 with addition of the 6th digit next to 5-digit code '08041' – noting again that these does not bear a direct link to ICCS (especially for codes 080413, 080414 and 080415 referring to aggressive tax avoidance). Rather, such coding, drawing from ICCS and expanding as appropriate, is a work in progress to guide the further development of a classification (see also below). Flows referred to in the table (F1-F5) were explained in chapter 2.

Building on this, a stand-alone statistical classification of activities that may generate IFFs can be designed. While its finalization requires further work and testing of its conceptual design in practice, the existing deliberations envisage a 4-level, 6-digit classification as per below description:

- Level 1: 1-digit code to identify the type of IFFs, such as
 - IFFs from tax and commercial activities
 - IFFs from illegal market activities

- IFFs from corruption
- IFFs from exploitation-type activities and financing of crime and terrorism
- Level 2: 2-digit code to identify the subtype of IFFs. For example, for tax and commercial IFFs, these are:
 - Trade misinvoicing
 - Tax evasion
 - Aggressive tax avoidance

These subtypes correspond to the flows F1-F5 referred to in previous sections.

- Level 3: 4-digit code to identify specific flows within the subtypes, in example for trade misinvoicing:
 - Trade mis-invoicing (general)
 - Trade mis-invoicing (evasion of custom duties)
- Level 4: 6-digit code identifying the activity that may generate IFFs.

Contrary to initial steps on the coding, building and extending directly from the ICCS (as in Table 4), the classification of activities that may generate IFFs sets up its own coding system (above) and related values. However, each of the level 4 activity would have a direct correspondence to ICCS, where appropriate. In such a way, description of activity or explanatory notes for this activity would draw directly from ICCS. In other cases, the explanatory notes will provide specific additional description of activities conceptually not being covered by the ICCS, i.e., aggressive tax avoidance. An example of the classification under developments is presented in Table 5.

Table 4 Classification of tax and commercial IFFs

Code	Description	Inclusion/exclusion		Code of flow	Type of flow	Flow	Typology
08041 1	Acts of concealing revenues or wealth in order to evade taxation	Inclusion	Outright undeclared (concealed e.g., in secrecy jurisdictions); Undeclared via instruments (Phantom corporations or shell companies, tax havens)	F1	Income management	Transfer of wealth to evade taxes, i.e., flows related to undeclared offshore wealth	Revenue offences
		Exclusion	Fraud, deception or corruption (07)				
08041 2	Acts of fraudulently misdeclaring the object, the quantity or the value of traded goods in invoicing transactions	Inclusion	Under/over reporting prices; Multiple invoicing; Over/under reporting of quantities; Misclassification of tariff categories	F2	Income management (income transfer) / Income generation (tariff avoidance)	Misinvoicing	Tariff, taxation and/or duty offences
		Exclusion	Transfer mispricing (08041 3)				
08041 3	Acts departing from the arm's length principle	Inclusion	Setting up over/under priced exchange of goods and services with the intent of moving profits among MNEs units	F3	Income generation	Transfer mispricing	Taxation offences
		Exclusion	Misinvoicing (08041 2)				
08041 4	Acts related to strategic location of debt, other financial assets, risks, or other corporate activities	Inclusion	Intracompany loans; Interest payments	F4	Income generation	Debt and other financial assets shifting	Taxation offences
		Exclusion	Transfer mispricing (08041 3)				
08041 5	Acts related to strategic location of intellectual property products and other non-financial assets	Inclusion	Strategic location of intellectual property; Strategic location of other assets; Cost-sharing agreements; Royalty payments	F5	Income generation	Intellectual property and other non-financial assets shifting	Taxation offences
		Exclusion	Transfer mispricing (08041 3)				

Source: Deliberations by the Task Force

Table 5 Preliminary version of classification of activities that may generate tax and commercial IFFs

Level	Category	Code	Text	ICCS correspondence
1	Type of IFFs	1	Tax and commercial illicit financial flows	
2	Subtype of IFFs	11	Trade misinvoicing	
3	Flow	1110	<i>Trade mis-invoicing (general)</i>	
4	Activity	111010	Acts against commercial, industrial or financial regulations	08042
4	Activity	111020	Unlawful market manipulation or insider trading	08045
4	Activity	111030	Acts against customs provisions	08041
4	Activity	111090	Acts against public revenue provisions and acts involving behaviour that is regulated or prohibited on moral or ethical grounds that are not described or classified in categories 111010-111030.	08049
3	Flow	1120	<i>Trade mis-invoicing (evasion of custom duties)</i>	
4	Activity	112010	Acts of fraudulently mis declare the object, the quantity or the value of traded goods in invoicing transactions	08041
4	Activity	112020	Unlawful market manipulation or insider trading	08045
4	Activity	112090	Acts against public revenue provisions and acts involving behaviour that is regulated or prohibited on moral or ethical grounds that are not described or classified in categories 112010-112020.	08049
2	Subtype of IFFs	12	Tax evasion	
3	Flow	1210	<i>Undeclared offshore wealth (non-financial assets)</i>	
4	Activity	121010	Acts of concealing revenues or wealth in order to evade taxation, non-financial assets	08041
4	Activity	121020	Acts against taxation and other public revenue provisions	08041
4	Activity	121090	Acts against public revenue provisions and acts involving behaviour that is regulated or prohibited on moral or ethical grounds that are not described or classified in categories 121010-121020.	08049

Level	Category	Code	Text	ICCS correspondence
3	Flow	1220	<i>Undeclared offshore wealth (Financial assets)</i>	
4	Activity	122010	Acts of concealing revenues or wealth in order to evade taxation, financial assets	08041
4	Activity	122090	Acts against public revenue provisions and acts involving behaviour that is regulated or prohibited on moral or ethical grounds that are not described or classified in category 122010.	08049
2	Subtype of IFFs	13	Aggressive tax avoidance	
3	Flow	1310	<i>Transfer mispricing</i>	
4	Activity	131010	Acts departing from the arm's length principle	/
4	Activity	131090	Other	/
3	Flow	1320	<i>Assets shifting</i>	
4	Activity	132010	Acts related to strategic location of financial assets (other than debt), risks, or other corporate activities	/
4	Activity	132020	Acts related to strategic location of intellectual property products and other non-financial assets	/
4	Activity	132090	Other	/
3	Flow	1330	<i>Debt shifting</i>	
4	Activity	133010	Acts related to strategic location of debt	/
4	Activity	133090	Other	/

Source: Authors' deliberations

4

MEASURING TAX AND COMMERCIAL ILLICIT FINANCIAL FLOWS

4.1 TRADE MISINVOICING

Trade misinvoicing has been identified as one of the main types of flows of IFFs in empirical research (see e.g., WCO, 2018). The *Methodological Guidelines* propose to apply and enhance two well-known approaches, the Partner Country Method Plus (PCM+) and the Price Filter Method Plus (PFM+). Studies have shown (e.g., WCO, 2018) that there is a wide difference in the magnitude of under-invoicing and over-invoicing amounts estimated by PFM and PCM. Somewhat expectedly, PCM yields higher values than PFM, as PCM has a high probability of taking other factors into account when producing estimates (e.g., statistical errors and differences in the recording of bilateral trade), whereas on the other hand, PFM may report estimates on the lower bound of IFFs due to various factors depending on price-filter determination, and because the method focuses on mispricing only. WCO (2018) cites several researchers in noting that cross-referencing the two methods could be an effective tool to assess the risk of trade transactions which were likely to contain instances of trade misinvoicing. However, for a reasonable comparison, comparable coverage and scope of application (e.g., commodities or flows) need to be ensured.

4.1.1 Method #1: Partner Country Method Plus

Concept and assumptions

The PCM is a top-down method comparing import (or export) values reported by one country with the corresponding export (or import) values reported by its partner country. The concept of PCM is based on a trade gap, defined as discrepancy in the values of a trade transaction, independently reported by both trading partners. The main assumption behind PCM is that partner's trade statistics are sufficiently accurate and comparable to treat differences in mirror statistics as misinvoicing, hence directly applicable to measuring tax and commercial IFFs as IFFs. This assumption is critical and highly unlikely, raising serious doubts about the reliability of this method.

Many factors contribute to trade asymmetry. Therefore, all measures must be taken to correct for other reasons before attributing a portion of asymmetry to IFFs or trade misinvoicing. According to UNSD (2019), three main and well-known reasons for asymmetries in bilateral merchandise trade are:

- i. Application of different criteria of partner attribution in import and export statistics,
- ii. Use of CIF-type values in import statistics and FOB-type values in export statistics,
- iii. Application of different trade systems (General versus Special Trade System).

Reported exports of one country may not coincide with the reported imports of its partner country also due to (see UNSD, 2019):

- shipping time-lags across different accounting periods (quarters or years);
- goods entering Customs warehousing for several months;
- goods passing through third countries;
- lack of information or misspecification of re-exports and re-imports;
- improper declaration of product classification at the customs border, either entry or exit;
- differences in scope and coverage e.g., merchanting and trade value thresholds;
- statistical measurement differences and errors;
- variations in data compilation methods, and confidentiality among other reasons.

Overcoming limitations

Even the major drawbacks of PCM do not render it redundant. According to WCO (2018), any implementation of the PCM approach requires additional assumptions to be made and inferential techniques to be chosen. Most PCM applications use globally accessible data on bilateral trade flows from IMF DOTS or United Nations Comtrade databases (such as WCO, 2018; and Global Financial Integrity, 2019). National statistical authorities, in particular Customs, have more detailed data. We propose the PCM method to be used but enhanced with national data and bilateral data exchange to improve the quality of estimates. PCM methodology (hence, PCM+) can be enhanced with the following:

1. Compare national data with trading partners as it can significantly improve the accuracy of PCM+ estimates. Carry out mirror exercises to exchange and compare trade statistics data focusing on important trade partner countries with the largest trade flows and the largest observed asymmetries (see case study 1.1 in (UNCTAD, 2021: Background documents: Case studies)).
2. Use granular national data, including most detailed levels of the product classification by partner country, and available microdata, to reduce uncertainty about the source of bilateral trade asymmetries. Apply PCM+ on the national data held by statistical authorities, in particular Customs, to improve the accuracy of PCM+ estimates. Focus corrections on trading flows or products with largest asymmetries and known prominent types of IFFs.
3. Resolve CIF-FOB differences. Exports are usually reported as FOB and imports as CIF. UNSD (2019) encourages countries to compile FOB values of imported goods as supplementary information. When these are not available, CIF/FOB ratios are needed to correct for the asymmetry caused by valuation differences. It is better to apply country and region-specific ratios rather than common ratios for all countries⁴². In some instances, commodity-specific CIF/FOB ratios are needed⁴³. Precious metals are a good example where transportation and insurance costs constitute a lower share of the value of goods (see case study 1.2 in UNCTAD (2021: Background documents: Case studies)).
4. Analyse remaining bilateral asymmetries after CIF-FOB differences have been accounted for. UNSD (2019) provides a step-by-step guide and tabular template to support the analysis of bilateral asymmetries, and this is applied to the following guidance on applying PCM+.
5. In cases where remaining asymmetries remain poorly explained and where they remain significant, apply the reliability weighting procedure. In cases where gaps in mirror trade statistics are substantial, doubt may arise as to whether this is due to misinvoicing or other factors. A weighting procedure to address the issue (WCO, 2018) assigns a higher weight to trade gap the closer the associated matched volume reports are, i.e., the smaller the gap. Note that this step can only be processed where reliable quantity data of trade flows are available, which is usually at a national level using direct Customs data.
6. Validate results with qualitative methods. Nolintha et al. (2020) suggest complementing the above steps with qualitative research, interviews and consultations with Customs and trade experts to enhance the reliability of PCM+ results.

⁴² GFI (2019) uses a 6 per cent fixed ratio, down from 10 per cent used in previous studies. WCO's (2018) study of 2016 import data for the United States of America revealed that the average CIF is 2.2 per cent with Europe, 4.81 per cent with South America and 2.8 per cent with all other partner countries. The United States International Trade Commission (2013) apply different CIF/FOB ratios for east and westbound transport between China and Hong Kong (China Special Administrative Region), and the United States of America.

⁴³ Carbonnier and Mehrotra (2020) apply a 2 per cent ratio for trade of gold. Gaulier et al. (2008) provide insight into CIF/FOB ratios differences across activity sectors, noting that transport costs are higher for mining and quarrying than for manufacturing and that fresh goods and other commodities (agricultural, fishing) appear to have 2 percentage points higher transport costs than those of manufacturing. Schuster and Davis (2020) produce estimates of CIF/FOB ratios by commodity groups.

Source data

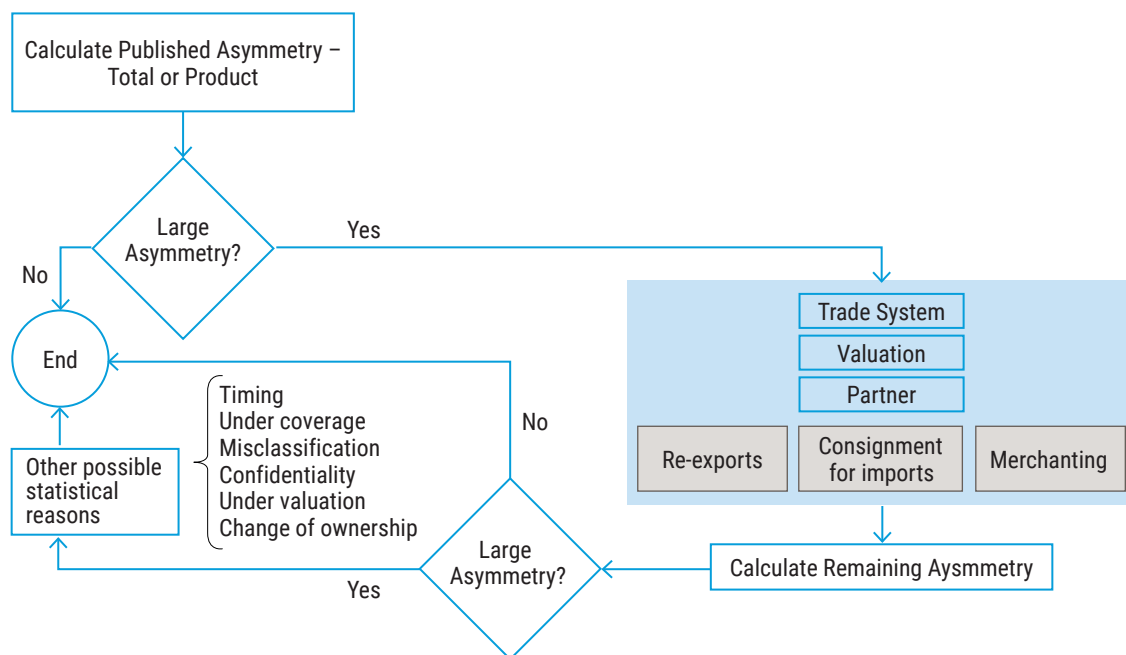
Application of PCM+ requires bilateral trade statistics between reporting country and its trading partners, ideally by partner and not aggregated to the rest-of-the-world category. Source data include trade data collected nationally by the Customs or other relevant national authority. Data are preferably at the most granular level of product classification (at least 6-digit HS level with data on price, quantity, total value, CIF or FOB valuation, trading partner, country of origin or destination and type of flow, e.g., import/export or re-import/re-export). International data sources such as United Nations Comtrade or the IMF DOTS can be used in addition. The UNCTAD Global Transport Costs database for International Trade can be useful for resolving CIF-FOB discrepancy and the OECD’s ITIC database a source of CIF-FOB margins.

Calculation

Once source data are gathered and prepared, PCM+ is implemented in the following phases.

The analysis starts from a review of bilateral asymmetries, as outlined in UNSD (2019) – see Figure 19. It will be useful to start by assessing published asymmetries starting with total exports and imports and then moving to selected commodity groups looking at the main trading partners. As an alternative, observe discrepancy at HS chapters, and go deeper when significant discrepancy is detected. In observing the bilateral asymmetries, also consider the difference of HS editions.

Figure 19 Flow chart for analysing and reducing bilateral asymmetries



Source: UNSD (2019)

1. Adjusting for trade system differences

The first step examines the sources of differences for large asymmetries. First, check differences of trade systems used in reporting and partner countries based on information provided by United Nations Comtrade⁴⁴ and adjust. Difference of trade systems may lead to trade asymmetries not attributable to IFFs. Case study 1.9 in UNCTAD (2021: Background documents: Case studies) illustrates how to deal with the differences caused by different trade systems.

2. Valuation - converting import data to FOB

The second step is to review the difference in valuation of imports and exports. It should be checked which valuation is used by the trade partner countries of interest. And where imports use CIF valuation, these should be adjusted to FOB to match with exports. Otherwise, this discrepancy may lead to trade asymmetries not attributable to IFFs.

First, annual import data need to be converted to FOB valuation, if not already available⁴⁵. Multiple ways of estimating the FOB values from CIF exist, apart from using fixed ratios. UNSD (2019) lists a few options, such as: extracting data from International Merchandise Trade Statistics (IMTS); collecting data on freight and insurance premiums from importers; analysing trade flows, freights, and insurance rates. Readers may consult the IMTS Compilers Manual, Chapter 14 on Valuation (UNSD, 2013) or Supplement to the Compiler's Manual (UNSD, 2008). If FOB import values cannot be obtained directly, CIF/FOB ratio approach is applied:

$$IM_{FOB,c,r,p,t} = \frac{IM_{CIF,c,r,p,t}}{CFr_{c,r,p,t}} \quad \text{Equation (1)}$$

where:

- IM* ... import value
- CFr* ... CIF/FOB ratio
- FOB* ... FOB valuation
- CIF* ... CIF valuation
- c* ... commodity
- r* ... reporter (country)
- p* ... partner (country)
- t* ... year.

During this phase, CIF/FOB ratios are constructed at as detailed level(s) as possible with respect to commodities, reporter and partner countries (or regions), and years. Studying existent data on trade flows, freight and insurance premiums, distance between trading partners and similar provides basis for ratio calculation. Basic ratio can be calculated as:

$$CFr_{c,r,p,t} = \frac{IM_{CIF,c,r,p,t}}{EX_{FOB,c,r,p,t}} = \frac{p_{CIF,c,r,p,t} * q_{IM,c,r,p,t}}{p_{FOB,c,r,p,t} * q_{EX,c,r,p,t}} \quad \text{Equation (2)}$$

where:

- EX* ... export value
- p_{CIF}* ... CIF price declared by importer
- p_{FOB}* ... FOB price declared by exporter
- q_{IM}* ... declared quantity by importer
- q_{EX}* ... declared quantity by exporter.

⁴⁴ See <https://comtrade.un.org/survey/Reports/byQuestion>, Section 12: "Trade System".

⁴⁵ United Nations Comtrade provides information on data availability. See <https://comtrade.un.org/survey/Reports/byQuestion>, Section 15: "Valuation".

Further considerations on data and methodology of estimating CIF/FOB ratios can be found in e.g., Gaulier et al. (2008) or Hummels and Lugovskyy (2003) and case study 1.2 in UNCTAD (2021: Background documents: Case studies) showcases the estimation of CIF for commodity-specific research (Schuster and Davis, 2020).

3. Partner country attribution

Goods are either shipped directly from one country to another or through third countries. Asymmetries can arise when the country of export may not know the final country of destination at the time of export. Similarly, importing country may not be able to identify the country of origin. This may lead to trade asymmetries not attributable to IFFs and should be corrected.

According to UNSD (2019), for imports, two categories of partner countries can be distinguished: country of origin and country of consignment (also called the country of exports). For exports, country of final (known) destination is important along with the identification of re-export flows. Identification of country of consignment is crucial for observing trade asymmetries.

There are three important considerations for partner country attribution: consignments for imports, re-exports and merchanting. In merchanting, a unit purchases goods from abroad and then sells them to another country without the goods entering the purchaser's economy. Goods under merchanting are recommended to be excluded from trade statistics (UNSD, 2013), but countries may end up measuring the related flows differently thus leading to asymmetry.

Instead of direct shipment of goods to the destination country, they can be re-exported further or shipped via a consignment country⁴⁶. This country is often mistakenly recorded as the destination or origin of the flow which causes trade asymmetry. Partner country attribution needs to be done for each trade partner country, and related flows studied carefully to make sure proper attributions are used (case study 1.3 in UNCTAD (2021: Background documents: Case studies)).

4. Review remaining asymmetry

Trade asymmetries can arise from time lags in shipments or seasonal trade cycles, e.g., high trade at the end of the year. Generally, goods are recorded at the time of entering or leaving the economic territory of a country (UNSD, 2013). This may lead to some flows, or their parts, to be assigned to different years (or months) by each trading partner. Differences are often due to country-specific reasons and need to be addressed in a case-specific way. As UNSD (2019) point out, the method of estimating time lags depends on dominant mode of transport and can be obtained from transport documents (e.g., bill of lading for sea transport) or from transport operators. Required adjustments are netted, i.e., consolidated from reporter's import or export perspective, and in the end subtracted to obtain adjusted value of imports, or exports.

There are also other sources of discrepancies, such as those listed at the start of this chapter, for instance coverage issues, misclassification, under valuation, difficulties in recording trade by change of ownership and measurement errors. Correcting for these asymmetries requires close collaboration of national authorities, such as the NSOs and Customs, within and across countries (see case study 1.4 in UNCTAD (2021: Background documents: Case studies)).

Finally, all the identified corrections should be implemented leaving the remaining part of trade asymmetries. The UNSD template (2019) is useful for addressing these to come to a value of remaining asymmetry. A procedure for adapting imports of a reporting country and exports of a partner country is presented in case study 1.10 in UNCTAD (2021: Background documents: Case studies). Accordingly, adjustments are processed for both exports and import of reporting country and partner country imports (to obtain InboundRA and OutboundRA as remaining, unexplained asymmetries). If any additional sources of

⁴⁶ A country of consignment is the country from which goods were dispatched to the importing country (or to which goods were dispatched from the exporting country), without any commercial transactions or other operations (UNSD, 2013).

asymmetries are detected at this point, they need to be considered. It needs to be noted that this step is particularly thorough and requires significant resources and commitment, as well as liaison with trading partners' institutions.

5. The reliability weighting procedure

Under certain conditions, i.e., that analysis of remaining asymmetries in previous step did not produce substantial reduction and asymmetries remain large, and the nationally-available data on quantities related to international trade flows are reliable and available, then the next phase brings in the reliability weighting procedure to mitigate risk of unproportionally privileging large trade gaps, which have higher potential of not indicating mispricing. The weights are applied to records of inbound flows from reporter's side using the weights:

$$w = 1 - \frac{|q_{IM,c,r,p,t} - q_{EX,c,r,p,t}|}{\max(q_{IM,c,r,p,t}, q_{EX,c,r,p,t})} \quad \text{Equation (3)}$$

In an analogous fashion, weights are applied to outbound flows, i.e., exports of reporter. By applying these weights, the inbound (imports) and outbound (exports) flows are expressed as:

$$Inbound_{c,r,p,t} = w * (IM_{FOB,c,r,p,t}^{Adj} - EX_{FOB,c,r,p,t}^{Adj}) \quad \text{Equation (4)}$$

$$Outbound_{c,r,p,t} = w * (EX_{FOB,c,r,p,t}^{Adj} - IM_{FOB,c,r,p,t}^{Adj}) \quad \text{Equation (5)}$$

We (can) assume they refer to misinvoicing. ECLAC (2016), similarly, applies a weighting procedure outlined in case study 1.5 in UNCTAD (2021: Background documents: Case studies) and ESCWA in their work in the Arab region (case study 1.6 in UNCTAD (2021: Background documents: Case studies)).

6. Calculate inward and outward IFFs

The final phase is to calculate inward and outward IFFs. Inward IFFs refer to over-invoiced exports and/or under-invoiced imports; and outward IFFs refer to under-invoiced exports and/or over-invoiced imports, as in:

$$Overinvoiced IM_{c,r,p,t} = \max(0, Inbound_{c,r,p,t}) \quad \text{Equation (6)}$$

$$Underinvoiced IM_{c,r,p,t} = -1 * \min(0, Inbound_{c,r,p,t}) \quad \text{Equation (7)}$$

$$Overinvoiced EX_{c,r,p,t} = \max(0, Outbound_{c,r,p,t}) \quad \text{Equation (8)}$$

$$Underinvoiced EX_{c,r,p,t} = -1 * \min(0, Outbound_{c,r,p,t}) \quad \text{Equation (9)}$$

To compile inward and outward IFFs the following equations are used:

$$InwardIFFs_{c,r,p,t} = Overinvoiced EX_{c,r,p,t} + Underinvoiced IM_{c,r,p,t} \quad \text{Equation (10)}$$

$$OutwardIFFs_{c,r,p,t} = Underinvoiced EX_{c,r,p,t} + Overinvoiced IM_{c,r,p,t} \quad \text{Equation (11)}$$

Finally, aggregation at national level is obtained by⁴⁷:

$$InwardIFFs_{r,t} = \sum_{c,p} InwardIFFs_{c,r,p,t} \quad \text{Equation (12)}$$

$$OutwardIFFs_{r,t} = \sum_{c,p} OutwardIFFs_{c,r,p,t} \quad \text{Equation (13)}$$

⁴⁷ For a single measure of IFFs in a country, the inflows and outflows can be summed, not netted, as per: $IFFs_{r,t} = InwardIFFs_{r,t} + OutwardIFFs_{r,t}$. Subtracting outflows from inflows of IFFs would indicate the net effect of IFFs on the country. However, in a case that inflows and outflows balance out, the country may be perceived as if no threat or danger from IFFs are present, whereas each flow, inward and outward, may be of significant scale. Therefore, their sum would be used to indicate the overall IFFs in a country, if relevant.

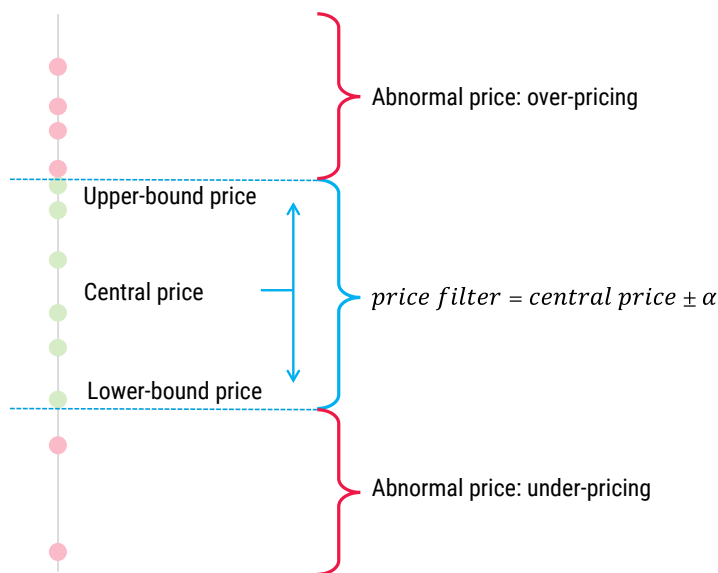
Various applications of PCM, however without thorough enhancement to the PCM+ are referred to in case study 1.7 in UNCTAD (2021: Background documents: Case studies).

4.1.2 Method #2: Price Filter Method Plus

Concept and assumptions

The PFM+ is a bottom-up method which estimates a price filter by determining a market price for each commodity and uses it as a proxy for arm's length prices. As such, the price filter is a range of normal, or acceptable prices for a specific commodity (see Figure 20 where green dots refer to normal observed prices and abnormal ones are red-dotted). The core idea of PFM+ is to compare the unit prices determined by the price filter with the actual observed unit prices.

Figure 20 Price filter to determine abnormal prices



Source: UNCTAD (2023b)

Trade mispricing then occurs when the unit price of a given transaction differs from the normal prices assumed by a price filter, i.e., when an abnormal price of a particular transaction is identified, and when this is systematically correlated with the underlying incentives to misprice that particular transaction. Price filters vary between transactions depending on the circumstances of a given transaction, such as economic circumstances of the countries involved, business strategies and situations of the buyer and seller (e.g., whether they are part of a multinational group or not), tariff rates, or contractual terms.

The main advantage of PFM+ is that it uses transaction level data from Customs or other relevant national authorities, and thereby does not rely on data collected and shared by other countries. This means that it operates efficiently and at low costs. While PFM+ can detect IFFs via transfer mispricing, i.e., mispricing among related parties within the same MNE, conceptually such obtained IFFs would fall in the category of profit shifting (chapter 4.2). Wherever possible, the analysis is to be done on unrelated parties transactions. Regardless, for administrative purposes it can help with automated monitoring of transactions in real time, allowing for inspection of historical records.

Overcoming limitations

The major challenge of PFM+ is determining the price filter, from which “abnormal” transactions then deviate. This challenge has multiple layers. First, transactions need to be classified using product classifications, and even at the most detailed level, they include products of varying degree of heterogeneity. These would inherently have different prices that would be picked up as abnormal prices using the price filter, while that would not necessarily be a sign of mispricing (e.g., high-end quality products within the same product code would have high(er) prices, potentially identified as abnormal prices, whereas in reality they simply reflect the quality of the product). To mitigate this concern, price filters should be identified at the most detailed HS-code level to depict segmented market features better and lead to a better identification of abnormal prices. Supplementing a low-level product code with a description of the commodity may address the problem of false identification of abnormal prices, where in fact, different products are being sold (e.g., high, medium, and low-quality products). Some products may also be more suitable for setting an accurate price filter, as their quality is not as heterogeneous, whereas gold⁴⁸, technical or IT products seem like natural candidates for high quality variations within a single product code. Experts’ knowledge is essential here (see below). A statistical tool of hedonic prices (see ILO et al., 2004) can also be applied, though the approach has not been tested yet.

Second, PFM+ suffers from the inability to identify legitimate abnormal prices, e.g., lower prices offered by long-term contracts, but also cases of volatile prices during the price filter estimation period, e.g., using annual price filters for crude oil when monthly crude oil price ranged between US\$56/barrel and US\$110/barrel in 2014 (see WCO, 2018).

Third, the PFM+ is not able to detect IFFs done at a small scale (compared to the underlying money flows). When declared prices are different from true prices only by a small margin, PFM+ will not detect them as abnormal prices.

Fourth, due to limitations of data availability or quality, it may be difficult to assess whether the trading partners have an incentive to deviate the unit price of a given transaction from the price filter. To efficiently determine these, it is necessary to collect data on the trading partners (e.g., whether they are part of the same MNE, or whether that multinational has an affiliate in a low-tax jurisdiction within its structure – see case study 2.6 in UNCTAD (2021: Background documents: Case studies)) and also on the tax environments of the partner countries (e.g., corporate income tax rates).

Lastly, as in other methods, there is a difficulty to identify recording errors.⁴⁹ Data cleaning techniques should always be applied to mitigate the risk of recording errors significantly biasing the results. A detailed manual examination of trade records (for example by selecting a random sample of records to be manually checked) can also help identify recording errors. Although this requires significant efforts by compilers, such data enhancements produce more accurate estimates of IFFs.

In addition, applying expert knowledge in implementing PFM+ is crucial for the reliability of its results. Experts’ inputs are essential for validating the price filter levels, but also to set the upper and lower bounds of the price filter. Commodity specialists from national agencies, such as Customs or related institutions, are best placed to support this exercise. Within NSOs, LCUs may have expertise related to strategic pricing by MNEs. Moreover, expert knowledge is also required in additional checks and examination of trade documents in cases of suspicious transactions. These, identified by PFM+, should be examined to avoid false positives. Collaboration of national authorities (NSOs, Customs and others) can help build the knowledge for identifying abnormal prices and addressing IFFs from trade misinvoicing.

⁴⁸ For a case of gold purity, see Carbonnier and Mehrotra (2020).

⁴⁹ PFM+ is subject to an important limitation: it does not capture mis-recording of quantities (which may not be insignificant, specifically in cases of only small-scale mispricing).

Source data

Transaction level data on international trade flows from Customs or other relevant national authorities are used as the main source. These contain data on trading partners (companies), price, value, quantity, commodity information (ideally at the most detailed level of HS classification), and whenever possible, additionally to the detailed code, also a description of the commodity. It is useful for the NSO and Customs to work together to prepare, clean and classify these datasets.

In addition to using a subsample of the transaction level data to determine the price filter, free-market prices of commodities can be sourced from international data sources, such as UNCTAD commodity prices or the World Bank's commodity market prices. Similarly, United Nations Comtrade offers a range of standard unit values (SUV) with global unit values including their acceptable range unit value for each HS sub-heading. These sources may be overly aggregated, however alongside experts' inputs they provide good basis for at least some of the commodities being heavily traded worldwide. Additional insight from (national) experts are required to determine specific commodity price filters, especially if these are not traded very frequently among unrelated parties.

Transaction level data are then complemented with information on the trading partners, for example from business registers and financial accounts datasets (available nationally or internationally via Orbis and similar databases), corporate tax returns, or international sources such as country-by-country reporting data (including OECD's CbCR), OECD's AMNE database, the OECD-UNSD Multinational Enterprise Information Platform, or the ADIMA database (see case study 2.6 in UNCTAD (2021: Background documents: Case studies) for more details).

Calculation

Once source data are gathered and prepared, PFM+ is implemented in the following phases⁵⁰:

1. Exploratory data analysis and preparation of the data

For the analysis, as the first step, the unit of observation is normally defined as a daily aggregation of transactions for a specific commodity (at most detailed available level, e.g., at 8-digit HS) per trading partners (at company level). This first step involves also obtaining data for imports and exports.

The second step involves aggregating or grouping transactions into groups of similar trades, by commodity, trading partners, time period (depending on volatility, seasonality of prices, this can be from days, to weeks, months, or even a year; we propose daily aggregations), or units of measurement (if applicable).

The third step builds on the previous and checks data for outliers, inspects them thoroughly also with experts' involvement, and defines the way they are treated (one obvious treatment would be their removal). Case study 2.1 in UNCTAD (2021: Background documents: Case studies) presents an example of basic treatment of source data held by the South African Revenue Service (SARS) before the application of PFM+.

2. Including experts of international trade

The second phase consists of the inclusion of trade experts in the process of applying PFM+. We list this as a second phase, although it can be done in first phase already and is to be continued throughout the process of PFM+ application. Extensive desk research is crucial to identify relevant national stakeholders (see chapter 3.4.2). Depending on national circumstances, agencies or institutions these experts come from vary, but could include Customs, frontier or border agencies, private and public agencies specialising in imports and exports procedures, tax authorities, think tanks and research institutions. Different commodities may require different institutions and/or experts to be involved. Case study 2.2 in UNCTAD (2021: Background documents: Case studies) showcases this phase in the study of mispricing of gold and cocoa exports from Ghana (Ahene-Codjoe et al., 2020).

⁵⁰ Like PCM+, also before implementing PFM+, an exploratory analysis can be conducted, narrowing down the scope, e.g., to only the top-10 traded products, or covering at least 75 per cent of the total trade. This choice will depend on the national circumstances and availability of resources.

3. Defining the price filter

The third phase defines the price filter. Several options are possible, including various enhancements as described above. Regardless, setting-up the price filter is composed of two steps: first, to define the central price, cp , and second to define the range, α :

$$pricefilter_{f,c,r,p,t,u} = cp_{f,c,r,p,t,u} \pm \alpha_{f,c,r,p,t,u} \quad \text{Equation (14)}$$

In the first step, decisions need to be made on the price series to use throughout the PFM+. These decisions include the sample of transactions to be used to determine the price filter, f ; level of commodity classification, c , for which prices are used; the timeframe applied, t ; flow f , i.e., focusing on only imports or exports, or both; reporting partner, r , and trading partner, p ; and units of measurement, u . We look at each in turn.

For the sample of transactions to be used to determine the price filter, there are two main options: (i) using a sub-sample of observed prices, which has an advantage of employing the same data source, however, there are challenges with identifying transactions that are not likely to include an IFF component to set the price filter in an unbiased way; and (ii) free-market price datasets remedy this drawback, yet it suffers from being applicable only to the commodities for which a clear, commonly accepted market exists, and can be easily identifiable.

In line with adjustments above, we propose to use a price at the **most detailed product classification level** possible, potentially enhancing it further with product descriptions. This will bring on board discussions on varying product characteristics (see case study 2.3 in UNCTAD (2021: Background documents: Case studies)) and will inherently require heavy involvement of commodity and trade experts.

The time dimension is important from two perspectives: first, which timeframe to use in the sense of including only the current price, or rather incorporate a longer period, to account for some of the variations in the market. Second, whether to use the rolling-value, such as moving average, or simply use one fixed value for entire studied period. We propose to avoid using a fixed value for a longer period yet to base the central price on multiple-period observations. To encompass this, a **moving-average** for a shorter period, e.g., three days, is proposed (see case study 2.4 in UNCTAD (2021: Background documents: Case studies)).

Whenever possible, detailed information about both the reporting and the partner company may be a valuable input to determine the incentives to misprice the underlying transaction. In such instances, using a common identifier is required to link a company from transactions database to either structural business or relevant MNEs databases (see case study 2.6 in UNCTAD (2021: Background documents: Case studies)).

Seeking expert knowledge (including those of trading partner abroad) is helpful also in cases where specific market conditions impact the observed and true prices on the market, such as long-term contracts. A particular market condition is also the prevalence (or domination) of trade flows by the use of intermediary entities located in low-tax jurisdictions (e.g., tax havens), such as observed in Brazil as high reliance on triangular operations through offshore intermediary entities located in low-tax jurisdictions (see case study 2.4 in UNCTAD (2021: Background documents: Case studies)) for an application of PFM+).

In the second step, i.e., after setting the central price in line with the decisions made in the areas detailed above, we need to define the range of the price filter, be it either as clearly defining lower- and upper-bound price, or defining an amount of variation around central price from the first step. There are two main approaches to defining the price filter. The first one is the use of statistical filter and is linked to using transactions-based prices in also determining the central price; and the second, the use of free-market prices and related range.

With reference to statistical price filters, using **inter-quartile range (IQR)** assumes that the range between first and third quartiles (25th and 75th percentile, respectively) for a particular case represents its arm's

length price range. The corresponding price filter, lower-bound price (*LP*) and upper-bound price (*UP*) are determined as:

$$pricefilter_{f,c,r,p,t,u} = IQR_{f,c,r,p,t,u} \quad \text{Equation (15)}$$

$$LP_{f,c,r,p,t,u} = 25thPercentile_{f,c,r,p,t,u} \quad \text{Equation (16)}$$

$$UP_{f,c,r,p,t,u} = 75thPercentile_{f,c,r,p,t,u} \quad \text{Equation (17)}$$

Referencing to using free-market price filters, the amount of variation, α , is the value that needs to be determined. This variation is to account for product specific circumstances, price volatility, contractual terms or other business conditions, transportation costs (if relevant), any political, economic or environmental shocks that may impact the prices of a particular commodity. Again, prices within the price filter's range are taken to be normally priced, while any prices outside this range are considered abnormal prices. Experts are heavily involved in this step to determine the magnitude of normal price deviations around the central price.

4. Over and underpricing

In the fourth phase, the amount of over and underpricing is determined. As noted above, lower and upper bound prices are used as thresholds to identify abnormal prices. Undervalued amount refers to the amount (value) of a transaction with a price below the lower bound, using quantity (volume) Q from the individual transaction:

$$Undervalued\ amount_{f,c,r,p,t,u} = Q_{f,c,r,p,t,u} * \max(0, LP_{f,c,r,p,t,u} - P_{f,c,r,p,t,u}) \quad \text{Equation (20)}$$

Similarly, overvalued amount is represented by:

$$Overvalued\ amount_{f,c,r,p,t,u} = Q_{f,c,r,p,t,u} * \max(0, P_{f,c,r,p,t,u} - UP_{f,c,r,p,t,u}) \quad \text{Equation (21)}$$

5. Inward and outward IFFs

In the final phase, inward and outward IFFs are calculated via aggregation. Inward IFFs are overvalued exports and/or undervalued imports; and outward IFFs refer to undervalued exports and/or overvalued imports. Using notations in this section, replacing subscript f with a superscript of either *EX* for exports or *IM* for imports, they are defined as:

$$InwardIFFs_{c,r,p,t,u} = Overvalued\ amount_{c,r,p,t,u}^{EX} + Undervalued\ amount_{c,r,p,t,u}^{IM} \quad \text{Equation (22)}$$

$$OutwardIFFs_{c,r,p,t,u} = Undervalued\ amount_{c,r,p,t,u}^{EX} + Overvalued\ amount_{c,r,p,t,u}^{IM} \quad \text{Equation (23)}$$

Finally, aggregation at national and annual levels is obtained by (assuming t referred to less-than annual level, e.g., daily frequency and its summation/aggregation therefore refers to an annual value):

$$InwardIFFs = \sum_{c,r,p,t,u} InwardIFFs_{c,r,p,t,u} \quad \text{Equation (24)}$$

$$OutwardIFFs = \sum_{c,r,p,t,u} OutwardIFFs_{c,r,p,t,u} \quad \text{Equation (25)}$$

4.2 PROFIT SHIFTING

Observing discrepancies in aggregated statistics (such as BoP) provides a starting point for estimating profit shifting by MNEs. As case study 3.1 (UNCTAD, 2021: Background documents: Case studies) describes, profit shifting will not lead to distortions in aggregate account balances, but it will affect their components (Hebous et al., 2001); profit shifting flows are also linked to concepts of BoP (Cobham et al., 2021). Analysis of aggregate data can offer valuable insight into profit shifting. Similarly, using statistics on FDI (or their ratio to GDP) can provide signs of profit shifting (see case studies 4.1 and 6.2 in UNCTAD (2021: Background documents: Case studies)) or help estimate IFFs (see UNCTAD, 2015; Janský and Palanský, 2019). FATS macro data have been used by Tørsløv et al. (2020) to compare profitability levels of MNE units in different jurisdictions. However, these macro approaches may not capture all IFFs or separate them sufficiently from other flows to provide an accurate measure.

With significant recent development in methodologies to measure MNE profit shifting, albeit differing model specifications and approaches, one concept is firmly rooted in existing economic theory used by many papers: that reported profits are composed of real profits (which arise due to economic activity in the country where they are reported) and shifted profits (which arise elsewhere and are then shifted). Two main approaches have evolved in research literature addressing the issue.

First, an analysis of the **global distribution of MNEs' profits** compares reported profits by MNEs with economic activity in the same country, judging any misalignment between the global shares of these as possibly due to profit shifting (for example OECD, 2015; Cobham and Janský, 2020; Garcia-Bernardo and Janský, 2021). In particular, the **tax semi-elasticity method** starts from a regression with reported profits on the left-hand side and tax rate on the right-hand side, controlling for proxies of capital and labour and potentially other characteristics. With the regression estimated, the scale of profit shifting is derived by removing the effect of tax rates or, in other words, simulating hypothetical scenarios in which tax rates did not differ (for example, Hines and Rice, 1994; Huizinga and Laeven, 2008; Dharmapala, 2014; Clausing, 2016; Wier and Reynolds, 2018; Beer et al., 2018; Fuest et al., 2021; Garcia-Bernardo and Janský, 2021). An alternative, risk-based approach focused on directly measuring misalignment between economic activity and reported profits can be applied when capacity or data do not allow the tax semi-elasticity method.

Second, **the method of comparing MNEs to domestic firms** builds on the idea that, absent profit shifting, the profitability of MNEs should be similar to that of domestic firms; any systematic differences between the two are then attributed to profit shifting (for example, Bilicka, 2019; Tørsløv et al., 2020; Sallusti, 2021).

Both approaches share the disadvantage of providing only an approximate estimation of tax avoidance by MNEs, with profit misalignment somewhat further suffering from identified misalignment not necessarily be tax-induced profit shifting. Two methods to estimate international tax avoidance by MNEs are presented. First, a tax semi-elasticity method analysing the global distribution of MNEs' profits and their corresponding corporate taxes. And second, a method comparing MNEs to similar domestic companies using microdata to determine aggressive tax avoiding behaviour and estimate IFFs.

4.2.1 Method #3: Global distribution of MNEs' profits

Concept and assumptions

This chapter presents approaches that examine how MNEs distribute their reported profits among their affiliates across different countries. To assess the level of tax-motivated profit shifting, the approaches connect MNE's distribution of reported profits to their incentives to shift profits, particularly in response to lower effective corporate income tax rates. The underlying assumption of the approach is that MNE affiliates are inclined to shift profits away from the country where they are generated, i.e., where the economic activity takes place, to the jurisdictions of an affiliate if the latter offers a more favourable tax

regime. The approach embraces two interconnected methods or approaches, based on data availability and capacity:

1. Semi-elasticity of reported profits:

The first method quantifies how MNEs' reported profits respond to profit-shifting incentives. It relies on a regression model, with MNEs' reported profits in each country serving as the dependent variable. Independent variables include incentives to shift profits, like effective tax rates on corporate income, as well as measures of economic activity. The regression coefficients serve as estimates of the semi-elasticity of reported profits in each country towards various environments that MNEs face, in particular towards existing profit shifting incentives like low corporate income tax rates (see case study 3.6 in UNCTAD (2021: Background documents: Case studies); Garcia-Bernardo and Janský, 2021; Fuest et al., 2021; Bratta et al., 2021).

2. Misalignment-based risk assessment:

The derived approach directly compares an MNE's global distribution of economic activity with its reported profits, identifying profits for which there is an elevated risk that they have been shifted for tax purposes as those reported profits that are not aligned with the economic activity in a jurisdiction and are instead reported in a low-tax jurisdiction (see Box 3) (Garcia-Bernardo and Janský, 2021); (Tax Justice Network, 2020). Countries exhibiting high misalignment are then scrutinized to evaluate the correlation between misalignment and incentives to shift profits, like low effective tax rates on corporate income or various loopholes and exemptions, to validate the results of the initial risk-based comparison.

The method assumes that any tax-driven, systematic deviation from predicted profitability of an MNE affiliate based on its economic activity and circumstances of the host country is a sign of profit shifting. Such identified deviations are further quantified to propose a measure of IFFs from profit shifting (flows F3-F5).

Overcoming limitations

Limitation 1: Defining and measuring profit shifting incentives

Adequately capturing MNE's response to profit shifting incentives requires a country-level measure tailored to those incentives. Determining the effective tax burden a company bears when reporting an additional unit of profits in a jurisdiction is complex. This complexity arises from varying tax rates applied to different types of income, such as patent box regimes offering lower rates on specific income, and specific tax-reducing arrangements with governments, especially for activities like research and development (R&D) (Fuest et al. (2021)). Non-tax factors, like concerns about expropriation, may also drive profit-shifting decisions (Reynolds and Wier, 2016). Consequently, relying solely on a jurisdiction's statutory tax rates proves inadequate as a measure for actual profit-shifting incentives.

Addressing this concern, more robust measures of profit-shifting incentives have been employed. First, for assessing tax rates, effective tax rates prove more suitable than statutory rates, offering a more comprehensive representation of a country's corporate income taxation landscape (Bratta et al., 2021). Statutory rates are deemed inaccurate measures for the actual tax burden in a country, as highlighted by studies such as Fuest et al. (2021). For instance, they point out the case of Luxembourg and Malta, where the statutory tax rates are nominally high (above 25 percent). Despite their high rates, these countries have consistently been labelled as tax havens, illustrating the limitations of relying solely on statutory rates to gauge the actual tax burden. While effective tax rates are preferred to statutory rates, their calculation is not straightforward. Effective tax rates can considerably vary for MNEs of different kinds. Micro data on jurisdiction-level reported profits and paid taxes (for instance, firm-level country-by-country reports) allow for a detailed calculation of a firms' effective tax rates.

Second, in addition to tax rates, other indicators for incentives to shift profits can be included. For example, the Haven Score from the Corporate Tax Haven Index (CTHI) (Ates et al., 2021) is a comprehensive

measure of the opportunities that a jurisdiction's regulatory framework provides to companies to lower their tax burden by reporting profits in their jurisdiction.

Overall, when the approach necessitates to distinguish between tax havens and non-havens (e.g., for presentation of results), in addition to corporate income tax rates we recommend including a broader set of indicators of profit shifting incentives. It is also recommended to use objective and verifiable criteria which allow to set multiple thresholds for identifying tax havens. For example, using the Haven Score from the CTHI, we can use varying thresholds (e.g., 65, 70, 75, 80) to create a more or less inclusive list of aggressive tax havens and thereby check the robustness of the results. Other, nationally relevant and available criteria may be applied instead.

Limitation 2: Non-linearity of response to profit shifting responses

Another challenge to estimating the semi-elasticity of reported profits is that firms may respond to profit shifting incentives in a non-linear way. To account for uneven tax-sensitivity across various tax jurisdictions, alternative non-linear specifications of the tax variable have been applied: quadratic by Fuest et al. (2021); cubic by Bratta et al. (2021), or, in cases of extreme non-linearity, logarithmic model as applied in Garcia-Bernardo and Janský (2021). We suggest adding a squared tax variable to the specification of the model, i.e., using quadratic specification. In cases when such specification would turn out inappropriate, or insufficient, listed alternatives used in prior literature could be applied.

In another approach to address potentially varying tax sensitivity depending on the size of MNE, existing research estimated the model on a number of sub-samples based on MNE's consolidated revenues. Estimates are then compared and combined to obtain overall profit shifting estimates (Fuest et al., 2021). Alternatively, some research has applied a weighted regression (Wier and Reynolds, 2018), see case study 3.2 in UNCTAD (2021: Background documents: Case studies). Data availability and sample size will determine the application of these mitigations. When applicable, we propose to break the sample into four sub-samples based on the quartiles of total consolidated revenues, and analyze the differences obtained from each subsample.

Limitation 3: Omitted variables and validation of results

Multinational companies geographically structure themselves the way they do because of many factors and considerations in addition to the tax environment. For example, different affiliates may make use of natural or human resources available in jurisdictions that may simultaneously offer low effective tax rates. In such a case, if the MNE does not use that jurisdiction for profit shifting, this may hinder the interpretation of this method's results. Prior literature has therefore used various tools to confirm and interpret results. Two main tools are proposed: (1) Analyzing characteristics (not related to tax) of the affiliates' jurisdictions, such as labour costs, environmental regulations, etc. to identify the role of the affiliate in the tax strategy of the MNE. (2) Analyzing the economic activity of an affiliate to assess to a certain degree the technological nature and role of each affiliate within the MNE's production chain. These tools can be based on aggregated data (e.g., analysing profits per employee, outward FDI, effective average tax rates, or intra-firm revenues across non-havens and tax havens as in Fuest et al. (2021) or Fortier-Labonté and Schaffter (2019)), or firm-level data, where available.

In addition, comparing the results from the regression analysis to a comparable control group (of either other multinationals or domestic companies (see Method #4 in chapter 4.2.2)), either in aggregate terms or on a case-by-case basis, can help validate the results. As such a process is inevitably resource intensive, it lends itself perfectly to LCU tasks. International collaboration of LCUs (where established) or experts of MNE data would support application of the method; LCUs are already engaged in the mapping of global MNE structures and roles of MNE affiliates.

Source data

The two methods outlined require data on MNEs activity per jurisdiction, incorporating variables like profits before taxes, taxes paid, number of employees, or the value of tangible assets. This data can be sourced from CbCR.

MNEs are mandated to prepare CbCRs under the OECD's BEPS Action 13, sharing this information with the tax administration of their headquarter country, which then shares these data with the administrations of countries where the MNEs operate, given those countries are part of the network of exchange of information from CbCRs (see OECD 2019). This gives national authorities access to firm-level information, i.e., at the level of each individual MNE affiliate. Researchers in several countries have collaborated with national authorities to analyse these data using Method #3 (see case study 3.3 on Germany, case study 3.4 on Italy, and case study 3.5 on Slovakia in UNCTAD (2021: Background documents: Case studies)).

Public access to CbCR data remains highly restricted. Only the aggregated reports compiled by the OECD are publicly available, but they come with significant limitations. First and foremost, aggregated data do not allow for a detailed assessment of firms' response to tax incentives. Moreover, the reports partly entail tax-exempt entities without a possibility to exclude them from a calculation; a problem that complicates the estimation of effective tax rates. The EU's forthcoming requirement for public CbCR, starting in 2024, is poised to substantially enhance data access for researchers and interested individuals.

Given the €750 million CbCR reporting threshold of consolidated group revenue, accessible CbCR data is also limited in its coverage. However, existing studies have shown that the largest MNEs account for the bulk of profit shifting flows (see Wier and Reynolds, 2018, and case study 3.2 in UNCTAD (2021: Background documents: Case studies)), making this less of a concern.

A recurring issue in both firm-level and aggregated data is the potential for "double counting" of items (OECD, 2023). This becomes particularly problematic in the context of intra-company dividends, where the dividends received may be partially reflected in the profit before income tax and separately reported by the affiliate that disbursed the dividend. Furthermore, the risk of double counting arises in connection with stateless entities (entities not resident anywhere for tax purposes) when revenue and profit are reported as "stateless" both in the transparent unit and in the jurisdiction where the units operate (OECD, 2020). However, as Fuest et al. (2021) show that at least for the German firm-level data, this double-counting issue is of minor significance when the additional guidance from the OECD on reporting practices is taken into account.

An alternative to CbCR data for estimating MNEs' profit shifting is detailed data on MNE affiliates operating in a country, accessible through national statistical authorities (see case study 3.2 in UNCTAD (2021: Background documents: Case studies) for an example of a national tax authority). While these data have the advantage of including all companies, not only those above the threshold for CbCR, a common limitation of these data lies in their restricted coverage of only the home country, a challenge that could potentially be surmounted through future collaborations and data integration across jurisdictions. Some legal frameworks for sharing economic data among national statistical authorities already exist, particularly within the European Statistical System, providing avenues to access data on MNE units below the CbCR threshold. Additionally, global data sources like the OECD's databases (ADIMA, AMNE, and Corporate Tax Statistics), GGR, EuroGroups register, or similar repositories can be judiciously employed as needed.

Calculation

In this section, the two methods for analysing shifted profits by looking at reported profits in different jurisdictions are presented. The section first outlines how to estimate semi-elasticities to favourable tax regimes. It then turns to the misalignment-based risk approach of comparing real economic activity to reported profits.

Estimating profit-shifting via semi-elasticities

The method estimates profit shifting in two steps. First, the presence of profit shifting is determined via estimating the semi-elasticity of profits to tax rates, controlling for other country characteristics. Second, the size of profit shifting flows is measured.

In the first step, following Hines and Rice (1994) and Fuest et al. (2021), the empirical regression model is specified as:

$$\log(y_{i,c,t}) = \alpha_i + \beta_1 T_{i,c,t} + \beta_2 T_{i,c,t}^2 + \gamma' Firm_{i,c,t} + \delta' Country_{c,t} + \theta_t + \varepsilon_{i,c,t} \quad \text{Equation (26)}$$

where $y_{i,c,t}$ is a measure of profits reported in a jurisdiction, i.e., either (i) the sum of profits before taxes of group i 's affiliates located in country c , or (ii) the sum of intra-firm revenues generated by group i 's affiliates in country c , including royalties and interest payments. $T_{i,c,t}$ is the tax variable of country c . In principle, this could be any variable capturing tax treatment of reported profits. In practice, studies mostly use either (i) the statutory tax rate of country c , (ii) the effective average tax rate, or (iii) a differential between tax rates the MNE would face in other jurisdictions and tax rates faced in jurisdiction c . As argued earlier, the effective average tax rate might be better able to capture the tax conditions that a firm actually faces, compared to statutory tax rates. $Firm_{i,c,t}$ is a vector including time-varying firm variables measuring the economic activity of group i 's affiliate in country c and year t , typically the number of employees, the value of tangible assets and unrelated party revenues generated by the affiliate. $Country_{c,t}$ is a vector with country characteristics that can capture time-varying country-specific differences in variables relevant for profit generation that are unrelated to tax incentives, usually macro variables like GDP per capita or population. θ_t is a year-fixed effect, capturing time-specific profitability patterns.

The coefficient of interest when investigating profit shifting is β_1 (and, in case of the quadratic term being included, as in the equation above, also β_2), the coefficient measuring MNE's response to differential tax conditions. If β is statistically insignificant, this means that preferential tax conditions of a jurisdictions, for instance lower rates, do not lead to any difference in reported profits, after controlling for variables that proxy value generation. Profit shifting then seems to be absent. A negative β , however, indicates that there is profit shifting. Controlling for real economic activity, country-specific contexts and time-specific developments, MNEs then report more profits in countries with preferential tax conditions, for instance in countries with lower effective tax rates. When the dependent variable is measured in logs (as in equation 26), a reduction in the tax rate $T_{i,c,t}$ by 1 percentage point would, on average, be associated with β per cent more reported profits.

This base equation can be extended or adapted in several ways (Fuest et al. 2021):

- Given that the response to different corporate tax regimes or rates may not follow a linear pattern, the tax conditions can be incorporated with quadratic terms in addition to their linear levels. This extension allows for testing whether the tax-sensitivity of profits and revenues varies across high and low-tax jurisdictions.
- In cases where the researcher is interested in the contribution of specific jurisdictions, such as well-known tax havens, to profit-shifting opportunities, dummy variables indicating whether a jurisdiction is a tax haven or not can be introduced. These dummy variables can be derived, for instance, from the Tax Justice Network's Corporate Tax Haven Score, which evaluates a country's regulatory framework concerning corporate tax loopholes.
- To substantiate the assertion that profit shifting is indeed a cause for concern, the regression analysis can be conducted for different subsamples. For example, the subsample of firms with business models tailored towards intangible assets should exhibit higher absolute values for β compared to firms that predominantly rely on traditional factors and cannot shift profits as easily.

In the second step, a dollar-measure of profits shifted to low-tax jurisdictions can be provided by comparing the reported profits in a jurisdiction to those counterfactual profits if the tax incentives to shift profits

were removed, for instance if the rate was moved up to the global average. This entails the following steps (following Bratta et al., 2021; see case study 3.4 in UNCTAD (2021: Background documents: Case studies)):

First, reported profits in each jurisdiction c can be decomposed into part R , related to real economic activity, and part S , related to differences in tax rates, i.e., tax-induced profit shifting. Note that S is positive for those jurisdictions where profits are shifted to, or negative for those jurisdictions where profits are shifted away from.

$$y_{i,c,t} = R_{i,c,t} + S_{i,c,t} \quad \text{Equation (27)}$$

Taking the log of both sides of the equation, we can re-write this into⁵¹:

$$\log(y_{i,c,t}) \cong \log(R_{i,c,t}) + \frac{S_{i,c,t}}{R_{i,c,t}} \quad \text{Equation (28)}$$

Building on the regression equation in the first step, the share of profits shifted expressed as a fraction of the profits which are generated by real economic activity can be expressed in terms of the obtained semi-elasticities:

$$\frac{S_{i,c,t}}{R_{i,c,t}} = \beta T_{i,c,t} \quad \text{Equation (29)}$$

Inserting Equation (29) into Equation (28) and taking the exponential on both sides yields:

$$y_{i,c,t} \cong R_{i,c,t}(1 + \beta T_{i,c,t}) \quad \text{Equation (30)}$$

From Equation (30), we can derive the profits related to real economic activity as:

$$R_{i,c,t} \cong \frac{y_{i,c,t}}{(1 + \beta T_{i,c,t})} \quad \text{Equation (31)}$$

And the profits shifted as:

$$S_{i,c,t} = y_{i,c,t} - R_{i,c,t} \cong \frac{y_{i,c,t} \times \beta T_{i,c,t}}{1 + \beta T_{i,c,t}} \quad \text{Equation (32)}$$

Therefore, building on equation (32), each flow of profits is determined either as an outward or inward IFF as per: t , depending on data availability). A negative value of $S_{i,c,t}$ indicates that profits are being shifted out of a country, with reverse holding for positive values of $S_{i,c,t}$, meaning profits are being shifted into a country⁵²

$$\text{OutwardIFFs}_{i,c,t} = |\min(0, S_{i,c,t})| \quad \text{Equation (33)}$$

$$\text{InwardIFFs}_{i,c,t} = \max(0, S_{i,c,t}) \quad \text{Equation (34)}$$

Country-level results may face an underestimation of shifted profits due to limitations in data coverage, such as the exclusion of firms below a certain threshold (e.g., the €750 million in CbCR data), or the potential oversight of foreign-owned MNE units operating within the domestic country. This downward bias can be alleviated by cautiously scaling up the obtained results and incorporating other microdata sources, where feasible. Clausing (2016) provides examples for the United States, and Fuest et al. (2021) (see case study 3.3 in UNCTAD (2021: Background documents: Case studies)) offers insights for Germany. However, addressing this issue may pose greater challenges in countries characterized by diverse combinations and effects of MNEs' presence, roles, and associated profit-shifting dynamics.

⁵¹ Approximation is based on the definition of $\log(y)$ as $\log(R+S)$, leading to $\log(R)+\log(1+S/R)$ which is considered as $\log(R) + S/R$.

⁵² Underlying assumption is the "correct" results from the first step, i.e., the marginal effect is negative. If this, however, cannot be proven econometrically, the model specification is unsuitable for the country at hand and will not produce reliable IFFs estimates. In such cases, in-depth knowledge is required to either reformulate the model in step 1, or apply other approaches (see the section on overcoming limitations of this method above, or the misalignment-based risk approach below).

Box 3 Misalignment-based risk approach

The method described above, which is based on the tax semi-elasticity of reported profits, may be unsuitable in some settings due to lack of data or constrained resources of the national authority conducting the analysis. We therefore review an additional method to analyze the global distribution of reported profits of MNEs, that of the misalignment-based risk approach. This method is less data- and resource-intensive, yet provides valuable insights into the largest discrepancies in economic activity and reported profit and allows for a rigorous risk analysis.

The misalignment method is grounded in the principle that profits should align with the location of economic activity. It quantifies profit misalignment by assessing the disparity between reported profits (π) and theoretical profits (p), representing the profits anticipated based on observed economic activities. The ensuing section provides an overview of the methodology (Garcia-Bernardo and Janský, 2021; Tax Justice Network, 2020).

First, theoretical profits ($p_{i,c,t}$) of corporate group i 's affiliate(s) in country c at time t are computed by considering the corporate group i 's economic activity in jurisdiction c , incorporating weighted factors such as employment (measured by the number of employees and/or payroll), capital (quantified by tangible assets), and sales (evaluated through unrelated party revenues). An example of such a formula is as follows.⁵³

$$p_{i,c} = \sum_{i,c} \pi_{i,c} \left(w_{\text{employment}} \frac{\text{employment}_{i,c}}{\sum_{i,c} \text{employment}_{i,c}} + w_{\text{assets}} \frac{\text{assets}_{i,c}}{\sum_{i,c} \text{assets}_{i,c}} + w_{\text{sales}} \frac{\text{sales}_{i,c}}{\sum_{i,c} \text{sales}_{i,c}} \right)$$

For example, if 10 per cent of an Indian MNE's employees, assets, and sales are situated in Bangladesh, the theoretical profits in Bangladesh should constitute 10 per cent of all profits generated by the Indian MNE.

In a second step, profit shifting on a bilateral level, within each jurisdiction c where corporate group i operates, is calculated. The profit shifted into or out of country c by MNE i $S_{i,c}$ is determined as the difference between reported profits by MNE i in country c ($\pi_{i,c}$) and theoretical profits in that country ($p_{i,c}$):

$$S_{i,c} = \pi_{i,c} - p_{i,c} \quad \text{Equation (36)}$$

If shifted profit is negative, it indicates that less profit is reported in country c than expected, implying a shift of profit out of jurisdiction c . Conversely, a positive estimate of shifted profits suggests inward profit shifting into jurisdiction c .

To focus solely on misaligned profits resulting from tax considerations, positive values of profit shifting estimates are set to zero when the effective tax rate in the destination country exceeds a specified threshold, e.g., 15 per cent. This assumption is based on the premise that MNEs engage in tax-induced profit shifting only when they can achieve an effective tax rate below 15 per cent in the destination.

The total profit shifted by MNE i is obtained by aggregating all misalignment estimates. This is done separately for positive and negative misalignment values. In the event that some positive misaligned profits are set to zero in the second step because the country's tax rate exceeds the threshold, the total positive shifted profits may be lower than the total negative shifted profits. To address this, if a detailed breakdown of profits shifted out of a specific country is desired, the values of profits shifted out of country c by corporate group i are adjusted proportionally.

Like for the previous analyses, the obtained results can be aggregated by jurisdictions, depending on the exact research question at hand.

⁵³ As in the previous approach, a time dimension can be included here. However, as no semi-elasticities or other parameters are estimated, a time dimension does not significantly increase the robustness of the estimation in this approach, but rather allows for the generation of time-specific estimates

4.2.2 Method #4: MNE vs comparable non-MNE profit shifting

Concept and assumptions

Like PFM+, the MNE vs comparable non-MNE profit shifting method also grounds its concept on the idea of deviation from normality. This is a bottom-up method, processed in two phases: first, to identify the tax-avoiding MNEs, and second, to measure the related amount of BEPS⁵⁴. The method identifies abnormalities in structural and economic variables of MNEs in comparison to the behaviour of similar domestic enterprises. The method uses information extracted from a double comparison: between MNEs and non-MNEs (e.g. by propensity score matching) and within the group of MNEs (by receiver operating characteristics analysis, ROC) (Sallusti, 2021). This method estimates BEPS as the difference between profits that are declared and those that should have been declared.

The identification phase is composed of two steps. The first focuses on a “between” comparison, assessing the abnormalities of MNEs with respect to the similar non-MNEs, i.e., domestic firms, which are unable to freely manage the allocation of their production and finances geographically. The control group of domestic firms is determined through propensity score (PS) matching using variables, such as territory, economic activity, employment etc.⁵⁵ Comparing profit-to-turnover ratio of a particular MNE with that ratio of domestic control group leads to identifying a proxy for abnormal behaviour of MNEs.

Second, referred to as the “within” comparison, the receiver operating characteristics (ROC) analysis is conducted, resulting in defining the threshold of normality (calculation provided below). This threshold is set to identify tax-avoiding MNEs among the total population of MNEs. This step starts from the proxy of first step and uses indicators capturing economic and strategic behaviours of MNEs. An important advantage of this method using this second step is that it does not treat all MNEs equally in the sense that not all MNEs are tax-avoiding. Therefore, ROC analysis also tends to adjust the suspect indicator provided by the proxy in the “between” comparison.

The subsequent measurement of the related amount of BEPS (second phase) is obtained by calculating the amount of profits identified tax-avoiding MNEs should have declared to classify them as non-tax avoiding. The method uses Earnings Before Interest and Tax (EBIT) as the variable to be adjusted.

To measure BEPS of tax avoiding MNEs, the indicator uses a vertical strategy, focusing only on the MNEs in the same country (rather than on all firms of a given MNE in all the countries the group operates, something not readily available in any statistical system). This strategy assesses BEPS by analysing anomalies between a given MNE and other (local) MNEs with similar characteristics.

Overcoming limitations

Comparing MNEs and Non-MNEs is challenging because the differences between the two groups could be driven by a range of different factors beyond BEPS (e.g., productivity, economies of scale). This drawback is eased somewhat by forcing the control group into same size class. This, true, may still pose a problematic issue in smaller economies, where it might be more difficult to identify an appropriate domestic match for the subsidiaries of large multinationals (at the same time bearing in mind that the size refers to the local subsidiary itself and not the holding). Even in larger economies it might be hard to find a good match for very large MNEs. To overcome this, MNE units can be compared to either an average of the domestic firms with respect to available size or industry classes (clusters), or in cases where capacity does not allow for such comparison, comparing all MNE units to all domestic firms could be considered as the solution of last resort.

⁵⁴ The method touches upon the concept of BEPS by OECD and is related to its indicator 4 of BEPS, namely MNE versus comparable non-MNE effective tax rate differentials (OECD, 2015). However, the method takes additional steps representing an innovation in the measurement of BEPS (Sallusti, 2021).

⁵⁵ See the application of the method by Sallusti (2021) case study 4.2 in (UNCTAD, 2021: Background documents: Case studies)

Another limitation of the method is that a proposed set of matching variables includes mainly ratios (except for the number of employees, sector and region), which could result in a poor match in terms of size. However, the issue is eased by imposing that each domestic firm in the control group is included in the same size class (additionally to the same sector and region) of the related MNE. Another way to control for the size-related comparability may be represented by including, if data permits, the size of assets as in the case in Bilicka (2019), see case study 4.3 in UNCTAD (2021: Background documents: Case studies).

The method suffers, like the previous method, from the confounding effect, where other reasons may contribute to, or lead altogether the identified BEPS activity.

The main drawback of the method for SDG reporting is that a country first needs to be defined as being prone to either outward (BEPS generating) or inward (BEPS collecting) flows of IFFs. Namely, the first step of defining a proxy is by design such that it requires this decision to be made prior to using the method. The method is designed to measure outward IFFs, whereas a symmetrical approach (with a different first phase) is presented in case study 4.5 in UNCTAD (2021: Background documents: Case studies).

Source data

This method uses structural business microdata available to NSOs (SBS) in a country and as such provides the possibility of linking with national accounts. These data are likely to be more complete relative to the CbCR data which have a threshold for inclusion of entities. The source data include firm-level data containing economic and structural variables (e.g., value added, research and development (R&D) spending, share of salaries to total costs, etc. – see also case study 4.2 in UNCTAD (2021: Background documents: Case studies)). NSO's SBS and other relevant sources with firm-level data can be used. Research showed that in some cases data from administrative data on taxable profits directly from the tax returns may be better suited than financial accounts (accounting profits). Foreign multinational subsidiaries seem to be reporting positive profits in their accounts, while at the same time reporting zero taxable profits on their tax returns. This would bias downwards the estimates of profit shifting obtained using accounting data (Bilicka, 2019). These microdata are further integrated with statistics on these firms' international trade by products and trading partners (country of origin/destination), and position of national firms within MNEs (sourced from, preferably, national Groups Register⁵⁶), where relevant. FATS, if available, can provide a useful additional data source. Moreover, LCU, if established in the NSO, can help with the integration of various data sources.

For exploratory analysis, this method can use macroeconomic statistics in a high-level, aggregate and global analysis of profit shifting (see case study 4.4 in UNCTAD (2021: Background documents: Case studies)).

Calculation

The method is described in Sallusti (2021) for the case of Italian MNEs (see also case study 4.2 in UNCTAD (2021: Background documents: Case studies)). Main phases of the application of MNE vs comparable non-MNE profit shifting method by NSOs are listed below.

0. Identification of inward/outward IFFs nature

Phase zero is the identification of either inward or outward IFFs nature of your country. Inspection of tax practices and other macroeconomic variables is used to process this classification of the country. Using OECD's dashboard approach of BEPS indicators (OECD, 2015) as an example of quantifying MNEs impacts on Canadian tax base is presented (and can be applied in this phase) by Fortier-Labonté and Schaffter (2019) – see case study 4.1 in UNCTAD (2021: Background documents: Case studies).

⁵⁶ In absence of national register with business groups structures, alternative registers can be used, if available.

1. Identification phase

The identification phase is processed in two steps: the **between** and **within comparison**.

Between comparison of the identification phase first applies the PS to define, for each MNE, the most efficient control group of domestic firms. Characterization is based on variables including territory, economic activity, employment, indicators of internationalization, structure of costs and revenues.

Next, clustering between MNEs with “normal” and “abnormal” behaviour in comparison to similar non-MNEs is processed based on a proxy for each MNE-control group pair (at unit, i.e., enterprise level):

- *Proxy*=1 (suspect, or indicator of “abnormality”) if EBIT-to-turnover ratio of the given MNE is lower than the average of the control group; and
- *Proxy*=0 (no suspect) if EBIT-to-turnover ratio of the given MNE is higher than (or equal to) the average of the control group.

The **within comparison** of the identification phase is processed using ROC analysis to determine the extent to which status outlined by the proxy binary variable from previous step can be reliably confirmed when variables of economic performance, strategies and contextual variable are taken into account. In other words, ROC analysis is used to define the final clustering between tax avoiding and non-tax avoiding MNEs starting from the proxy variable from previous step. To that end, first, the classifier is represented by a composite indicator built from the following set of characteristics (Sallusti, 2021): EBIT-to-turnover ratio; Value added-to-turnover ratio; R&D spending with respect to turnover; share of royalties on total costs; share of salaries on total costs; share of services on total costs; export-to-turnover ratio; import-to-total cost ratio; average differential in income taxation among (related) countries.

To account for differences in economic activities, they are treated separately in strata. For each such stratum, the composite indicator for the i -th MNEs (I_i) is constructed using factor analysis on the whole set of selected characteristics, and then aggregating the first two factors⁵⁷ using the relative share of explained variance as weight (ω):

$$I_i = \omega_1 \left(\sum_j \gamma_{j,1} x_{j,i} \right) + \omega_2 \left(\sum_j \gamma_{j,2} x_{j,i} \right) \quad \text{Equation (37)}$$

where:

- $\gamma_{j,1}, \gamma_{j,2}$... loadings of variable j in factors 1 and 2
- $x_{j,i}$... value of variable j for observation i ⁵⁸

Here, $\gamma_{j,1}$ and $\gamma_{j,2}$ are the loadings of variable j in factors 1 and 2, $x_{j,i}$ is the value of the j -th variable for the i -th observation, and ω_1 and ω_2 are weights in term of explained variance.

Next, the composite indicator calculated in Equation (37) is then used as explanatory variable in a logit model having as dependent the proxy of “suspect” (*Proxy*=1).

As a result of the ROC analysis⁵⁹, the threshold observation is identified (for each stratum). The value of its composite indicator can be interpreted as the threshold value (ω) above or below which other MNEs can be classified. Specifically, MNEs will be considered as tax avoiding if $I_i < \bar{I}$, while they will be considered as non-tax avoiding if $I_i \geq \bar{I}$.

⁵⁷ Two factors are proposed here, although this may vary given the data at hand. The share of explained variance by the factors should be at least about 80 per cent.

⁵⁸ Factor analysis is based on correlation matrix of variables.

⁵⁹ The value of parameter h , weight to manage the trade-off between true and false positives in ROC, is set to a neutral 0.5 (Sallusti, 2021).

2. Measurement of BEPS

For each MNE that was identified as tax avoiding in the previous phase, i.e., confirmed by the model, estimate of the BEPS is provided using the amount of EBIT concealed using aggressive tax avoidance⁶⁰.

Next, for each tax avoiding MNE, BEPS is calculated as the difference between the theoretical profits (amount of profits that they should have declared in order to be classified as non-tax avoiding) and the actually declared profits. The measurement of BEPS is carried out by increasing the EBIT-to-turnover ratio ($x_{h,i}$), keeping the other variables ($x_{h,j}$) unchanged so as to obtain $I_i = \bar{I}$. Applying this to equation (37), the adjusted value of EBIT-to-turnover ratio in line with the threshold shifting from tax avoiding to non-tax avoiding MNE i is presented as:

$$\tilde{x}_{h,i} = \frac{\bar{I} - (\omega_1 \sum_{-h} \gamma_{-h,1} x_{-h,2} + \omega_2 \sum_{-h} \gamma_{-h,2} x_{-h,2})}{\omega_1 \gamma_{h,1} + \omega_2 \gamma_{h,2}} \quad \text{Equation (38)}$$

Finally, the amount of EBIT connected with BEPS, termed outward IFFs here, is calculated, for each tax avoiding MNE i , as:

$$\text{OutwardIFFs}_i = (\tilde{x}_{h,i} - x_{j,i}) * \text{Turnover}_i \quad \text{Equation (39)}$$

where:

$x_{j,i}$... the declared value of EBIT to turnover ratio;

$\tilde{x}_{h,i}$... the threshold value of the EBIT to turnover ratio in order to be classified as non-tax avoiding MNE.

At national level and for a given year, the aggregate value of IFFs is obtained by aggregating over all MNEs in a country:

$$\text{OutwardIFFs} = \sum_i \text{OutwardIFFs}_i \quad \text{Equation (40)}$$

Application of the method to provide for inward IFFs is depicted in case study 4.5 in UNCTAD (2021: Background documents: Case studies).

Given the concept of the method, a particular country can be prone to either outward IFFs or inward IFFs. Hence, once the country is classified accordingly, its value of total IFFs will equal that category, e.g., $IFFs = \text{OutwardIFFs}$ for the case at hand in equation (40). Using this methodology, therefore, a breakdown of IFFs by the direction of flows cannot be achieved.

⁶⁰ This is equal to value added if the labour cost is given. As Sallusti (2021) notes the conceptual correspondence of EBIT and value added under the condition of fixed amount of labour costs is relevant if one is willing to use the estimates in the context of the measurement of GDP and GNI in national accounts.

4.3 TAX EVASION BY INDIVIDUALS

Flows of offshore wealth are difficult to match with the concept of IFFs. First, the stock of offshore wealth tells us little about how it was generated: it can result from legally earned incomes or from illegal activities. Simply being offshore does not mean it is illegal, or illicit. It can be perfectly compliant with tax and other regulations. Second, offshore wealth is a stock, while IFFs are flows. If we assign a share of offshore wealth to IFFs, it opens up challenges related to the origin, transfer, or use of these flows.

The application of so-called gravity models to tax and commercial IFFs is worth exploring (see Box 4) in the future. While the methods suggested for pilot testing do not include gravity models, some elements of IFFs may be analysed using that approach. Rather, the methods suggested for pilot testing attempt to transform offshore wealth to flows (F1). This technical paper outlines conceptual approaches and seeks to identify practical applications, yet this sphere will require further methodological enhancement, also using case studies.

Box 4 Gravity model

Concept

Gravity models have traditionally been used in the context of international trade to estimate bilateral trade flows between country i and country j , though they can be used to model any flow between two countries. The basic premise is that these flows are a function of each country's economic size and the distance between them, analogous to mass and distance in Newton's law of universal gravitation, hence their name.

$$F_{ijt} = G \times \frac{M_{it}M_{jt}}{D_{ij}} \quad (1)$$

Formula (1) illustrates a gravity model in its simplest form, where the trade flows from country i to country j at time t , F_{ijt} , are represented by G , a constant, M_{it} and M_{jt} , the economic sizes of countries i and j , respectively, and D_{ij} , the distance between countries i and j . For econometric modelling, this formula is transformed using a natural logarithm to obtain what is considered a "very simple and thus appealing" (Cassetta et al., 2014: 7) econometric formula:

$$\log F_{ijt} = g + \beta_1 \log M_{it} + \beta_2 \log M_{jt} - \beta_3 \log D_{ij} + \epsilon_{ijt} \quad (2)$$

This formula can be extended to better suit the context of estimating IFFs by including parameters such as corruption levels, banking secrecy, shared language and so on. With modifications in specifications of the model, the method of estimating IFFs from gravity models would estimate normal trade flows between two countries and compare this estimated value with observed values. Deviations from the predicted levels can then potentially be attributed to IFFs.

Strengths

While gravity models perform well in the context of bilateral trade, their use to measure IFFs and money laundering is less well validated. Still, the approach has advantages, primarily around its data requirements. In order to estimate a gravity model for IFFs, only commonly available economic and geographic data in addition to other domain-specific data, such as corruption levels, are required. More research needs to be carried out to validate their usefulness in the IFFs context, but the approach can be an appealing one as a starting point for countries lacking other types of data.

Limitations

The outputs of gravity models are entirely estimated, with no attempt to directly measure IFFs or incorporate any hard data on them. This potentially limits their usefulness in generating indicator data. Furthermore, in several applications, the approach attempts to model flows at a macro level, making disaggregation into particular sectors challenging, also limiting their usefulness in informing policy.

Applications

Given the limitations of gravity models, they can be used for comparison or validation of the results of other methods to measure IFFs. With microdata, these models may provide detailed insight, such as the study of Italian cross-border bank transfers case study 5.1 in UNCTAD (2021: Background documents: Case studies) or application of a gravity model on foreign securities owned by the Cayman Islands (case study 6.3 in UNCTAD (2021: Background documents: Case studies)).

4.3.1 Method #5: Undeclared offshore assets indicators

The present chapter reviews some of the methods that have been used by different authors to measure IFFs from undeclared offshore wealth.

The undeclared offshore assets indicator outlined in Cobham and Janský (2020) is a top-down method which tries to address offshore tax evasion by individuals. It does so by measuring the excess of the value of citizens' assets declared by (partner) countries, over the value declared by citizens for tax purposes.

The indicator is reported by each territory, i.e., country. This means that for a particular country A, first, the sum of assets of country A's citizens reported as being held in all other countries is calculated. This is then compared to the sum of assets declared by the citizens of country A as being held in all those countries. The difference is the amount of undeclared assets. Financial institutions are required to confirm the citizenship of account holders. At the same time, the indicator requires that Tax authorities aggregate their data on citizens' self-declaration of assets held abroad for comparison.

Calculation of the indicator is straightforward and stems from its definition as the excess of the value of country i 's citizens' assets declared being held in countries j over the value declared by citizens of country i :

$$\phi_i = \sum_j \beta_{j,i} - \alpha_i \quad \text{Equation (41)}$$

where:

- ϕ_i ... undeclared assets of citizens of country i
- $\beta_{j,i}$... the sum of assets of citizens of country i reported as being held in country j
- α_i ... the sum of assets declared by citizens of country i as being held in other countries
 $j=1, \dots, n$, where $j \neq i$

Source data are available from the BIS, where data are published by location. Data are reported on annual level, end-of-year stock.

Limitations

While relatively straightforward, the method has several conceptual and practical limitations. Conceptual limitations include the following:

- the indicator is not able to capture the various sources of IFFs, meaning that results include assets generated not only by tax evasion but also by other undeclared (including illegal) activities. Therefore, there is a high risk of double counting if the results are aggregated with other bottom-up estimates, for example with estimates of drug-related IFFs.
- the concept of wealth relates to a stock measure, while - by definition - IFFs are a flow measure.
- the indicator only focuses mainly on the side of IFFs that leave, or are outside the country under analysis, hence linking to outward IFFs only.
- the concept of citizenship is used, although it does not always imply tax liability. Tax authorities and national regulations may differ in how they treat dual citizenship or how they define tax residency, i.e., residency for tax purposes. The so-called citizenship-by-investment programmes can obscure the measurement of tax evasion by individuals. Using data on cross-border bank deposits, Langenmayr and Zyska (2020) find that deposits in tax havens increase after a country starts offering a citizenship-by-investment program, providing indirect evidence that these programmes are used by tax evaders.

Practical statistical challenges emerge in relation to the general scope and availability of data, and from cross-country comparability of results. Although BIS data are considered the most consistent data

currently available for this purpose by Cobham and Janský (2020), this source has limitations in terms of countries covered. Moreover, certain asset classes (e.g., art, real estate, or cryptocurrencies) are not considered. Additionally, in several cases, countries do not impose any taxes on wealth held abroad (rather, on incomes generated abroad), significantly limiting data basis for the application of the method.

Building on estimated stock of undeclared wealth, the stock measure needs to be transformed into a flow measure. This can be achieved in theory by taking the difference of two subsequent stock measures, close enough in time so that they can capture all (or most) flows taking place between the two assessment periods. In addition, changes in the values of assets need to be considered first before assigning them to IFFs. The growth of wealth through measures of capital gains is accounted for, but the method does not provide means to consider the consumption of wealth.

Overcoming limitations

As mentioned, the two important methodological challenges that needs to be addressed in relation to measuring the IFFs following the methodology described above are:

1. the indicator assesses only assets held abroad, as a result of outflows (relating to **outward IFFs only**).
2. the indicator measures the assets, therefore a **stock**, and does not refer to flows.

We address the **second issue** first. To obtain the value of **flows** (outflows of IFFs) based on this indicator for a given year, t , we will need to calculate the indicator in equation (41) also for a preceding period, $t-1$. With the assumption that the difference in two successive stocks can be assigned to the flows, such difference could be a measure of related IFFs. It is recommended that the two assessment periods (t and $t-1$) are close enough in time, so that flows happening in opposite directions between such two periods do not net out, thus leading to an estimation of *net* outward flows instead of the total outward IFFs.

Capital gains in an offshore jurisdiction, if not accounted for, would be conflated with IFFs⁶¹. The latter can, however, be addressed by including a factor of market valuation of the offshore wealth, v_t , thus, the flows of assets held abroad by citizens of country i in period t are calculated as:

$$flow_{i,t} = \phi_{i,t} - \phi_{i,t-1}(1 + v_t) \quad \text{Equation (42)}$$

To determine the yearly rate of increase of assets captured in v_t , the MSCI world price index can be used (MSCI, 2023).

If these flows from equation (42) are positive, citizens of country i are, by assumption, shifting assets abroad without declaring that to domestic authorities, even though they may be fully compliant with destination's jurisdiction. Here the challenge is that increases could refer to capital gains on offshore assets, and decreases could point to consumption of offshore assets. Further, some offshore wealth may fall under limited reporting responsibility whereby a citizen is not required to report the wealth held abroad. Country pilots could consider ways of adjusting for some of these limitations. In the lack of corrections for the previous challenges, we can only assume the positive result of equation (42) corresponds to outflows of IFFs by citizens (for country i in time t):

$$OutwardIFFs_{i,t} = \max(0, flow_{i,t}) \quad \text{Equation (43)}$$

If the flows, however, are negative, this only indicates that the undeclared assets are "less undeclared" – be it because reporting or detection has improved, or the assets have been transformed into consumption

⁶¹ Similarly holds for the consumption of assets, whereas it is not fully clear how this would affect each-period calculation of the flows; rather, it may have a more concrete effect in estimating the proper value of the opening stock.

or other form of capital. We cannot treat the negative flows (defined by equation (42)) as inflows of IFFs into country i .

Addressing the **first of the issues** outlined above, to be able to determine the inward IFFs, the mirror image of all countries in j with respect to country i would need to be studied and aggregated. Also here, methodological and practical (data availability) limitations arise.

Without a clear concept supporting measurement of inward and outward IFFs the use of this indicator is limited to outward IFFs only. In absence of better alternatives, and without specific case studies on its application, the indicator is still suggested for pilot testing and further refinement and developments of the methodology and data availability required.

Alternative approaches

More recent standards and legislations initiatives introduced to combat tax evasion and promote tax transparency, include, among others, the OECD Common Reporting Standard (CRS). CRS data can offer substantial support for the measurement of non-tax compliant IFFs. An important application of this relevant data source to the estimation of IFFs has been tested by the OECD in South Africa (OECD, 2022). An overview of this application is offered in Box 5.

Box 5 Assessing Tax Compliance and Illicit Financial Flows in South Africa

The method to measure IFFs from undeclared non-tax compliant offshore wealth proposed by the OECD (2022) offers an alternative structured bottom-up approach based on granular micro-data from tax audits or individual tax returns, allowing to overcome some of the limitations illustrated above. The method adopted by the OECD for the case of South Africa allows to quantify the scale of non-tax-compliant assets held abroad (by South African residents) and derive the amount of IFFs associated with the transfer of such assets. It is highly specific to the country context, as it relies on information from the adoption of specific legislations and programmes, like Voluntary Disclosure Programmes (VDP) and Exchange of Information agreements (like Automatic EOs). The novelty of the approach also lies in the use of microdata from the CRS, a more granular and country-specific data source on assets held abroad by individual taxpayers. The use of administrative microdata offers advantages over studies focused on errors and omissions in global macroeconomic statistics, which risks conflating IFFs estimates with measurement errors, and over survey data, which often suffer from small-sample biases or sampling errors.

Data sources

The method uses anonymised individual tax records of South African taxpayers. The data comprises information on various sources of taxable income, tax returns on foreign investment income and detailed data from participants in the VDP and in the Special Voluntary Disclosure Programme (SVDP), as well as data on information exchanged under the CRS. In particular, three main types of data are used:

1. **Personal income tax data from the SARS-NT panel**, providing a comprehensive picture of the taxable income distribution of taxpayers in South Africa. Data are provided on foreign capital income by source of the income, namely income from interest, dividends or capital gains stemming from capital invested abroad and at home.
2. **Information collected under South Africa's VDPs and SVDP**. The anonymized SVDP dataset, mostly compiled with self-declared applications by taxpayers, provides a comprehensive account of all individual applications to the SVDP programme throughout its active period. It is worth noticing that, for the case of South Africa, individuals who are already under audit or investigation by the revenue administration cannot participate in such programmes.
3. **Data exchanged under the CRS**, which provide aggregated financial account data received by foreign jurisdictions participating in the CRS. The data provide evidence of financial accounts held by South African taxpayers abroad. Apart from the total amount of assets invested in these accounts, the dataset also contains information on the jurisdiction of account incorporation, the different account types such as bank deposits or

investment accounts, and payments into these accounts per transmission period. In this sense, CRS data are a very powerful tool to grasp foreign wealth holdings of residents, which may not have previously been reported. The major institutions providing such data are the SARS, namely the local revenue authority holding data on all South African taxpayers, and the South Africa Reserve Bank (SARB), whose financial surveillance department cooperates with the SARS for VDPs.

Step-by-step application

Recognising that IFFs could be generated from assets previously held abroad before the data collection and estimation processes started, the method guides in the estimation of present, but also past non-compliant assets held abroad, capitalised by their respective asset-based rate of return.

1) Estimating past non-compliant foreign wealth

The estimated past non-compliant foreign wealth in South Africa is the sum of all individual foreign income streams declared in new tax returns (interest, dividends, capital gains), capitalised by their respective asset-based rate of return. Detailed and high-quality data from the **SARS-NT** panel are used for this step.

2) Estimating non-compliant foreign wealth held in international financial centres (IFCs)

After a cleaning of exchanged CRS data, the aggregation of total foreign wealth held in IFCs is processed. Out of the 47 IFC jurisdictions identified in O'Reilly, Parra Ramirez, and Stemmer (2021), 37 report active accounts to South African authorities. The aggregated account balances from IFCs are multiplied by estimates of non-disclosure probability for offshore accounts of between 60 - 80 per cent, based on evidence from the literature and SARS data. Lastly, the estimated amount of wealth in IFCs is compared to the one declared in the SVDP jurisdictions.

3) IFF estimates from estimated stock of foreign non-compliant wealth

Previously undeclared offshore wealth is assumed as the likely result of past financial outflows. Assumptions regarding the duration of yearly outflows and the rate of annual return to these flows abroad are taken based on evidence from the literature and the data analysis on the South African case: average real returns of about 5 per cent to foreign assets is used to capitalize assets; average values are a 10-year holding period and 5 – 7 per cent of annual interest.

Results

The study estimates that between US\$ 3.5 - 5 billion in IFFs have left South Africa every year over the last decade. The result is being derived from undeclared non-compliant offshore wealth held in IFCs estimated at US\$ 40 – 54 billion, based on data exchanged under the CRS in 2018.

Limitations

- The method allows to estimate outward IFFs only.
- The method considers undeclared offshore wealth held abroad by South African taxpayers as an approximation of the total IFFs outflowing South Africa. This has two implications: (I) wealth, which is a stock measure, cannot be used directly to approximate IFFs, namely a flow measure. IFFs are not a measure of net flows (in the specific case, outflows), but the measurement has to consider all possible transactions leaving the country at any time, regardless of what is the net balance at the end of the assessed period; (II) undeclared offshore wealth can be generated by operations associated with evasion of taxes on income from legal activities, as well as other taxable income. Some of such income might be generated by the laundering of proceeds of crime.
- Regarding data sources, CRS data suffer from a few noteworthy limitations. Despite its broad geographic coverage, not all major jurisdictions participate in the CRS. This includes, for instance, the United States of America, which administers its own information exchange standard, namely the Foreign Account Tax Compliance Act (FATCA). CRS data also reports only information on financial accounts; other forms of wealth storage such as real estate, art or crypto assets are currently outside its scope unless the proceeds of their sales have been deposited in a reported account.

- Data are based on self-assessed tax forms, and there may be underreporting or no disclosure of income flows at all, especially if the likelihood of being audited by tax authorities is low.
- In terms of methods, despite the detailed coverage of foreign accounts under CRS data, estimating previously non-compliant offshore wealth requires a number of important assumptions.
 - The analysis is based on the key assumption that offshore wealth is predominantly located in IFC jurisdictions as previously identified in O'Reilly, Parra Ramirez, and Stemmer (2021). Moreover, even though previous hidden offshore wealth is expected to be held in IFCs, assets invested in these jurisdictions may not necessarily have been non-compliant with tax laws.
 - Based on literature suggesting that non-compliance of assets invested in IFCs ranges from as low as 60 - 80 per cent (Pellegrini et al., 2016), up to 85 - 95 per cent, based on Alstadsæter, Johannesen, and Zucman (2018) and United States Senate (2014), all foreign wealth estimates are expressed under the assumption that all past non-compliance rates are within bounds of 60 to 80 per cent.
 - Average values are a 10-year holding period and 5 - 7 per cent of annual interest, regardless of where and how these capitals have been invested.

Overcoming limitations

Despite some limitations, the OECD approach to measure IFFs from undeclared offshore wealth offers highly valuable elements that are worth testing in wider group of countries with similar legislations, availability of data, and extended inter- and intra-country cooperation agreements. The granularity of data sources and the bottom-up approach used can be used by countries to focus the analysis on selected sources of undeclared offshore wealth, and help carrying out further investigations by tax and law enforcement authorities. The potential for accurate and targeted evidence-based policy inputs and more effective resource mobilisation strategies is high.

A few strategies are suggested to overcome some of the limitations listed above, bringing further consistency with the *Conceptual Framework* and the definition of SDG Indicator 16.4.1. These, while being theoretical at this stage, may offer good avenues of further testing of the approach, include:

- I. From stock to flow measure: in step indicated under 2 (CRS data cleaning, including removing duplicates, yet that may distort estimations), consider all multiple transmissions through the CRS under the same account.
- II. Consider including applications for (S)VDPs that were rejected because they are under investigation. If data from investigations are available, they can potentially suggest which predicate offences are linked to the rejected declarations.
- III. Consider applying customised rates of returns on foreign assets, depending on where the assets are held, which types of assets (cash, stocks...) and for how long (step 3).
- IV. Consider applying specific compliance rates based on large-scale systematic tax audits carried out in the country, if possible on annual basis and by income group. Specific analysis on Politically Exposed Persons (PEPs) might also be carried out.

4.3.2 Method #6: Flows of offshore financial wealth by country

Concept and assumptions

As in previous method, this method focuses on wealth held by individuals outside their countries and unreported to the Tax authorities where they are a resident. It is a top-down method. Offshore financial wealth by country as proposed here is a three-step approach to estimate international tax evasion by individuals by country as presented in the European Commission (2019). The steps, or phases, are:

- a) Estimation of global offshore financial wealth, focusing on **global level imbalance between international portfolio liabilities and assets**. As these discrepancies may be driven by measurements errors in international investment statistics rather than illicit activity, they need to be inspected with

caution by experts in the field before moving ahead with the method application. Case study 6.1 in UNCTAD (2021: Background documents: Case studies) illustrates how the Central Bank of France identifies hidden securities assets in the BoP.

- b) Breakdown of data by country of ownership and by IFC, conducted using data on offshore deposits to allocate estimated global offshore wealth to each individual country of ownership and IFC.
- c) Estimation of international tax evasion by country applied only partially in the *Methodological Guidelines* to account for IFFs; the non-compliance rate on offshore wealth is applied and followed by transformation of stock measure to flow to identify the level of illicit flows. This step captures capital gains, but not wealth consumption; and it only produces grounds to estimate IFF outflows, not inflows.

In view of tax and commercial IFFs the method further suffers from collating other categories of IFFs into this category, specifically, criminal activities (to generate the income located abroad or conceal the proceeds of crime or corruption).

Another critical point lies in the challenges related to associating deposits with their origin: various screening arrangements, e.g., shell companies, prevent direct estimation of ownership shares of undeclared offshore wealth. Such arrangements are normally located in an IFC, not the country of residency of the actual owner(s), hence incorrectly assigning deposits to IFC instead of the country of actual owner.

Overcoming limitations

Major drawback in the practical application of the method is data availability. Several assumptions are therefore required for the method to reach results. An assumption is also required to divide offshore wealth into deposits and portfolio investments, assuming a 25 – 75 per cent division. A crucial assumption also relates to the 75 per cent non-compliance rate. According to the European Commission (2019), a large part of offshore wealth is not likely to be reported through tax returns. These assumptions may need constant validation and calibration.

The coverage of assets is also limited: only portfolio assets and deposits are considered, whereas other asset classes (real estate assets, artwork, life insurance contracts, cash money and cryptocurrencies) are not included.

Source data

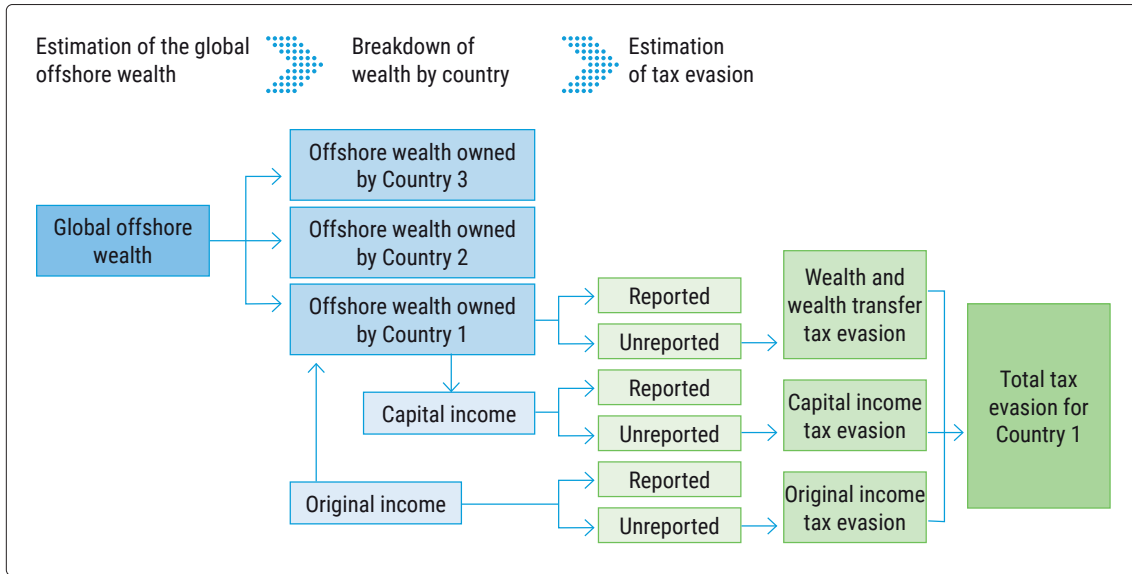
Source data are spread in various international databases and are found in statistics on international portfolio securities and on foreign deposits. Three global databases provide reliable global data on portfolio securities: the IMF's Coordinated Portfolio Investment Survey (CPIS), the IMF's International Investment Position (IIP) and the External Wealth of Nations Mark II database (EWN). These have limitations, above all their coverage of countries.

The Central Bank of Switzerland publishes detailed statistics on bank deposits, portfolios of equities, bonds, and mutual fund shares managed by Swiss banks on behalf of foreigners. Data on foreign deposits are sourced from BIS locational banking statistics, with limitations in terms of coverage, confidentiality restrictions, and difficulty to distinguish between individuals and entities.

Calculation

The method is implemented in three phases, as per original three-step approach by the European Commission (2019).

Figure 21 Three-step approach to estimating tax evasion by individuals



Source: The European Commission (2019)

1. Estimating the global offshore financial wealth

First, an assumption is made that the financial wealth held offshore by individuals (households) is comprised of: (i) portfolio assets; and (ii) deposits, namely:

$$offFinW_{G,t} = offPFW_{G,t} + Deposits_{G,t} \quad \text{Equation (44)}$$

where:

$offFinW_{G,t}$... global (G) offshore financial wealth in time t ;

$offPFW_{G,t}$... global (G) offshore portfolio wealth in time t ;

$Deposits_{G,t}$... global (G) offshore deposits in time t .

For estimating the (i) global offshore portfolio wealth held by individuals, the global excess of international portfolio liability positions over international portfolio asset positions is taken:

$$offPFW_{G,t} = \sum_i IPFLiabilities_{i,t} - \sum_i IPFAssets_{i,t} \quad \text{Equation (45)}$$

where:

$offPFW_{G,t}$... global (G) offshore portfolio wealth in time t ;

$IPFLiabilities_{i,t}$... international portfolio liability position for country i in time t ;

$IPFAssets_{i,t}$... international portfolio asset position for country i in time t .

The European Commission (2019, Appendix 1) lists relevant and required data corrections to assess the global portfolio assets and liabilities.

Next, to estimate the (ii) offshore deposits in IFCs, following procedure in the European Commission (2019), an assumption is made that 25 per cent of financial wealth is held in the form of deposits and the remaining 75 per cent in the form of portfolio securities. Therefore:

$$Deposits_{G,t} = offPFW_{G,t} * \frac{25}{75} \quad \text{Equation (46)}$$

2. Dividing global offshore financial wealth by country of ownership and by IFC

In the second phase, the global offshore financial wealth from first phase is broken down by country of ownership and by IFC.

First, estimate the breakdown by country of ownership using ownership shares of cross-border deposits held by individuals in IFCs as proxies (see European Commission, 2019). These are sourced from BIS locational banking statistics, which, however, do not distinguish between cross-border deposits from individuals and those from entities. However, they are becoming more often available on disaggregated counterparty ownership of bank deposits. Corrections are made on the assumption that a country with a large outgoing FDI stock (relative to GDP) is assumed to have a large proportion of outgoing corporate deposits, and vice versa, as presented in case study 6.2 in UNCTAD (2021: Background documents: Case studies). These data will likely be available to NSOs.

Second step in this phase refers to breakdown by IFC. Offshore wealth in each IFC is estimated using either direct observation of Swiss National Bank (SNB) data for Swiss IFCs or using BIS data to supplement the estimation.

3. Estimate IFFs based on offshore wealth using non-compliance rate

The final phase reflects the estimation of IFFs, which is based on the set non-compliance rate of 75 per cent and applied to entire offshore wealth held by individuals, estimated in the previous phase. Crucial assumption is being further constructed on the calculation of the flows from estimated stocks of wealth: flow in a given year is calculated as the difference of offshore wealth of the current year and the previous year (similar to method in section 4.3.1). To account for the possibility that wealth increase from one year to another can also stem from an increase of portfolio assets valuation (and not because additional investments or inflows have been made), such market valuation effects are considered. Applying the rate of variation of the market asset price level in a given year, v_t , the flow of assets for country i in time t is calculated by:

$$flow_{i,t} = offFinW_{i,t} - offFinW_{i,t-1} * (1 + v_t) \quad \text{Equation (47)}$$

To determine the yearly rate of increase of assets captured in v_t , the MSCI world price index is used (MSCI, 2023).

If these flows are positive, citizens of country i are shifting assets out of their country. Applying the non-compliance rate, r_n , we obtain the outward IFFs as:

$$OutwardIFFs_{i,t} = \max(0, flow_{i,t}) * r_n \quad \text{Equation (48)}$$

On the other hand, when the wealth from one period to another is diminishing, the negative value of outward IFFs does not represent inward IFFs. The mirror image would be required to calculate inward IFFs, i.e., calculating for all other countries their respective outward IFFs, but only specifically into a given country studied for its inflows. Their positive sum would present inward IFFs of studied country. However,

with current data availability, dictating also the first phase of presented methodology, this calculation is not viable.

Recent application of the method, with the new, updated data sources is available in Maga and Marshall (Forthcoming) in the application of the method to measure these IFFs for selected countries in Asia – see also case study 6.5 in UNCTAD (2021: Background documents: Case studies).

4.4 TIER CLASSIFICATION OF METHODS AND OTHER APPROACHES

The proposed methods to measure tax and commercial IFFs in previous subchapters provide tools for national authorities to select and apply selected methods to measure specific subtypes of tax and commercial IFFs. Supporting the selection process, methods fact sheets can provide a useful tool. They are found in the online annexes with the *Methodological Guidelines* (UNCTAD, 2021: Background documents). While the question of how to stack together results from methods measuring trade misinvoicing and profit shifting (e.g., method #1 and method #3) into a single measure of IFFs as per dissemination requirements for SDG indicator 16.4.1 are being addressed in chapter 5, a question under consideration here dwells on the selection of a method among the proposed ones within a certain subtype, e.g., how to select either method #1 or method #2.

Decision on which method to use within a certain group of methods, e.g., to measure IFFs from trade misinvoicing, will primarily be driven by factors of data availability and statistical capacity. As a pair of methods has been proposed with intention to capture, or reflect these varying national circumstances, national authorities are advised to with guidance presented in chapter 3.4.4 – i.e., if possible, apply method that is classified as tier 1; and then work down the classification, as needed. Using the criteria and evaluation framework (see in UNCTAD (2021: Background documents)), each of the methods is to be nationally evaluated, as national circumstances would dictate the point allocation and valuation. Regardless, given the overall methods' specifications and concepts, the following general guidance is observed (again, see specific evaluation in respective annexes in UNCTAD (2021: Background documents)):

1. Trade misinvoicing:
 - a. **Method #1** is classified as **tier 3** (method of last resort). This is primarily driven with practical limitations in fully and comprehensively applying the “plus” part of PCM+ requiring detailed and thorough, often case-by-case inspection of the data sources to uncover true reasons for observed discrepancies in bilateral trade flows. In an initial application using aggregated internationally available data, the method serves as an initial risk analysis, identifying areas with larger trade discrepancies, that require more in-depth analysis.
 - b. **Method #2** is tier classified as **tier 1** (preferred method). It builds on transaction-level data and despite several limitations, it provides a sufficient and granular approach to the measurement of IFFs.
 - c. If a country has transactions level Customs data with low non-reporting and a good capacity to analyse those data, method #2, the Price Filter Method (PFM+) is a natural choice as a tier 1 method. Ideally, the data would be used at the most detailed level, even at transactions level, for PFM+. This is important to account for the heterogeneity of products and quality aspects. The Customs data should also include a description of the commodity, and information on exporters and importers etc.
 - d. If such rich data and high capacity are not there, the Partner Country Method (PCM+), method #1, may be a better first option. There, on the other hand, more work is needed to account for discrepancies not driven by IFFs. Here bilateral and international collaboration of statistical authorities to address statistical trade asymmetries would be essential. Such partnerships could be formed in the pilot testing to share lessons learned.

2. Profit shifting:

- a. **Method #3** is classified as **tier 3** (method of last resort). Due to significant limitations in data availability and several assumption needed to be made, it does require significant inputs and engagement, along with reliance on econometric modelling/regression analysis to produce official statistics, rendering its placement relatively low. Alternative option presented within the method (see Box 3) falls likewise into this category, noting that it serves more as a risk-analysis approach.
- b. **Method #4** is classified as **tier 2** (fallback-option method). Building on data sources that are both granular (microdata) and mostly available within national statistical systems, it does require several modelling approaches and assumptions to be made, but offers a step-wise approach that can override some of the limitations in various steps. Data availability in developing countries as well as the ability to “only” measure either inward or outward IFFs scored the method in a global context below tier 1.
- e. If statistical authorities have comprehensive firm-level data with economic variables, such as value added, R&D spending, share of salaries to total costs and the ability to link to firms’ international trade by products and trading partners (country of origin/destination), and business register information on MNEs, the method analysing MNE vs. comparable non-MNEs, method #4, would be the ideal choice. It could be useful to experiment further with the variables that are used to make the comparison. This method will require more from source data and analytical capacity.
- c. Otherwise, global distribution of MNEs’ profits and corporate taxes, method #3, could be a feasible choice. This method can be performed on microdata from CbCR, if available; alternatively, OECD published aggregate CbCR should provide some starting ground in application of this method. Assumptions and country-specific alterations including national experts may be required to operationalise this method in practice.

3. Tax evasion by individuals:

- a. **Method #5** is classified as **tier 3** (method of last resort). Significant data availability limitations and conceptual concerns about significant elements, namely the flow identification, as well as required assumptions being made, renders the method fall into the last tier. Alternative applications (see Box 5) suffer similarly from assumptions being made to arrive at the result, although data availability may be somewhat improved in some countries.
- b. **Method #6** is classified as **tier 3** (method of last resort). Addressing IFFs from a global perspective and breaking it down by country, its application to national authorities may be limited. Data unavailability and significant assumptions required to move the calculation through phases add to the potential unreliability of the method in its application in many countries and statistical systems.
- c. In the case of availability of granular data from individual tax administration records on foreign income and wealth, the method of flows of undeclared offshore assets indicator (method #5) is a preferred method to measure international tax avoidance of individuals. The exchange of data between financial institutions and Tax authorities, including across borders, can further improve the method’s reliability. Pilot testing will reveal further potential of the method application, as well as its limitations in data use.
- d. Offshore financial wealth by country, method #6, is a suitable fall-back option due to its comprehensiveness in coverage, achieved through combining various datasets covering portfolio assets and liabilities, and bank deposits. Nevertheless, the underlying assumptions for conducting the analysis require careful consideration. Testing its robustness to assumptions will be required to ensure proper international comparability of the results.

Two methods for each of the three main areas of tax and commercial IFFs allow flexibility to select a feasible method considering the national capacity, existing data sources and other methods used in statistics, legal and regulatory frameworks, and other conditions. Statistical authorities are encouraged to

select one or two methods for the application. This will enable the comparison of feasibility and robustness and will accumulate information on the methods. Statistical authorities are also encouraged to carry out an in-depth study of IFFs at regular intervals by using more resource intensive methods, e.g., in a base year in combination with less resource-intensive measures of IFF dynamics for other years. The in-depth study could include additional direct data collection. In case where both of the methods from a pair (i.e., both methods #1 and #2; or #3 and #4) can be applied, their values could be in general used as a cross-checking or benchmarking exercise, accounting for potential differences in their coverage.

In addition to the methods described in this chapter, there is a broad set of literature and research on IFFs among academia and researchers, but also by international organizations and UN Regional Commissions. They address various aspects of IFFs, providing significant new knowledge about the IFFs, their nature, measurement process, and ways to inform policies and procedures. To that end, they are an invaluable contribution to the knowledge of IFFs, although in several aspects they could not be considered directly as methods for a statistical measurement of SDG indicator 16.4.1. Several of alternative approaches or specific applications have been or are being referred to in specific case studies in UNCTAD (2021: Background documents: Case studies). Other applications of measurement of IFFs from different sources have also been the cases of studying IFFs from trade misinvoicing in the Arab region (case study 1.6 in UNCTAD (2021: Background documents: Case studies)) and the specific case of grey re-exports in Asia by Maga et al. (2023)(case study 1.8 in UNCTAD (2021: Background documents: Case studies)). Forthcoming studies will also find their place there, e.g., ESCAP's work on remittances (ESCAP, Forthcoming).

However, caution is needed to ensure alignment to the *Conceptual Framework* and the *Methodological Guidelines*, especially in the view of providing reliable and comparable evidence base for informing policy. Additionally, methods presented here and developed within an inclusive framework of the Task Force ensures their compatibility with several statistical frameworks, as we have seen in chapter 2, and is further discussed in the coming chapters.

5

REPORTING ON SDG INDICATOR 16.4.1

5.1 AGGREGATION AND OVERLAPS IN MEASURING TAX AND COMMERCIAL ILLICIT FINANCIAL FLOWS

The ultimate goal of IFFs measurement is to compile estimates for total inward and outward IFFs (separately), in accordance with the definition of SDG indicator 16.4.1. Thus far, countries have been reporting estimates of different IFFs subtypes. Because all these subtypes (tax evasion, trade misinvoicing, corruption, etc.) concern different phenomena, estimates have been generated using distinct methodologies. However, such estimates cannot always offer collectively exhaustive and mutually exclusive results. In other words, two major challenges emerge while summing up distinct IFF estimates into one total estimate, namely: (1) the absence of information, which occurs when certain methods fail to comprehensively assess all the aggregates related to IFFs, and (2) the risk of double counting, which happens when there is an overlap in measurements from different methods for the same type of IFFs (or aggregate) during the aggregation process.

The present chapter illustrates solutions for the aggregation of estimates of different IFF (sub)types, mapping all possible risks emerging from the two above-mentioned challenges and offering strategies that minimize those risks.

The framework considers the five tax and commercial IFFs introduced in chapter 2 (F1-F5, see also below) and the six methods for measuring them outlined in chapter 4. Although this technical paper focuses on tax and commercial IFFs only, reference to criminal activities is also made to discuss and address possible double counting risks with related estimates across the entire scope of IFF (sub)types. The presented deliberations are subject to further refinement and joint work by UNCTAD and UNODC on methodologies to measure all (sub)types of IFFs, including based on additional pilot testing of methodologies outlined in this technical paper.

In this context, Table 11 provides a conceptual matrix that associates tax and commercial practices with measurement methods, considering both income generation and income management IFFs, and having the following structure.

Rows are associated with eight tax and commercial and crime-related IFFs⁶²:

- (F1) Transfer of wealth
- (F2) Misinvoicing
- (F3) Transfer mispricing
- (F4) Debt shifting
- (F5) Assets and intellectual property shifting
- (I1) Illegal market activities
- (I2) Corruption
- (I3) Exploitation-type activities and financing of crime and terrorism.

Columns are associated with eight methods of measurement:

- (M1) Partner country method plus
- (M2) Price filter method plus
- (M3) Global distribution of profits and corporate taxes
- (M4) MNEs vs. comparable non-MNEs

⁶² “Crime-related IFFs” shall be intended here as IFFs associated with illegal market, corruption, and exploitation-type/terrorism financing activities. Although some tax evasion practices can amount to criminal activities too, they are treated here in the group of illicit tax and commercial practices.

- (M5) Undeclared offshore wealth indicator
- (M6) Offshore financial wealth by country
- (M7) Bottom-up methods for crime-related activities⁶³
- (M8) Indirect method to measure income management IFFs from illegal activities.

Cells in Table 11 are characterized by three colours, having the following meaning:

- Highlighted in purple are the cases in which methods M1 to M6 are able to assess the different typologies of tax and commercial IFFs.
- In blue, the cases in which methods M7 and M8 are able to assess different typologies of crime-related IFFs.
- In yellow, the cases in which there is a risk of overlap (double counting) between the origin of IFFs (tax and commercial vs. crime-related) and the method that assess the related amount of IFFs.

Additionally, grey colour marks the cells that are not suitable for the analysis in the sense that these combinations cannot occur in practice, such as estimating income generation for (F1) Transfer of wealth.

Table 11 Tax and commercial IFFs vs. methods of measurement matrix (aggregated version)

Flows and activities		IG-IM framework	Methods							
			Income generation				Income management			
			M1	M2	M3	M4	M7	M5	M6	M8
			Partner country method Plus	Price filter method Plus	Global distribution of profits and corporate taxes	MNEs vs. comparable non-MNEs	Bottom-up methods for crime-related activities	Undeclared offshore wealth indicator	Offshore financial wealth by country	Indirect method to measure IM IFFs from income determined in IG
F1	Transfer of wealth	IM	Grey				Purple			
F2	Trade misinvoicing	IG/IM	Purple				Yellow	Purple		
F3	Transfer mispricing	IG/IM	Purple				Purple			
F4	Debt shifting	IG/IM	Purple				Purple			
F5	Assets and intellectual property shifting	IG/IM	Purple				Purple			
I1	Illegal markets	IG/IM	Blue		Blue			Yellow		
I2	Corruption	IG/IM	Blue		Blue			Yellow		
I3	Exploitation and terrorism financing	IG/IM	Blue		Blue			Yellow		

Source: Authors' deliberations

Reading Table 11 by row, it is possible to identify the methods to measure income generation and/or income management IFFs related to each IFFs generating activity, also stressing possible overlaps emerging from the aggregation of estimates from different methods. In other terms, for each tax and commercial practice (or crime-related activity), it is possible to identify different methods among which one can choose the more suitable for measuring the related IFFs.

Reading Table 11 by column, conversely, it is possible to identify different IFFs that can be assessed by each method. It also highlights potential overlaps in measurement across the IFFs. In other terms, for each and comprehensive practice of measurement of tax and commercial IFFs within the scope of aggregated IFFs, under the label "M7" several methods are included, such as methods to measure IFFs from drug trafficking, smuggling of migrants, trafficking in persons and similar. Please refer to UNODC (UNODC, 2023) for further information..

method, it is possible to identify which typology of IFFs can be estimated, thus establishing its “coverage” with respect to the comprehensive information requirements.

To understand the issues related to aggregation and possible double counting emerging from overlaps in measurement, a column-based perspective is more suitable. In principle, an exhaustive measurement of IFFs could be obtained through a combination of methods ensuring that each relevant cell in Table 11 is either marked in purple or blue for every row. In other words, the selected combination of methods should ensure that the relevant flows originating from each type of activity are incorporated into the measurement.

Looking at Table 11, the following combinations of methods could guarantee an exhaustive measurement of IFFs related to both tax and commercial practices and illegal activities:

- M5 or M6 for measuring income management IFFs in F1 to F5
- M1 or M2 for measuring income generation IFFs in F2
- M3 or M4 for measuring income generation IFFs in F3 to F5
- M7 for measuring income generation IFFs in I1 to I3
- M8 for measuring income management IFFs in I1 to I3.

However, though this combination meets the needs of having a measurement for each relevant typology of tax and commercial and crime-related IFFs, several overlaps in measurement (yellow cells) are associated to the estimates, thus preventing simply adding-up the different measurements for a comprehensive estimate of the total value of IFFs.

In particular, the following overlaps are of significance:

- (O1) Using M1 or M2 for measuring income generation IFFs in F2 may generate an overlap with respect to the estimates provided by M7 for income generation IFFs in I1 to I3. For example, misinvoicing in international trade could hide transactions associated with illegal market activities (e.g. misinvoicing of legal goods to purchase/sell illicit drugs concealed in a shipment).
- (O2) Using M5 or M6 for measuring income management IFFs in F1 to F5 may generate an overlap with respect to the estimates provided by M8 for income management IFFs in I1 to I3. For example, proceeds of crime can be laundered in offshore financial centres where also assets from tax evasion/avoidance are held, which is already captured by estimates produced using M5 or M6.
- (O3) Using M8 for measuring income management IFFs in I1 to I3 may cause an overlap with respect to the estimates provided by M5 or M6 for income management IFFs related to F2. Indeed, there is evidence about the use of misinvoicing to channel proceeds of crime into legal markets.

Additionally to identifying overlaps among the groups of methods, e.g., estimating IFFs from trade misinvoicing (F2) using methods M1 and M2, and using methods for tax evasion by individuals M5 or M6, there are overlaps possible when using methods within the same group, i.e., using M1 and M2. For example, national authorities using M1 and M2 to estimate trade misinvoicing, face a challenge of which estimate, from M1 or M2, to use; or how to interrelate those. For more guidance on this, please see chapter 4 where methods are discussed. Similar logic applies to other pairs of methods (whereas overlaps across pairs of methods are being discussed here).

Aggregating the IFF estimates with the combinations of methods illustrated above provides a collectively exhaustive measurement of the phenomenon⁶⁴. However, in some areas, the risk of double counting is high and must be mitigated to avoid an over-estimation of IFFs. While mitigating measures cannot be fully

⁶⁴ There is clearly a direct link to the question of operational definition (see chapter 3.4.5), linking conceptual elements to practical application, hence leaving room for undercoverage. When exhaustive measure is referred in this context, it stems from conceptual perspective, i.e., considering methods' full alignment to the intended coverage and scope, hence generating type-wide complete coverage.

provided at this stage, general guidance can be provided in the sense of identified overlaps in coverage and, accordingly, to avoid such overlapping combinations.

To deepen the issue of double counting and emphasize additional concerns related to the incompleteness of the estimates for certain aggregates, Table 12 provides a more detailed version of Table 11, specifying, for each activity, all the aggregates involved in income generation and income management IFFs. The meaning of the colours is the same as in Table 11. Also in this disaggregated matrix, grey cells represent non-relevant aggregates for each tax and commercial and crime-related IFFs.

Considering income generation IFFs, illicit flows coming from both tax and commercial practices and crime-related activities are fully covered by some combination of measurement methods. However, considering income management IFFs, the component related to final consumption is not covered for tax and commercial practices by M5 and M6. Furthermore, M6 does not cover operations related to non-financial assets.

Table 12 also helps to better visualize overlaps:

- (O1) relates to the flows of imports and exports that are assessed at the same time by M1 and M2 for tax and commercial practices and by M7 for crime-related activities.
- (O2) relates to financial and non-financial assets and to only financial assets according to whether M5 or M6 is used to estimate income management IFFs in tax and commercial practices.
- Finally, (O3) is associated to imports and exports, when M1 or M2 are used to assess income generation IFFs from F1, and M7 is used to measure income management IFFs from I1 to I3.

Table 12 IFFs typologies vs. methods of measurement matrix (disaggregated version)

Flows and activities	IG-IM framework	Methods																			
		Income generation					Income management														
		M1 Partner country method Plus	M2 Price filter method Plus	M3 Global distribution of profits and corporate taxes	M4 MNEs vs. comparable non-MNEs	M7 Bottom-up methods for crime-related activities	M5 Undeclared offshore wealth indicator	M6 Offshore financial wealth by country	M10 Indirect method to measure IM IFFs from income determined in IG												
F1 Transfer of wealth	IG: imports	NO																			
	IG: exports	NO																			
	IG: value added / income	NO																			
	IG: transfers	NO																			
	IM: non-financial assets	YES																			
	IM: financial assets	YES																			
	IM: consumption (imports and exports)	YES																			
	IG: imports	YES																			
	IG: exports	YES																			
IG: value added / income	YES																				
F2 Misreporting	IG: transfers	NO																			
	IM: non-financial assets	YES																			
	IM: financial assets	YES																			
	IM: consumption	YES																			
F3 Transfer mispricing	IG: imports	YES																			
	IG: exports	YES																			
	IG: value added / income	YES																			
	IG: transfers	NO																			
	IM: non-financial assets	YES																			
	IM: financial assets	YES																			
F4 Debt shifting	IM: consumption	YES																			
	IG: imports	YES/NO																			
	IG: exports	YES/NO																			
	IG: value added / income	YES/NO																			
F4 Debt shifting	IG: transfers	NO																			
	IM: non-financial assets	YES																			
	IM: financial assets	YES*																			
F4 Debt shifting	IM: consumption	YES																			

Flows and activities	IG-IM framework	Methods									
		Income generation					Income management				
		M1	M2	M3	M4	M7	M5	M6	M10		
Partner country method Plus	Price filter method Plus	Global distribution of profits and corporate taxes	MNEs vs. non-MNEs	Bottom-up methods for crime-related activities	Undeclared offshore wealth indicator	Offshore financial wealth by country	Indirect method to measure IM IFFs from income determined in IG				
F5 Assets and intellectual property shifting	IG: imports	YES									
	IG: exports	YES									
	IG: value added / income	YES									
I1 Illegal markets	IG: transfers	NO									
	IM: non-financial assets	YES									
	IM: financial assets	YES									
	IM: consumption	YES									
	IG: imports	YES									
	IG: exports	YES									
	IG: value added / income / wages	YES									
	IG: transfers	NO									
	IM: non-financial assets	YES									
I2 Corruption	IM: financial assets	YES									
	IM: consumption (imports and exports)	YES									
	IG: imports	YES									
I3 Exploitation and terrorism financing	IG: exports	YES									
	IG: value added / income / wages	YES									
	IG: transfers	YES/NO									
	IM: non-financial assets	YES									
	IM: financial assets	YES									
	IM: consumption (imports and exports)	YES									
	IG: imports	YES									
	IG: exports	YES									
	IG: value added / income / wages	YES									

Source: Authors' deliberations

Table 12 shows the correspondence between different methods for measuring IFFs and the aggregates that are actually measured. Considering income generation IFFs, M1 and M2 measure IFFs from misinvoicing (F2) based on the flows of imports and exports among countries. M3 and M4 measures the value added (income) generated by tax and commercial practices associated with profit shifting (F3 to F5). M7 is able to identify imports, exports and value added resulting from different types of criminal activities.

Considering income management IFFs, while M8 is able to assess all the flows (financial and non-financial assets, consumption) related to IFFs from crime-related activities, M5 estimates financial and non-financial assets from illicit tax and commercial practices, and M6, in the same context, is able to identify only the flow of financial assets.

5.2 REPORTING ON SDG INDICATOR 16.4.1

Countries are making significant progress in understanding concepts and methodologies and implementing methods for the measurement of tax and commercial IFFs. Building on custodian agencies and their partners methodological support and guidance, reporting on tax and commercial IFFs for SDG indicator 16.4.1 is close to be achieved. To facilitate future reporting and ensure meaningful comparison of reported data on SDG indicator 16.4.1, custodian agencies work with IAEG-SDGs to provide a data structure for reporting consistent with the indicator's metadata and identified reporting features to feed analysis and policy requirements. Therefore, the SDG indicator 16.4.1 should be reported at the high level as, separately, inward and outward IFFs, and then broken down by four types of IFFs as per the *Conceptual Framework* (see chapter 2). Furthermore, depending on data availability, each of these should be further disaggregated to reflect specific subtype, as presented in Table 13. This will allow for appropriate comparison of various estimates produced by national authorities and hence proper use of official statistics on IFFs, including comparing and aggregating IFFs from both tax and commercial and crime-related IFFs. Additional information on further disaggregation, where available (e.g., on specific economic activity or commodities included, or countries of origin/destination) should be provided in data-series or data-point footnotes as appropriate.

Table 13 SDMX codes and descriptions for disaggregated reporting on SDG indicator 16.4.1

SDMX Code	Description
IFF_TXC	Tax and commercial IFFs
IFF_TXC_TMI	Trade misinvoicing
IFF_TXC_TEV	Tax evasion
IFF_TXC_ATA	Aggressive tax avoidance
IFF_ILM	Illegal markets
IFF_ILM_DRG	Drug trafficking
IFF_ILM_SOM	Smuggling of migrants
IFF_ILM_WLD	Wildlife trafficking
IFF_ILM_FIR	Firearms trafficking
IFF_ILM_IMN	Illegal mining
IFF_ILM_OTHR	Other
IFF_COR	Corruption
IFF_COR_BRB	Bribery
IFF_COR_TIN	Trading in influence
IFF_COR_OTHR	Other
IFF_ETF	Exploitation-type and terrorism financing
IFF_ETF_TIP	Trafficking in persons
IFF_ETF_EXT	Extortion
IFF_ETF_THE	Theft
IFF_ETF_FRA	Fraud
IFF_ETF_OTHR	Other

Source: UNCTAD, UNODC; IAEG-SDGs

To account for some level of uncertainty in applying the selected method(s), reflecting either data sources or methodology limitations, it is advised that a point-estimate is complemented with a range estimate, i.e., compiling and reporting also a lower-bound and upper-bound estimates. Such a range would offer some, albeit limited level of robustness of estimates and increase reliability of the compiled statistics. It is advised that in compiling estimates, method-specific parameters are set at different values to reflect different scenarios. For example, for methods #1 and #2, the CIF-FOB ratios can be applied at the level of 6 per cent for all commodities compared to commodity-specific values. For method #3 this may relate to the model specification or setting the threshold value for tax haven indicator. For method #4 it may be the value of the parameter h in ROC analysis, while for methods #5 and #6 the variability may relate to assumptions on the non-compliance rates.

6

FURTHER WORK AND RESEARCH AGENDA

6.1 EXTENDING NATIONAL ACCOUNTS FOR ILLICIT FINANCIAL FLOWS

Full compliance of IFF concepts and methods with statistical frameworks is ultimately the goal of conceptual and methodological maturity process to measure IFFs. Complementing SNA in a fully integrated manner by resulting in extended or thematic accounts on IFFs will inherently solve conceptual and methodological challenges outlined in this technical paper. While both, specific final integrated outcome as well as related terminology will evolve in due course in parallel with maturing of concepts and methodologies to measure IFFs, as a direct result of continuous efforts by custodian agencies and partners to develop and national actions to test and apply methodologies, this section shares views on extending national account for IFFs in the form(at) of so-called satellite accounts. According to the SNA (United Nations et al., 2009), satellite accounts have the role of meeting specific data needs by providing more detail, rearranging concepts from the central framework or providing supplementary information about a given phenomenon. They may range from simple tables to an extended set of accounts, and can be compiled and published with different timings.

Starting from the National Accounts central framework, the SNA, satellite accounts are designed to overcome its possible limitations in fully representing specific phenomena. Indeed, though satellite accounts typically use the concepts, classifications and schemes of SNA, they also exploit a wide range of flexibility in terms of rearrangements of data and conceptual modifications. This flexibility is aimed at grasping the complexity characterizing certain phenomena, a complexity that may prevent them from being completely stressed and represented within the SNA.⁶⁵

In this context, the compilation of a satellite account on IFFs represents a challenge and an opportunity. On the one hand, as largely pointed out in chapter 5, there are still several issues related to IFFs measurement in terms of completeness and possible overlaps. On the other hand, a satellite account framework may help conceptualize and solve part of these problems, allowing to provide a clear representation of the flows that are involved in criminal activities and tax and commercial practices, also stressing possible interaction between illicit and regular activities. Moreover, a satellite account perspective may also provide guidance for assessing the extent to which IFFs are already included in SNA aggregates.

The design and compilation of a satellite account of IFFs are not in the scope of this publication, which is aimed at providing guidance for the measurement of tax and commercial IFFs in the context of SDG indicator 16.4.1. That notwithstanding, this chapter provides an insight about and dwells on some of the challenges to be addressed in the transition from measuring IFFs for the SDG indicator to compiling a satellite account of IFFs.

In particular, two main challenges emerge. The first is related to the definition of a consistent conceptual framework for the IFFs satellite account, while the second one relates to the need for broadening the set of IFFs-related aggregates to be measured.

Concerning the first challenge, the conceptual elements outlined in chapter 2 provide a sound starting point for designing the IFFs satellite account framework. Indeed, on the one hand, the current co-custodians conceptual and measurement work has been conceived consistently with the main concepts of SNA and

⁶⁵ There is a wide range of examples of satellite accounts currently compiled by national accounts departments: Environmental Accounts, which extend the central framework to consider environmental externalities; Tourism Accounts, which rearrange data in order to stress the role of tourism-related flows in different industries; Household Production Accounts, which extend the production boundary to include unpaid household services in economic flows. Other types of satellite accounts are currently being developed, such as the Space Economy Accounts, which is aimed at rearranging data in order to stress the economic role of space-related business activities, or the eSUT framework, which is designed to provide standard Supply and Use Tables (SUT) with a larger detail in terms of business units' characteristics.

BoP while, on the other hand, it addresses IFFs-specific needs in terms of detail of data and definition of concepts, thus allowing to obtain a sound representation of the phenomenon.

Concerning the second challenge, the methods for measuring IFFs presented in chapter 4 allow to assess the amount of IFFs as required by the compilation of the SDG indicator 16.4.1. Indeed, besides the issues connected with possible overlaps, it is possible to define a set of methods that guarantee a (conceptually) exhaustive measurement of IFFs related to tax and commercial practices and criminal activities.

However, different methods provide estimates of IFFs in terms of different aggregates. For example, focusing on tax and commercial IFFs, M1 and M2 assess the value of the imports and exports involved in IFFs generation, but they do not provide estimates of the value added coming from F2. Likewise, M3 and M4 estimate the value added coming from F3 to F5, but they are not able to assess the related flows of imports and exports of goods, services and financial assets.

This incompleteness does not affect the measurement of the total value of IFFs for the sake of the SDG indicator, but it prevents from having both a complete representation of the phenomenon and a clear understanding of the interaction between illicit tax and commercial practices and the regular economic flows.

In order to compile a satellite account framework for IFFs, therefore, all the flows that are directly or indirectly involved in the given practice or action should be measured. Following the simple representation in Table 12, for example, estimates of imports and exports (in the case of F2) and of value added (in the cases of F3-F5) should be provided to complete the framework. Similarly, estimates of financial and non-financial assets involved in income management IFFs provided by M5&M6 should be complemented with the measurement of final consumption.

Compiling a satellite account of IFFs starting from the measurement of the SDG 16.4.1 requires further efforts towards the development of a set of indirect methods that allow for assessing the missing aggregates for each IFFs generating activity.

6.2 WHERE TO NEXT?

Concluding remarks of the technical paper thus evolve around the next steps needed to enhance methodologies and build up a comprehensive accounting framework, allowing IFF statistics' full integration into SNA, also directly and comparably feeding into policy sphere. The methodologies presented to measure tax and commercial IFFs have been developed based on significant research and expertise of various related stakeholders within the Task Force and national authorities experience in their application. Acknowledging that while some elements of IFFs are more readily measurable, others are highly challenging to estimate, country pilots are central to building the statistical capacity to measure IFFs and testing the feasibility of measurement. Experience gained during the country pilots show the way forward on tackling the measurement of tax and commercial IFFs. In this vein, methods presented in this technical paper are another step in the iterative process of learn-use-enhance and are therefore recommended for pilot testing and are open for further refinement, in the view of producing a comprehensive Statistical Framework to measure IFFs.

While there is a call for continued support through the technical expertise from custodian agencies UNCTAD and UNODC, and partners including United Nations Regional Commissions and their experts, this need for continued support is fully user-driven, as revealed in numerous requests by member States. Further technical support is required in terms of training for the responsible authorities to strengthen their capacities to measure, monitor, and disseminate official statistics on IFFs, securing access to and sharing of sensitive statistical data in safe statistical environments to safeguard confidentiality and retaining trust in official statistics, sensitization and awareness raising at high-level government fora and

other stakeholders. Training a panel of national experts on different methods of assessing IFFs to ensure sustainable production of annual monitoring reports for SDG indicator 16.4.1. The measurement work itself needs to be formalized and endorsed at the political level, incorporating the work into daily activities of government officials and experts, rendering this work sustainable. Moreover, resources need to be allocated to ensure that national technical working groups' work on measurement is made permanent. Iterations and constant improvement in measuring IFFs are crucial for enhancing robustness of methods, data sources and results.

Measuring IFFs is not merely a task with the purpose of producing IFF estimates and reporting to the SDG indicators monitoring framework. Rather, measurement of IFFs is the first step in identifying threats and risks from IFFs with further steps conducting country risk profile on IFFs and serves as evidence base for further policy formulation. Such work envisages partnering with other stakeholders in the policy analysis and formulation domains, nationally, regionally and internationally.

The early pilots developed tools and approaches and tested first methods to measure IFFs. Efforts in Africa and in Asian countries, as well as previously in Latin America (on crime-related IFFs) have demonstrated that measurement can be achieved, and will offer essential elements to further refine the application of methods and strengthen statistical capacity to measure multiple types of illicit financial flows.

Concerted actions and efforts, both at national and international levels are crucial in stepping up the efficiency of various workstreams on IFFs worldwide. Creating a platform uniting developed and developing countries to enable sharing of knowledge, expertise, lessons learned and experience from the measurement processes in their respective environments may significantly raise the awareness and enhance reporting towards SDG Indicator 16.4.1. Communicating, sharing and collaborating among stakeholders will reinforce the value of impressive results national authorities have achieved with the support of UNCTAD and UNODC with partners – and scale these up to global coverage and reporting on SDG indicator 16.4.1 on IFFs.

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