

FORMULARY APPORTIONMENT FOR THE EXTRACTIVES INDUSTRY: HOW SHOULD RESOURCE RENTS BE TAXED?

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ABSTRACT

In contrast to the current transfer pricing (TP) regime with its arm's length requirement, unitary taxation using formulary apportionment has for many decades been suggested as a more appropriate alternative for allocating income of multinational entities to jurisdictions for the purposes of taxing rights. The concept and application of unitary taxation and formulary apportionment is neither new nor novel, with inter-jurisdictional regimes having been in place around the world for many decades. Scholars such as Sol Picciotto (1992, 2013a, 2017) have long advocated for formulary apportionment at a global level while noting the difficulties that potentially arise in determining appropriate formulary apportionment allocation keys, as well as ensuring that countries of the Global South are not net losers from its application. The same scholars also emphasise that while formulary apportionment at a global level is the gold standard, there are many benefits to a more gradual move towards formulary apportionment within the current international tax regime.

Through the recent work of the Organisation for Economic Co-operation and Development (OECD) and the United Nations (UN), there has been a proposed shift towards formulary apportionment with a focus on ensuring profit allocation is to jurisdictions where economic activity occurs. Economic activity is reflected in the allocation keys that make up the formula and their respective weightings. The biggest challenge to introducing formulary apportionment is global agreement on these allocation keys and their weighting. There are numerous examples of formulas used in domestic regimes as well as proposals at a global level. Generally, formulas consist of a combination of factors such as capital and labour that reflect the origin or source jurisdiction and sales that reflect destination jurisdiction. These formulas, however, may not be suitable for countries in the Global South, especially those that are resource-rich, where such an application results in a large proportion of income being allocated to jurisdictions other than the source country because the formula relies heavily on sales at the destination.

Picciotto (1992, 2013, 2017) has, in several papers, noted the exploitation of natural resources, especially the extraction of minerals, oil and gas, as being critical to the economic development of countries in the Global South, with the main benefit being the tax revenue generated. Corporate income tax, however, is generally found to be disappointingly low, with resource rent taxes producing much higher tax revenues. The above observations lead to two questions in designing a regime that adequately captures the value of natural resources for source countries. The first is whether the extractives industry should be subject to a corporate income tax regime that adopts formulary apportionment using the traditional three-factor formula or should include a fourth 'resource rents' factor. Second, the question arises of where the roles being separate but complementary charges should be imposed. Both questions address the overarching issue of whether the corporate income tax regime should capture a greater proportion of income from the extractives industry or the income should be captured through alternative means.

This article builds on the work of Picciotto and others who have previously highlighted the tensions around a formulary apportionment regime for the extractives industry and, in doing so, focuses on source jurisdiction entitlement concerns in the Global South. It addresses the

questions outlined above and considers the arguments for and against a fourth factor or allocation key, such as a production volume factor or a source-based sales factor that modifies any general apportionment formula and reduces the significant emphasis on sales at the destination and the role of separate charges.

The article ultimately suggests that while economic rents should be taxed separately outside the corporate income tax regime, reform of the corporate income tax system based on unitary taxation and formulary apportionment that addresses the fundamental flaws in the current regime should be undertaken. However, the article also recognises that this top-down approach is one that is difficult to attain and that a pragmatic bottom-up approach, which is being witnessed in the current international tax reform arena, may also benefit resource-rich countries, especially those in the Global South.

1. INTRODUCTION

The extractives industry is one in which sizeable rents generally arise, providing a potentially attractive tax base. Still, it is also an industry dominated by multinational entities (MNEs) highly skilled in profit-shifting arrangements that often face tax assessments by far less resourced revenue authorities in developing countries (IMF, 2012). Despite sizeable rents, it is also generally accepted that countries rich in natural resources often fail to collect a ‘fair share’ of tax revenue from the exploitation of those resources (Hubert, 2017). MNEs in the extractives industry can minimise their tax contributions by shifting profits from the jurisdictions in which natural resources are mined to foreign low-tax jurisdictions through various profit-shifting mechanisms (Baunsgaard and Devlin, 2021). These include intra-firm sales agreements at prices that deliberately reduce reported profits in the source jurisdictions, payments by source jurisdiction-based subsidiaries of excessive marketing fees to related foreign companies, the use of intra-company loans subject to high-interest charges, and financing arrangements known as thin capitalisation that substitutes excessive debt funding for ordinary equity investments (Beer, et al., 2020).

The scale of revenue losses through various profit-shifting techniques is impossible to quantify. However, the OECD reports that revenue losses from tax base erosion and profit shifting (BEPS) is an estimated USD 100 to 240 billion annually across all sectors (OECD, 2017) and that revenue loss from BEPS is substantial for resource-rich developing countries (OECD, 2014). Within the extractives industry, empirical analysis suggests significant profit-shifting risks (Beer and Devlin, 2021). There are, in theory, an array of tools countries can use to counter these profit-shifting arrangements. Some target specific arrangements such as “thin capitalisation” rules, which limit the extent to which foreign investors can substitute interest-bearing loans for equity funding of local subsidiaries. However, the most important measure is a rule found in both domestic tax laws and bilateral tax treaties that allows local tax authorities to substitute the ‘arm’s length’ price for intra-group transactions for the profit-shifting price initially adopted by the MNE. The arm’s length price is based on the price unrelated enterprises would pay for the same transfers of goods or services that were used as the basis for profit-shifting transactions.

In practice, the arm’s length price rule has proved relatively ineffective at preventing profit shifting. Its shortcomings are particularly exposed in transactions involving intellectual property rights where the parties claim the price they have used is an arm’s length price by pointing out there is no comparable independent price that can be used as a benchmark given the unique nature of their intellectual property. In theory, it can be easier to find a ‘comparable’ price in the extractives industry where there is global trade in generic commodities and various public long-term and spot markets that can be used as benchmarks for determining an arm’s length price. In practice, however, it has proved as easy for the extractive industry to shift profits as it has been for other industries (Durst, 2014). While the price of commodities may be known, extractive industry MNEs have successfully found ways to adjust prices using

complex bespoke contractual arrangements¹ and adopted other techniques, such as intra-group loans, to shift profits².

In recent years, some concerned groups have advocated the use of information disclosure through transparency programs to make the public more aware of the profit-shifting activities of MNEs, hoping that the increased disclosure might impact MNE behaviour (ActionAid, 2020). An important initiative in this vein is the Extractive Industries Transparency Initiative (EITI), a program sponsored by a Norwegian-based non-profit body and supported by several governments, companies, and social bodies. There is, however, no evidence that increased exposure has had any impact on profit-shifting activities (Kovermann and Velte, 2021).

An alternative response to profit-shifting advocated by several tax policy experts, including Sol Picciotto, is the replacement of the arm's length system of allocating profits of MNEs with a formulary apportionment regime which would measure the total profits of MNEs and then allocate them to the places where the MNE has the three elements that give rise to profits – inputs that create the goods or services sold by the enterprise and sales that bring in revenue from customers of those goods and services. Under this system, currently used to allocate profits of enterprises operating across sub-national borders in some federal states and proposed for the allocation of profits in the European Union (EU), profits of an MNE are allocated to parts of the enterprise based on their proportion of capital, labour costs and sales of the global groups.

From a purely theoretical perspective, formulary apportionment with unitary taxation is advocated as the gold standard in allocating profits to the jurisdiction of economic activity. However, advocates of formulary apportionment pragmatically recognise that a top-down approach, with the need for global agreement, will be challenging to attain (Weiner, 2007). Consequently, a bottom-up approach whereby jurisdictions unilaterally adopt components of a formal apportionment regime is not without merit. For some time, scholars have recognised that the transition to unitary taxation is already underway (Picciotto and Kadet, 2022) and have further suggested that unilateral moves are also possible and, in some cases, preferable (Durst, 2015).

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¹ See for example, *Federal Commissioner of Taxation v. Glencore Investment Pty. Ltd.* [2020] FCAFC 18. In that case, the taxpayer was the Australian subsidiary of a multinational mining company that had agreed to sell the entire output of its copper mine over the full life of the mine to a related Swiss company. The group had researched all the different pricing arrangements that might be found in genuine arm's length circumstances. The prices that might be determined in these agreements varied widely because each precedent contract was intended to be used in very different circumstances. The agreement between the taxpayer and its related customer allowed the taxpayer to choose the pricing agreement that yielded the lowest profits at the time of the sale and further allowed the taxpayer to change from one agreement to another each month, an arrangement that would never be tolerated in a contract between genuine arm's length partners.

² See for example, *Chevron Australia Holdings Pty Ltd v. FCT* [2017] FCAFC 62. In that case a multinational oil and gas firm that had borrowed funds from genuine arm's length outside financiers. The funds borrowed by the group's finance arm were secured by guarantees and collateral from the very well-endowed group and thus bore a very low interest rate. The finance arm then on-lent a portion of the borrowed funds to the group's Australian subsidiary at an interest rate many multiples of the actual cost of funds, justifying the higher rate by the conditions attached to the internal loan and most significantly, the absence of all the guarantees and securities provided by the group to obtain the original loan from outside financiers. The Australian High Court settled on an interest rate about halfway between the true cost of funds to the group and the exorbitant rate charged by one group company on the loan to another group company.

It is unclear whether this shift to formulary apportionment would notably impact the revenues of countries with a significant presence of extractives industries. The massive profits of MNEs in the resource sector result from the large, and sometimes enormous, gaps between the price they pay for the commodities they extract and the price they can command from their customers. The significant profit attributable to their ability to buy commodities they extract for a value far below the selling price is commonly referred to as ‘resource rents’. However, a formulary apportionment system might not greatly increase the portion of the resource rents allocated to the country hosting an extractive industry for tax purposes. Labour costs are a relatively low contributor to costs, given the high level of mechanisation in the industry. Also, wages in developing economies exporting natural resources are low compared to those paid personnel in other parts of the enterprise, such as those performing head office functions. The sales factor would yield no share of profits for the extractive jurisdiction as almost all, if not all, customers will be abroad. Given the high cost of specialised capital equipment, the capital factor may have an impact, but the portion found in any one jurisdiction is unlikely to be significant.

In light of the likely inability of a conventional formulary apportionment regime to capture an adequate portion of the resource rents enjoyed by MNE resource enterprises, some commentators have called for the adoption of a modified formulary apportionment system that incorporates a fourth factor in the allocation formula, incorporating resources that give rise to resource rents such as special extraction factors ((Matheson, et al, 2021; Siu, et al, 2017). In effect, the fourth factor seeks to recapture for the source state some of the profits attributable to the large gap between the price paid by the MNE for exploiting natural resources and their actual value to customers.

This article builds on the work of Picciotto and others who have previously highlighted the limitations of a conventional formulary apportionment regime in the allocation of profits that include large resource rents and proposals for adding a fourth factor to the formula to address those limitations. It considers the nature of resource rents and the optimal method for capturing a share of the benefit of those rents, reviewing two options: adoption of unitary taxation and a four-factor formulary apportionment regime to replace the current arm’s length allocation system and modification of the pricing system used for the sale of natural resources to MNEs so that the initial return to the source state better reflects the market value of the natural resources. The article ultimately suggests that while economic rents should be taxed, it goes further by arguing for a reform model for the corporate income tax system based on unitary taxation and formulary apportionment that addresses the fundamental flaws in the current regime. However, it also recognises that wholesale reform would be difficult to achieve, and many elements of a formulary apportionment regime may also assist the Global South in collecting a greater share of corporate tax revenues (Durst, 2015). Prior to these considerations, the following section of the article provides a short overview of formulary apportionment and the nature of resource rents.

2. FORMULARY APPORTIONMENT AND THE NATURE OF RESOURCE RENTS

A fundamental principle of international tax law is that countries have the right to tax income sourced within their jurisdiction. However, under the current international tax regime, this right is often given up or reduced through the notion of the permanent establishment (PE) in tax treaties. Through the operation of treaties and the notion of the PE, it is well known that this limitation in the right to tax has not resulted in a system that provides an adequate way to tax the extractives industry in the source country. Proposals for international tax reform generally

recognise the justification for having a special fiscal regime for the extractives industry based on location-specific economic rents from non-renewable resources (Baunsgaard and Devlin, 2021). However, to date, there is no consensus on what industry-specific reforms may look like.

The problems associated with the TP regime with its arm's length requirement are well known (Picciotto, 2018). The current international tax regime for allocating taxing rights over profits - the TP regime - is based on the fiction that MNEs operate in different jurisdictions as separate and independent parts rather than a single or unitary entity. The TP regime requires transactions between different parts of the entity to be priced at arm's length, an often impossible task due to the lack of genuine arm's length comparables. As Hellerstein (1983) explains, "Separate accounting operates in a universe of pretense; as in Alice in Wonderland, it turns reality into fancy, and then pretends it's in the real world." This is a regime that has been in place for nearly a century and remains embedded in OECD guidance on TP and domestic regimes globally.

Given the flaws in the current regime, an alternative, which is used in subnational systems, is known as formulary apportionment and is often combined with unitary taxation. Formulary apportionment is typically advocated for on the basis of a unitary taxation system. That is, MNEs are treated as a single entity with local branches and subsidiaries ignored. However, formulary apportionment can operate more conservatively in the traditional international tax system by using a formula, for example, to allocate super profits, such as the current Pillar One proposal of the OECD. Formulary apportionment has, for many decades, been suggested as a more appropriate alternative for allocating the income of multinational entities to jurisdictions for the purposes of taxing rights. When formulary apportionment is used to allocate profits under a unitary taxation system, it is a regime that recognises the true nature of the firm, one of a unitary corpus, that maximises the overall profits of the global entity. Currently, TP assists MNEs to increase their after-tax profits by facilitating the transfer of funds from high-tax to low-tax jurisdictions. On the other hand, formulary apportionment ignores internal transactions as it considers the MNE to be a single or unitary entity. It then allocates profits based on factors or allocation keys representing the underlying economic activity or factors producing profits.

The concept and application of formulary apportionment is neither new nor novel, with inter-jurisdictional regimes having been in place around the world for many decades. Scholars such as Sol Picciotto (1992, 2013a, 2017) have long advocated for formulary apportionment at a global level while noting the difficulties that potentially arise in determining appropriate formulary apportionment allocation keys, as well as ensuring that countries of the Global South are not net losers from its application.

Formulary apportionment is argued to be a superior model for two overarching reasons. First, it recognises the unitary nature of the MNE. That is, global firms operate as one entity, and by internalising transactions, there are cost savings that result in an advantage over firms operating as independent entities (Coase, 1937). These cost savings are purely attributable to the firm as a whole rather than the separate parts of the entity, a fundamental premise built into a formulary apportionment regime. Second, economic activity is more accurately reflected under a formulary apportionment regime to allocate taxing rights over profits as the activity is reflected in the allocation keys that make up the formula along with their respective weightings. To this extent, industries have different factors and contributions impacting their overall profits. Arguably, with its resource-intensive nature, the extractives industry is one such industry.

In several papers, Picciotto (1992, 2013a, 2017) has noted the exploitation of natural resources, especially the extraction of minerals, oil, and gas, as being essential to the economic development of countries in the Global South, with the main benefit being the tax revenue

generated. Corporate income tax, however, is generally found to be disappointingly low, with resource rent taxes producing much higher tax revenues. It is recognised that the use of tax incentives, treaties, and government agreements with the extractives industry participants also contributes to the low amount of revenue raised, and these factors cannot be dismissed. Further, the domestic corporate tax rate plays a large part in the amount of revenue an individual country raises. However, the question addressed in this paper is not how much revenue is raised but rather whether the current regime adequately captures the value of natural resources for source countries. If the allocation of taxing rights over profits for the purposes of corporate income tax is to move towards a formulary apportionment regime, the question becomes one of the design of the formula itself, that is, the allocation keys and their relative weightings.

Through the recent work of the OECD and the UN, some argue that there has been a proposed shift towards formulary apportionment focusing on ensuring profit allocation to jurisdictions where economic activity occurs. It has been suggested that the OECD, with its ‘Two-Pillar Solution to Address the Challenges Arising from the Digitisation of the Economy,’ is moving towards reform that takes a more unitary approach to the taxation of MNEs. In particular, it is argued that the OECD is going some way towards introducing a formulary apportionment regime through its work on Pillar One, dealing with the tax challenges of the digitisation of the economy (OECD 2020, OECD 2022). However, it is a conservative proposal that retains the arm’s length pricing requirement with only a residual amount allocated on a formula basis to market jurisdictions.

Further, noticeable exceptions from Pillar One are the extractives and regulated financial services industry, which are deemed out of scope. Given that the extractives industry is excluded from any ongoing work of the OECD, there is an underlying assumption that the TP regime, with its arm’s length requirement, is adequate. Many suggest this is far from the case, and proponents of formulary apportionment advocate that many of the flaws in the current system could be overcome with a unitary taxation approach. Pillar Two, on the other hand, which imposes a global minimum effective tax rate of 15 percent, does capture the extractives industry and goes some way towards recognising that MNEs are a unitary body. However, Pillar Two is not a profit allocation rule, nor does it prevent transfer mispricing and aggressive tax planning; rather, it is a mechanism designed to ensure a global minimum tax on the profits of an enterprise. It also remains unclear whether those implementing the Pillar Two reforms will be net beneficiaries or losers from its implementation (Redhead and Lassourd, 2021). Ultimately, Pillars One and Two do not replace the traditional separate entity approach but rather build on existing principles.

As noted, the OECD excludes the extractives industry in its Pillar One Blueprint. More accurately, it excludes the types of activities that are considered to involve natural resources, defined as including ‘non-renewable extractives (such as petroleum and minerals), renewables (such as agricultural, fishery and forestry products) and renewable energy products and similar energy products (such as biofuels, biogas, green hydrogen)’ (OECD, 2020, p.47). The extractives industry is part of this category, with extractive businesses defined as ‘those engaged in the exploration for, and extraction from the earth’s crust of, non-renewable natural resources such as hydrocarbons and minerals, the processing and refining of those resources into usable commodities, and the sale of those commodities’ (OECD, 2020, p.47).

The extractives industry is excluded on the basis that ‘taxes on profits from the extraction of a nation’s natural resources can be considered to be part of the price paid by the exploiting company for those national assets, a price which is properly paid to the resource owner.’ (OECD, 2020, p.47). Further rationale for excluding natural resources is provided on the basis

that ‘as natural products of the earth, all are closely linked with the place of production and quality is highly dependent on location-specific factors. Due to local environmental impacts, including the sustainability of the resource itself, production is usually regulated in the local jurisdiction.’ (OECD, 2020, p.47). Also highlighted as an argument against the inclusion of these businesses and claimed as a rationale for exclusion is ‘the close connection with the place where the resources are found and transformed (reflected in current tax treaty treatment of immovable property); the capital intensity of their production; and the high volume of the products used as raw materials in other industries.’ (OECD, 2020, p.47).

While justification is provided for excluding the extractives industry from Pillar One, no alternative solution is offered resulting in a reversion to the default position to the current arm’s length TP regime. However, resource-rich countries in the Global South are missing out on their fair share of tax revenue (Johannesen, et al., 2020). Estimates suggest that developing countries are losing more than US 200 billion a year across all sectors (Crivelli et al., 2015), with losses in the extractives industry sector being a significant contributor due to profit-shifting techniques such as TP and treaty shopping (Danso et al., 2020). The rationale for excluding the extractives industry from Pillar One, emphasising the resource owner, close links with the place of production, and high dependency on location-specific factors, provides insight into the primary considerations in designing a suitable corporate income tax regime for this industry.

While Pillar One does not offer a solution for taxing the extractives industry, it is well-recognised that applying the traditional TP regime results in significant challenges. However, the extractives industry is one where applying the traditional arm’s length price is often seen as simple because it is perceived as difficult for MNEs to move activities from resource-rich countries, which are a crucial part of their value creation process. This is because the raw materials in the ground are immobile. However, such an argument is flawed, yet, ‘Remarkably little attention has been given in leading international transfer pricing guidelines to issues or examples involving extractive industries.’ (Shay, 2016, p42).

Perhaps the most notable contribution to a discussion on the difficulties of taxing the extractives industry is found in the UN *Handbook on Select Issues for the Taxation of the Extractive Industries in Developing Countries* (UN, 2017). The UN devotes a chapter to TP and lists five separate problematic issues – (1) Fragmentation of the supply chain and ability to locate functions in order to allocate profits to Marketing/procurement companies or branches and offshore hedging companies; (2) fragmentation of transactions (i.e., where MNEs enter into convoluted structures involving the inter-positioning of multiple companies, generally in low-tax jurisdictions (splitting out of functions and risks to divide profits); (3) thin capitalisation; (4) intra-group charges (e.g., technical fees and management fees); and (5) taxpayers using offshore marketing companies to divide profits, arguing that they are securing demand through customer relationships, ‘smart contracting’ and high-quality services – all of which are key to placing products in the market and to overall value creation (UN, 2017).

Even before MNEs adopt the strategies above, determining an arm’s length price for related-party transactions is nearly impossible. There is a perception that the market drives prices for natural resources, and those prices are publicly available for use in any related-party transaction. However, in nearly all cases, the initial sale of the extracted product is to a related-party where the affiliate engages in further processing or other activity, thereby posing opportunities (and risks) for the shifting of profits between the parties. To the uninitiated, published indices would appear to determine the sales price straightforwardly (Shay, 2016,

p51). Yet, this is far from the case, with numerous complex factors, such as quality, driving different prices.

3. DESIGNING AN INTERNATIONAL FORMULA FOR THE EXTRACTIVES INDUSTRY

A formulary apportionment model that applies to a specific industry requires an adequate definition of the market sector and the activities that fall within that sector with considerations at both sector and entity levels. At a sector level, the extractives industry is generally easily defined based on economic and commercial factors, with definitions already contained in related legislative regimes, for instance, where there are resource rent taxes and/or international accounting and disclosure regimes. For example, the United States' (US) Dodd-Frank Act, the EU Accounting and Transparency Directive, and the EITI, all broadly define what is included in the extractives industry (Matheson, et al, 2021, p.298). Also, at a sector level, there is the problem of determining the scope of activities. Many businesses are multifaceted and provide a range of different products and services that may be outside what is typically considered part of an industry so defined. Again, this is easier with the extractive industry than with many other business sectors.

At an entity level, the unitary business needs to be defined to ascertain which parts of the enterprise fall within the business' scope for the purposes of applying a formulary apportionment model for income tax purposes (Sadiq, 2020). These questions are labelled 'scope of group' and 'scope of business activities' questions. Again, the extractive industries market sector poses fewer challenges in this determination than other, more modern enterprises. 'Scope of group' requires an understanding of the unitary business. This can be done first by way of business activities with jurisdictions able to claim a nexus to tax where activities are performed within the jurisdiction without consideration of any form of legal affiliation such as a branch or subsidiary. Alternatively, the scope of the tax base can be defined by more traditional means, with a determination of the commonly controlled group, taking into account subsidiaries and affiliates. For the extractives industry, adopting the latter, being the traditional model of determining the tax unit, will unlikely pose problems.

Additionally, an appropriate nexus rule is needed. The current international tax regime, with its adoption of the concept of the PE, ensures there is a taxing right for jurisdictions where a threshold is met in terms of physical activities in that location. The concept of a taxable connection or jurisdictional nexus is no less important in a formulary apportionment regime. However, the nexus in any formulary apportionment model generally focuses on the presence of allocation keys in a jurisdiction rather than a physical presence. This is particularly significant where a sales-at-destination factor is used. To this end, significant economic activity, however defined, is generally the threshold for taxing rights, with sales considered a strong indicator of business activity. Within the extractives industry, establishing a nexus is unlikely to cause controversy for genuine activities such as the physical extraction process in the source jurisdiction. Once a jurisdiction is considered to have a right to tax, formulary apportionment simply allocates the amount a jurisdiction can tax and does not interfere with tax sovereignty. A jurisdiction can continue to provide tax incentives such as subsidies and tax holidays, which are common in the extractives industry.

It is generally accepted that defining the business and determining a nexus have workable solutions. However, the most controversial aspect of any formulary apportionment model is the formula itself - the factors or allocation keys that make up that formula and their weightings - as global profits are allocated to jurisdictions based on a predetermined formula where different formulas have altered effects on a jurisdiction's tax base. Such a regime needs to be

sustainable for all stakeholders, specifically governments and the MNEs themselves. Undoubtedly, the global distribution of an MNE's consolidated income would be susceptible to the apportionment factors or allocation keys and the relative weightings applied to each (IMF, 2019). Sound policy design consequently requires an analysis of the various options. Each factor is designed to act as a proxy for economic activity either in the jurisdiction of origin or jurisdictions of destination. All internal transactions are ignored, as are any legal entity constructs such as the subsidiary or PE. Worldwide income is determined according to an agreed accounting method, and then a proportion is allocated to each jurisdiction that meets the requisite nexus.

A traditional three-factor, equally weighted formula of capital, labour, and sales is often the starting point for determining the appropriate proxies for economic activity. Capital and labour factors represent contributions in the origin jurisdiction, whereas the sales factor represents activity in the destination jurisdiction. However, a traditional formula such as this is often considered one that fails to adequately proxy for activity within certain industries, and a specific formula may be required (Picciotto, 2013b). Academics and civil society groups have attempted to demonstrate the different effects of various formulas but generally fail to provide any certainty (see, for example, Cobham, et al (2021); Cobham and Loretz (2014)). There is simply an inability to model the likely impact of formulary apportionment and the differing effects that alternative allocation keys and their combinations and weightings have on income and, therefore, taxing rights allocation because MNEs do not provide sufficient data to do so. For example, data on sales at the destination is almost impossible to ascertain, so proxies are often used, which distort results (Devereux and Loretz, 2008) and problems acknowledged in the literature (Oestreicher and Koch, 2011). This article, however, does not attempt to demonstrate the difference formulary apportionment would make in terms of global or jurisdictional revenue, instead, it provides a policy rationale for formulary apportionment in the extractives industry along with recommendations for a justifiable formula.

The greatest challenge for the extractives industry in applying a standard formula is the significant emphasis placed on the sales at destination factor. There are two obvious ways to address this issue. The first is either a differently weighted formula or a fourth factor that considers production volume, extraction, or a source-based sales factor (Siu, et al, 2017). This fourth factor may measure business activity in the sector more accurately than the standard formula. The second is to use the standard formula for corporate income tax purposes with a greater emphasis on levies, recognising that such an approach allocates profits to the location of the sales (destination).

The rationale for an industry-specific formula is found in the unique qualities of the relevant industry. Numerous qualities in the extractives industry separate it from other types of multinational businesses. Large, foreign-owned and vertically integrated firms often dominate the industry. These firms exploit natural resources which are location-specific and immovable resources. This often occurs in developing countries where private producers negotiate with governments to extract non-renewable resources. In turn, this results in the relevant government having rights that entitle it to economic rent. Often, because natural resources are viewed as national assets and state-owned, there is a community expectation that the private producers are being taxed at a rate above other corporate taxpayers.

The business of the extractives industry is also fundamentally different from other types of businesses. The scale of upfront investment, the timelines of projects, and the potential for super-profits suggest that a different tax system is required (Hubert, 2017). The result is that, to date, the focus of tax revenue has been on levies rather than corporate income tax, with the

latter tending to raise very little tax and the former being an additional charge. Ultimately, there could be an industry-specific formula. However, the decision to adopt such an approach would not be without controversy and would require a decision as to what form that specific formula should take.

The biggest challenge to the introduction of formulary apportionment, in general, is often suggested to be global agreement on the allocation keys and an appropriate weighting of each within the formula. The argument put forth is that without an agreement, countries have incentives to structure their formula to capture larger profits, leading to double taxation. However, such a global agreement is neither necessary (Avi-Yonah and Benshalom, 2011) nor will it necessarily result in a regime that misallocates taxing rights. Currently, each nation determines its tax base, and taking into account concessions and exemptions, for example, this will continue. Further, the US system is an example of an effective formulary apportionment regime where different states apply different formulas. As such, while international agreement on a formula is ideal, it is far from necessary.

No doubt the case would be put forward that global agreement would be further complicated by the fact that it can be hard to determine where value is added in the supply chain (Baunsgaard and Devlin, 2021), making it challenging to determine allocation keys and moving to an industry-specific formula would add significantly to the complexity of a unitary tax regime. However, there are numerous examples of general formulas used in domestic regimes as well as proposals (e.g., Business in Europe: Framework for Income Taxation (BEFIT) and previously Common Consolidated Corporate Tax Base (CCCTB) at a global level. Generally, formulas consist of a combination of factors such as capital and labour that reflect the origin or source jurisdiction and sales that reflect the destination jurisdiction. These formulas may not be suitable for countries in the Global South, especially those that are resource-rich, where such an application results in a large proportion of income being allocated to jurisdictions other than the source country because the formula relies heavily on sales at destination.

Subnational regimes provide examples of different formula approaches in terms of both factors and weightings. The US system, perhaps the most well-known of the jurisdiction-based regimes, has, over the years, included a range of factors such as physical or intangible assets, employment, sales, manufacturing costs, purchases, expenditure for labour, accounts receivable, net cost of sales, capital assets, and stock of other companies (Weiner, 1996). All current formulas adopt a combination of some or all factors of property, payroll, and sales.

Historically, the Massachusetts three-factor formula, consisting of equally weighted tangible property, payroll expense, and sales revenue factors, was the one used. Currently, greater emphasis is placed on sales, either by double-weighting the sales factor or adopting a single sales factor formula (Durst, 2013). Also often used in formulary apportionment studies is the EU's proposed CCCTB, which adopts a three-factor equally weighted formula with the allocation keys of labour, assets, and sales. The labour factor in this formula is not merely based on the payroll but is calculated based on an equal weighting between payroll and the number of employees.³ Canada is an often-cited example of a standard two-factor formula of payroll and sales.

Each formula for the US, Canada, and the proposed CCCTB for the EU contain modifications for various regimes. As such, the need to adapt a standard formula has already been recognised

³ On 18 May 2021, the European Commission presented a renamed and revised proposal for the CCCTB known as Business in Europe: Framework for Income Taxation (BEFIT). It is expected that the BEFIT proposal will be similar to CCCTB.

in subnational regimes where unique characteristics of particular regimes are recognised in the adopted formula. The two examples commonly provided are the financial sector and the extractives industry.

The literature, along with existing and proposed regimes, suggests that there is still doubt as to whether a traditional formula is suitable for the extractives industry or whether a sector-specific formula is required (Siu, 2017; Sadiq, 2020; Matheson, et al, 2021, p.298). However, more recent literature (Matheson, et al, 2021, p.298) suggests that the extractives industry is recognised as requiring an alternative formula to any standard one adopted due to the immobile and exhaustible natural resource assets that can generate substantial rents. To that extent, design options from existing regimes are offered. Surprisingly, Canada does not vary its formula from the standard payroll and destination-based sales for the extractives industry. The result is that the revenue of resource-rich provinces is reduced by applying the formula (Matheson, et al, 2021, p.297). However, it is recognised that Canada's equalisation payments mitigate the effects somewhat (Siu, et al, 2017, p.12).

In contrast to Canada, the US does have special formulary apportionment provisions for the extractives industry. Most notably, Alaska varies the standard formula. In Alaska's case, *'The mining sector apportionment follows the general three-factor formula of sales, property, and payroll, while the oil, gas, and pipeline sector tax base is apportioned by a formula based on sales (including tariffs), property, and an extraction factor, consisting of the total production of barrels of oil plus 1/3 Mcf of natural gas. If the taxpayer is engaged in all three subsectors (oil, gas, and pipelines), the formula factors are sales, property (including intangible drilling and development costs), and the extraction factor. If the taxpayer is not involved in the production of oil and gas or gas only, the formula factors are property and sales. If the taxpayer is not involved in the pipeline transport of oil or gas, the formula factors are property and extraction.'* (Siu, et al, 2017, p.12). Perhaps the most straightforward variation within part of the extractives industry is the originally proposed CCCTB, which provides for a sector-specific formula for the petroleum sector in which sales are attributed to the place of extraction and production rather than consumption. To date, it is unknown whether the BEFIT proposal will provide alternative industry-specific formulas.

Mining is not only a significant contributor to the revenue of resource-rich countries but is also characterised by high fixed costs, considerable economies of scale, and high price volatility. Mining revenues are crucial for resource-rich governments to finance expenditures on health, education, and other welfare schemes. These revenues channel subsoil natural resource wealth into monetary returns benefiting local communities. Corporate taxes paid by mining multinationals do not generate commensurate revenues, especially in resource-rich countries, because of tax-motivated income shifting. According to Beer and Loerprick (2017), oil and gas firms engage in more aggressive profit-shifting than those operating in the manufacturing sector. Incomes in the oil and gas sector are also susceptible to domestic profit shifting, where firms engage in cross-sector income-shifting activities within a country. Therefore, the current corporate taxation system has led to legal but artificial tax avoidance in the case of mining multinationals, and this part of the paper focuses on whether formulary apportionment can allocate corporate tax revenues to resource-rich countries.

4. MODIFICATION OF THE PRICING SYSTEM USED FOR THE SALE OF NATURAL RESOURCES

It has already been noted that corporate income taxes are often inadequate in taxing the actual value of a country's natural resources, with the regime becoming increasingly vulnerable to base erosion (Durst, 2014). The problems associated with the current international tax regime

embedded in the corporate income tax system can also be somewhat mitigated by jurisdictions through the use of charges beyond the corporate income tax regime (Siu, et al 2017). However, this requires charges to adequately capture economic rents if a country wishes to charge effectively for the extraction of its natural resources. Assets are being depleted, and governments generally wish to generate returns to compensate for that depletion's value (ActionAid, 2020). For investors, however, there are significant upfront costs, subject to high risk, associated with extractives industry projects prior to income generation (ActionAid, 2020). The question then becomes one of the ideal model for capturing economic rents.

Today, governments worldwide tend to impose a mix of corporate income taxes and royalties to capture economic rent (Durst, 2016). In fact, Picciotto (2013b) argues that for extractive industries, in particular, corporate taxes must be supplemented by rent taxation, using royalties and/or a rent resource tax. The formulation of a government's tax policy for the extractives industry will be influenced by four notable features, as explained by Baunsgaard and Devlin (2021). First, the location-specific rents that reflect the fixed supply of non-renewable resources, meaning that, in principle, rents can be taxed without distorting investment decisions. Second, the high risk/reward for investors means that a fiscal regime that provides certainty and faster investment recovery is desirable. Third, the nature of the industry means there are substantial capital outlays, generally at the beginning of the lifecycle, resulting in revenues from profit-based taxes being deferred until later in the project. Fourth, commodity prices are cyclical and subject to significant price sensitivity, meaning government revenues may also fluctuate significantly over time.

Standard fees and taxes for the extractives industry used by countries beyond a corporate income tax include bonuses, royalties, sliding royalties, resource rent taxes, variable income taxes, and State participation (ActionAid, 2020). Each of these charges is aimed at different government objectives. Fiscal regimes can take several forms, including a combination of corporate income tax and royalties or contractual production sharing arrangements (Baunsgaard and Devlin, 2021). While a limited number of countries extract natural resources using state-owned enterprises, the most common means of doing so is either private companies as partners with state-owned companies or private companies acting wholly independently (Hubert, 2017). The contract between a private producer and a government is one of principal (government) and agent (producer) and often provides for significant incentives in the form of tax holidays and reduced rates of corporate income tax. Stabilisation clauses then generally protect the private producer from any changes to the contract terms. The result is that often, very little revenue is raised through the corporate income tax regime.

Given the low amount of revenue generated from corporate income taxes, resource-rich countries commonly supplement their corporate income tax with a range of levies such as royalties and resource rent taxes, which can be based on volume, revenue, or profits (Siu, et al. 2017). Royalties, the most common means of imposing a levy on resources, are a production-based charge where payments are calculated according to the resources extracted, whereas a resource rent tax is akin to an additional income tax, which applies a higher percentage of tax to windfall profits. Additionally, countries may use a production sharing system, a common model in the petroleum sector. A petroleum production sharing system first involves the production of the petroleum being allocated to the private producer to recover costs, and second, the remaining production being split between the private producer and the government. In this sense, the production sharing model acts like a profit-based tax but is often part of a tax system that also includes royalty payments and corporate income tax (Hubert, 2017).

Ultimately, the decision to impose a profit-related levy is one for domestic jurisdictions to determine, with a consideration centred on the desired revenue mix and fiscal objectives. It has been suggested that in most cases, governments aim to secure revenue collection early in a project's life, maximise its take of revenues throughout the project's lifecycle, ensure adequate incentives for exploration and possible future projects, increase its share of revenue when commodity prices incomes, maintain strategic ownership and interest, and minimise the administrative burden and risk (ActionAid, 2020). There are suggestions that rent taxes are superior to royalties as the latter are distortionary, whereas the former can be designed not to distort the choice made by investors (Boadway and Kenn, 2014). However, this will ultimately be a decision for governments.

5. THE WAY FORWARD

A decade ago, an OECD report (2014) pointed out that for resource-rich developing countries, the taxation of natural resources is possibly the single most significant make or break fiscal concern and noted that TP was a critical issue in the extractives industry. However, little reform has occurred. This article has discussed both corporate income tax reform and charges for economic rents. It does so on the basis that the extractives industry should be considered unique and subject to its own regime. As Baunsgaard and Devlin, (2021) state, 'This recognises the principle that the location-specific economic rents provide a basis for the primary taxing rights remaining with the source country.' They propose a special regime predominantly geared toward taxing rents with sufficient safeguards against profit-shifting (Baunsgaard and Devlin, 2021, p.321). While this article also suggests taxing economic rents, it goes further by suggesting a reform model for the corporate income tax system that addresses the fundamental flaws in the current regime. However, it also recognises that parts of the formulary apportionment model could be adopted to assist the Global South.

Unlike the digital economy, which has been the OECD's recent focus, the extractives industry is generally regarded as a traditional business, as old as civilisation itself, with easily comparable world market benchmark prices that can be used for the purposes of arm's length comparables in the TP regime. However, this is not the case, and there are clearly problems applying such an approach, with the posted price representing only an approximate starting point for estimating market value (Durst, 2014). Formulary apportionment is also not without its difficulties, perhaps the most obvious being the design of the formula and the subsequent weightings of the relevant factors. The above analysis applied existing formulas that are used in subnational regimes or proposed models. However, none of these formulas account for the location or value of the fundamental resource assets in this industry. In addition to general corporate income taxes, taxes imposed on the extractives industry generally seek to tax the rent from natural resource extraction in the source location. Where rent-based taxes are imposed on ex-ante production, it is possible to avoid the associated problems with the international tax regime (Siu, et al 2017, p.12). However, where taxes on resource rents are profit-based, an arm's length pricing requirement may make it difficult for jurisdictions to capture revenue (Siu, et al 2017, p.12).

The introduction of formulary apportionment removes the possibility of tax avoidance through intragroup payments or the abuse of tax treaties (Matheson, et al, 2021, p.288). However, tax manipulation may not be removed altogether. If a formula could be agreed upon, the ability to engage in tax avoidance would depend on MNEs changing the location of the factors or allocation keys, something that cannot be done through internal transactions. Mobility of factors is still possible, however, where labour and physical assets are taken into account.

Any formula for apportioning profits needs to consider the taxing rights of the place of origin and the place of destination. That is, both the supply and demand sides of income need to be adequately represented through the allocation keys. Property and labour generally reflect the supply side, while sales at the destination represent the demand side. With its principal wealth generation being natural resource assets at the source location, the extractives industry arguably requires a fourth allocation key or factor to satisfy source jurisdiction entitlement claims. This could take the form of an extraction factor tied to production level (Matheson, et al, 2021; Siu, et al, 2017) or origin-based sales factors such as the CCCTB Model.

In the words of Picciotto himself, “What is now needed is a combination of principle and pragmatism. There should be a clear statement of principle that the objective is to ensure that MNEs can be taxed in accordance with economic theory and reality as unitary firms with a fair and balanced allocation of taxing rights based on their presence in each country. With that goal clearly in view, the discussions and negotiations should focus on developing allocation keys and weightings suitable for different economic sectors and business models.” (Picciotto and Kadet, 2022, p.461).

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