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Tax Treaty Aggressiveness: Who is Undermining Taxing Rights in Africa?

Lucas Millán-Narotzky, Javier García-Bernado, Maïmouna Diakité and Markus Meinzer

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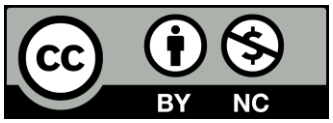

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Summary

Tax avoidance strategies by multinational companies rely heavily on tax treaties. Multinational companies can relocate financial activities across countries to ensure the applicability of the most beneficial tax treaties. This 'treaty shopping' can be particularly harmful to African countries, impairing their efforts for domestic resource mobilisation and achieving sustainable development goals. In this paper, we analyse the aggressiveness of tax treaties towards African countries – the extent to which signing tax treaties reduces the taxing rights of African governments. We find that treaties signed with France, Mauritius and the United Arab Emirates reduce withholding tax rates the most, while treaties signed with European countries – and, in particular, the United Kingdom and France – greatly limit other taxing rights, for example, by restricting the scope of permanent establishment definition.

Keywords: double taxation agreement, tax treaty, tax convention, tax avoidance, tax haven, profit shifting, foreign direct investment, treaty networks, treaty shopping, withholding taxes, permanent establishment, domestic revenue mobilisation, Africa

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Acronyms

AEUC	Arab Economic Union Council
ATAF	African Tax Administration Forum
BTT	Bilateral Tax Treaties
CEMAC	Economic Community of Central African States
FDI	Foreign Direct Investment
GCC	Gulf Cooperation Council
IBFD	International Bureau of Fiscal Documentation
ICTD	International Centre for Tax and Development
IMF	International Monetary Fund
Latam	Latin America
MAP	Mutual Agreement Procedure
MLI	Multilateral Legal Instrument
MNC	Multinational Corporations
OECD	Organisation for Economic Co-operation and Development
PE	Permanent Establishment
PR	Peer Review
sink-OFC	Sink Off-shore Financial Centres
SOMO	The Centre for Research on Multinational Corporations
UAE	United Arab Emirates
WAEMU	West African Economic and Monetary Union
WHT	Withholding Taxes

Introduction

The increase in international investment is a defining characteristic of economic globalisation. For over 90 years, tax treaties have played an integral part in this process, enabling the rise of the multinational firm. In 2016, the total inward stock of cross border foreign direct investment (FDI) amounted to US$28tn, while the associated intra-group trade amounted to an estimated annual US$6tn (Meinzer 2019). A large majority of this investment and trade – 82% and 90% respectively – is governed by tax treaties. Tax treaties divide the taxing rights over cross-border economic activity between two jurisdictions and are, thus, important determinants of tax revenues. As tax treaties rose in numbers to more than 3800 in 2019 (International Bureau of Fiscal Documentation n.d.), so have the disputes about their interpretation and application. The large number (Baistrocchi and Hearson 2017) and the stockpile of unresolved mutual agreement procedure cases (MAPs) bears witness to the distributive conflict and tax avoidance potential inherent in these treaties.

The distributive conflict and tax avoidance risks arise most pronouncedly when treaty partners are economically diverse. For example, if one treaty partner is a high-income country with many resident multinational corporations (MNCs), while the other is a low-income country without many MNCs, but host to inward FDI and subsidiaries of foreign MNCs, any reciprocal provision in a treaty to constrain the taxing rights of source jurisdictions – i.e. where subsidiaries are located – amounts *de facto* to a unilateral, asymmetric loss of tax revenues borne almost exclusively by the lower-income source country. Tax treaties can thus be conceptualised both as building blocks of tax avoidance strategies for large MNCs and as an element in a mercantilist foreign economic policy strategy whereby domestic economic actors' foreign activity is sought to be shielded from foreign taxes (Durst 2019; Hearson 2021; Wells and Lowell 2014).

The academic literature on tax treaties has mainly focused on treaty shopping and negotiation dynamics (Hearson 2018; Mutava 2019), whilst some research has quantified revenue losses of individual treaties, countries or features of the treaty network (Balabushko, Beer, Loeprick and Vallada 2017; Janský and Šedivý 2019). However, the extent to which tax treaties reduce source taxing rights in lower-income countries has not been systematically analysed. We address this research gap in our paper by asking two interrelated questions: What countries are most aggressive in reducing taxing rights through tax treaties in Africa? How sensitive are the findings to different measures of treaty content and aggressiveness? We replicate and extend previous analyses of treaty aggressiveness for the Corporate Tax Haven Index (Tax Justice Network 2019a; Tax Justice Network 2021b) by incorporating a novel dataset (Hearson, Carreras and Custers 2021) developed at the International Centre for Tax and Development. These extensions of the model and diversification of data allow us to derive more nuanced and robust findings on the most aggressive treaty partners, highlighting the aggressive role of former colonial powers as well as new players. Our analysis of treaty aggressiveness rests on the following conceptualisation: an aggressive treaty is that which reduces source tax rights more acutely than other treaties in force in the source jurisdiction.

This paper is structured as follows. In Section One, we position our contribution in the literature and introduce key concepts that determine the taxing rights in tax treaties. Section Two details the data sources and models employed in the analysis. Results of the different models and datasets are presented in Section Three. Section Four concludes.

1 The role of tax treaties in international tax avoidance

1.1 Distributing taxing rights with tax treaties

Bilateral tax treaties (BTT) divide taxing rights over income arising from cross-border investment between two jurisdictions. The purpose of these treaties has traditionally been stated as preventing double taxation of the same income. If cross-border investment occurs in the absence of a treaty, the lack of coordination between tax rules of a pair of jurisdictions may result in overlapping taxing rights on the same income by both jurisdictions, resulting in so-called double taxation.[1]

Over the years, with concerns over tax avoidance rising on the policy agenda, clauses on preventing treaty abuse have been inserted into the model treaties of the OECD and the United Nations (OECD 2017; United Nations 2017). While both model treaties differ in how they attribute the tax base between jurisdictions, they are very similar in structure and shape almost all BTTs in force today (Lennard 2009).

Vis-à-vis any investment, a jurisdiction can either be host to an inward investment sourcing profits (source country) or home of the investor (residence country) with an outward investment. Tax treaties prevent double taxation essentially by limiting the taxing rights of the source country. These limitations can be grouped into three types of provisions. The first type relates to the definition of the Permanent Establishment (PE; Article 5 of the UN and OECD model treaties). This is one of the main building blocks of a treaty since source taxation of business profits depends on whether or not the foreign company has a 'permanent establishment' in the country where income arises. Furthermore, even if the foreign company has a PE in the source country, some treaties only allow source taxation when income is directly 'attributable' to such a PE. The specifics of what constitutes a PE is thus of paramount importance for determining source taxing rights. While the UN model suggests a broad definition of PE, which allows companies engaging in economic activity in a jurisdiction to be more easily considered taxable, the OECD provides a range of exceptions applicable, for example, to stock and delivery companies, dependent agents, consultancy services, or insurance businesses.

The second category of treaty limitations to source taxing rights pertains to withholding taxes (WHT). Treaties often impose upper limits on the tax rates a country can levy on outbound payments, such as dividends, interest and royalties, or management fees and technical service fees. A 0% WHT rate is the most disadvantageous to the source country since it cannot levy any WHT on outward cross border payments. For example, the OECD model tax convention sets for dividends a 5% or 15% rate (the lower rate applies to substantial holdings), for interest 10% and for royalties 0%. In the UN model, no rates are set. These are left for negotiation between potential treaty partners.

The third category of treaty limitations to source taxing rights comprises a set of diverse provisions. These provisions may alternatively protect or constrain the rights of the source

[1] Literature differentiates between *legal* and *economic* double taxation. Legal double taxation is when two different authorities impose tax on the same income. For example, a foreign business earns profits in a country, and both that country and the country where the business is incorporated charge tax on the same amount of income. Economic double taxation refers to situations where the same increase in capital is taxed at the level of two different taxpayers. That is the traditional framework resulting from limited liability considered legal entities: the state recognises that a company is an entity separate from its owner, and thus both the entity and the owner have to pay tax on income received (the entity is usually subject to corporate income tax, while the owner or shareholder pays tax when income is distributed as a dividend). We consider that economic double taxation is a constitutive feature of most tax systems worldwide and 'double taxation' will hereafter refer to *legal* double taxation only.

country to tax capital gains from the sale of shares of a 'land-rich' company (a company whose value is more than 50% derived from domestic real estate), income from the disposal of shares of companies resident in the source country, or any other income arising in the country but not specifically covered in the treaty. Although not directly linked to PE or WHT, these and other characteristics can constitute a significant source of revenues or losses for source jurisdictions. Furthermore, vague definitions of 'dividend' and 'interest' within a bilateral treaty may give rise to hybrid mismatches of investment income, which may result in negative tax rates (BEPS Monitoring Group 2014).[2]

The overall balance of the distribution of taxing rights in model tax treaties has been analysed by legal scholars. It is widely accepted that the most widely-followed OECD model treaty attributes most taxing rights to the capital-exporting country, i.e. the jurisdiction of residence of the investor (Daurer and Krever 2014; Figueroa 2005). Sol Picciotto found that the OECD model treaty gives 'virtually all the exclusive rights to tax […] to the state of residence' (Picciotto 1992: 61). The question of the distributive impact of tax treaties has been analysed by legal scholars, not only by comparing treaty models or individual treaties but also by contrasting tax treaties to situations without any treaty. Notably, Dagan (2000) revisited the need for treaties to avoid double taxation and observes in a sample of treaties of 'major developed countries' that almost all of these offer unilateral treaty relief to prevent double taxation (Dagan 2000: 979). She concluded that the common idea that treaties are necessary for alleviating double taxation is a 'myth', and that they instead serve '[…] much more cynical goals, particularly redistributing tax revenues from the poorer to the richer signatory countries' (Dagan 2000: 939).

Dagan's empirical claim about the widespread nature of unilateral treaty relief was corroborated recently through research covering 70 jurisdictions representing 86.5% of global foreign direct investment (Tax Justice Network 2021a). According to the Tax Justice Network's findings, unilateral double taxation relief in the form of tax exemption or credit exists in the vast majority of cases. Over 89% of jurisdictions provide such relief for portfolio dividends, 94% for qualified dividends and 84% for interest and royalties. Although treaties may effectively ensure a fixed legal framework that provides tax certainty to businesses operating in two or more jurisdictions, or convenient to reduce multinationals' overall tax liability, it is clear tax treaties are not *necessary* to avoid double taxation.[3] Indeed, recent academic work has identified the reduction of multinationals' foreign tax liability as the main function of tax treaties, akin to common tax incentives (Zolt 2018). Comparing tax treaties to unilateral tax incentives, Brooks and Krever (2015) concluded that the latter had significant advantages in terms of administrative capacity, flexibility in time and democratic governance.

[2] Assuming that a 'dividend' flow is subject to withholding tax in country A when paid to a parent company in country B. Hybrid treatment may occur when the flow is considered 'interest' in country A (deductible), potentially subject to no withholding tax, and then considered 'dividend' income in country B, where such income is tax-exempt. As a result, not only can hybrid treatment result in non-taxation of certain amount of income, but it can also result in having that amount considered deductible (interest), effectively lowering the tax paid on other income.

[3] It must be conceded, however, that unilateral provisions to avoid double taxation are not as effective at preventing double taxation as double tax treaties. For instance, there may be cases in which the rules determining the residency of taxpayers conflict between countries, leading to both claiming residence and full tax liability of one legal entity or taxpayer. Yet, for a number of reasons this argument is of limited relevance: a) these cases are the exception rather than the rule; and b) pure economic 'single taxation' is a theoretical concept derived from economic modelling that is only of limited value in reality. In many countries different types of taxes are levied on the same economic activity, for instance VAT is levied on the turnover of a company, then the profits stemming from the turnover are taxed through federal and state corporate income taxes and in a third stage, the investment income in form of dividends is again taxed when received by shareholders. No one would reasonably speak about 'triple taxation' in such a case. Similarly, it is dubious to speak about double taxation in a cross-border context. In the words of Sol Picciotto: 'double taxation is a dubious concept. Firstly, it does not mean companies' tax bills doubling: it means that there may (rarely) be some overlap between states' taxing claims (think of this in terms of the overlap in a Venn diagram). Any overlap may result in a modestly higher overall effective tax rate, not a '"double" rate'. (Picciotto 2013: 3). This 'modestly higher overall effective tax rate' (ibid) could be higher than the corporate tax rate of one particular country, but it may still be lower than another country's corporate tax rate. If one called this situation double taxation, then this implies speaking about double taxation also in situations in which two unrelated companies operate in two different countries, with one country levying twice as high a corporate tax rate as the other country. This, of course, is misleading and reveals the dubious and theoretically flawed nature of the concept of double taxation. This note is cited with minor modifications with authorisation from (Tax Justice Network 2019a: 33).

Beyond the direct impact of treaties on the distribution of taxing rights, tax treaties can have important indirect effects in the context of treaty shopping. Treaty shopping consists of restructuring the corporate group to access specific treaties or specific features of a treaty. This typically involves setting up intermediate legal entities (holding companies) in a jurisdiction that has signed an advantageous tax treaty with the target jurisdiction. As a result of this process, multinational corporations are structured as hundreds of separate entities purposefully assembled across multiple jurisdictions to channel any investment and associated payment through the least taxed avenue.

Indirect treaty effects through treaty shopping exacerbate the direct distributional impact of tax treaties. Consider the treaty between France and Vietnam, signed in 1993. It sets the upper limit of the WHT rate for interest payments at 0%. On average, the other treaties signed by Vietnam set withholding tax rates of about 10% with respect to interest payments (PricewaterhouseCoopers (PWC 2021a). Thus, even if Vietnam wants to reduce dependence on foreign creditors by increasing its domestic withholding rates on interest, French lenders will still be able to earn interest without paying any withholding taxes, as long as the treaty is in force. This low rate benefits French banks and corporate investors rather than Vietnamese banks and lenders vis-à-vis French borrowers, given the asymmetries between both economies. Yet profits shifted from Vietnam through interest payments may not end up in France but could be shifted further to lower-tax countries like Switzerland, with which France has favourable treaties.

Recently developed offshore financial centres like Mauritius have also been negotiating highly aggressive treaties, reducing the taxing rights of African countries. For example, domestic WHT rates in the Republic of Congo range between 15 and 20%, but Mauritius and Congo have signed a treaty limiting WHT rates to between 0% and 5% for all types of payments (IBFD 2019b; 2020b). Yet, the aggressiveness of this treaty is not limited to WHT. The Republic of Congo is also prevented from taxing capital gains of Mauritius-resident companies with substantial real estate holdings in the Republic. Both provisions are examples of tax treaty aggressiveness, which the models discussed in the next section will formalise. The absence of an anti-abuse provision in the treaty also contributes to treaty shopping and tax avoidance risks emanating from this treaty. With these aggressive provisions, Mauritius reduces the taxing rights of the Republic of Congo and can be used in treaty shopping strategies by multinational corporations.

Legal scholars have discussed the risks for tax avoidance emanating from treaties (Sheppard 2013). A pervasive and complex problem involves applying transfer pricing rules in the attribution of profits within a corporate group across jurisdictions (Avi-Yonah, Clausing and Durst 2009; Durst 2010; Picciotto 2018). The transfer pricing guidelines by the OECD are referred to in the OECD's model tax treaty (Picciotto 2018) and heavily influence the interpretation of treaty language for the attribution of profit across treaty partners.

In recent years, legal scholars discussed the potential for treaty abuses in case studies of specific treaty combinations, for example leading to triple non-taxation (Li 2017). Mounting concerns about treaty-related tax avoidance, base erosion and profit shifting have been reflected in the OECD's BEPS Action plan (BEPS Monitoring Group 2015; OECD 2015). In 2017, this process culminated in the signature of the Multilateral Legal Instrument (MLI). It amends all those treaties that individual signatory countries have chosen with a view to reducing their potential for abuse (Brauner 2018; Tandon 2018). While the MLI has attempted to address issues, such as the artificial avoidance of PE status or hybrid mismatches between legal characterisation in two jurisdictions, the effectiveness of these provisions has been questioned by legal scholars (Durst 2018; Li 2017).

1.2 Tax treaties in economic development and international relations: the controversial FDI argument

While some legal scholars have observed decreases in treaty rates fuelled by tax competition and resulting in a race to the bottom (Avi-Yonah 2000), most of the literature on the empirical effects of treaties and treaty shopping comes from the disciplines of international relations, political economy and public finance economics (Arel-Bundock 2017; Balabushko et al. 2017; Hearson 2021; Janský & Šedivý 2019). This is where our main contribution to the literature lies.

Conventional wisdom had associated decreased taxes with increased investment and increased investment with additional economic growth. While the intensity of the causal mechanisms at play between taxes, investment and economic growth was a traditional subject of academic debate, this conventional wisdom has been challenged more fundamentally over the last years (Beer and Loeprick 2018; IMF 2014; IMF, OECD, United Nations and World Bank 2015; Reurink and Garcia-Bernardo 2020). The idea that bilateral treaties increase foreign direct investment is seldom supported by empirical evidence (Brada, Drabek and Iwasaki 2021; Davies 2004; IMF 2014), and low-income countries have consistently been found not to benefit from treaties through additional FDI (Beer and Loeprick 2018; Neumayer 2007). Signing treaties with investment hubs is not associated with increased investment; on the contrary, those treaties 'tend to come with non-negligible revenue losses' (Beer and Loeprick, 2018: 5-6). Some salient exceptions relate to conduits or treaty shopping hubs, such as the Netherlands (Weyzig 2013). Only when considering the networked nature of treaty shopping and its potential for treaty abuse and profit shifting has a significant positive effect on FDI been found for those treaties that most reduce multinationals' tax obligations (Petkova, Stasio and Zagler 2019; van't Riet and Lejour 2018). Moreover, research has identified pervasive methodological issues in the study of FDI effects of tax treaties, in that econometric studies finding positive effects miss exogenous variables such as the disintegration of the USSR or China's transition to a market economy, which may have a direct effect in both FDI and the number of tax treaties (Lang, Pistone, Schuch, Staringer, Storck and Zagler 2010).

Nevertheless, these direct foreign investment flows have little, if anything, in common with the usual greenfield FDI expectation whereby new factories, distribution or research and development centres are created (Meinzer, Ndajiwo, Etter-Phoya and Diakité 2019). Instead, recent studies suggest that 40% of global FDI stocks are 'phantom' FDI in empty shells with little activity, staff, nor production (Damgaard, Elkjaer and Johannesen 2019). A much higher ratio of phantom FDI is found in notorious corporate tax havens, such as the Netherlands, Luxembourg, Hong Kong, British Virgin Islands, Bermuda, Singapore and the Cayman Islands (Damgaard et al. 2019). Thus, a substantial share of FDI may largely consist of holding and financing activities that exist mainly as accounting artifices to facilitate tax avoidance. Such inward FDI may be a proxy for the intensity of base erosion capacity out of an economy in the form of debt rather than an indicator for job creation and sustainable growth of the real economy.

Phantom FDI may further consist of roundtripping capital, which is ultimately owned by domestic companies and is estimated to account for about 25% of FDI in China and Russia, between 10% and 20% in Canada and Indonesia, and between 5% and 10% for Germany, Italy, Spain, France and the United Kingdom (Damgaard et al. 2019). In addition, a large part of inward and outward FDI corresponds to sales or purchases of company shares, which may not come with increased expenditure in the host country (Head and Ries 2008). Estimates suggest that, since the 1990s, more than half of FDI reflects mergers and acquisitions (Chang, 2011; IMF, 2014). With a sample of 29 OECD countries between 1987 and 2001, a study found that merger and acquisitions amounted to 82% of inward FDI (Head and Ries 2008). Other researchers also found tax treaties to be associated with higher cross-border flows of mergers and acquisitions (di Giovanni 2005). Some scholars have described mergers as creating value,

if any, only for the investment bankers negotiating the deal (Schilling 2018). Importantly, FDI may not be desirable since quantitative and qualitative research indicates that foreign investment often leads to the worsening of labour conditions and environmental degradation (Durand 2007; Jorgenson 2007; Long, Stretesky and Lynch 2017; Maconachie, Srinivasan and Nicholas 2015). FDI data has been criticised more broadly for its lack of nuance and inherent unreliability (Linsi and Mügge 2019; Reurink and Garcia-Bernardo 2020).

Another strand of political-economic literature has focused on tax treaty negotiation practices and outcomes (Barthel and Neumayer 2012; Hearson 2021; Mutava 2019; Schwarz and Rixen 2009). While Schwarz and Rixen (2009) did not find empirical support for the role of power and investment asymmetries in the negotiation outcomes in their analysis of 45 German treaties, Hearson (2018) replicated their model with a more nuanced dataset and found that higher asymmetries in the FDI positions resulted in more unfavourable treaty provisions for poorer countries. Beyond the unequal investment position, He attributes a part of this outcome to unequal technical expertise (Hearson 2018). Hearson (2021) traces the role of interactions between technical experts and domestic interest groups in contributing to the expansion of the United Kingdom's treaty network during the 1970s. He finds evidence that, instead of eliminating double taxation, British industry groups and civil servants were motivated by directly securing tax concessions to British businesses to obtain competitive advantages abroad or by disseminating OECD tax standards as an indirect means to achieve similar ends. Frequent interactions between public officials, lobbyists and private sector tax experts were found to be influential in setting negotiating priorities.

It has also been found that countries often sign tax treaties for non-tax reasons (Brooks and Krever 2015), an issue that the Platform for Tax Collaboration (UN, OECD, IMF, World Bank) considers problematic (Platform for Collaboration on Tax 2021). Most recent analyses of African tax treaty practices point to governance challenges, for example, because of the absence of an explicit treaty policy guiding strategic choices and negotiations (Mutava 2019). Yet, there is also some evidence for a trend based on institutional learning in some developing countries towards more source-based negotiation positions after observing the effects of treaties in force (Kangave, Waiswa and Zzimbe 2016; Michielse 2012). To this end, the model tax convention developed by the African Tax Administration Forum (ATAF) shows a collective commitment in Africa to change treaty negotiation outcomes (ATAF 2012).

Another body of more economic literature looks beyond the history and rationale of treaty negotiations and dynamics. It complements the legal analysis of the distributional aspects of treaties with economic data and estimates revenue losses and investment in response to treaties. As for the investment positions between residence and source countries, the IMF confirmed in 2014 that investment flows in lower-income countries are highly asymmetric and that low-income countries 'are essentially "source" countries, the recipients of capital inflows and the site of production, not investors in business activities outside their borders'. (IMF 2014: 11–12). Because of these considerations and concomitant treaty shopping, the IMF concludes that revenue losses to developing countries through tax treaties are of great concern (IMF 2014).

Across the entire spectrum of the literature on tax treaties, underlying economic assumptions of studies are either made explicit or remain implicit to varying degrees. In the interest of transparency, Table 1.1 attempts to summarise and stylise all relevant assumptions, and positions our paper in that context.

Table 1.1 Stylised assumptions of underlying tax treaty literature and policy

Stylised Assumption	Our paper position
Tax treaties are necessary for the avoidance of double taxation.	Existing unilateral measures suffice to prevent almost all double taxation except for a handful of capital-exporting countries. These countries could implement unilateral measures to drastically reduce potential double taxation in the absence of treaty.
Double taxation is quantitatively more important than double non-taxation.	Unproven and highly unlikely, based on available empirical evidence.
Treaty shopping is the main source of revenue losses associated with tax treaties.	Unknown; more likely true for most net capital exporters; more likely untrue for net capital importers.
Tax treaty negotiations are positive-sum games in which concessions in source taxing rights are compensated by increased inward investment. - Double taxation is an obstacle to desirable investment and economic development. - Low tax rates lead to desirable greenfield FDI. - Lowering tax rates ultimately yield higher tax revenues through a growing tax base.	Unproven and highly unlikely to hold, at least for country pairs with asymmetric FDI positions. Even if studies found an increase of inward FDI associated with tax treaties, these studies typically fail to a) estimate tax revenue losses, b) differentiate desirable greenfield FDI from merger & acquisitions, as well as from base eroding debt loading types of FDI ('phantom FDI'), c) account for theoretical and empirical failure of the Laffer curve assumption, or d) include exogenous variables affecting FDI flows regardless of treaty-making.

When double tax treaties are signed between a developed country (or a tax haven) and a developing country, the latter is usually the capital-importing party to the bilateral agreement. In other words, capital is expected to flow into the developing country as investment and the income resulting from the investment is expected to mostly flow out from the developing country to a tax haven or a developed country. Given that the function of double tax treaties in relation to dividends, interest and royalty payments is to restrict the tax that the source country can withhold on the outflows, then, almost by definition, developing countries will forego substantially more revenue in absolute and relative terms than their capital-exporting counterparty (Hearson 2018; Picciotto 1992).

1.3 Contribution to literature

We make a first contribution to the literature by specifying and updating the extent of asymmetrical FDI positions between different country groupings with data as of 2018. There are large differences in greenfield FDI positions between lower-income and higher-income countries (Figure 1.1, see also Figure A3.5 for a map of global FDI). The slope in the higher income country bracket is predominantly downward (visualised in red), indicating more outward than inward investment, i.e. net capital export. In contrast, the opposite holds for the lower-income country groups. Those with the strongest inward FDI position stand to suffer the greatest tax revenue losses from curtailing source taxing rights, e.g. by lower withholding tax rates in treaties.

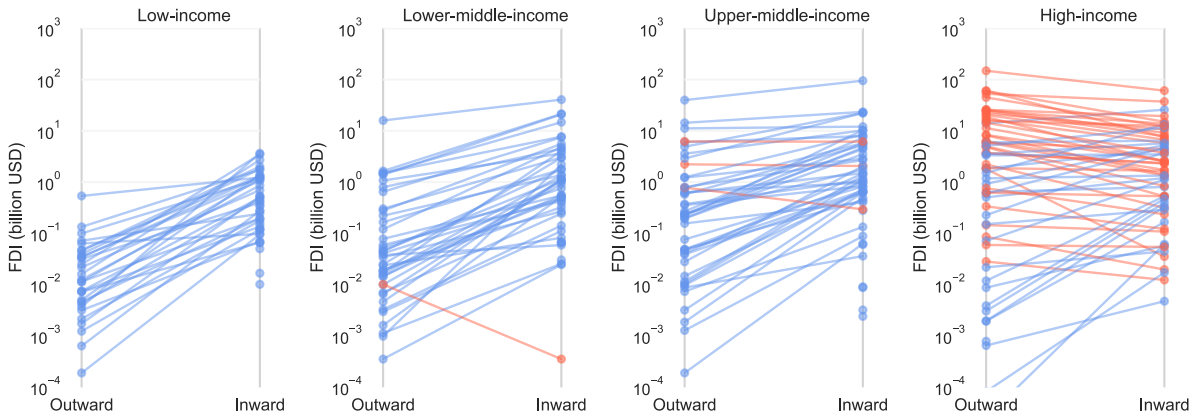

Figure 1.1 Net greenfield FDI positions from OECD data by income level

Several case studies have estimated the revenue losses caused by tax treaties. For the Philippines, Pakistan and Bangladesh alone, these losses amounted to almost US$800m in just one year (Janský & Šedivý 2019). A study found that the treaties that the Netherlands signed with developing countries led to more than €770m in lost revenue in 2011 (McGauran 2013). Similarly, the IMF cites an estimate of revenue losses through US tax treaties to non-OECD signatory states of US$1.6bn in 2010 (IMF 2014). For Ukraine, a research paper by the World Bank estimated the revenue losses caused by five treaties to amount to over US$300m in each of the two years under examination (Balabushko et al. 2017). More recent research provides dynamic estimates that take into consideration elasticities in dividend and interest flows, finding lower but non-negligible estimates of annual revenue forgone, to the tune of US$410m to 444m for South Africa (Janský, Lánička and Palanský 2020).

The importance of tax treaties in the context of aggressive tax planning is evident by contrasting effective average tax rates of withholding payments in treaty and non-treaty situations. For the European Union, the effective average rate on royalty payments is 40.7% in the absence of a treaty; however, the rate goes down to 2% if tax treaties are available (Spengel, Zentrum für Europaïsche Wirtschaftsforschung European Commission and Directorate-General for Taxation and the Customs Union 2016: 5). with regard to offshore profit shifting via interest payments, the effective tax rate is 36.4% without and 16.2% with a treaty (Spengel et al., 2016: 5).

A body of literature has analysed the quantitative aspects of treaty shopping on a global scale, factoring in the actual use of treaties for routing FDI and income streams. Because of network externalities, even a single treaty can greatly affect a country's tax base (IMF 2014b: 27) if the treaty partner has various low or no tax treaties. The networked nature of tax rules creates opportunities for treaty shopping using the most favourable treaties to minimise the tax bill. In this regard, IMF research shows that the percentage of diverted income can reach 92% when a developing country signs a treaty with an investment hub (Beer and Loeprick 2018). Even if a bilateral treaty purportedly distributes taxing rights between two jurisdictions only, the treaty provisions are heavily exploited by companies in third countries, creating negative externalities (Arel-Bundock 2017). Company ownership data shows that these dynamics broadly split profit-shifting enablers between conduits (intermediate jurisdictions such as the Netherlands and Luxembourg) and sinks (no-tax jurisdictions like Bermuda or the British Virgin Islands), where profits end up accumulating (Garcia-Bernardo, Fichtner, Takes and Heemskerk 2017).

The fall of treaty withholding tax rates across the globe bears witness to the extent to which tax competition or tax war dynamics[4] have resulted in a race to the bottom. This is both a

[4] For the use of the term 'tax war' see Tax Justice Network (2015).

consequence and a building block of tax avoidance and treaty shopping. According to the IMF, since 1980, average withholding tax rates have fallen by 30% for most types of income, while the average rates on qualifying dividends have fallen by almost 50% (IMF, 2014b: 68–69). The empirical data we collect on tax treaties in Africa confirm a race to the bottom in treaty withholding tax rates. Figure 1.2 illustrates the fall in African tax treaty withholding rates broadly since the end of the 1970s, setting in not long after decolonisation.

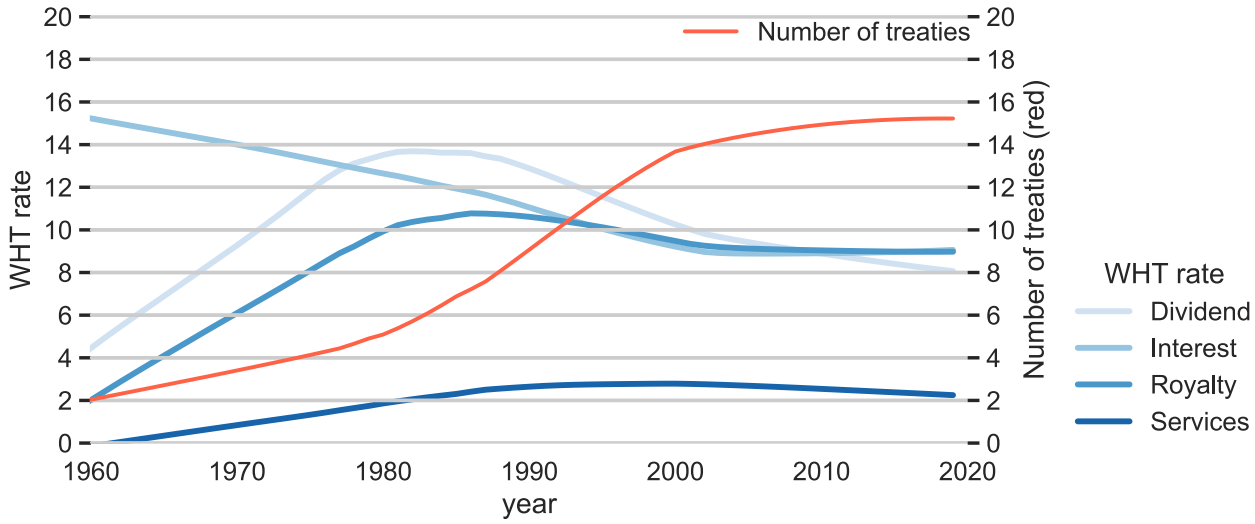

Figure 1.2 Evolution of treaty withholding rates in treaties with African countries signed 1970-2017. Lines are smoothed using locally weighted scatterplot smoothing (lowess).

Source: WHT rates extracted from IBFD WHT tables and ICTD Source Index dataset (2020); authors' own calculations.

Note: Values correspond to average treaty rates in treaties in force as of 2020.

Research is scant with respect to identifying the jurisdictions whose treaty network is most aggressive in the race to the bottom. One study has recently identified high-income countries and jurisdictions with big 'financial centres' as being most aggressive in curtailing source taxation rights in their attempt to secure the lowest possible rates for resident or treaty shopping investors. The Corporate Tax Haven Index 2021 found within a sample of 70 jurisdictions that just 14 jurisdictions were responsible for more than 50% of global treaty aggressiveness. All of these were categorised as High-Income Countries by the World Bank and at least 9 out of 14 can be considered financial centres: United Arab Emirates (Dubai), France (Paris), United Kingdom (London), Switzerland (Zurich), Germany (Frankfurt), Ireland (Dublin), Netherlands (Amsterdam), Luxembourg and Cyprus (Tax Justice Network, 2021b). The aggressiveness of a treaty was established by comparing the legal provisions applicable between two treaty partners to the usual provisions agreed by each partner separately in its other treaties.

However, the robustness of this study's findings was constrained because of a number of factors. Firstly, the underlying model only incorporates withholding tax rates on three types of investment income as the sole indicator of taxing rights allocation and potential aggressiveness. Second, the data used for the tax treaty rates as reported by the source was sometimes inconsistent and, in a few cases, erroneous (see Appendix 1 Shortcomings in IBFD data). Thirdly, alternative measures of treaty aggressiveness were not tested. We seek to address these shortcomings in the present paper, asking two interrelated questions: one focusing on a substantive issue and the other focusing on methodological issues. Firstly, which

countries are most aggressive in clipping taxing rights through tax treaties in Africa? Secondly, how sensitive are the findings to different measures of treaty content and aggressiveness?

To answer these questions and enhance the robustness of the answers over the earlier study, we replicate the original study by using data from a novel ICTD dataset on African tax treaties. Because this dataset contains measures of source taxing rights beyond withholding rates (including on permanent establishment rules), we adjust our model to estimate an alternative measure of aggressiveness that takes into account a range of crucial qualitative characteristics of tax treaties, which have long been missing from treaty network analyses (Balabushko et al. 2017; Beer and Loeprick 2020; van't Riet and Lejour 2014). The treaty assessment framework introduced by Hearson (2016) and developed through the ICTD dataset (Hearson, Carreras and Custers 2021) provides a new basis allowing the study of treaty networks.

In the remainder of this paper, we use and compare the existing sources to provide a new and comprehensive network analysis of tax treaties. It is comprehensive in various ways. Firstly, we focus on source countries' tax rights, considering that the situs of economic activity is of utmost importance. Secondly, we assess each treaty in the context of each jurisdiction's treaty network, allowing for country-specific policy insights. Thirdly, we test the robustness of our conclusions with a model that integrates domestic tax law in the analysis of tax treaty networks. Finally, we expand treaty network assessments over and above withholding rates, nuancing straightforward quantitative factors with equally important qualitative variables. We expect the results to enhance our understanding of tax treaty dynamics and to allow us to derive hypotheses for future research.

One limitation of our methodology warrants brief consideration. While tax treaty provisions enable different types of abuses, arguably the 'arm's length principle' underpinning most transactions between related economic parties across borders is a more fundamental flaw in enabling profit shifting, base erosion and tax avoidance than any treaty provision. This principle has been described by the OECD as follows:

> The basic approach […] is to require the determination of the profits under the fiction that the permanent establishment is a separate enterprise and that such an enterprise is independent from the rest of the enterprise of which it is a part as well as from any other person. The second part of that fiction corresponds to the arm's length principle which is also applicable […] for the purpose of adjusting the profits of associated enterprises.
> OECD 2019: 458–459

The core inconsistency of this fundamental 'fiction' in international taxation is the underlying reason for contemporary profit-shifting and tax avoidance concerns, and may only be overcome with a shift to unitary taxation. The shortcomings of this original misconception are, however, outside the scope of this study. In the next section, we proceed with formalising the modelling of treaty aggressiveness.

2 Data and Methods

2.1 Data

Our analysis is based on two data sources. The first data source is the International Bureau of Fiscal Documentation (IBFD), which provides country tables of WHT rates (IBFD, n.d.). The second data source is the Source Index dataset from the International Centre for Tax and Development (ICTD), a project co-funded by the World Bank and the G-24 Inter-governmental group. Developed by Martin Hearson, the Source Index builds on previous work from ActionAid

(Hearson, Carreras and Custers 2021) and captures the key characteristics of tax treaties signed by developing countries, including WHT rates, as well as manually coded variables on permanent establishment and other treaty provisions. A detailed explanation is included below and summarised in Table 2.1.

Table 2.1 Comparison of IBFD and ICTD. Three types of rates, raw rates, coded values and indices.

	IBFD	ICTD
Raw treaty rates		
WHT dividend	Qualifying and non-qualifying	FDI and portfolio
WHT interest	Main and qualifying rates	Main and loans from banks
WHT royalty	Main and qualifying rates	Main, copyright and equipment
WHT services	-	Technical/management fees
Raw domestic rates (IBFD only)		
WHT dividend	Main and qualifying rates	
WHT interest	Main and qualifying rates	
WHT royalty	Main and qualifying rates	
Coded values (ICTD only)		
WHT dividend coded	All eight sub-components in the raw data were normalized from 0 to 1. Zero corresponds to a 0% WHT rate, and 1 corresponds to a WHT rate greater than 20%, or the absence of a rate in the treaty.	
WHT interest coded		
WHT royalty coded		
WHT services coded		
PE	Eight provisions are coded in the dataset with respect to permanent establishment. A value of 1 corresponds to broader PE definition under the UN model, while values closer or at 0 corresponds to PE exceptions under the OECD model (see below *Coded Variables*).	
Other provisions (Other)	Eight additional provisions relative to source taxing rights are coded in the dataset. For each, a value of 1 corresponds to treaty language conferring taxing rights to the source country under the UN model, while values of 0 are coded for tax limitations pursuant to the OECD model (see below *Coded Variables*).	
Indices (ICTD only)		
PE	Average across the eight provisions coded.	
WHT rates	Average over the four WHT rates coded	
Other	Average across all remaining coded fields	
SI	Average over the three indices above	

2.1.1 IBFD dataset

The IBFD Research Platform contains quick-reference tables giving the withholding tax rates provided in bilateral and multilateral treaties in force for each jurisdiction.[5] In particular, there is information on two withholding tax rates on dividends (qualifying and non-qualifying), as well as varying numbers of withholding tax rates for interest and royalty. The IBFD WHT tables have some mild shortcomings in terms of coverage and accuracy. In terms of coverage, the number of WHT rates is not consistent across countries. For instance, the qualifying rate for publicly-owned companies and institutions may or may not be shown on the Interest column of the WHT tables. Moreover, multilateral tax treaties are not usually covered and so we added them manually. A symmetric bilateral treaty is sometimes presented differently in the WHT table of each treaty partner. In such situations, we selected the data in the WHT table that showed a higher number of WHT rates. For example, because the IBFD WHT table for Italy presents two interest WHT rates with respect to Algeria (0/15), while the table for Algeria presents only one WHT rate with respect to Italy (15), we retain both rates. Appendix 1 gives a more complete account of the cleaning process for IBFD data.

[5] We disaggregated the multilateral treaties into the corresponding bilateral treaties and confirmed that the information for the pair of countries A-B was consistent with the information for the pair B-A. In the case of the Economic Community of Central African States (CEMAC) and the Arab Economic Union Council (AEUC), we found discrepancies in WHT tables, checked the original treaty by hand and amended the data.

Finally, we obtained the average WHT rate for dividends[6], interest and royalties by averaging all available rates within each type of income. In the example, the WHT rate for interest in the Algeria-Italy treaty would be 7.5%.

2.1.2 ICTD dataset

Raw data

The ICTD data contains information on withholding rate limitations contained in bilateral and multilateral treaties, all manually coded. ICTD obtained the text of most treaties from the IBFD's treaty collection, but worked from this raw text rather than its quick-reference tables. While the IBFD tables only present WHT data regarding dividends, interest and royalty payments, ICTD's coding also includes WHT rates for management and technical service fees. In contrast with the IBFD tables, the ICTD dataset clearly categorises the different rates applicable to qualifying situations. For instance, every treaty presents two interest rates: a 'main' rate applicable to interest payments (default rate) and a rate for interest payable to banks and financial institutions. Moreover, two rates are available for dividends (FDI or 'substantial holding' and portfolio) and three rates for royalties ('main' rate, rate applicable to copyright payments and royalties for the use of equipment).

As we did with the data from IBFD quick reference tables, we calculated the WHT rate for dividends, interest, royalties and services as the average of all available rates for each type. For instance, a treaty may provide that the maximum WHT rate chargeable by the source country on outbound royalty payments is 10% and provide a lower 5% rate for royalties qualifying as copyright payments (PWC 2004). Therefore, the royalties component would take the value of the average of both rates (7.5%).

Coded variables

A key difference between the approach taken by ICTD and the IBFD in its WHT tables is the presence of coded variables. In the coded values, values closer to 1 are assigned to treaties more favourable to the country where income arises ('source country') and values closer to 0 correspond to treaties whose provisions are favourable to the country of residence of the investor ('destination' or 'capital-exporting' country). The coded variables come in two forms. Firstly, the coded information of the eight withholding tax rates ranges from 0 to 1. Zero corresponds to 0% WHT rate and 1 corresponds to WHT rates equal to or greater than 20, or the absence of a rate in the treaty. The coded variables for dividend, interest, royalties and services are again calculated as the average of all available rates for each type. Secondly, the ICTD dataset provides coded variables on 'PE' and 'Other Provisions (Other)'.

There exist eight coded variables for 'PE', which correspond to eight different provisions found in Article 5 of the UN and OECD model conventions (OECD 2017; United Nations 2017). Provisions relating to PE exceptions for supervisory activities, delivery services, insurance and agents are coded using the UN model as reference. Zero is coded where these exceptions are granted following the OECD model, while 1 corresponds to provisions following the UN model. Otherwise, two provisions assessing the time length that triggers PE qualification are normalised from 0 to 1. Zero corresponds to a length of 24 (construction) or 12 (services) months, and 1 corresponds to treaties where construction and services activities automatically trigger PE (0 months requirement).

There exist eight coded variables for 'Other provisions (Other)'. Although not directly linked to PE or WHT, these treaty characteristics can constitute a significant source of revenues or

[6] The average of qualifying and non-qualifying dividend rates probably yields an over-estimation of the most common treaty rate. Indeed, research combining micro and macro data finds that qualifying rates are applied to at least 80% of dividend payments (Balabushko et al. 2017: 13)

losses for source jurisdictions. For example, provisions such as source taxation of shipping income, absence of deduction for payments to head office, taxation of capital gains on shares of resident companies or source taxation of income not specifically covered by the agreement are coded for each treaty. All eight variables are coded by reference to the UN model, where a provision substantially equivalent to the UN provisions is coded 1 and a provision following the OECD model coded 0.

This coding is consistent with the fact that the OECD model comparatively restricts source taxing rights in these regards. A full account of the different variables is provided in the table in Appendix 2 Variables included in the Source Index dataset.

Indices

Finally, the ICTD has created three sub-indices and one index based on coded variables. The first sub-index, *WHT rates,* corresponds to the average of the four coded WHT rates (dividend, interest, royalty and services). The second, *PE*, corresponds to the average of the eight coded PE variables. The third, *Other*, corresponds to the average of the eight coded variables on other treaty provisions. Finally, the index *SI* corresponds to the average of the other three indices.[7]

2.2 Comparison of IBFD and ICTD dataset

Our first goal is to understand the similarity between the IBFD tables and ICTD dataset. An overall high similarity would show the potential of the IBFD tables in the analysis of tax treaties, despite shortcomings. Reciprocally, it would validate the Source Index treaty dataset as a reference source for the study of tax treaties, to the same extent as IBFD. Our main goal is to understand to what extent our analysis of the most aggressive treaties and treaty partners is robust when considering other treaty data, such as PE and other relevant provisions.

We kept all tax treaties with an African partner for both datasets, excluding the Seychelles and Mauritius. These two countries were excluded since their withholding and corporate income tax rates are effectively 0%[8], and thus other countries cannot be aggressive towards them. Moreover, we only kept treaties currently in force – the ICTD dataset includes over 200 treaties either terminated or not currently in force.

Coverage

Firstly, we investigated the differences in coverage between the two sources. Out of 455 treaties in force, 415 (91.2%) were found in both sources, ten only in the IBFD dataset and 30 only in the ICTD dataset. We find these differences due to residual differences in coverage. Otherwise, minimal treatment of duplicated treaties was needed in ICTD data due to the inclusion of protocols and/or amendments as separate dyads.[9]

[7] A fifth index, which measures conformity with the UN model convention, has not been analysed in this paper.

[8] In Seychelles, although the 'statutory' withholding tax rates are at 15%, companies established in the Seychelles International Trade Zone are fully exempt from withholding taxes, as well as corporate income tax (Muyaa 2020a). More generally, all Seychelles companies are fully exempt on foreign income, pursuant to the principle of territoriality (Muyaa 2020b). In Mauritius, 0% withholding tax rates are available for all types of income (IBFD 2021). Otherwise, locally incorporated 'Authorised Companies' are considered non-resident for tax purposes (PricewaterhouseCoopers (PWC) 2021b). Only subject to tax on domestic source income, non-residents are fully tax-exempt on foreign source income (Ramloll 2021). Authorised Companies can engage in a wide range of economic activities, with the exception of certain financial and corporate services (PricewaterhouseCoopers (PWC) 2021b; Sunibel Corporate Services 2019). In addition to Authorised Companies, Mauritius offers full tax exemptions in all other economic sectors (Tax Justice Network, 2021).

[9] A total of 41 treaties were duplicated. In those cases, we kept the treaty with the latest date of signature. For example there are two treaties in the ICTD database between UAE and Egypt, one from 1973 with no withholding tax rates and one from 1994 with withholding tax rates 0/10/10/0 (dividend/interest/royalty/services).

Accuracy

We calculated the similarity between the two datasets in relation to the withholding tax rates on dividend, interest and royalty. We see a general good correlation between the two sources (Spearman's rank coefficients of 95, 83 and 93% respectively, Figure A1 in Appendix 3 Additional results and figures). A possible source of discrepancies derives from the way WHT data is presented in each dataset. While the categories are quite similar for dividends (2 categories in both IBFD and ICTD), discrepancies may arise in the case of interest and royalties, for which ICTD provides two categories and IBFD only one (see Appendix 1 Shortcomings in IBFD data). The significant discrepancies that can be observed in the case of interest are caused by the differences in coverage of qualifying rates between the two datasets (see Figure A1 in Appendix 3 Additional results and figures). While ICTD consistently records qualifying interest rates applicable to financial institutions, other qualifying rates are not recorded. IBFD, on the contrary, may present any type of qualifying interest rate in WHT tables.

2.3 Methodology

2.3.1 Aggressiveness of a treaty

Our main contribution is to understand the aggressiveness of each treaty—the extent to which a treaty decreases the taxing rights of African countries (source countries). We measure the aggressiveness in terms of how much a treaty disadvantages the source country compared to all other treaties signed by the African country. Importantly, we do not intend to measure how effective taxation is affected by tax treaties, as this would require an in-depth analysis of domestic economies and tax systems. Rather, we study how tax treaties affect the 'tax rights' of source countries, analysing to what extent African countries give up the possibility to tax domestic source income effectively.

For example, to understand the aggressiveness of Singapore with respect to Rwanda in relation to dividends withholding (Figure 2.1), we compare the WHT agreed between Singapore and Rwanda with those agreed between Rwanda and Jersey, Belgium, Mauritius and South Africa. This contextual comparison is performed not only for WHT rates but also in relations to PE and other treaty provisions.

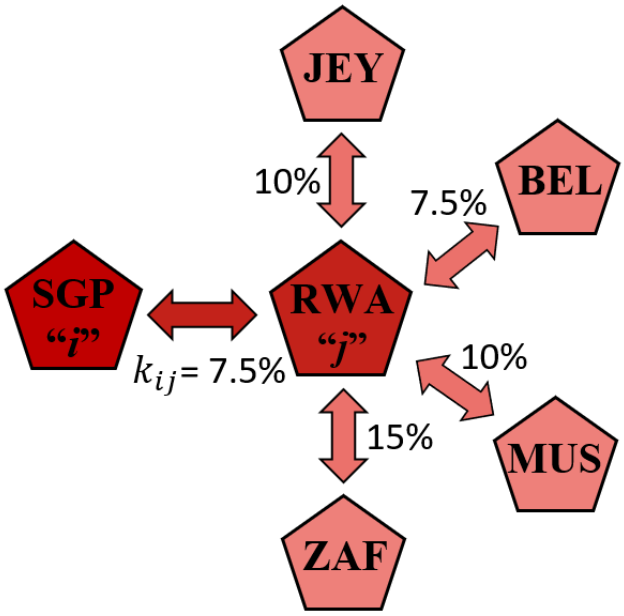

Figure 2.1 Example of the assessment of treaty aggressiveness in Rwanda's treaty network

Formally, the aggressiveness, *D*, with respect to, for example, raw withholding tax rates on dividends (component *k*) of Singapore (country *i*) on Rwanda (country *j*) is defined as

$$D_{ij}^{k} = \begin{cases} \overline{k_{j,\iota}} - k_{ij} & if\ \overline{k_{j,\iota}} - k_{ij} > 0 \\ 0 & otherwise \end{cases}, \quad (1)$$

where k_{ij} is the withholding tax rate on dividends agreed between Singapore and Rwanda and $\overline{k_{j,\iota}}$ is the average value of the WHT rate on dividends in all treaties between Rwanda (country *j*) and all its treaty partners, excluding Singapore (country *i*)—the average 'otherwise available' in Rwanda.

We can notice that k_{ij} is defined so that higher values represent treaty characteristics that are more favourable to the source country—the subsidiary's country. The higher the withholding rate in the treaty between Singapore and Rwanda, the higher the taxing rights that Rwanda maintains on subsidiaries of Singaporean firms.

Importantly, to assess the overall aggressiveness of a country's tax treaty network, only the positive differentials are considered. If the value $\overline{k_{j,\iota}} - k_{ij}$ is negative (i.e., when the treaty offers worse conditions than the average treaty signed by *j*), we set it to zero. We choose to set it to zero because negative differentials do not have a clear mitigating effect with regard to the aggressiveness and impact of positive differentials (e.g. jurisdiction shopping, race to the bottom). In any case, the difference between averaging all differentials or considering only positive differentials is small (Figure A3.2).

The example associated with Figure 2.1 is detailed in Table 2.2. For example, the aggressiveness with respect to WHT on dividends of Singapore towards Rwanda is 3.125, the difference between the average WHT for all treaties of Rwanda excluding Singapore (10.625) and the WHT on dividends of the treaty Rwanda-Singapore (7.5).

Table 2.2. Aggressiveness of WHT on dividends for Rwanda

Country i	Country j	WHT on dividends (k_{ij})	Average WHT, excluding *i* ($\overline{k_{j,\iota}}$)	$\overline{k_{j,\iota}} - k_{ij}$	D_{ij}^{k}
Singapore	Rwanda	7.5	10.625	+3.125	3.125
Jersey	Rwanda	10	10	0	0
Belgium	Rwanda	7.5	10.625	+3.125	3.125
Mauritius	Rwanda	10	10	0	0
South Africa	Rwanda	15	8.75	-6.25	0

2.3.2 Types of aggressiveness

We define five types (or models) of aggressiveness (Table 2.3). The first four are based on WHT rates, while the fifth is based on WHT rates, PE and Other provisions.

Table 2.3 Three different models to measure aggressiveness. See Table 2.1 for a difference between the raw, coded and indices data

Name	Measurement	Components *k*
M1-IBFD	WHT	Raw treaty WHT rates on dividends, interest and royalties
M1-ICTD	WHT	Raw treaty WHT rates on dividends, interest, royalties and services
M2-IBFD	WHT DOM	Raw treaty and domestic WHT rates on dividends, interest and royalties
M3-ICTD	WHT	Coded treaty WHT rates on dividends, interest, royalties and services
M4-ICTD	SI	Indices WHT rates, PE and Other

Firstly, M1-IBFD uses *raw* WHT data on three components (*k*): WHT rates on dividend, interest and royalty. Secondly, M1-ICTD uses raw WHT data for the same three components, plus services WHT (all from the ICTD dataset). Thirdly, M2-IBFD uses the raw IBFD data but compares the WHT rate with the domestic rate of the treaty partner (k_j^{dom}), instead of the average treaty rate of such partner ($\overline{k_{j,\iota}}$). Formally, this is defined as

$$D_{ij}^{k} = \begin{cases} k_j^{dom} - k_{ij} & if\ k_j^{dom} - k_{ij} > 0 \\ 0 & otherwise \end{cases}. \quad (2)$$

Fourthly, M3-ICTD uses *coded* WHT data on three components (*k*): WHT rates on dividend, interest and royalty. Finally, M4-ICTD aggregates the three indices provided in the ICTD dataset: WHT rates, PE and Other. These two last models use Equation 1.

The total aggressiveness of a treaty for the models is the sum of aggressiveness for the three components *k:*

$$a_{ij} = \sum_k D_{ij}^{k}. \quad (3)$$

2.3.3 Aggressiveness of a country

The total aggressiveness of a country, A_i is calculated by summing the aggressiveness of country *i* with all partners and normalised by the maximum aggressiveness. This allows us to compare different countries' aggressiveness on a scale from 0 to 100, with the highest value being that of the most aggressive jurisdiction. The relative values are maintained and thus, no information is lost in the process.

$$A_i^{raw} = \sum_j a_{ij} \quad (3)$$

$$A_i = \frac{100 \cdot A_i^{raw}}{\max(A^{raw})} \quad (4)$$

3 Results

3.1 Aggressiveness towards WHT rates

We start by analysing the top aggressors with respect to raw WHT rates. We find an 89% correlation between results using IBFD and ICTD raw WHT data (Figure A3, Appendix 3 Additional results and figures). For both data sources, the main three aggressors are France, the United Arab Emirates (UAE) and Mauritius (Figure 3.1). Their aggressiveness arises from different sources. France shows unmatched aggressiveness in royalties WHT. In the case of the UAE, aggressiveness derives from securing reductions in WHT on dividends and, to a lesser extent, on interest and royalties. In Mauritius, the three components are roughly equally important. The most aggressive reductions of source taxing rights via royalties are found in France, Mauritius, South Africa and the United Kingdom. With regard to services WHT (only covered in ICTD), the highest aggressiveness is measured for France, Mauritius, South Africa and Zambia.

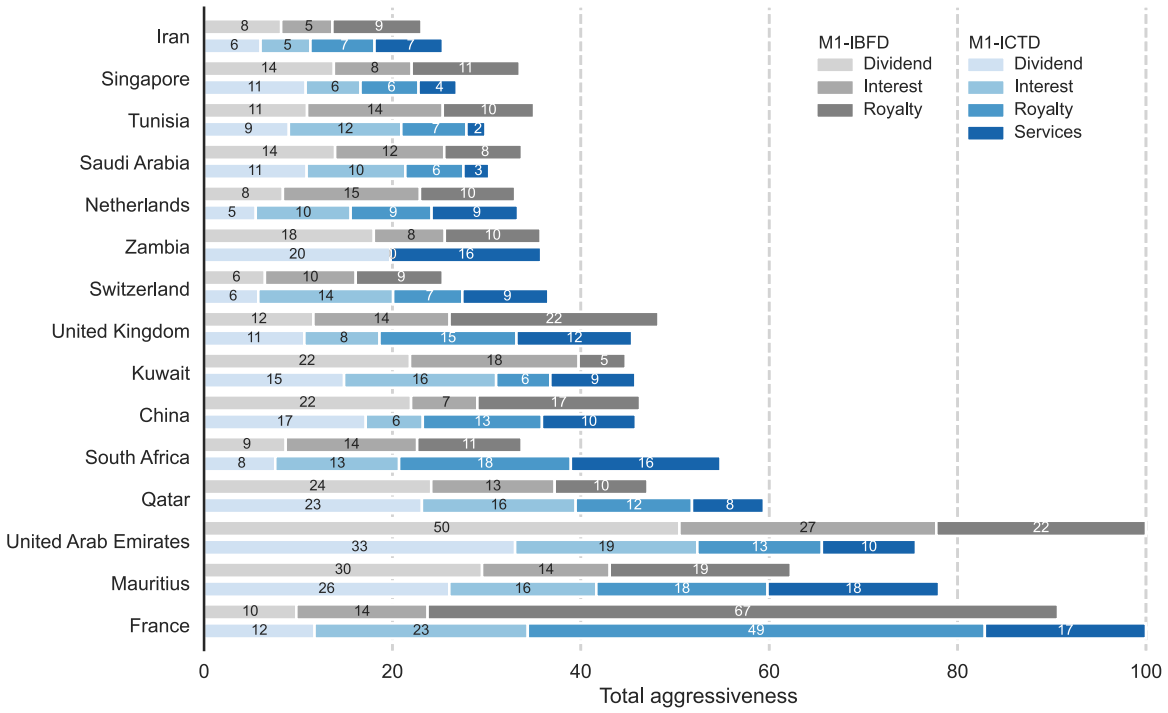

Figure 3.1 Comparison of the results between IBFD and ICTD for the top 15 countries of M1-ICTD.

Next, we review some salient differences between the ICTD and IBFD results. We observe that France is found to be particularly aggressive with respect to royalties in IBFD data but less so in ICTD data. After closer examination, both aggressiveness measures are similar, but the IBFD measure is normalised with the highest aggressiveness for the UAE. In contrast, the ICTD measure is normalised using France as having the highest aggressiveness (which is higher in absolute terms). In the case of the UAE, the aggressiveness measured with IBFD data is higher for dividends and royalties due to the more aggressive rates recorded under the

UAE-Morocco treaty and also due to the inclusion of the UAE-Sudan treaty with very low WHT rates.

South Africa, in contrast, is shown as particularly aggressive with respect to royalties in ICTD data, but to a much lesser extent in IBFD data. This is due, in part, to the exclusions for royalties for the use of equipment in the ICTD dataset. If payments for the use of 'industrial, commercial or scientific equipment' are not included in the definition of royalties, ICTD data follows the legal determination that such payments cannot be taxed at source.[10] For example, that is the case for South Africa's treaties with Tanzania, Tunisia and Zimbabwe. On average, royalties WHT are around 20% lower in ICTD data than in IBFD. This difference in the interpretation of treaty language between ICTD and IBFD reveals more accentuated aggressiveness profiles for certain countries. Otherwise, the aggressiveness of South Africa with regard to services WHT is significant. That is because 12 of its treaties do not provide source taxation of management and technical services fees.

With regard to Zambia, although overall measures are comparable for both data sources, aggressiveness for interest and royalties is non-existent according to ICTD data. This is due to the interpretation, under ICTD, that the Zambia-Tanzania treaty does not impose limitations on source tax rights for interest and royalties. Conversely, IBFD considers that the same criteria apply for all three types of payments; the income is exempt at source if it is taxed at destination (IBFD 2020g). Checking treaty language, we conclude that this criterion (exempt at source if taxed at destination) only applies to dividends and the inverse criterion (exempt at destination if taxed at source) applies to interest and royalties. Thus, aggressiveness under IBFD data might be overestimated by nearly 60%.

Next, we asked how sensitive our results are to the operationalisation of aggressiveness. We first tested the alternative model M2-IBFD, in which aggressiveness is defined as the differential between the WHT rate in the treaty and the domestic WHT rate of the source country. We find that the results are consistent with those of M1-IBFD (Figure 3.2). The main discrepancies arise in four countries. The aggressiveness of the United Kingdom, South Africa and Switzerland increases. This implies that they can get more aggressive treaties when the domestic WHT rates are high. In particular, the United Kingdom increases its aggressiveness in interest and royalties WHT substantially due to treaties with Algeria, Sierra Leone, Malawi and South Africa. This discrepancy reveals that, even if, concretely, the UK's treaties with these countries reduce applicable rates far below domestic rates, such lower rates are actually common in the countries' treaty networks. It means that the domestic rates of these countries might not be commonly used since various treaties allow significantly lower tax rates.[11] Zambia's aggressiveness decreases. This is due mainly to its tax treaty with Tanzania, which defines a WHT rate for dividends of 0%, while the average WHT rate in other treaties is 16.25%, providing a high score in the M1-IBFD model. The domestic WHT on dividends is a relatively lower 7.5%, which decreases the score of the M2-IBFD model.

[10] When payments for the use of equipment are not included in the definition of royalties in Article 12 (UN and OECD models), the income of the recipient company is considered under Article 7 'Business Profits', whose language provides that the income of a company is only taxable in its country of residence *unless* the company has a permanent establishment in the other country (OECD 2017; United Nations 2017). Thus, if the company receiving payments for the use of equipment does not have a permanent establishment in the source country, then the source country cannot charge any withholding tax on those payments (hence 0% WHT in this case). The OECD supports this interpretation of equipment royalties taxation (OECD 2010: 132)

[11] For example, Algeria's average domestic tax rate on interests is 25% (10% main rate, and 40% for interests derived from bearer securities). However, its average WHT across Algeria's treaties is 7%. The UK-Algeria treaty provides for a tax rate on interests of 7%. Thus, while UK can be considered aggressive by reducing the average domestic tax rate from 25% to 7%, if we consider other applicable treaties (M1), the UK-Algeria treaty does not appear to be aggressive, as it does not reduce interest WHT below the usual treaty rate. Out of 35 treaties, 15 treaties provide interest WHT rates at or below 7%.

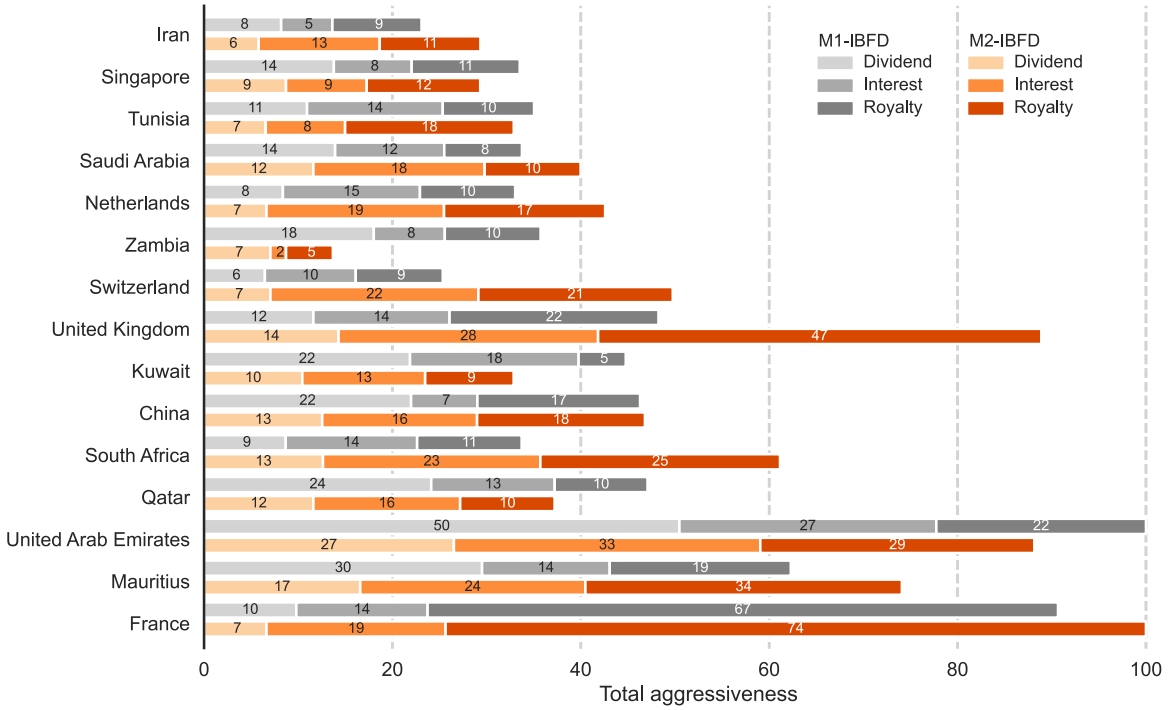

Figure 3.2 Aggressiveness using only treaty WHT rates (M1) or both treaty and domestic rates (M2), with IBFD data.

It is worth noting that, contrary to the other models presented in this paper, M2-IBFD effectively considers all possible bilateral relations of each African country, including both treaty dyads and dyads that are governed by domestic law. Indeed, when considering aggressiveness comparing applicable WHT (treaty or domestic) with domestic WHT rates, all non-treaty dyads are measured as 'zero' aggressive. This is because the withholding rate applicable to outbound flows in a non-treaty dyad is the domestic rate of the African country. Thus, the differential between such a rate and the domestic rate is null. Accordingly, only treaty dyads with rates that are lower than domestic rates are considered aggressive.

Model specification M3-ICTD normalises the WHT rates between 0 and 1. This model seeks to consider both the limitations to source tax rights (as previous models) and the absence of limitation under the treaty. For instance, even if a treaty has a zero rate for qualifying interest payments, the aggressiveness of the treaty is reduced if there is otherwise no limitation for interest WHT. Again, the results are very consistent with those of M2-ICTD (Figure A3.3, Appendix 3 Additional results and figures). The aggressiveness of Mauritius and Zambia decreases, while that of the United Kingdom increases. The decrease of aggressiveness, in this case, is a reflection of the inclusion of treaties with no limitation to WHT in our sample. On the contrary, the United Kingdom can set limitations on most tax treaties they sign, leaving no room for the application of domestic law.

The measures presented in the figures above result from the analysis of aggressiveness with raw WHT rates and should (in the case of ICTD data) be distinguished from measures based on coded WHT rates (see Section 2.1). Model M1-ICTD and models M1-IBFD and M2-IBFD use raw WHT while M3-ICTD and M4-ICTD use coded WHT in the assessment of sub-index values.

Overall, when considering WHT only, the three most aggressive jurisdictions under both IBFD and ICTD data are France, the United Arab Emirates and Mauritius. While the former is an old colonial power, the latter two jurisdictions have developed as 'offshore financial centres', building on a clear tax haven strategy (Tax Justice Network 2019b; 2021a), and both have

withholding taxes of 0% available under domestic law (IBFD 2020a; 2020c). Because these jurisdictions already provide 0% WHT rates to outbound payments, it might be easier for them to negotiate lower WHT in treaties with other countries. In the model that considers domestic WHT (M2-IBFD), it is also worth noting that the United Kingdom rises to second place, almost doubling its royalties aggressiveness (with respect to the other WHT models).

3.2 European countries are more aggressive in relation to PE and other treaty provisions

We proceed to expand our analyses beyond WHT to PE and other treaty provisions (Other). These provisions affect the source country by excluding economic activity from taxation altogether (if a foreign company is not considered to have a permanent establishment) or by preventing source taxation of specific activities (shipping or independent services) or income realisation events (sale of shares of a company). It is worth noting that each of the three categories or sub-indices considered is built as an average of coded variables chosen in the ICTD Source Index dataset (Hearson, Carreras and Custers 2021). As such, the authors' decision to equally weight the three categories (WHT, PE, Other) rests upon the decision to include certain treaty provisions (coded variables) and not the others in the construction of each sub-index. Nonetheless, we consider that the weighting is fair insofar as it is balanced and covers the main treaty provisions that affect source tax rights in the conduct of globalised business activities.

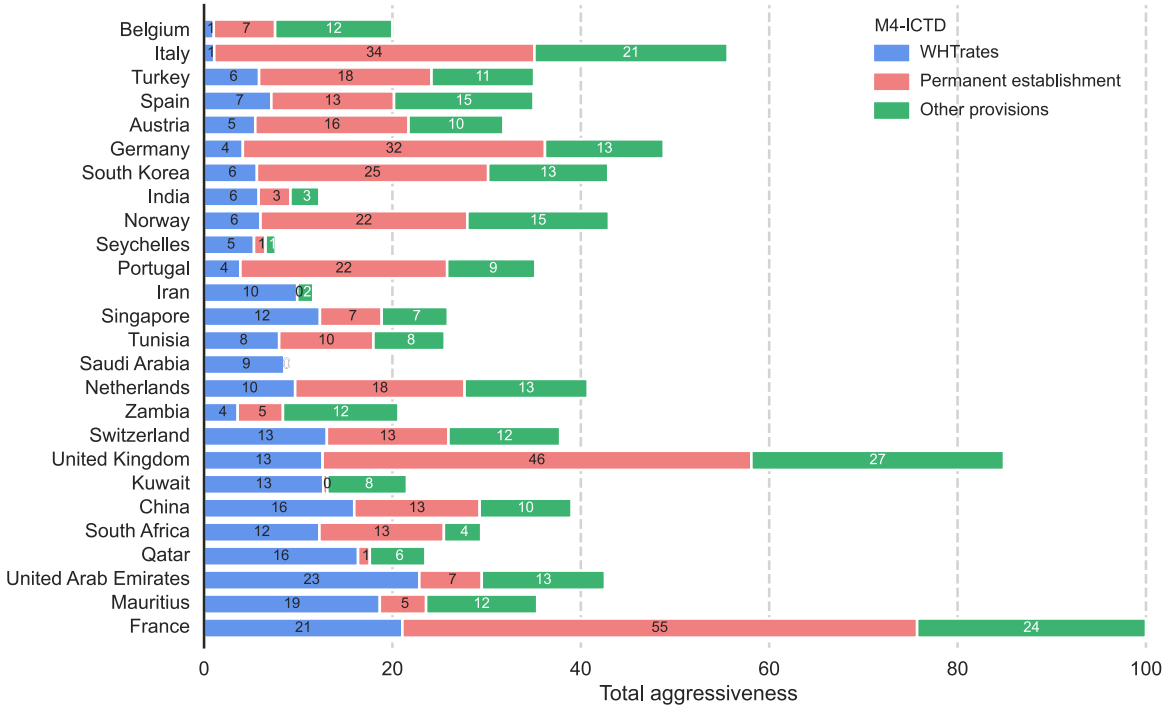

Figure 3.3 Aggressiveness measures for jurisdictions in the top 15 of any model, sorted by M1-ICTD for comparability.

Interestingly, while Mauritius and the UAE are among the largest aggressors for WHT, they are not the largest aggressors with respect to permanent establishment and other treaty provisions. When comparing average aggressiveness towards African partners by treaty, we observe that Mauritius and the UAE are, on average, around 20% more aggressive than France and UK with respect to withholding rates. Conversely, the UK and France are eight times as aggressive as the UAE and Mauritius with regard to permanent establishment provisions. Other treaty provisions show a nuance, with the UAE and Mauritius being relatively less aggressive than France and the UK but comparable to Germany, Norway and Spain.

Table 3.1 shows the aggressiveness percentage represented by WHT, PE and Other treaty provisions for the three most aggressive treaties signed by the UK, France, the UAE and Mauritius.

Table 3.1 Source Index aggressiveness profiles for the most aggressive treaties of selected countries.

Assessed country	African treaty partner	Treaty agg. measure with M4	% aggressiveness derived from		
			WHT	PE	Other
France	Guinea	1.00	0%	75%	25%
France	Libya	0.86	59%	40%	1%
France	Namibia	0.71	13%	65%	22%
United Kingdom	Eswatini	0.89	25%	59%	16%
United Kingdom	Egypt	0.79	15%	61%	24%
United Kingdom	Morocco	0.74	0%	60%	40%
Mauritius	Tunisia	0.65	67%	5%	29%
Mauritius	Madagascar	0.63	55%	45%	0%
Mauritius	Congo, Rep.	0.46	46%	0%	54%
United Arab Emirates	Guinea	0.57	56%	0%	44%
United Arab Emirates	Tunisia	0.51	64%	0%	36%
United Arab Emirates	Mozambique	0.46	72%	10%	18%

For instance, the United Kingdom's treaty with Morocco, setting maximum WHT at around 10%, is not particularly aggressive compared to other treaties signed by Morocco, whose average treaty WHT rates are close to 11%. However, the treaty does not include a provision for a services PE and specifically excludes delivery services, insurance and agents' economic activity from PE qualification. Moreover, under Other provisions, it does not allow source taxation of shipping business or capital gains from shares of foreign-owned domestic companies and lets domestic companies deduct payments to the head office. The characteristics of PE and Other treaty provisions are significantly aggressive towards Morocco in reducing its taxing rights more intensely than other treaties signed by Morocco.

When the relative harmfulness of individual treaties is compared (using M4-ICTD; see aggressiveness model in 2.3.1 *Aggressiveness of a treaty*) with the Source Index value for that treaty (average of 3 sub-indices), we generally observe consistent trends; yet interesting differences appear. In general, the lower the Source Index value of a treaty (more favourable to investor country), the higher its aggressiveness (downward pressure in source taxing rights). However, as Table 3.2 illustrates, certain treaties have a similar Source Index value but show markedly different levels of aggressiveness and vice-versa.

Table 3.2 Comparison of harmfulness assessments by treaty between SI values and M4 aggressiveness.

African country	Treaty partner	Source Index value	M4-ICTD (by treaty)	WHT s.i.	WHT agg.	PE s.i.	PE agg.	Other s.i.	Other agg.
Egypt	Italy	0.43	0.68	0.94	0.00	0.09	0.49	0.25	0.19
Egypt	China	0.42	0.24	0.33	0.17	0.56	0.01	0.38	0.06
Tanzania	India	0.64	0.43	0.34	0.43	0.95	0.00	0.63	0.00
Tanzania	Italy	0.39	0.30	0.72	0.01	0.19	0.15	0.25	0.14
South Africa	Brazil	0.40	0.29	0.59	0.00	0.09	0.29	0.50	0.00
South Africa	Algeria	0.38	0.04	0.41	0.00	0.34	0.04	0.38	0.00

Note: the colour coding above reflects that in M4-ICTD, higher values correspond to more aggressive treaties, whereas in the Source Index, higher values correspond to treaties that are more favourable to source countries.

In these treaties, our approach measuring harmfulness with the relative aggressiveness of each treaty (in comparison to other treaties of the source country) brings significant new insights. For instance, while Egypt's treaties with Italy and China have very similar Source

Index values, the Egypt-Italy treaty appears much more aggressive (M4-ICTD) than the Egypt-China treaty. This is because although the treaty with China is more aggressive with respect to tax rates (with lower dividends, interest and royalties WHT), the treaty with Italy includes very aggressive PE provisions that are overall significantly more harmful than PE provisions found in Egypt's other treaties. Furthermore, in the Egypt-China treaty, where the Source Index assesses that WHT and Other treaty provisions have very similar levels of harmfulness (WHT s.i. = 0.33, Other s.i. = 0.38, with higher values corresponding to more source tax rights), our aggressiveness model (M4) estimates that China's harmfulness with regard to Other treaty provisions is notably lower than its harmfulness due to Withholding rates (WHT agg. = 0.17; Other agg. = 0.06). Thus, although in absolute terms, Egypt's treaty with China might be as harmful as the one with Italy, in relative terms, the Egypt-Italy treaty is much more harmful because its provisions deviate much more from that of Egypt's other treaties. Specifically, although Other treaty provisions in the treaty with China might not be that favourable to source tax rights, these appear to be the norm across Egypt's treaties. Therefore, we could conclude that such a choice of treaty provisions simply corresponds to Egypt's treaty policy stance. In addition, the relative assessment presented with our aggressiveness models (M1-5) may shed greater light on the tax revenue impact that the cancellation or amendment of a treaty may have.

In comparison with M1-IBFD and M1-ICTD (solely based on WHT), we can generally observe that OECD countries increase their measure of aggressiveness. Other than the United Kingdom and France, countries such as Italy, Norway, Germany, South Korea, Portugal, the Netherlands and Spain are among the top 15 most aggressive. The fact that these countries are highlighted when considering aggressiveness with the Source Index's three broad categories may be because OECD countries have followed the OECD tax treaty model closely in negotiations and the resulting provisions are particularly harmful to source taxing rights (as is the OECD model). However, this would not explain why the aggressiveness derived from permanent establishment and other provisions is disproportionately higher than that derived from withholding rates. Instead, this characteristic could be due to a higher negotiating power and expertise in these rich OECD countries, which could result in a 'trade-off' between concessions for more straightforward and easily understandable withholding rates, in exchange for demands with regard to more obscure provisions such as permanent establishment exceptions or taxation of other income not specifically covered by the treaty (Hearson 2018).

The use of Source Index data enriches the study of treaty networks by illustrating how less easily quantifiable treaty characteristics are relevant dimensions often ignored in treaty analyses. It is worth reiterating how a single provision relating to PE or Other treaty characteristics (capital gains, shipping rights etc.) can effectively allow multinational companies engaged in specific activities to escape source taxation completely.

3.3 Aggressiveness per cluster

Sections 3.1 and 3.2 have shown how specific sets of countries (e.g. the UAE and Qatar, Mauritius and Seychelles, European countries) are typically highly aggressive. We further investigate this by aggregating jurisdictions in clusters and calculating the average aggressiveness in the cluster compared with countries outside the cluster (Figure 3.4).

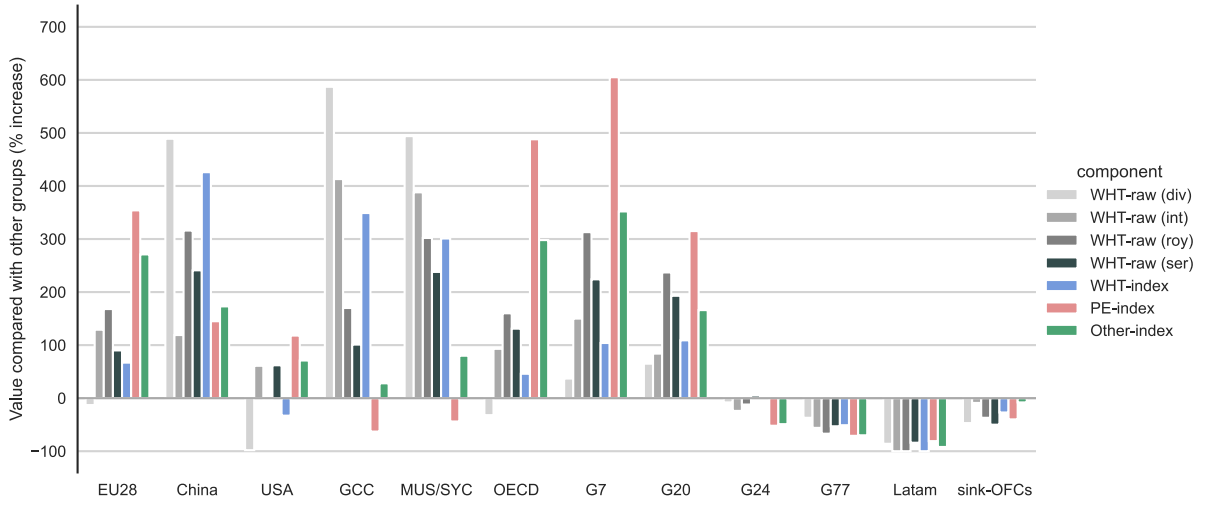

Figure 3.4 Relative aggressiveness of jurisdictions in different groups. GCC=Gulf *Cooperation Council. Latam = Latin-America. Sink-OFC = sink-offshore financial centres (Garcia-Bernardo et al. 2017). See Appendix 3 for a list of countries in each region.*

Overall, rich countries are more aggressive in hindering African countries' rights to tax domestic economic activity. In particular, the richest countries (members of the G7, G20, the European Union pre-Brexit (EU28), the Gulf Cooperation Council (GCC) and the OECD[12]) are disproportionately aggressive in terms of permanent establishment and other treaty provisions, with average aggressiveness up to 700% higher than other countries. Countries in the G24 and G77 groups are significantly less aggressive in their treaties with African countries. The three Latin American countries in our sample (Brazil, Chile and Mexico) are nearly 100% less aggressive than other countries. Finally, the African tax havens of Mauritius and Seychelles (MUS/SYC) are extremely aggressive towards African countries in terms of WHT rates. Similar countries to Mauritius and Seychelles (sink-OFCs) are not generally aggressive towards African countries.

In this case, as well, the differences may be due to the 'success' of the OECD tax convention among rich countries. However, it is worth noting that certain OECD countries show no or very low aggressiveness towards African treaty partners: namely Australia, Chile, Mexico, New Zealand, and Latvia.

4 Conclusions

Tax treaties constitute the backbone of tax planning by multinational corporations, hindering domestic revenue mobilisation in capital-importer countries. In this paper, we develop a novel methodology based on the network of tax treaties of African countries with three objectives: (i) to quantify which countries reduce the taxing rights of African countries and how much, (ii) to analyse the similarities between the IBFD and ICTD dataset and (iii) to understand the differences between the aggressiveness regarding withholding taxes and the aggressiveness regarding permanent establishment and other provisions.

Our results provide a uniquely nuanced landscape of the countries providing opportunities for eroding tax bases in Africa through tax treaties. When considering treaty WHTs only, the three jurisdictions that most aggressively deviate from source countries' usual treaty rates in both datasets are France, the United Arab Emirates and Mauritius. The analysis of PE and other

[12] See Appendix 3.4 for a list of the members of each cluster.

treaty provisions reveals a different pattern, one that is completely dominated by European countries. Treaties with France, the United Kingdom, Italy and Germany reduce the scope of PE regulations in African countries the most. Overall, capital-exporter countries (China, OECD, GCC) and African corporate tax havens (mainly Mauritius) appear as disproportionately aggressive in tax treaties impairing African countries' rights to tax domestic economic activity.

Our analysis provides three important insights related to our three objectives. The broadest takeaway supported by our findings is that capital-exporting countries and African offshore secrecy jurisdictions and corporate tax havens are the most responsible for curtailing taxing rights in Africa. This can be explained by power dynamics between capital-exporter and African countries. The perceived dependence on foreign direct investment for development in Africa may be explained by a pervasive 'competitiveness' ideology, resulting in fiscal policies that may not be in the interests of these countries' citizens. Supported by tax treaties, the stateless nature of multinational companies creates profit shifting networks that undermine domestic revenue mobilisation efforts by African countries, preventing the strengthening of key institutions such as public education, health care and infrastructures. The fragility of these institutions can result in mass migration due to environmental or economic shocks, destabilising, in turn, developed economies.

The second lesson relates to objectives (ii) and (iii). We have shown that while both the IBFD and ICTD datasets are similar with respect to WHT rates, the effect of PE and Other tax provisions should not be understated. The aggressiveness of OECD countries – particularly of France and the United Kingdom – is understated when considering only WHT rates. The inclusion of PE and Other tax provisions in our analysis – only available in the ICTD dataset – increases the aggressiveness of OECD countries while reducing the aggressiveness of China, the Gulf countries, and corporate tax havens and secrecy jurisdictions. By securing exceptions to permanent establishment definitions and limiting source countries' ability to tax specific activities and income realisation events, OECD countries obtain advantages for resident corporations that reduce the tax base of African countries. The pattern we observe among OECD countries may be explained by the adherence to the OECD model tax convention, which is generally unfavourable to source tax rights.

The third key finding relates to the policy implication of our analysis. This paper and the associated results provide an effective analytical lens for policymakers and tax administrations to assess the potential harm or gain of a treaty. Recognising that every country is in a different economic position in its relations with other jurisdictions, this work can provide valuable insights into the treaties governing cross-border economic activity. In that regard, the aggressiveness measures presented in Appendix 3 can assist tax officials in deciding whether to renegotiate or terminate a treaty by determining how much a treaty deviates from the rest (see Table A3.2, Table A3.3, Table A3.4). In combination with administrative data, this methodology can be used to assess priorities and strategies to strengthen domestic revenue mobilisation. Indeed, there has been a growing initiative among African countries to cancel or renegotiate harmful treaties in recent years. Kenya, Senegal and South Africa have done so with their treaties with Mauritius (Business & Human Rights Resource Centre 2019; Orbitax News 2015; TaxNotes 2020).

Likewise, our findings could support reforms and legal cases within the European Union and its associated territories. The Lisbon Treaty obliges the European Union to implement policy coherence for development, whereby any EU member states' policies – including tax policies – should 'complement and reinforce' the EU's policy goals of reducing and eradicating poverty worldwide (Treaty on the Functioning of the European Union (TFEU) 2007: Article 208: C326/141). With our analysis adding to the empirical data on how EU member states' tax policies hinder domestic resource mobilisation and anti-poverty policies in the Global South,

the European Commission could consider taking action to review tax treaties in light of its commitment to implement the Addis Ababa Action Agenda (European Commission 2019).[13]

Our analysis has a series of limitations that can spark new research on tax treaties. First of all, our methodology analyses the aggressiveness of country *i* on country *j* with respect to other partner countries of country *j*. However, the partners of country *i* are also important. If country *i* itself is extremely aggressive with regard to country *j* but has no other tax treaties, it is unlikely that country *i* is used for global tax planning schemes. Future research can include higher-order network measures to address this limitation. The second limitation that could be addressed by future research relates to the causal economic effect of tax treaties. By analysing tax treaties in combination with different investment types (e.g. greenfield, phantom FDI), it would be possible to assess under what circumstances, if any, tax treaties are associated with desirable investment. Furthermore, by analysing corporate tax revenues after signing tax treaties, the impact of tax treaties on domestic revenue mobilisation could be quantified.

[13] If action by the European Council does not allow for significant overhaul of EU treaties with developing countries, the European Commission might be able to challenge in front of EU courts specific treaties as overt actions by a Member State against EU development policy.

References

Arel-Bundock, V. (2017) 'The Unintended Consequences of Bilateralism: Treaty Shopping and International Tax Policy', *International Organization* 71.2: 349–371, https://doi.org/10.1017/S0020818317000108

ATAF (2012) *ATAF Model Tax Agreement for the Avoidance of Double Taxation and the Prevention of Fiscal Evasion with Respect to Taxes on Income*, ATAF's International Taxation and Technical Assistance Publication, Pretoria: ATAF, https://irp-cdn.multiscreensite.com/a521d626/files/uploaded/ATAF%20Model%20Tax%20Agreement_Highres.pdf

Avi-Yonah, R. S. (2000) 'Globalization, Tax Competition, and the Fiscal Crisis of the Welfare State', *Harvard Law Review* 113.7: 1573–1676

Avi-Yonah, R. S., Clausing, K. A., and Durst, M. C. (2009) 'Allocating Business Profits for Tax Purposes: A Proposal to Adopt a Formulary Profit Split', *Fla. Tax Rev.* 9: 497–1077, https://litigation-essentials.lexisnexis.com/webcd/app?action=DocumentDisplay&crawlid=1&doctype=cite&docid=9+Fla.+Tax+Rev.+497&srctype=smi&srcid=3B15&key=056cd48cddfe80d7037eb6ab3139847b

Baistrocchi, E. A. and Hearson, M. (2017) 'Tax Treaty Disputes: A Global Quantitative Analysis' in E. Baistrocchi (ed.) *A Global Analysis of Tax Treaty Disputes*, Cambridge: Cambridge University Press, https://papers.ssrn.com/abstract=3045917

Balabushko, O., Beer, S., Loeprick, J. and Vallada, F. (2017) *The Direct and Indirect Costs of Tax Treaty Policy. Evidence from Ukraine*, Policy Research Working Paper 7982, Washington: World Bank, documents.worldbank.org/curated/en/534391488205311904/pdf/WPS7982.pdf

Barthel, F. and Neumayer, E. (2012) 'Competing for Scarce Foreign Capital: Spatial Dependence in the Diffusion of Double Taxation Treaties', *International Studies Quarterly* 56.4: 645–660, https://www.jstor.org/stable/41804822

Beer, S. and Loeprick, J. (2018) *The Cost and Benefits of Tax Treaties with Investment Hubs: Findings From Sub-Saharan Africa*, Policy Research Working Paper 8623, Washington: World Bank, https://doi.org/10.1596/1813-9450-8623

Beer, S. and Loeprick, J. (2020) 'Too high a price? Tax treaties with investment hubs in Sub-Saharan Africa', *International Tax and Public Finance* 28: 113-153, https://doi.org/10.1007/s10797-020-09615-4

BEPS Monitoring Group (2014) 'Neutralising the Effects of Hybid Mismatch Arrangements', Submission to OECD Discussion Paper on Hybrid Mismatch Arrangements, http://bepsmonitoringgroup.files.wordpress.com/2014/05/bmg-hybrid-mismatches-submission.pdf

BEPS Monitoring Group (2015) 'The BEPS Monitoring Group Overall Evaluation of the G20/OECD Base Erosion and Profit Shifting (BEPS) Project', https://bepsmonitoringgroup.files.wordpress.com/2015/10/general-evaluation.pdf

Brada, J. C., Drabek, Z. and Iwasaki, I. (2021) 'Does Investor Protection Increase Foreign Direct Investment? A Meta-Analysis', *Journal of Economic Surveys* 35.1: 34–70, https://doi.org/10.1111/joes.12392

Brauner, Y. (2018) 'McBEPS: The MLI – The First Multilateral Tax Treaty that Has Never Been', *Intertax* 46.1: 6–17

Brooks, K. and Krever, R. (2015) 'The Troubling Role of Tax Treaties' in G. M. M. Michielse and V. Thuronyi (eds), *Tax Design Issues Worldwide, Series on International Taxation* 51: 159-178, https://papers.ssrn.com/abstract=*2639064*

Business & Human Rights Resource Centre (2019) *NGO says recently nullified Double Tax Avoidance Agreement between Kenya & Mauritius could have been used for tax evasion by businesses*, https://www.business-humanrights.org/en/latest-news/ngo-says-recently-nullified-double-tax-avoidance-agreement-between-kenya-mauritius-could-have-been-used-for-tax-evasion-by-businesses/

Chang, H.-J. (2011) *23 Things They Don't Tell You About Capitalism*, London: Penguin

Dagan, T. (2000) 'The Tax Treaty Myth', *New York University Journal of International Law and Politics* 32.939

Damgaard, J., Elkjaer, T., & Johannesen, N. (2019). *What Is Real and What Is Not in the Global FDI Network?,* IMF Working Paper 19/274, Washington: International Monetary Fund

Daurer, V., & Krever, R. (2014) 'Choosing between the UN and OECD Tax Policy Models: An African Case Study', *African Journal of International and Comparative Law* 22: 1–21, https://doi.org/10.3366/ajicl.2014.0077

Davies, R. B. (2004) 'Tax Treaties and Foreign Direct Investment: Potential versus Performance', *International Tax and Public Finance* 11: 775–802

di Giovanni, J. (2005) 'What drives capital flows? The case of cross-border M&A activity and financial deepening', *Journal of International Economics* 65.1: 127–149, https://doi.org/10.1016/j.jinteco.2003.11.007

Durand, C. (2007) 'Externalities from foreign direct investment in the Mexican retailing sector', *Cambridge Journal of Economics* 31.3: 393–411, https://doi.org/10.1093/cje/bel046

Durst, M. (2010) 'ECD Guidelines: Causes and Consequences. Fundamentals of International Transfer Pricing in Law and Economics', *Max Planck Institute for Tax Law and Public Finance,* https://www.tax.mpg.de/en/events/details.html?tx_sfeventmgt_pievent%5Bevent%5D=58&tx_sfeventmgt_pievent%5Baction%5D=detail&tx_sfeventmgt_pievent%5Bcontroller%5D=Event&cHash=f1fa9a7e94e8dd6eb91760cd1e82895b (accessed 30 June 2021)

Durst, M. (2018) 'Chapter 4: The OECD's BEPS Project and Lower-Income Countries', *Tax Notes International* 90.11: 1157–1178, https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/13913/The_OECD_BEPS_Project.pdf?sequence=3&isAllowed=y

Durst, M. C. (2019) *Taxing Multinational Business in Lower-Income Countries: Economics, Politics and Social Responsibility*, Brighton: International Centre for Tax and

Development, https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/14336/Durst_Book_Final.pdf?sequence=1&isAllowed=y

European Commission (2019) *EU development policy*, https://eur-lex.europa.eu/legal-content/EN/LSU/?uri=CELEX:52017DC0667, 12 July 2019

European Union (2007), *Treaty on the Functioning of the European Union (TFEU)*, 26 October 2012, https://eur-lex.europa.eu/eli/treaty/tfeu_2012/oj

Figueroa, A. H. (2005) 'International Double Taxation: General Reflections on Jurisdictional Principles, Model Tax Conventions and Argentina's Experience', *Bulletin for International Fiscal Documentation* 59: 379–386, http://faculty.law.wayne.edu/tad/Documents/Research/Figueroa_Argentina_Intl_Double_Taxation.pdf

Garcia-Bernardo, J., Fichtner, J., Takes, F. W. and Heemskerk, E. M. (2017) 'Uncovering Offshore Financial Centers: Conduits and Sinks in the Global Corporate Ownership Network' *Scientific Reports* 7.1: 1–10, https://doi.org/10.1038/s41598-017-06322-9

Head, K. and Ries, J. (2008) FDI as an outcome of the market for corporate control: Theory and evidence, *Journal of International Economics* 74.1: 2–20, https://doi.org/10.1016/j.jinteco.2007.04.004

Hearson, M. (2016) *Measuring Tax Treaty Negotiation Outcomes: The ActionAid Tax Treaties Dataset*, ICTD Working Paper 47, Brighton: International Centre for Tax and Development, www.ictd.ac/ju-download/file/88-ictd-wp47-pdf/latest/download?2951319cb2220550f30e41fe8d5e70c7=1&return=aHR0cCUzQSUyRiUyRnd3dy5pY3RkLmFjJTJGanUtZG93bmxvYWQlMkYyLXdvcmtpbmctcGFwZXJzJTJGOTktbWVhc3VyaW5nLXRheC10cmVhdHktbmVnb3RpYXRpb24tb3V0Y29tZXMtdGhlLWFjdGlvbmFpZC10YXgtdHJlYXRpZXMtZGF0YXNldA==

Hearson, M. (2018) 'When Do Developing Countries Negotiate Away Their Corporate Tax Base?' *Journal of International Development* 30.2: 233–255, https://doi.org/10.1002/jid.3351

Hearson, M. (2021) *Imposing Standards: The North-South Dimension to Global Tax Politics.* Ithaca, NY: Cornell University Press.

Hearson, Carreras and Custers 2021. *Using New Data to Support Tax Treaty Negotiation*. Equitable Growth, Finance and Institutions Insight. Washington, DC: World Bank.

IBFD (n.d.) *Tax Treaties Database - Global Tax Treaty Information - IBFD*, Amsterdam: International Bureau of Fiscal Documentation, https://www.ibfd.org/IBFD-Products/Tax-Treaties-Database (accessed 12 March 2020)

IBFD (2019a) 'Document—Sudan—Treaty Withholding Rates Table—Tax Research Platform', https://research.ibfd.org/#/doc?url=/collections/wht/html/wht_sd.html

IBFD (2019b) 'Document—Congo (Rep.)—Treaty Withholding Rates Table—Tax Research Platform', https://research.ibfd.org/#/doc?url=/collections/wht/html/wht_cg.html

IBFD (2020a) R.Ramloll—Mauritius—Corporate Taxation—Sec. 6. International Aspects' [IBFD Country Tax Guides], https://research.ibfd.org/#/doc?url=/document/gtha_mu_s_6.

IBFD (2020b) 'Document—Mauritius—Treaty Withholding Rates Table—Tax Research Platform', https://research.ibfd.org/#/doc?url=/collections/wht/html/wht_mu.html

IBFD (2020c) 'S. Gueydi & A. Abdul Raheem, United Arab Emirates—Corporate Taxation—6. International Aspects' (Country Tax Guides), https://research.ibfd.org/#/doc?url=/document/gtha_ae_s_6.

IBFD (2020d) 'Document—Tunisia—Treaty Withholding Rates Table—Tax Research Platform', https://research.ibfd.org/#/doc?url=/collections/wht/html/wht_tn.html

IBFD (2020e) 'Document—Zambia—Treaty Withholding Rates Table—Tax Research Platform', https://research.ibfd.org/#/doc?url=/collections/wht/html/wht_zm.html

IBFD (2020f) 'Document—Yemen—Treaty Withholding Rates Table—Tax Research Platform', https://research.ibfd.org/#/doc?url=/collections/wht/html/wht_ye.html

IBFD (2020g) 'Tanzania—Treaty Withholding Rates Table' (Treaty Withholding Rates Tables), https://research.ibfd.org/#/doc?url=/document/wht_tz

IBFD (2021) 'Mauritius—Treaty Withholding Rates Table' (Treaty Withholding Rates Tables), https://research.ibfd.org/#/doc?url=/document/wht_mu

IMF (2014) *Spillovers in International Corporate Taxation*, IMF Policy Paper 9 May 2014, Washington: International Monetary Fund, http://www.imf.org/external/np/pp/eng/2014/050914.pdf

IMF, OECD, United Nations, & World Bank (2015) 'Options for Low Income Countries Effective and Efficient Use of Tax Incentives for Investment: A Report to the G-20 Development Working Group by the IMF, OECD, UN and World Bank', *A Report to the G-20 Development Working Group*, Washington: World Bank, https://doi.org/10.1596/22923

Janský, P., Lázničkа, J. and Palanský, M. (2020) 'Tax treaties worldwide: Estimating elasticities and revenue foregone', *Review of International Economics* 29.2: 359-401, https://doi.org/10.1111/roie.12515

Janský, P. and Šedivý, M. (2019) 'Estimating the revenue costs of tax treaties in developing countries', *The World Economy* 42.6: 1828–1849, https://doi.org/10.1111/twec.12764

Jorgenson, A. K. (2007) 'Does Foreign Investment Harm the Air we Breathe and the Water We Drink? A Cross-National Study of Carbon Dioxide Emissions and Organic Water Pollution in Less-Developed Countries, 1975 to 2000', *Organization & Environment* 20.2: 137–156

Kangave, J., Nakato, S., Waiswa, R. and Zzimbe, P. L. (2016) *Boosting Revenue Collection through Taxing High Net Worth Individuals: The Case of Uganda*, ICTD Working Paper 45, Brighton: International Centre for Tax and Development, http://www.ictd.ac/ju-download/2-working-papers/98-boosting-revenue-collection-through-taxing-high-net-worth-individuals-the-case-of-uganda

Lang, M., Pistone, P., Schuch, J., Staringer, C., Storck, A. and Zagler, M. (eds) (2010) *Tax Treaties: Building Bridges between law and economics*, Amsterdam: International Bureau of Fiscal Documentation, https://dialnet.unirioja.es/servlet/libro?codigo=556938

Lennard, M. (2009) 'The UN Model Tax Convention as Compared with the OECD Model Tax Convention – Current Points of Difference and Recent Developments', *IBFD Asia-Pacific Tax Bulletin* January/February 2009: 4–11

Li, J. (2017) 'Triple Non-Taxation and BEPS: Implications' in E. Baistrocchi (ed.) *A Global Analysis of Tax Treaty Disputes*, Cambridge: Cambridge University Press, https://doi.org/10.1017/9781316528945.033

Linsi, L. and Mügge, D. K. (2019) 'Globalization and the growing defects of international economic statistics', *Review of International Political Economy* 0.0: 1–23, https://doi.org/10.1080/09692290.2018.1560353

Long, M., Stretesky, P. and Lynch, M. (2017) 'Foreign Direct Investment, Ecological Withdrawals, and Natural-Resource-Dependent Economies', *Society and Natural Resources: An International Journal* 30.10: 1261-1276, https://doi.org/10.1080/08941920.2017.1331483

Maconachie, R. A., Srinivasan, R. and Nicholas, M. (2015) *Responding to the challenge of fragility and security in West Africa: Natural resources, extractive industry investment, and social conflict*, World Bank Working Paper 98902, Washington: World Bank, http://documents.worldbank.org/curated/en/169321468189569256/Responding-to-the-challenge-of-fragility-and-security-in-West-Africa-natural-resources-extractive-industry-investment-and-social-conflict

McGauran, K. (2013) *Should the Netherlands sign tax treaties with developing countries?,* Amsterdam: The Centre for Research on Multinational Corporations, https://www.somo.nl/wp-content/uploads/2013/06/Should-the-Netherlands-sign-tax-treaties-with-developing-countries.pdf

Meinzer, M. (2019) 'Countering cross-border tax evasion and avoidance. An assessment of OECD policy design from 2008 to 2018', PhD Dissertation, Utrecht University, School of Economics, coffers.eu/wp-content/uploads/2019/10/1910-Meinzer-PhD-Dissertation-OECD-Tax-Policies.pdf

Meinzer, M., Ndajiwo, M., Etter-Phoya, R. and Diakité, M. (2019) *Comparing tax incentives across jurisdictions: A pilot study*, Chesham: Tax Justice Network, https://www.taxjustice.net/wp-content/uploads/2018/12/Comparing-tax-incentives-across-jurisdictions_Tax-Justice-Network_2019.pdf

Michielse, G. M. M. (2012) *Mongolia: Technical Assistance Report—Safeguarding Domestic Revenue—A Mongolian DTA Model,* IMF Country Report 12/306, Washington: International Monetary Fund, https://www.imf.org/external/pubs/ft/scr/2012/cr12306.pdf

Mutava, C. N. (2019) *Review of Tax Treaty Practices and Policy Framework in Africa*, ICTD Working Paper 102, Brighton: International Centre for Tax and Development, https://opendocs.ids.ac.uk/opendocs/handle/20.500.12413/14900

Muyaa, E. (2020a) 'Seychelles—Business and Investment—7. Investment Incentives' (Business and Investment), *IBFD*, https://research.ibfd.org/#/doc?url=/document/gthc_sc_s_7

Muyaa, E. (2020b) 'Seychelles—Corporate Taxation—1. Corporate Income Tax' (Country Tax Guides), *IBFD*, https://research.ibfd.org/#/doc?url=/document/gtha_sc_s_1

Neumayer, E. (2007) 'Do double taxation treaties increase foreign direct investment to developing countries?', *The Journal of Development Studies* 43.8: 1501–1519, https://doi.org/10.1080/00220380701611535

OECD (2010) *Commentaries on the Articles of the OECD Model Tax Convention*, Paris: OECD Publishing, https://www.oecd.org/berlin/publikationen/43324465.pdf

OECD (2015) 'BEPS 2015 Final Reports', Organisation of Economic Co-operation and Development, http://www.oecd.org/ctp/oecd-presents-outputs-of-oecd-g20-beps-project-for-discussion-at-g20-finance-ministers-meeting.htm

OECD (2017) 'Model Tax Convention on Income and on Capital: Condensed Version 2017', https://read.oecd-ilibrary.org/taxation/model-tax-convention-on-income-and-on-capital-condensed-version-2017_mtc_cond-2017-en#page1

OECD. (2019) 'Model Tax Convention on Income and on Capital (Full Version)', https://read.oecd-ilibrary.org/taxation/model-tax-convention-on-income-and-on-capital-2017-full-version_g2g972ee-en#page1

Orbitax News (2015) *Tax Treaty between Mauritius and South Africa has Entered into Force*, https://www.orbitax.com/news/archive.php/Tax-Treaty-between-Mauritius-a-10357

Petkova, K., Stasio, A. and Zagler, M. (2019) 'On the relevance of double tax treaties', *International Tax and Public Finance* 27: 575-605, https://doi.org/10.1007/s10797-019-09570-9

Picciotto, S. (1992) *International Business Taxation. A Study in the Internationalization of Business Regulation*, Cambridge: Cambridge University Press, https://taxjustice.net/cms/upload/pdf/Picciotto%201992%20International%20Business%20Taxation.pdf

Picciotto, S. (2013) *Unitary Taxation: Our Responses to the Critics*, Chesham: Tax Justice Network, www.taxjustice.net/cms/upload/pdf/Unitary_Taxation_Responses-1.pdf

Picciotto, S. (2018) *Problems of Transfer Pricing and Possibilities for Simplification*, ICTD Working Paper 86, Brighton: International Centre for Tax and Development: https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/14117/ICTD_WP86.pdf?sequence=1&isAllowed=y

Platform for Collaboration on Tax (2021) *Toolkit on Tax Treaty Negotiations*, 10 March 2021, https://www.oecd.org/tax/treaties/toolkit-on-tax-treaty-negotiations.htm

PWC (2004) 'Bulgaria—South Africa Income Tax Treaty', *PWC Tax Summaries, https://taxsummaries.pwc.com/bulgaria/corporate/withholding-taxes* (accessed 30 June 2021)

PWC (2021a) 'Vietnam—Corporate—Withholding taxes', https://taxsummaries.pwc.com/vietnam/corporate/withholding-taxes

PWC (2021b) 'Mauritius—Corporate—Tax credits and incentives, https://taxsummaries.pwc.com/mauritius/corporate/tax-credits-and-incentives

Ramloll, R. (2021) 'Mauritius—Corporate Taxation—Country Tax Guides—Sections 6.1.1. And 6.2.2' (Country Tax Guides), I*BFD,* https://research.ibfd.org/#/doc?url=/linkresolver/static/gtha_mu_s_6.3.2.%23gtha_mu_s_6.2.

Reurink, A. and Garcia-Bernardo, J. (2020) 'Competing for capitals: The great fragmentation of the firm and varieties of FDI attraction profiles in the European Union', *Review of International Political Economy* 0.0: 1–34, https://doi.org/10.1080/09692290.2020.1737564

Schilling, M. A. (2018) 'Potential Sources of Value from Mergers and Their Indicators', *The Antitrust Bulletin* 63.2: 183–197, https://doi.org/10.1177/0003603X18770068

Schwarz, P. and Rixen, T. (2009) 'Bargaining over the Avoidance of Double Taxation: Evidence from German Tax Treaties', *FinanzArchiv* 65.4: 442, https://doi.org/10.1628/001522109X486589

Sheppard, L. (2013) 'How Can Vulnerable Countries Cope With Tax Avoidance?', *International Tax Policy Forum,* https://www.itpf.org/itpf_blog?article_id=130

Spengel, C., Heckemeyer, J. H., Nusser, H., Klar, O. and Streif, F. (2016) *Final report: The impact of tax planning on forward-looking effective tax rates*, Taxation Papers 64, Luxembourg: Office for Official Publications of the European Communities, https://www.econstor.eu/bitstream/10419/148155/1/872162370.pdf

Sunibel Corporate Services (2019) 'Authorised Company in Mauritius: All you need to know', *Sunibel Corporate Services*, https://www.sunibelcorporateservices.mu/authorised-company-mauritius/

Tandon, S. (2018) *The Multilateral Legal Instrument: A developing country perspective*, NIPFP Working Paper 220, New Dehli: National Institute of Public Finance and Policy, https://nipfp.org.in/journal/1924/

Tax Justice Network (2015) *Ten Reasons to Defend the Corporation Tax*, Chesham: Tax Justice Network, https://www.taxjustice.net/wp-content/uploads/2013/04/Ten_Reasons_Full_Report.pdf

Tax Justice Network (2019a) 'Corporate Tax Haven Index (CTHI) 2019 Methodology', https://cthi.taxjustice.net/cthi2019/CTHI-Methodology.pdf

Tax Justice Network (2019b) 'Corporate Tax Haven Index—2019 Results (Corporate Tax Haven Index 2019)', https://cthi.taxjustice.net/en/archive

Tax Justice Network (2021a) *Corporate Tax Haven Index (CTHI) 2021 Methodology*, Chesham: Tax Justice Network, http://cthi.taxjustice.net/cthi2021/methodology.pdf

Tax Justice Network (2021b) *Haven Indicator 20: Double Tax Treaty Aggressiveness*, Chesham: Tax Justice Network, https://cthi.taxjustice.net/cthi2021/HI-20.pdf

Tax Justice Network (2021c) 'Mauritius—Country profile', https://cthi.taxjustice.net/en/cthi/profiles?country=MU&period=21

TaxNotes (2020) 'Senegal Terminates Tax Treaty With Mauritius', https://www.taxnotes.com/tax-notes-today-international/treaties/senegal-terminates-tax-treaty-mauritius/2020/02/13/2c5j8

United Nations (2017) *United Nations Model Double Taxation Convention between Developed and Developing Countries (2017 Update)*, https://www.un.org/esa/ffd/wp-content/uploads/2018/05/MDT_2017.pdf

van't Riet, M. and Lejour, A. (2014) *Ranking the Stars: Network Analysis of Bilateral Tax Treaties*, CPB Discussion Paper 290, The Hague: CPB Netherlands Bureau for Economic Policy Analysis, https://ideas.repec.org/p/cpb/discus/290.rdf.html

van't Riet, M. and Lejour, A. (2018) 'Optimal tax routing: Network analysis of FDI diversion', *International Tax and Public Finance* 25.5: 1321–1371

Wells, B. and Lowell, C. (2014) 'Income Tax Treaty Policy in the 21st Century: Residence vs. Source' *5 Columbia Journal of Tax Law 1,* University of Houston Law Center 2014-A-2, https://papers.ssrn.com/abstract=2380241

Weyzig, F. (2013) 'Tax treaty shopping: Structural determinants of Foreign Direct Investment routed through the Netherlands' *Int Tax Public Finance* 20: 910–937, https://doi.org/10.1007/s10797-012-9250-z

Zolt, E. M. (2018) *Tax Treaties and Developing Countries*, Law-Econ Research Paper, 18-10, California: University of California, Los Angeles, School of Law, https://papers.ssrn.com/abstract=3248010

Appendices

Appendix 1 Shortcomings in IBFD data

1.1 Including within WHT tables treaties not in force

The first category of issues we have encountered is that of treaties that appear in the WHT tables of a jurisdiction while being 'not in force'.

For instance, in the WHT table Yemen, 'based on information available up to 19 February 2020', the document specifies 'withholding tax rates applicable […] under the tax treaties in force as at the date of review' (IBFD 2020f). The following treaties are shown (with corresponding rates): Algeria – Yemen (2002), Iraq – Yemen (2001), Morocco – Yemen (2006), Oman – Yemen (2002). However, when consulting the treaty text available in IBFD's own database (IBFD n.d.), all these treaties are shown as 'Not yet in force' (as of April 2020).

Similarly, in the case of Sudan, the IBFD WHT table presents treaties in force 'up to 1 January 2019' (IBFD 2019a), and the following treaties are shown: Libya – Sudan (1990), Jordan – Sudan (2000), Iraq – Sudan (2002). However, these three treaties are not in force (as of April 2020).

1.2 Inconsistencies in WHT table reporting of the same treaty for the two treaty partners

The vast majority of treaties in force today have reciprocal provisions. That is, the names of treaty partner jurisdictions only appear at the beginning of the treaty and all provisions generally refer to 'one Contracting State' and 'the other Contracting State' so that the treaty language applies interchangeably to either of the two treaty partners. Thus, one would expect that information presented for a specific treaty would be the same when consulting the WHT table of one treaty partner or the other. Yet, a significant number of treaties are reported inconsistently in the tables of each treaty partner.

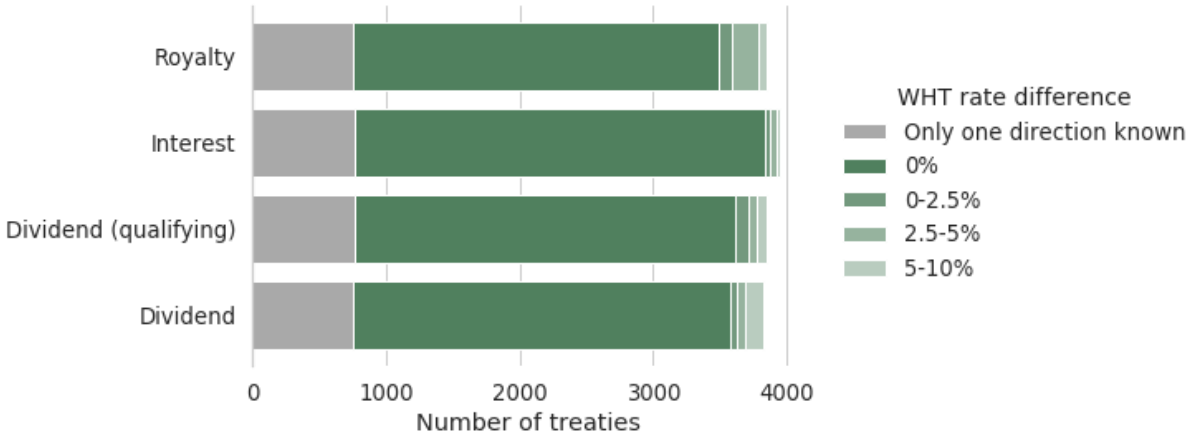

Figure A1.1 Differences in WHT rates in WHT tables of treaty partners (as of April 2020)

The treaties shown in grey correspond to treaties where one partner does not have an IBFD WHT table. For instance, the United Arab Emirates, Bahrain and Syria do not have WHT tables as of April 2020. Thus, while treaties signed by those countries might be presented in their treaty partners' WHT tables, the treaty does not appear 'both ways'.

More problematic are the cases where a treaty that is in force is reported very differently in the WHT tables of the two partners. For example, the treaties between Zambia and Tanzania, and between Zambia and Uganda are reported inconsistently (see Table A1.1).

Table A1.1 Inconsistencies in rate reporting in WHT tables of treaty partners (as of April 2020)

The country WHT table where the treaty is shown is underlined	**Dividend**	**Qualifying Dividend**	**Interest**	**Royalty**
Zambia – Tanzania	-	-	-	-
Tanzania – Zambia	0	0	0	0
Zambia – Uganda	-	-	-	-
Uganda – Zambia	0	0	-	-

A different but related issue is that the same information may be presented in different ways. When this occurs, it is often because the primary data presented is a dash '-', complemented by a footnote. For instance, in the WHT tables of Tunisia (IBFD 2020d) and Zambia (IBFD 2020e), a dash '-' can mean both that there is no tax limitation under the treaty or that no tax can be levied at source (corresponding to a 0% rate).

1.3 Inconsistencies in the treatment of multilateral treaties (WAEMU, AEUC, CEMAC, EU)

1.3.1 Treaty not included for all signatories (WAEMU, AEUC)

The West African Economic and Monetary Union (WAEMU or UEMOA in French) treaty is in force between Benin, Burkina Faso, Guinea-Bissau, the Ivory Coast, Mali, Niger, Senegal and Togo. The treaty is shown in the WHT tables of each of the treaty partners, except Senegal. For the countries showing the WAEMU treaty, the rates are consistent across countries.

With regard to the Arab Economic Union Council (AEUC) Income and Capital Tax Treaty of 1973, IBFD presents the said treaty in the WHT tables of three jurisdictions: Jordan, Sudan and Yemen. In those tables, a footnote indicates that 'Members of the Arab Economic Union Council are: Egypt, Iraq, Jordan, Kuwait, Libya, Mauritania, Palestinian Autonomous Area, Saudi Arabia, Somalia, Sudan, Syria, United Arab Emirates and Yemen'. (IBFD 2020f) Yet, the treaty is not included in the WHT tables of most of these countries.

1.3.2 Treaty inconsistently included for different signatories (CEMAC, AEUC)

The Economic Community of Central African States (CEMAC, for its initials in French) is a treaty between Cameroon, the Central African Republic, Chad, the Republic of Congo, Equatorial Guinea and Gabon. Here IBFD presents the CEMAC treaty in each of these countries' WHT table, yet the data is different in each of the six cases. For instance, while the WHT table of Congo (Rep.) indicates a 20% limit on dividends WHT, the tables in all other countries indicate no WHT limitation under the CEMAC treaty. With regard to royalties, five of the six signatories show '-' for the rate, three of which indicate in a footnote that 'no withholding tax is imposed if the income is subject to tax in the state' of the recipient. Another of the countries showing '-' as the rate has a longer note saying 'royalties are taxable in the state in which the recipient has his fiscal domicile' and indicating an exception for source taxation of natural resources. Another of the countries showing '-' for the rate applicable to royalties WHT indicates that there is no limitation under the treaty. Finally, another country simply presents '0' as WHT applicable under CEMAC, without footnote.

1.3.3 Multilateral treaty rate included as domestic rate (European Union directives)

Two directives relative to WHT are in force in the European Union, which limit the withholding tax applicable to dividends, interest and royalties to 0% in cases where a parent company receives such payments from a subsidiary owned or controlled at 10% or more (25% for interest and royalties). The Parent-Subsidiary Directive (2003/123/EC) and the Interest and Royalties Directive (2003/49/EC) are multilateral treaties entered into by sovereign states in relation to withholding rates. However, instead of including the rates applicable under the directives among the treaty WHT rates, IBFD presents such rates among the 'domestic' rates, even if those rates are only valid for payments destined to a subset of countries. This is unfortunate in terms of analysis of bilateral and multilateral treaty rates because WHT rates under the directive have to be included for each European dyad. Importantly, Switzerland is also covered by the directives.

Appendix 2 Variables included in the Source Index dataset

Sub-Index inclusion	UN model reference	**Description** (value under UN an OECD models)	Coding
Permanent Establishment (**PE**)	5(3)(a)	Construction PE length in months (UN = 6; OECD=12)	Proportional: 24 months or more months → 0; zero months → 1
	5(3)(a)	Supervisory activities associated with construction (UN=yes, OECD=no)	Binary: OECD → 0; UN → 1
	5(3)(b)	Service PE length in months (UN=6, OECD=not included)	Proportional: No service PE, or 12 or more months → 0; zero months → 1
	5(4)(a)	Delivery exception to PE (UN=no, OECD=yes)	Binary: OECD → 0; UN → 1
	5(4)(b)	Delivery exception to PE (UN=no, OECD=yes)	Binary: OECD → 0; UN → 1
	5(5)(b)	Stock agent PE (UN=yes, OECD=no)	Binary: OECD → 0; UN → 1
	5(6)	Insurance PE (UN=yes, OECD=no)	Binary: OECD → 0; UN → 1
	5(7)	Dependent agent extension (UN=yes, OECD=no)	Binary: OECD → 0; UN → 1
Withholding Tax (**WHT**)	10	FDI dividend WHT in % (OECD=5)	Proportional: 0% → 0; 20% or more → 1
	10	Threshold shareholding in % (UN=10; OECD=25)	*Not coded*
	10	Portfolio dividend WHT in % (OECD=15)	Proportional: 0% → 0; 20% or more → 1
	11(2)	Main interest WHT in % (OECD=10)	Proportional: 0% → 0; 20% or more → 1
	11(2)	WHT applying to loans from banks and financial institutions in %	Proportional: 0% → 0; 20% or more → 1
	12(2)	Main royalties WHT in % (OECD=0)	Proportional: 0% → 0; 20% or more → 1
	12(2)	WHT applying to payments for copyright in %	Proportional: 0% → 0; 20% or more → 1 .
	12(2)&(3)	WHT applying to payments for the use of equipment in %	Proportional: 0% → 0; 20% or more → 1
	12A	Management or technical fees (UN and OECD = NA)	Proportional: No specification of fees tax (NA) or 0% → 0; 20% or more → 1
Other provisions (**Other**)	7(1)(b&c)	Limited force of attraction (UN=yes, OECD=no)	Binary: OECD → 0; UN → 1
	7(3)	No deduction for payments to head office (UN=yes, OECD=no)	Binary: OECD → 0; UN → 1
	8(2)	Source shipping right as a % (UN=yes[option B], OECD=no)	Binary: OECD → 0; UN → 1
	13(4)	Source capital gains on 'Land rich' company (OECD and UN=yes, NA=capital gains article omitted)	Binary: omitted provision (NA) → 0; OECD or UN → 1

	13(5)	Source capital gains on 'other shares' (UN=yes, OECD=no, NA=no article)	Binary: omitted provision (NA) or OECD → 0; UN → 1
	14	Independent personal services included (UN=yes, OECD=no)	Binary: OECD → 0; UN → 1
	16(2)	Top-level managerial officials (UN=yes, OECD=no)	Binary: OECD → 0; UN → 1
	21(3)	Source taxation of other income (UN=yes, OECD=no, NA=no article)	Binary: omitted provision (NA) or OECD → 0; UN → 1

Appendix 3 Additional results and figures

3.1 Figures

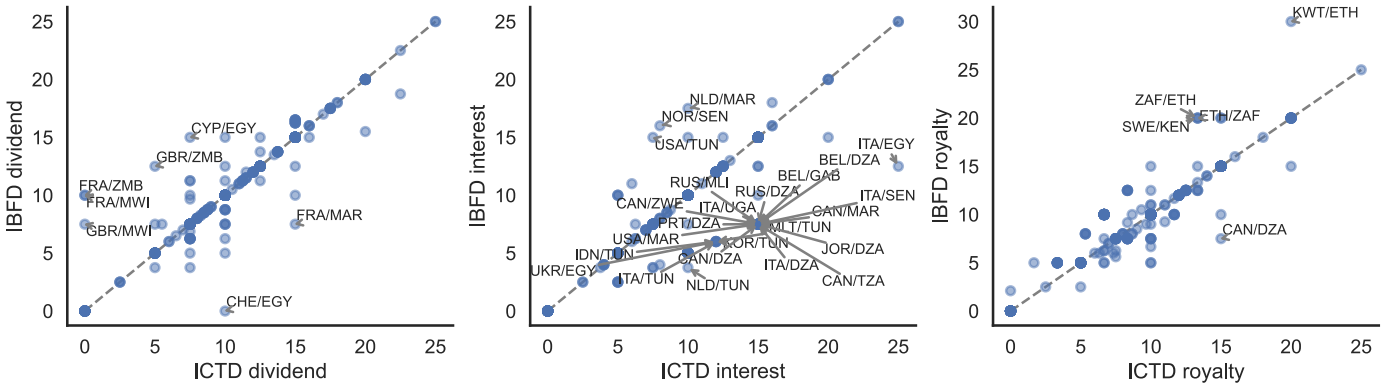

Figure A3.1 Discrepancies in WHT rates between the IBFD and ICTD datasets

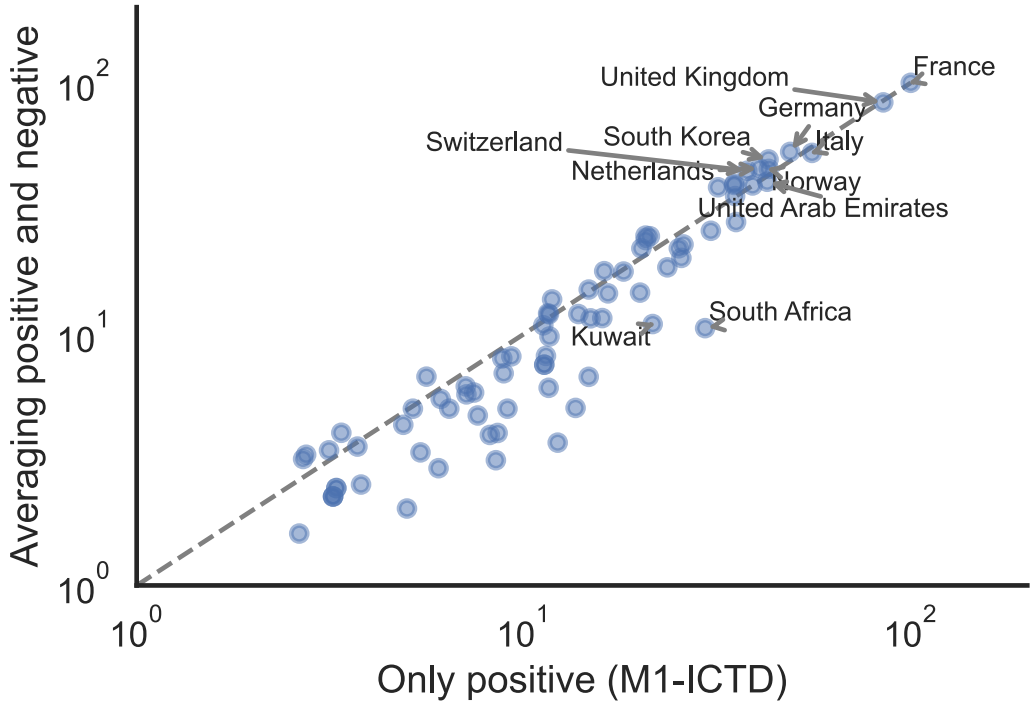

Figure A3.2 Difference between averaging positive and negative differentials or considering only positive differentials (see equation 1)

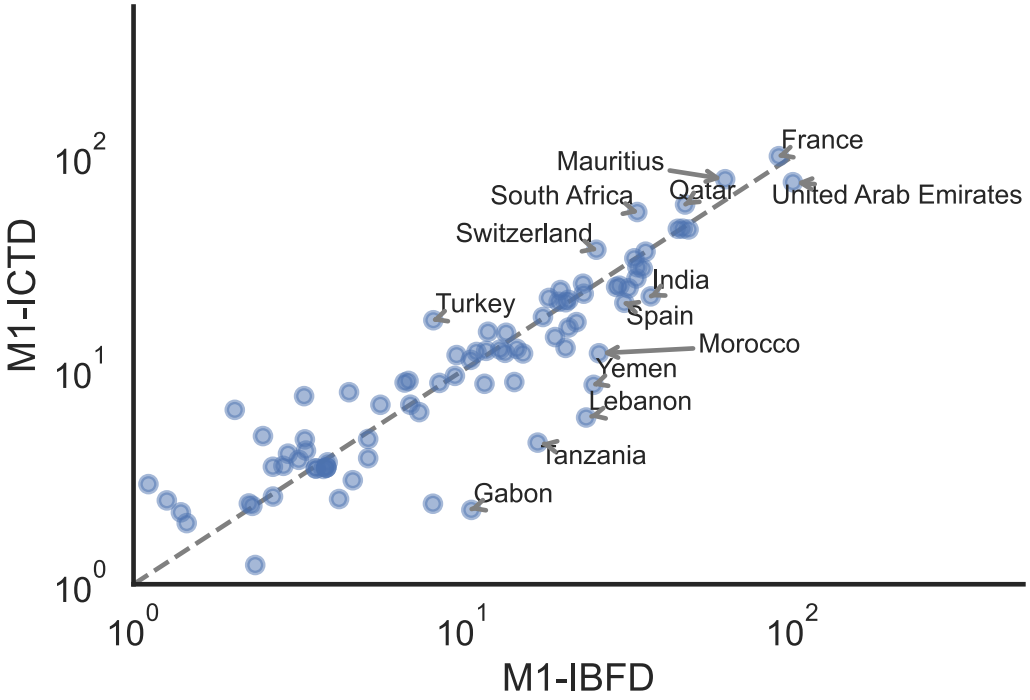

Figure A3.3 Correlation between M1-IBFD and M1-ICTD, using WHT rates from each dataset

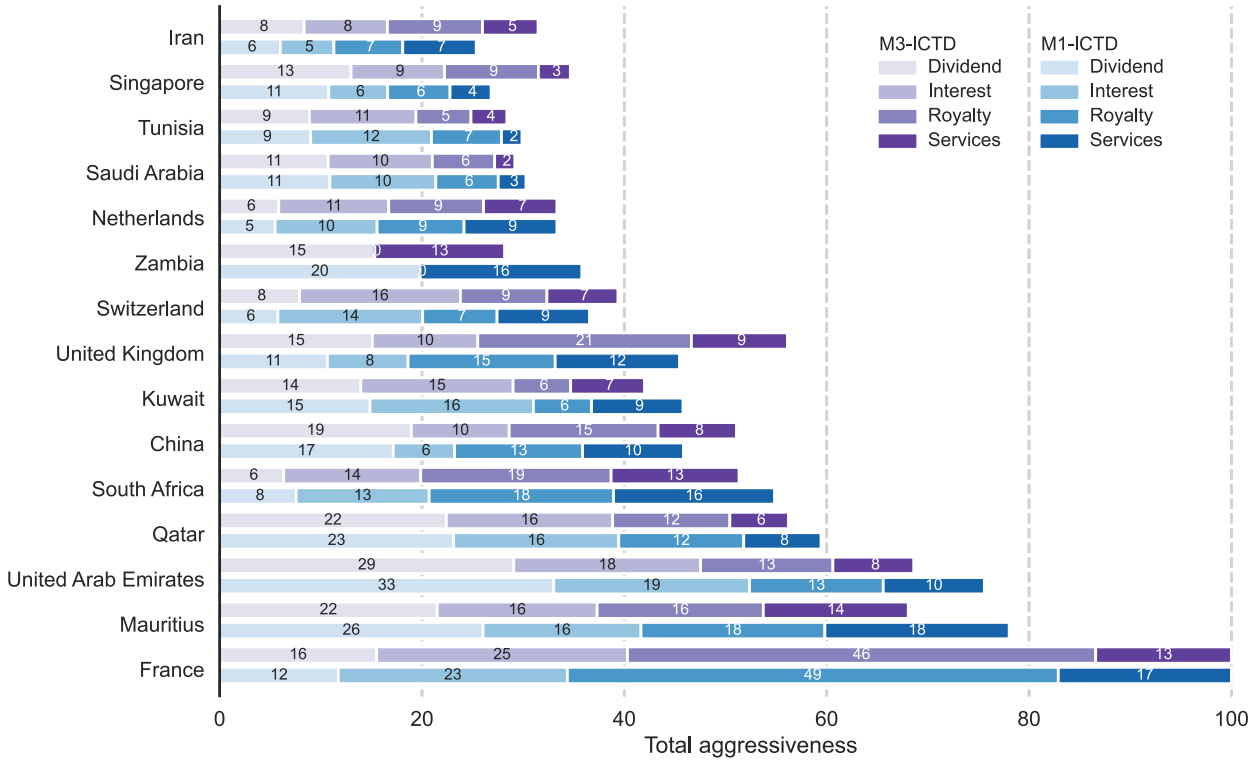

Figure A3.4 Aggressiveness measured with raw WHT (M1) and coded WHT (M3) rates pursuant to ICTD Source Index

3.2 Model comparison tables

Table A3.1 Comparison between Model 1-IBFD, Model 4-ICTD, and Source Index average

	Model 1-IBFD				*Model 4-ICTD*				*SI (av)*
	Total	**DIV agg.**	**INT agg.**	**ROY agg.**	**Total**	**WHT agg.**	**PE agg.**	**Other agg.**	**Source Index**
France	100	11.7	22.6	48.5	100	21.1	54.6	24.3	0.36
Mauritius	78	26	15.6	18.2	35.4	18.7	4.9	11.8	0.42
United Arab Emirates	75.6	33	19.3	13.2	42.6	22.9	6.6	13.1	0.38
Qatar	59.4	23.1	16.3	12.3	23.5	16.3	1.2	5.9	0.42
South Africa	54.8	7.6	13.1	18.2	29.4	12.3	13.2	4	0.47
China	45.8	17.2	6.1	12.6	39	15.9	13.3	9.8	0.34
Kuwait	45.8	14.9	16.1	5.8	21.5	12.7	0.4	8.5	0.39
United Kingdom	45.5	10.6	8	14.5	84.9	12.6	45.5	26.8	0.32
Switzerland	36.6	5.8	14.3	7.3	37.8	13	12.9	11.9	0.28
Zambia	35.8	19.8	0	0	20.6	3.6	4.8	12.3	0.38
Netherlands	33.3	5.5	10.1	8.6	40.7	9.7	18	13.1	0.3
Saudi Arabia	30.3	10.9	10.5	6.2	8.5	8.5	0	0	0.51
Tunisia	29.9	9	11.9	6.9	25.5	8	10	7.6	0.53
Singapore	26.8	10.8	5.8	6.2	25.9	12.3	6.6	7	0.38
Iran	25.4	6	5.3	6.8	11.6	9.9	0	1.7	0.43
Ireland	24.8	6.7	7.2	8.2	21.2	7.1	10.9	3.2	0.34
Portugal	24.5	2.5	5.4	11.1	35.2	3.9	21.9	9.4	0.36
Seychelles	24.1	7.2	10	5.7	7.6	5.3	1.2	1.1	0.44
Norway	23.7	0.1	5.8	11.5	43	6	22	15	0.41
Sweden	22.8	2.1	5.1	5.6	16.5	3.6	7	5.9	0.5
India	22.1	6	3.7	4.6	12.2	5.8	3.4	3.1	0.57
Bahrain	21.8	7.5	5.5	6.6	8.6	7.1	1.4	0	0.44
South Korea	21.3	5.9	0.8	5	42.9	5.6	24.5	12.8	0.27
Germany	20.9	0.1	8.3	6.2	48.8	4.1	32.1	12.6	0.32
Austria	20.8	1.4	5.1	9.5	31.8	5.4	16.3	10.1	0.23
Spain	20.7	2	8.1	5.4	35	7.1	13	14.8	0.3
Cyprus	17.7	4.1	5.9	6.1	11.6	5.2	3.1	3.3	0.31
Turkey	17.1	1.3	1.9	5.1	35	5.8	18.3	10.9	0.28
Russia	16.8	3.4	0.2	10.9	8.8	2.7	2.6	3.5	0.48
Oman	15.8	7.1	3.5	2.6	7.1	4.4	2.7	0	0.47
Denmark	15.1	0.1	4.2	5	30.4	2.8	16.2	11.4	0.38
Mali	15	6.5	3.1	0.3	7.4	4.2	2.7	0.6	0.48
Italy	14.3	2.4	1.6	2.5	55.6	1.1	34	20.5	0.32
Belgium	12.7	2.6	3.6	4.3	20	1	6.5	12.4	0.44
Malta	12.6	5.1	3	3.1	13.6	6.6	2.5	4.5	0.46
Luxembourg	12.5	0.2	5.1	4	16.1	3.5	8.1	4.6	0.32
United States	12.3	0.1	4.5	3	20.1	2.1	11.9	6.2	0.29
Ethiopia	12.2	3.9	1.3	4.2	9.3	4.1	1.3	3.9	0.42
Senegal	12.1	1.8	0.8	6.9	6	3	0.8	2.2	0.5
Morocco	12	2.2	5.8	3.9	5.4	2.2	2.4	0.8	0.63

	Model 1-IBFD				*Model 4-ICTD*				*SI (av)*
	Total	**DIV agg.**	**INT agg.**	**ROY agg.**	**Total**	**WHT agg.**	**PE agg.**	**Other agg.**	**Source Index**
Malaysia	12	9	0.2	2.7	11.4	2.2	4.5	4.7	0.41
Canada	11.8	0.1	0	1.5	14.7	0	12.8	1.9	0.53
Burkina Faso	11.2	2.6	3	2.6	4.9	2.8	1.5	0.6	0.47
Hungary	9.4	0.1	3.5	3	20.7	2.6	10.8	7.2	0.33
Romania	8.9	1	2.3	1.8	25.2	3.5	16	5.6	0.4
Slovakia	8.8	0.1	4.6	2.6	16	4.1	7.8	4	0.39
Algeria	8.8	0.5	3.8	1.6	8.5	6.3	0.4	1.8	0.56
Croatia	8.7	1.8	3.5	0.6	6.1	2.7	0.8	2.6	0.38
Finland	8.6	0.9	3.5	3	14.9	1.9	9.9	3	0.41
Yemen	8.5	4.6	0	1.4	11.2	3	5.4	2.8	0.4
Czechia	7.9	0.7	3.5	0	11.7	1.6	6.5	3.6	0.43
Egypt	7.6	0	1.8	0.2	8.9	2.4	5.1	1.4	0.47
Syria	6.9	4.7	0.2	0	3.7	1.6	1.8	0.3	0.52
Israel	6.9	0	0.1	5.3	7.1	0.5	5.7	0.9	0.28
Poland	6.5	1.2	0.5	0.7	18.1	1.2	11	5.9	0.36
Mauritania	6.4	0	0	5.3	8.2	0	5.3	2.8	0.55
Lebanon	6	1.5	1.2	3	11.8	1.4	3	7.5	0.33
Greece	4.9	1.8	0.2	0	2.6	1.3	0.4	0.9	0.53
Japan	4.8	3.5	0	0	13.8	1.4	9.8	2.7	0.29
Taiwan	4.8	0.7	0.5	0	14.7	0	8.5	6.2	0.29
Kenya	4.6	3.5	0	0	3.2	0	0.8	2.4	0.48
Tanzania	4.6	3.4	0	0	3.2	0	0.8	2.4	0.39
Cote d'Ivoire	4.2	0.9	0.8	0.3	1.8	1.2	0.6	0	0.52
Bulgaria	4.1	1.4	1.2	0.6	11.6	1.2	5.7	4.8	0.41
Uganda	3.9	3.4	0	0	3.2	0	0.8	2.4	0.38
Indonesia	3.8	0.1	0.2	0	2	2	0	0	0.64
Uzbekistan	3.7	1.7	1.3	0.7	1.3	1.3	0	0	0.61
Malawi	3.7	0	0	3	3.4	0.6	2.8	0	0.24
Mozambique	3.6	0	1.5	1.4	1.2	0.8	0.4	0	0.32
Guinea	3.5	1.3	0.2	0	1.3	1.3	0	0	0.69
Guinea-Bissau	3.5	1.8	0.7	0	1.4	0	1.4	0	0.49
Niger	3.5	1.8	0.7	0	1.3	0	1.3	0	0.49
Togo	3.5	1.8	0.7	0	1.3	0	1.3	0	0.49
Georgia	3.5	0.5	1.3	1.6	1.9	1.2	0	0.7	0.57
Albania	3.5	0.5	1.3	1.6	1.9	1.2	0	0.7	0.53
Monaco	3.5	0	3.5	0	5.6	0.6	1.2	3.8	0.29
Botswana	3.1	3.1	0	0	0.9	0.1	0	0.9	0.58
Jordan	2.9	0.1	0.2	0	9.1	0.2	8.1	0.8	0.53
Hong Kong	2.6	1.2	0	0.6	1.1	0.3	0	0.9	0.42
Zimbabwe	2.5	1.5	1	0	1.5	0	0	1.5	0.48
Vietnam	2.5	0.1	0.2	0.3	1.2	1.2	0	0	0.72
Australia	2.4	0.1	1	0.6	0.6	0.6	0	0	0.36
Ukraine	2.4	0.2	0.5	0.9	3.8	3.8	0	0	0.57
Benin	2.3	1.3	0	0	1.4	0	1.4	0	0.49

	Model 1-IBFD				*Model 4-ICTD*				*SI (av)*
	Total	**DIV agg.**	**INT agg.**	**ROY agg.**	**Total**	**WHT agg.**	**PE agg.**	**Other agg.**	**Source Index**
Gabon	2.2	0	0.2	0	2.7	0.3	2	0.4	0.39
Belarus	2.2	0.1	1.3	0	3.1	0	2.2	1	0.38
Mexico	1.9	1.2	0	0	0	0	0	0	0.52
Serbia	1.5	1.1	0	0.3	5.6	3.5	0	2.1	0.54
Nigeria	1.3	0.6	0	0	0.5	0.1	0.4	0	0.42
Latvia	1.2	1.1	0.2	0	0.7	0	0.7	0	0.48
New Zealand	0.8	0.1	0	0	0.4	0	0.4	0	0.36
Namibia	0.8	0.1	0	0	0	0	0	0	0.45
Congo DRC	0.8	0.1	0	0	0.4	0	0.4	0	0.41
Chile	0.8	0.1	0	0	0.9	0	0	0.9	0.36
Iraq	0.7	0	0	0	11.3	0.2	9.2	2	0.43
Somalia	0.7	0	0	0	11.3	0.2	9.2	2	0.43
Thailand	0.7	0	0	0	0	0	0	0	0.7
Grenada	0.7	0	0	0	3.3	3.3	0	0	0.28
Sierra Leone	0.7	0	0	0	3.3	3.3	0	0	0.28
Libya	0.6	0	0	0	1.2	0	1.2	0	0.64
Palestine	0.6	0	0	0	6.4	0.2	5.4	0.8	0.43
Montenegro	0.6	0.5	0	0	2	0	0	2	0.53
Philippines	0.6	0	0.6	0	1.7	0	1.7	0	0.51
Pakistan	0.6	0.1	0.2	0.3	5	0	2.4	2.6	0.6
North Macedonia	0.3	0.1	0.2	0	0	0	0	0	0.7
Ghana	0.1	0.1	0	0	1.8	0	1.8	0	0.34

3.3 Country-by-country assessment of principal aggressors

The table below (Table A3.2) yields results from a model based exclusively on treaty withholding rates. Thus, amendment or cancellation of treaties mentioned therein should be considered together with transaction data that the administration holds with respect to passive investment flows. To redress the aggressive aspects of treaties mentioned below, negotiating teams should consider the relative aggressiveness corresponding to different payment types (dividends, interest and royalties). Also, if the domestic withholding rates are lower than the rates considered aggressive under the model, governments should consider the amendment of such rates to produce positive revenue effects. Finally, as we discussed in this work, a number of provisions over and above withholding rates are of great importance for protecting source tax rights. Thus, careful consideration of PE and Other provisions is advised (see Appendix 2 Variables included in the Source Index dataset).

Table A3.2 Most disadvantageous treaty partners for each African country according to Model 1-IBFD (treaty rates)

(1)		(2)	(3)	(4)	(5)	
African country (excl. Mauritius and Seychelles)		Total # of treaties of African country	Intensity of agg. of this particular treaty	Share of total agg. received by this African country	Principal aggressor (most aggressive treaty partner of African country)	
TZA	Tanzania	9	45.6	59.8%	Zambia*	ZMB
ZMB	Zambia	22	27.9	33.4%	Tanzania*	TZA
MDG	Madagascar	2	25	100.0%	Mauritius*	MUS
TUN	Tunisia	55	24.4	10.8%	Mauritius*	MUS
EGY	Egypt	61	24	8.5%	India*	IND
GIN	Guinea	3	23.8	100.0%	United Arab Emirates*	ARE
DZA	Algeria	35	23	17.5%	Qatar*	QAT
SDN	Sudan	22	22.3	28.3%	United Arab Emirates*	ARE
MOZ	Mozambique	8	22	56.0%	United Arab Emirates*	ARE
SEN	Senegal	23	20.7	20.3%	United Arab Emirates*	ARE
BFA	Burkina Faso	9	20.1	59.4%	Tunisia	TUN
ZWE	Zimbabwe	15	18.6	35.9%	Kuwait*	KWT
COG	Congo, Rep.	5	18.2	51.0%	Mauritius*	MUS
ZAF	South Africa	79	17.5	4.5%	Netherlands	NLD
NGA	Nigeria	15	17.5	26.1%	Spain*	ESP
MLI	Mali	12	17.3	26.9%	Russia*	RUS
TGO	Togo	8	15	100.0%	France	FRA
NER	Niger	8	15	100.0%	France	FRA
MRT	Mauritania	14	15	100.0%	Senegal	SEN
KEN	Kenya	15	14.9	16.0%	Seychelles* ¤	SYC
CIV	Cote d'Ivoire	18	14.1	19.9%	Portugal* ¤	PRT
BEN	Benin	9	13.1	29.7%	Norway* ¤	NOR
MAR	Morocco	56	11.7	8.5%	United Arab Emirates*	ARE
UGA	Uganda	9	11.7	38.8%	Zambia*	ZMB
LBY	Libya	21	11.2	28.9%	France	FRA
NAM	Namibia	10	11.1	25.3%	Germany*	DEU
BWA	Botswana	14	10.5	32.7%	Ireland ¤	IRL
GNB	Guinea-Bissau	8	10	100.0%	Portugal*	PRT
MWI	Malawi	5	10	57.1%	United Kingdom*	GBR
GMB	Gambia	6	9.7	45.4%	United Kingdom*	GBR
ETH	Ethiopia	23	9.6	8.8%	Singapore* ¤	SGP
CMR	Cameroon	6	9.5	33.3%	Gabon* ¤	GAB
SWZ	Eswatini	5	9.4	42.9%	United Kingdom*	GBR
RWA	Rwanda	5	8.1	72.2%	Belgium	BEL
GHA	Ghana	11	7.6	25.9%	Netherlands	NLD
LSO	Lesotho	3	7.5	80.0%	United Kingdom*	GBR
GAB	Gabon	10	5.8	15.8%	South Korea*	KOR
CPV	Cape Verde	3	5	100.0%	Portugal*	PRT
COD	Congo DRC	2	5	80.0%	Belgium	BEL

SLE	Sierra Leone	3			N/A	
TCD	Chad	2			N/A	
CAF	The Central African Republic	3			N/A	
GNQ	Equatorial Guinea	5			N/A	
AGO	Angola	1			N/A	
COM	Comoros	1			N/A	
LBR	Liberia	1			N/A	
SOM	Somalia	10			N/A	
STP	Sao Tome and Principe	1			N/A	

Note 1: Aggressiveness measures presented in column (3) may be misleading for countries with less than three treaties (see column (2)).
Note 2: Where N/A is shown on column (5), this indicates all of the African countries' treaties are homogeneous and no treaty partner appears as aggressive.
(*) These countries provide complete relief from double taxation in the absence of a treaty (unilateral credit or exempt treatment for foreign-source dividends, interest and royalties). Cancelling or suspending the application of a treaty with these countries poses little or no risk of double taxation.
(¤) As measured with Model1-IBFD: France and Norway are equally aggressive towards **Benin**; China and Ireland are equally aggressive towards **Botswana**; Gabon and Equatorial Guinea are equally aggressive towards **Cameroon**; Morocco and Portugal are equally aggressive towards **Côte d'Ivoire**; Ireland, Cyprus, Seychelles and Singapore are equally aggressive towards **Ethiopia**; Iran, Seychelles and the United Arab Emirates are equally aggressive towards **Kenya**.

Table A3.3 Most disadvantageous treaties for each African country according to Model 2-IBFD (domestic/treaty rates)

The table below yields results from a model based exclusively on withholding rates (both domestic and treaty rates). Thus, amendment or cancellation of treaties mentioned therein should be considered together with transaction data that the administration holds with respect to passive investment flows. To redress the aggressive aspects of treaties mentioned below, negotiating teams should consider the relative aggressiveness corresponding to different payment types (dividends, interest and royalties). Finally, as we discussed in this work, a number of provisions over and above withholding rates are of great importance for protecting source tax rights. Thus, careful consideration of PE and Other provisions is advised (see Appendix 2 Variables included in the Source Index dataset).

(1)		(2)	(3)	(4)	(5)	
African country (excl. Mauritius and Seychelles)		Total # of treaties of African country	Intensity of agg. of this particular treaty	Share of total agg. received by this African country	Principal aggressor (most aggressive treaty partner of African country)	
MOZ	Mozambique	8	50	20.3%	United Arab Emirates*	ARE
SLE	Sierra Leone	3	50	52.6%	Norway*	NOR
DZA	Algeria	35	49.4	5.9%	Qatar*	QAT
ZMB	Zambia	22	47.5	11.7%	Tanzania*	TZA
GIN	Guinea	3	40	55.2%	United Arab Emirates*	ARE
TUN	Tunisia	55	39.6	5.1%	Mauritius*	MUS
ZAF	South Africa	79	33.8	2.5%	Netherlands	NLD
MLI	Mali	12	31.6	13.2%	Russia*	RUS
COG	Congo, Rep.	5	30.8	29.1%	Mauritius*	MUS
MWI	Malawi	5	30	38.7%	United Kingdom*	GBR
LSO	Lesotho	3	28.8	40.4%	United Kingdom*	GBR
EGY	Egypt	61	27.5	3.7%	India*	IND
SEN	Senegal	23	27.5	12.2%	United Arab Emirates*	ARE
TCD	Chad	2	27.5	50.0%	Equatorial Guinea ¤	GNQ
UGA	Uganda	9	26.2	18.9%	Netherlands	NLD
TZA	Tanzania	9	26.2	72.4%	Zambia*	ZMB
BFA	Burkina Faso	9	21.9	40.3%	Tunisia	TUN
TGO	Togo	8	20	36.4%	France	FRA
CPV	Cape Verde	3	20	57.1%	Portugal*	PRT
STP	Sao Tome and Principe	1	20	100.0%	Portugal*	PRT
COD	Congo DRC	2	18.8	55.6%	Belgium	BEL
SWZ	Eswatini	5	18.8	30.6%	Mauritius*	MUS
CIV	Cote d'Ivoire	18	17.5	9.8%	Portugal*	PRT
GMB	Gambia	6	17.5	24.3%	United Kingdom*	GBR
SDN	Sudan	22	17	16.0%	United Arab Emirates*	ARE
NER	Niger	8	16	69.6%	France	FRA
CAF	Central African Republic	3	15	33.3%	France ¤	FRA
MAR	Morocco	56	12.5	6.1%	United Arab Emirates*	ARE
RWA	Rwanda	5	12.5	35.7%	Belgium	BEL
BEN	Benin	9	12	50.0%	Norway* ¤	NOR
NGA	Nigeria	15	11.9	30.2%	Spain*	ESP

GHA	Ghana	11	11	14.8%	Netherlands ¤	NLD
NAM	Namibia	10	10	14.0%	Russia* ¤	RUS
GNQ	Equatorial Guinea	5	10	20.0%	Central African Republic ¤	CAF
GNB	Guinea-Bissau	8	10	22.2%	Portugal*	PRT
GAB	Gabon	10	10	14.3%	Congo, Rep. ¤	COG
CMR	Cameroon	6	10	39.2%	Gabon ¤	GAB
MDG	Madagascar	2	7.5	100.0%	Mauritius*	MUS
KEN	Kenya	15	7.5	13.4%	India* ¤	IND
ETH	Ethiopia	23	7.5	8.7%	Singapore* ¤	SGP
ZWE	Zimbabwe	15	4.6	47.8%	Kuwait*	KWT
BWA	Botswana	14	2.5	50.0%	China*	CHN
MRT	Mauritania	14			N/A	
LBY	Libya	21			N/A	
LBR	Liberia	1			N/A	
AGO	Angola	1			N/A	
COM	Comoros	1			N/A	
SOM	Somalia	10			N/A	

Note 1: Aggressiveness measures presented in column (3) may be misleading for countries with less than three treaties (see column (2)).
Note 2: Where N/A is shown on column (5), this indicates all of the African countries' treaties are homogeneous and no treaty partner appears as aggressive.
(*) These countries provide complete relief from double taxation in the absence of a treaty (unilateral credit or exempt treatment for foreign-source dividends, interest and royalties). Cancelling or suspending the application of a treaty with these countries poses little or no risk of double taxation.
(¤) As measured with Model2-IBFD: Norway and France are equally aggressive towards **Benin**; Equatorial Guinea and Gabon are equally aggressive towards **Cameroon**; Equatorial Guinea, France and Gabon are equally aggressive towards the **Central African Republic**; Equatorial Guinea and Gabon are equally aggressive towards **Chad**; Cameroon, Central African Republic, Chad, Congo Rep. and Gabon are equally aggressive towards **Equatorial Guinea**; Ireland, Cyprus, Seychelles, Singapore, Saudi Arabia and Kuwait are equally aggressive towards **Ethiopia**; Cameroon, Central African Republic, Chad, Congo Rep. and Equatorial Guinea are equally aggressive towards **Gabon**; the Netherlands and Denmark are equally aggressive towards **Ghana**; UAE, Iran, Seychelles, Qatar, South Africa and India are equally aggressive towards **Kenya**; Germany, United Kingdom, Malaysia, Mauritius and Russia are equally aggressive towards **Namibia**.

Table A3.4 Most disadvantageous treaties for each African country according to Model 4-ICTD (Source Index)

The table below yields results from a model based on three types of treaty provisions (see Appendix 2 Variables included in the Source Index dataset). Thus, amendment or cancellation of treaties mentioned therein should be considered together with tax residency and transaction data that the administration holds. In order to redress the aggressive aspects of treaties mentioned below, negotiating teams should consider the relative aggressiveness corresponding to different types of provisions (PE, WHT and Other treaty provisions). Also, when considering the cancellation of a treaty, the domestic legal environment should be taken into account, as potential loopholes or gaps in tax assessment might need to be addressed to produce a positive revenue effect.

(1)		(2)	(3)	(4)	(5)	
African country (excl. Mauritius and Seychelles)		Total # of treaties of African country	Intensity of agg. of this particular treaty	Share of total agg. received by this African country	Principal aggressor (most aggressive treaty partner of African country)	
EGY	Egypt	61	1	6.8%	Austria*	AUT
GIN	Guinea	3	1	63.8%	France	FRA
DZA	Algeria	35	0.9	10.9%	Spain*	ESP
LBY	Libya	21	0.9	16.9%	Singapore*	SGP
KEN	Kenya	15	0.9	17.4%	South Korea*	KOR
SWZ	Eswatini	5	0.9	62.5%	United Kingdom*	GBR
GNB	Guinea-Bissau	8	0.8	100.0%	Portugal*	PRT
MAR	Morocco	56	0.8	5.1%	Germany*	DEU
BEN	Benin	9	0.8	81.0%	Norway*	NOR
ZAF	South Africa	79	0.8	4.2%	Netherlands	NLD
BWA	Botswana	14	0.8	27.8%	China*	CHN
SDN	Sudan	22	0.7	17.3%	Turkey*	TUR
NAM	Namibia	10	0.7	26.0%	Germany*	DEU
TZA	Tanzania	9	0.7	20.0%	Zambia*	ZMB
MOZ	Mozambique	8	0.7	39.5%	Italy*	ITA
TUN	Tunisia	55	0.6	5.3%	Mauritius*	MUS
SEN	Senegal	23	0.6	15.1%	Italy*	ITA
ZMB	Zambia	22	0.6	13.9%	Japan*	JPN
MLI	Mali	12	0.6	35.9%	Tunisia	TUN
MDG	Madagascar	2	0.6	100.0%	Mauritius*	MUS
GMB	Gambia	6	0.6	38.5%	Switzerland	CHE
CMR	Cameroon	6	0.6	49.4%	France	FRA
BFA	Burkina Faso	9	0.5	86.3%	Tunisia	TUN
NGA	Nigeria	15	0.5	15.3%	China*	CHN
UGA	Uganda	9	0.5	31.1%	United Kingdom*	GBR
COG	Congo, Rep.	5	0.5	83.1%	Mauritius*	MUS
ZWE	Zimbabwe	15	0.5	13.1%	France	FRA
MRT	Mauritania	14	0.5	17.8%	Senegal	SEN
RWA	Rwanda	5	0.4	48.3%	Singapore*	SGP
GAB	Gabon	10	0.4	47.0%	France	FRA
LSO	Lesotho	3	0.4	44.2%	United Kingdom*	GBR
GHA	Ghana	11	0.4	22.6%	Switzerland	CHE

COD	Congo DRC	2	0.4	100.0%	Belgium	BEL
MWI	Malawi	5	0.4	31.6%	Switzerland	CHE
ETH	Ethiopia	23	0.4	10.7%	China*	CHN
CPV	Cape Verde	3	0.3	62.5%	Mauritius*	MUS
CIV	Cote d'Ivoire	18	0.3	13.0%	Tunisia	TUN
NER	Niger	8	0.2	87.0%	France	FRA
SLE	Sierra Leone	3	0.2	80.0%	United Kingdom*	GBR
TGO	Togo	8	0.2	87.0%	France	FRA
SOM	Somalia	10			N/A	
AGO	Angola	1			N/A	
CAF	The Central African Republic	3			N/A	
COM	Comoros	1			N/A	
GNQ	Equatorial Guinea	5			N/A	
LBR	Liberia	1			N/A	
STP	Sao Tome and Principe	1			N/A	
TCD	Chad	2			N/A	

Note 1: Aggressiveness measures presented in column (3) may be misleading for countries with less than three treaties (see column (2)).
Note 2: Where N/A is shown on column (5), this indicates all of the African country's treaties are homogeneous and no treaty partner appears as aggressive.
(*) These countries provide complete relief from double taxation in the absence of a treaty (unilateral credit or exempt treatment for foreign-source dividends, interest and royalties). Cancelling or suspending the application of a treaty with these countries poses little or no risk of double taxation.

3.4 Jurisdictions per region

The list of jurisdictions in our sample per region is:

- EU28: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden, United Kingdom
- China: China
- USA: United States
- GCC: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
- MUS/SYC: Mauritius, Seychelles
- OECD: Australia, Austria, Belgium, Canada, Chile, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Latvia, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, South Korea, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States
- G7: Canada, France, Germany, Italy, Japan, United Kingdom, United States
- G20: Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Mexico, Russia, Saudi Arabia, South Africa, South Korea, Turkey, United Kingdom, United States
- G24: Algeria, Brazil, China, Congo DRC, Cote d'Ivoire, Egypt, Ethiopia, Gabon, Ghana, India, Iran, Kenya, Lebanon, Mexico, Morocco, Nigeria, Pakistan, Philippines, South Africa, Syria
- G77: Algeria, Benin, Brazil, Burkina Faso, Cameroon, Central African Republic, Chad, Chile, Congo DRC, Congo, Rep., Egypt, Ethiopia, Gabon, Ghana, Guinea, India, Indonesia, Iran, Iraq, Jordan, Kenya, Kuwait, Lebanon, Libya, Malaysia, Mali, Mauritania, Morocco, Niger, Nigeria, Pakistan, Philippines, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Sudan, Syria, Tanzania, Thailand, Togo, Tunisia, Uganda, Vietnam, Yemen
- Latam: Brazil, Chile, Mexico
- sink-OFCs: Cyprus, Hong Kong, Jersey, Luxembourg, Malta, Monaco, Taiwan

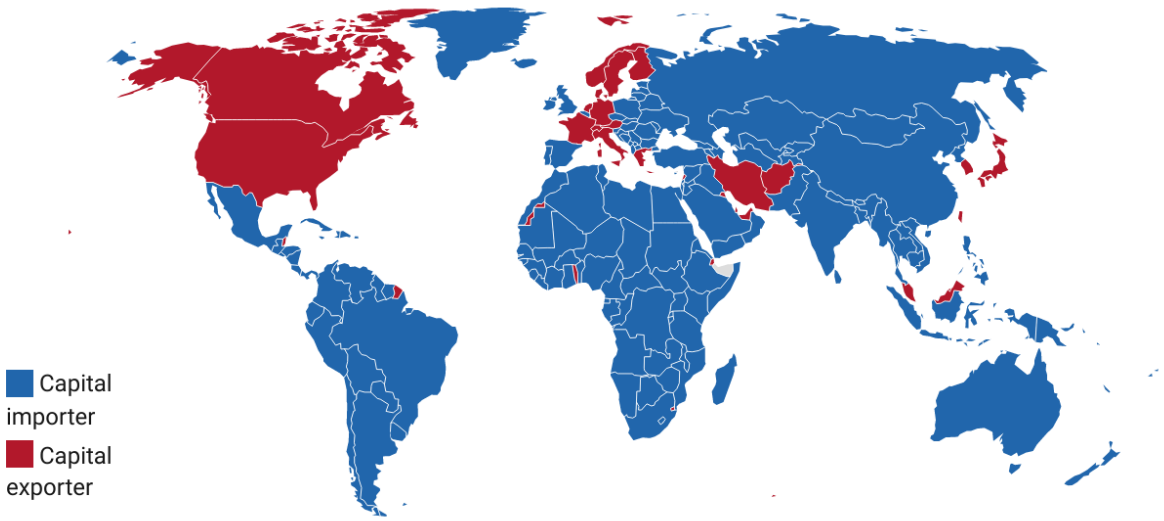

Figure A3.5 Foreign Direct Investment. Data: UNCTAD (World Investment Report, Annex tables 13 and 14)