Global inequalities in taxing rights:

An early evaluation of the OECD tax reform proposals

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Abstract. The current OECD process to reform the international rules governing corporate tax, aimed to achieve a consensus solution by 2020, has finally recognised the need to introduce elements of formulary apportionment to allocate the profits of multinationals and is framed explicitly in terms of redistributing taxing rights between countries. In this paper we provide the first public evaluation of the redistribution of taxing rights associated with the leading proposals of the OECD, IMF and the Independent Commission for the Reform of International Corporate Taxation (ICRICT). The first key finding is that that reallocation of taxing rights towards “market jurisdictions”, as it is currently understood, is likely to be of little benefit to non-OECD countries. Indeed, the proposal is likely to reduce revenues for a range of lower-income countries. Second, all of the proposals deliver a much broader distribution of benefits if some element of taxing rights is apportioned according to the location of multinationals’ employment, and not only of sales.

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1. Introduction

Tax is rightly recognised, in target 17.1 of the UN Sustainable Development Goals, as the *primary means of implementation*. The ability of states to meet their obligations – indeed, to function at all – depends, in a simple and direct way, on the availability of resources.

A significant challenge to resource availability – and to the prospects for sustainable development – stems from the iniquities of international tax rules. Estimates of the global revenue losses due to the tax abuses of multinational companies vary significantly, from \$100bn to \$600 billion each year². Low income countries (LICs) are especially exposed to profit shifting and tax competition, and have limited alternatives for raising revenue (IMF, 2019).

Faced with the scale of this problem, the OECD is consulting on the biggest reshaping of international tax rules for ninety years, following an earlier attempt (through phase 1 of the OECD Base Erosion and Profit Shifting initiative, 2013-2015) to patch up the existing tax rules.

Negotiations are ongoing within the OECD/G20 Inclusive Framework on BEPS³ (Inclusive Framework), which brings together 134 countries (both OECD and non-OECD members). The basis for the current negotiations is the Work Programme agreed by the Inclusive Framework published in June 2019⁴.

Now, the organisation and its members – the richest economies – appear to have embraced three much more radical changes (Cobham & Nelson, 2019) and the workplan considers the introduction of novel features to address some of the failings of the current international tax system.

First, the decision has been taken to move beyond the arm's length principle that the League of Nations settled upon in the 1920s and 1930s. Limitations of the arm's length principle – under which transactions between related parties are to be priced

² http://www.europarl.europa.eu/cmsdata/161049/2019%2001%2024%20-%20Petr%20Jansky%20written%20questions%20-%20Ev_TAX%20GAP.pdf Page 3, Table 1

³ <https://www.oecd.org/tax/beps/flyer-inclusive-framework-on-beps.pdf>

⁴ <https://www.oecd.org/tax/beps/programme-of-work-to-develop-a-consensus-solution-to-the-tax-challenges-arising-from-the-digitalisation-of-the-economy.pdf>

as if they were between independent entities – and reliance on notions of physical presence of the taxpayer to establish a legal basis to impose income tax have allowed apparently profitable firms to pay little tax.

Alternative directions for progress do exist (IMF, 2019), and tax justice advocates have long proposed the alternative of a unitary approach: recognising profits at the unit of the multinational group, and then apportioning these as tax base between the countries of operation on the basis of the location of groups' real economic activity . The European Commission has proposed a 'Common Consolidated Corporate Tax Base' (CCCTB) for the EU⁵. Worldwide formula apportionment has been proposed by, for example, the Independent Commission for the Reform of International Corporate Taxation (2018). Several scholars have also advocated such an approach, see e.g. the contributions in Picciotto (2016).

The great breakthrough of 'Pillar One' of the reforms is a recognition that (at least some) profit must be allocated in this way, if the scale of tax abuse is to be reduced.

Second, at the prompting of lower-income countries that are not members of the OECD but have been promised a voice through the 'Inclusive Framework', the new reforms are framed explicitly as addressing the distribution of taxing rights between countries. This should ensure that for the first time, policy proposals are evaluated on precisely the basis of the extent to which they achieve desired redistribution of taxing rights. As noted, the current rules generate a systematic inequality in taxing rights to the detriment of lower-income countries. They also cost most high-income OECD member countries, however, with only a relatively small number of profit-shifting jurisdictions benefiting alongside multinationals and their professional advisers.

Third, the new reforms include in 'Pillar Two' a proposed minimum tax (Global Anti-base Erosion or GloBe"⁶), which if implemented well has the potential to put a floor under the race to the bottom. There are a range of questions here, about how to

⁵ https://ec.europa.eu/taxation_customs/sites/taxation/files/com_2016_683_en.pdf

⁶ <https://www.oecd.org/tax/beps/programme-of-work-to-develop-a-consensus-solution-to-the-tax-challenges-arising-from-the-digitalisation-of-the-economy.pdf> p 27 onwards

ensure such a proposal genuinely curtails the actions of jurisdictions seeking to procure profit-shifting from elsewhere, but without unduly curtailing sovereignty over industrial policy levers for others. The principle of establishing a common minimum tax rate is however a powerful and important one, which should stymie the current race to the bottom in corporate tax rates.

In this paper, we focus on the proposals made under Pillar One: the allocation of profits as tax base between countries. In order to find consensus, the OECD secretariat has been tasked with assessing the potential economic implications so that Inclusive Framework members are provided with an indication on their impact on taxing rights and revenues before they commit to any solution. Many countries are also carrying out their own assessments. But there are two major obstacles to this work.

The first is the speed of progress being demanded, and the rapid evolution of the working basis for proposals. As the head of the OECD secretariat told journalists this month (September 2019), bilateral discussions between the USA and France have been especially important in setting direction, and G7 countries are driving the discussions (Tax Notes Talk, 2019). The G7 have reiterated the intended timeline of *“reaching in 2020 an agreement to simplify regulatory barriers and modernize international taxation within the framework of the OECD”*⁷. With proposals first laid out only in June 2019, the OECD and many Inclusive Framework members are struggling to carry out analysis in time.

The OECD secretariat is currently testing a unified approach on a solution to tax digitalisation, which tries to bring together three proposals: (i) a proposal put forward by the U.K to recognise the value of ‘sustained engagement and active participation of users’; (ii) a proposal by the USA to give market jurisdictions a greater allocation of taxing rights based on the more active engagement by all kinds of businesses with customers (recognising the concept of ‘marketing intangibles’) and (iii) the proposal put forward by the G24 group of lower-income countries, a

⁷ <https://www.consilium.europa.eu/en/press/press-releases/2019/08/26/g7-leaders-declaration-biarritz-26-august-2019/>

more comprehensive approach which combines a new definition of taxable nexus based on significant economic presence with an allocation of income using fractional apportionment, which allocates profits of multinational through the use of a balanced formula with supply and demand factors. A version of the unified proposal is expected to be made public only in October 2019, after the Inclusive Framework is scheduled to have agreed the direction – raising real issues for timely analysis of the effects on the distribution of taxing rights.

The second obstacle to such analysis is the paucity of publicly available data. It is unclear whether any of the economic analysis carried out by the OECD will be made public before an agreement is reached. Some OECD countries are able to perform such analysis independently of the OECD, using their private access to data, but most Inclusive Framework countries are not in a position to do so.

We survey the main possible data sources and their strengths and weaknesses in the following section, but the best option is the country-by-country reporting that multinationals are now required to submit to tax authorities, following the adoption in the BEPS process of a longstanding Tax Justice Network proposal. Multinationals have so far been successful in their lobbying to keep this data out of the public domain, but the OECD has managed to garner agreement on publishing aggregate statistics in January 2020. The USA has already published aggregate statistics from the country-by-country reporting of its own multinationals. At present, this US data provides the clearest insight into the likely redistribution of taxing rights associated with various proposals, despite its limitations, and it is this that we use in the current paper.

We use the data to calculate the (static) changes in tax base and revenues for individual countries that would arise under what is currently understood to be the core OECD proposal. For comparative purposes, we also assess competing proposals of the International Monetary Fund (IMF⁸) and of the Independent Commission for the Reform of International Corporate Taxation (ICRICT, 2018).

⁸ <https://ntanet.org/wp-content/uploads/2019/05/What-Do-We-Know-About-Global-Residual-Profit-Allocation-A-First-Assessment-of-its-Efficiency-and-Revenue-Impact-SLIDES-1.pdf>

In the third section, we lay out the four models we evaluate, with eight variations in total. The fourth section presents the key results, and final section summarises the policy implications of the different distribution formulae.

2. Data

There are multiple data sources on the economic activity and tax behaviour of multinational companies, but all are lacking in important ways (see the surveys in Cobham & Janský, forthcoming 2020; and in Garcia-Bernardo, Janský & Tørsløv, 2019). The main sources of company balance sheet data, Orbis and Compustat, are available to purchase access but suffer from systematic gaps that impede understanding of profit shifting behaviour in particular. Compustat focuses on large US companies. Orbis, while often exhibiting broad coverage for parent companies and subsidiaries in large, high-income economies, typically lacks data on the accounts (and even the existence) of entities in smaller, financially secretive jurisdictions and in lower-income countries.

Eurostat provides some data on the activities of foreign affiliates of multinationals operating in the EU (as used by Tørsløv, Wier, & Zucman, 2018, for example); while the Bureau of Economic Affairs publishes data on the activities of US multinationals abroad (as used by Cobham and Janský, 2019). Both provide a useful, if partial picture.

In terms of strictly private data, national tax authorities also have access to corporate tax returns for companies operating in their jurisdiction. In most cases, these have only recently begun to be exploited for public research. Bilicka (2019) uses UK data to reveal a much wider gulf than previously understood between the tax payment of domestic firms, and that of subsidiaries of foreign multinationals of equivalent size and industry sector, which tend systematically to declare near-zero profits.

None of these sources, however, provide the level of public transparency for multinationals, consistently across each jurisdiction of operation, that would be expected for a standalone domestic business that files its accounts publicly. The long battle for this type of country-by-country reporting by multinationals (detailed in

Cobham, Janský & Meinzer, 2018), entered a new phase in 2013, when the G20 group of countries gave the OECD a mandate to develop a reporting standard. This standard, based on the original Tax Justice Network proposal (Murphy, 2003), was agreed and implemented as part of the BEPS process in 2015.

Although the data are currently restricted to private reporting to OECD tax authorities, with problematic information exchange arrangements to allow limited sharing with lower-income countries, there is a commitment for the OECD to publish aggregate statistics based on the reporting to individual tax authorities, annually from January 2020. The USA has pressed ahead and published the aggregate statistics for its multinationals, for 2016, already.

Garcia-Bernardo, Janský & Tørsløv (2019) provide a comprehensive comparison of these statistics with the other publicly available sources, and show that the new data both confirm existing knowledge and also allow analysis to go further – with a particular focus on the patterns of profit shifting, including the particular jurisdictions that benefit and those that lose most, and the underlying pattern of differentials in effective tax rates.

The major limitation of the data, for our purposes, is that it relates only to the operations of US multinationals; and only to those with annual turnover exceeding \$750 million. Without directly comparable data, it is not possible to conclude with certainty as to whether these large US multinationals are more, less or equally aggressive in their profit shifting, compared to multinationals from other countries. Nonetheless, US multinationals are the biggest single group and the US accounts for a disproportionate share of global foreign direct investment.

A further attraction of this data is that it will soon be available for the majority of the world's leading multinationals. The OECD secretariat is understood by now to hold equivalent aggregate statistics for most OECD economies, in advance of its publication in January 2020, and the data is already in use for private analyses of various proposals. This means that work carried out with the US data can be replicated quickly for a near-representative global dataset, should the OECD choose to do so; and in January at the latest, by any independent researcher.

We draw on a variety of additional data sources for the analysis that follows. Data on tax revenues (total and those from corporate income tax) we take from the ICTD/UNU-WIDER Government Revenue Dataset (GRD) 2019. For full details see Prichard, Cobham & Goodall (2014), and McNabb (2017). Data on GDP in US dollars we take from the IMF's World Economic Outlook database. Data on statutory tax rates we take from Janský & Palanský (2018). Lastly, data on population are drawn from the World Bank database.

The summary Country by Country Reporting (CbCR) for a large sample of US MNEs (for the year 2016) is published by the Internal Revenue Service.⁹ In relation to the BEA survey of all US MNEs in 2016, which is at least in theory comprehensive, the CbCR sample accounts for 84 % of sales and 59 % of employment. This implies an even greater coverage of profits because these are clearly the larger firms. The data show how in 2016 the US MNEs paid total income tax at an average effective rate of 19 percent on their worldwide profits; but that the rate paid in lower-income countries was on average 43 percent, in high-income countries 21 percent, and in 'tax havens' only 5 percent.

The decision as to how to allocate profits between tax jurisdictions is largely made by these companies; who have many methods of shifting their profits and thus the tax base. The current OECD reform process is based on the recognition that existing tax rules do not constrain companies sufficiently to declare profits where their real activity takes place. In what follows, we use the CbCR data to model the effects of three leading approaches to address this failing.

3. Models to apportion taxing rights

The object of this exercise is to compare the distributive effects of the models currently under discussion for an alternative system to BEPS for assigning the tax base – that is, taxing rights over MNE profits – between the jurisdictions where they

⁹ This database is discussed in depth in Garcia and others (2019), with particular attention to its coverage. Original data can be found at <https://www.irs.gov/statistics/soi-tax-stats-country-by-country-report>

operate. We look at three models: a simulation¹⁰ of the models proposed by IMF and the OECD, and a proposal for ‘global formulary apportionment’ (GFA) supported by the Independent Commission for the Reform of International Corporate Taxation (ICRICT) and others. In addition, in line with recent media statements from the OECD secretariat (see e.g. Tax Notes, 2019), we consider a substantially less ambitious version of the OECD model. We also explore two different variants for each case: one where allocations in line with multinationals’ real economic activity are based on their sales only, and one that reflects the location of both their sales and their employment.

A key concept in this policy debate is the distinction made between ‘routine’ and ‘residual’ profit. Economists divide ‘profits’ (i.e. operating income) into two parts: the ‘normal’ or ‘routine’ rate of profit on the one hand, and a residual variously known as ‘rent’, ‘excess profits’ or ‘residual profits’ on the other; where the former refers to the opportunity cost of capital – what it can earn elsewhere – and the latter¹¹ to the fruits of market power, technical innovation etc. In corporate finance, the weighted average cost of capital (WACC) is a common measure of the minimum expected weighted average return of all investors in a company given the riskiness of its future cash flows.¹² In other words, the minimum return that a company must earn on an existing asset base to satisfy its creditors, owners, and other providers of capital, or they will invest elsewhere.

In principle, so long as corporate income tax does not reduce the firm’s rate of return below the cost of capital, production and investment will continue to be worthwhile – in other words, Corporate Income Tax (CIT) is a charge on *rent* and thus has no

¹⁰ Full details of IMF and OECD proposals have not been published, so simulations included in the paper are based on authors’ understanding of the proposed models.

¹¹ Stiglitz (1976, 2018).

¹² See Frank and Shen (2016). The WACC takes into account the relative weights of each component of the capital structure as well as the cost of each. The capital structure of an MNE can be complex, but the simplest case where the capital is only debt and equity illustrates the approach: $WACC = (\text{Cost of Equity}) \times (\text{Equity Share}) + (\text{Cost of Debt}) \times (\text{Debt Share})$. There are several possible proxies for each element of cost (expressed as an annual rate) such as the return on the stock market for the ‘cost of equity’ and the corporate bank lending rate for the ‘cost of debt’. Each will contain a risk premium – measured as the difference between the cost of capital and the long-term riskless (e.g. government bond) rate. The cost of capital will also vary considerably by line of business (e.g. industrial sector) because technology, markets, uncertainty etc are all different.

disincentive effect. In the theoretical models of textbook economics, it is assumed that the profit rate is equal to the cost of capital ('at equilibrium') and so this issue is eliminated by definition, and thus CIT does reduce investment and growth – *but only by assumption*. The empirical evidence is not nearly so clear.

Recent estimates based on market data for the cost of capital¹³ (defined as “the weighted average of the cost of equity and after-tax cost of debt, weighted by the market values of equity and debt”) identify the 2016 cost of capital for the US (11%), EU (6%), Japan (4%) and Emerging Markets (14%) - leading to a global average figure of 8%. The cost of capital to MNEs does not necessarily vary by region to this extent because they can source funds in all major capital markets due to their global reach; while as large firms, they may also present less risk to the lender and thus enjoy cheaper funding.

The CbCR data on US MNEs discussed below yields for 2016 an overall rate of return on fixed assets (before tax) of 22 %, so if the cost of capital ('routine profit') is 8%, then almost two-thirds of profits are 'residual'. The same source shows that the rate of return after tax is 18%, in which case the residual *after tax* is just over one half of total profits. In short, the tax base subject to reallocation from just these firms alone in one year is of the order of US\$ 700 billion – and by implication potential tax revenue of the order of US\$ 150 billion.

The three current proposed models for redefining the tax base (or 'taxing rights') all aim to reallocate profits away from 'tax havens', the jurisdictions that most aggressively procure profit shifting from elsewhere, and back to the jurisdictions where the firms' economic activities take place – the conceptual basis for this going back to the 'Massachusetts Formula' in the USA and similar federal mechanisms in Canada and the EU.¹⁴

¹³ The Stern Business School compiles extensive data for cost of capital for quoted companies sourced from Bloomberg, Morningstar, Capital IQ and Compustat (Damodaran, 2019).

¹⁴ Clausing (2017) shows that even within the US federal system, tax competition does not affect investment. “This ... is consistent a long literature in public finance that emphasizes a *hierarchy* of behavioral response to taxation timing and financial responses are generally much larger than real behavioural responses.” (p. 98 emphasis in original). See also Saez and others (2012).

We consider first the “IMF model”. This proposes that the routine profits of an MNE to be attributed to each jurisdiction are defined by the global cost of capital applied to the capital assets located there – say, a 7.5% return. Residual profits (the difference between total group profits and the sum of these routine profits) are then apportioned in proportion to sales in each jurisdiction. By construction, this would lead to a major shift of taxing rights away from tax havens towards market jurisdictions where sales actually take place. We also apply a variant where residual profits are apportioned in line with an equally weighted combination of sales and employment.

The “OECD model” proposes that routine profits be defined in terms of the rigorous application of BEPS rules in each jurisdiction to establish the ‘true’ local profit generated locally on the “arms-length” principle. Some or all of the residual profits (the difference between total group profits and the sum of these routine profits) are then apportioned in proportion to sales in each jurisdiction.¹⁵

Earlier discussions at the OECD suggested that this approach would work as follows. First, the current distribution of taxable profits under the arm’s length approach would be respected, and labelled as ‘routine’, for all but some pre-determined group of ‘tax havens’. Profits currently declared in these jurisdictions would be labelled as ‘residual’, and then distributed globally in proportion to sales.

This has the political attraction of ensuring that no non-tax haven jurisdiction can lose taxing rights in the reform. The obvious drawbacks, however, are two. First, there is no universally agreed definition of ‘tax havens’, and any lists historically have been highly politicised – with smaller, weaker jurisdictions much more likely to be listed than larger, powerful states, regardless of their actual behaviour (Cobham, Janský & Meinzer, 2015). Second, the sharp difference in treatment between the two groups creates a clear question of fairness – to say nothing of political feasibility.

More recently, it seems likely that a version of the IMF model will be used instead. This would assess a rate of return on fixed capital as determining routine profit, but

¹⁵ Clausing and Avi-Yonah (2007)

at the global level rather than for individual jurisdictions. That is, a multinational's total routine profit would be determined by applying a return of e.g. 7.5% on their (global) fixed capital. This global routine profit would then be allocated between jurisdictions in proportion to their current share of profits, as determined by the current tax rules. The remaining global profit would be labelled 'residual', and apportioned according to the location of sales, which effectively results in a redistribution of taxing rights to market jurisdictions.

This version allows for jurisdictions to lose out, where they have enjoyed current profits much higher than the determined 'routine' level, and do not have proportionate sales to account for this. This remains likely therefore to generate losses for 'tax haven' jurisdictions with excess profit currently; but has the attraction that all jurisdictions are treated equally. Again, we also apply a variant where residual profits are apportioned in line with an equally weighted combination of sales and employment.

As it is possible that not all residual profits will be distributed in a formulaic manner to market jurisdictions, we also estimate the impact of a limited (20%) reapportionment of the residual profit. In this version, the other 80% of the residual profit would be allocated in proportion to current profits – that is, in line with the distribution under arm's length pricing. The overall redistribution would of course be much smaller under what we label the 'OECD 20%' model.

The final "GFA model" (global formulary apportionment) abandons the separation of routine from residual profits as unworkable and apportions all group profits by jurisdiction according to a simple formula of one or more 'factors' in the tradition of the Massachusetts Formula. In one variant, the 'Destination Based Sales Tax'¹⁶, taxing rights are claimed on the basis of the proportion of the MNEs sales in each jurisdiction – the justification being that final sales are territorially specific and thus cannot be manipulated by firms in order to avoid tax liability. In the other variant,

¹⁶ Auerbach (2010)

the taxing rights are claimed on the basis of the proportion of MNEs' shares of both sales and employment in each jurisdiction (the so-called 'Canada Formula').

We can now apply these models to the data for US MNEs in 2016. In order to do this, we need to operationalize the three models in a tractable fashion to obtain estimates of the scale of reallocation of the tax base between countries that might occur under each scheme. The operationalized models are as follows:

- a. For the "IMF Model" we estimate routine profits arising in each country as a 7.5 % return on fixed assets. Residual profits are then the difference between this figure and reported profits in the US CbCR data. These residual profits are summed globally, and then reallocated to each country in proportion to: (i) the country's share in total US MNE sales in the survey; and (ii) the combined shares of sales and employment in the survey. The final allocation of taxable profits to each jurisdiction c is then given as:

$$IMF_c = 0.075FA_c + \left(\sum_i P_i - 0.075 \sum_i FA_i \right) Factor_c$$

where FA_c is the jurisdiction's share of global fixed assets; P is profits (under the current rules); and $Factor_c$ the jurisdiction's share of the apportionment factors, so variously:

$$\begin{aligned} \text{i.} \quad & Factor_c = \frac{Sales_c}{\sum_i Sales_i} \\ \text{ii.} \quad & Factor_c = \frac{1}{2} \left(\frac{Sales_c}{\sum_i Sales_i} + \frac{Employment_c}{\sum_i Employment_i} \right) \end{aligned}$$

- b. For the "OECD Model" we estimate routine profits at the global level as a 7.5% return on fixed assets. This value is attributed between jurisdictions according to arm's length pricing: that is, for our purposes they are distributed between jurisdictions according to the current proportions of taxable profit. Second, the 'residual' profit (i.e the

remaining global value of profits that is not covered by the return on fixed assets) is then apportioned between jurisdictions according to (i) the country's share in total US MNE sales in the survey; and (ii) the combined shares of sales and employment in the survey

$$OECD_c = 0.075FA_c \frac{P_c}{\sum_i P_i} + \left(\sum_i P_i - 0.075 \sum_i FA_i \right) Factor_c$$

- c. "OECD 20% approach": First, identify routine profits at the global level as a 7.5% return on fixed assets. Then add 80% of the remaining 'residual' profits. This value is attributed between jurisdictions according to arm's length pricing: that is, for our purposes they are distributed between jurisdictions according to the current proportions of taxable profit. Second, the remaining 20% of 'residual' profit (i.e the remaining global value of profits that is not covered by the return on fixed assets) is then apportioned between jurisdictions according to (i) the country's share in total US MNE sales in the survey; and (ii) the combined shares of sales and employment in the survey:

$$OECD(20)_c = 0.075FA_c \frac{P_c}{\sum_i P_i} + 0.8 \left(\sum_i P_i - 0.075 \sum_i FA_i \right) \frac{P_c}{\sum_i P_i} + 0.2 \left(\sum_i P_i - 0.075 \sum_i FA_i \right) Factor_c$$

- d. For the "GFA Model" we do not need to estimate routine profits: total profits reported for all countries in the 2016 US CbCR data are summed and then apportioned to jurisdictions using the two formulae. This means, therefore that on the one hand the sales-based apportionment version of this model reproduces the proposed Destination Based Sales Tax; while on the other hand, the sales-and-employment ('Canada') version reflects the Global Unitary Taxation proposal:

$$GFA_c = \sum_i P_i Factor_c$$

In all our models, reallocation based on sales reflects where sales are currently booked by US MNEs for accounting purposes and reported in the CbCR data, as information on sales by destination of customers is not publicly available.

4. Key results

We created four versions of the CbCR data. In one, used throughout the paper, we excluded countries for which the total reported profits were negative. In the second, we maintained all countries. The results for these two versions are highly similar, since firms report profits or small losses in most countries. The only countries where firms report large losses in 2016 were Switzerland (\$-6 billion), Venezuela (\$-3 billion) and Luxembourg (\$-2 billion).

In the third version of the data, we excluded countries for which the total gains according to the model were negative. Finally, the fourth version excludes both countries for which the total reported profits were negative, and for which the gains were negative. The last two versions allow us to focus on the countries that do not attract disproportionate amounts of profits. The results found are similar to those found using the first two versions of the data for all income groups and regions, except in those groups featuring major profit shifting hubs. All results are available publicly, along with the replication code.

For the main results, to allow straightforward comparison of the potential redistribution in taxing rights, we proceed on the basis that redistributed profit (tax base) would be taxed at the statutory corporate income tax rate, and present the resulting revenues as a proportion of total tax revenues or total corporate income tax revenues. We also present the projected revenue changes as a share of countries' GDP, and on a per capita basis by population. The overall results can be seen in Table 1, which shows how the different models affect the overall distribution of profits between countries (grouped based on World Bank income classification¹⁷) and the percentage gain compared to the current distribution of profits.

¹⁷ <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

Table 1 Profit distribution under different models (\$bn)

	CURRENT ALLOCATION	GFA - SALES	GFA - SALES + EMP	IMF - SALES	IMF - SALES + EMP	OECD (20%) - SALES	OECD (20%) - SALES + EMP	OECD - SALES	OECD - SALES + EMP
HIGH INCOME	1010.4	1120.6	1098.5	1130.4	1115.6	1025.2	1022.2	1084.4	1069.6
UPPER MIDDLE INCOME	45.7	74.1	131.8	73.1	111.8	49.5	57.3	64.8	103.6
LOWER MIDDLE INCOME	20.2	15.6	53.0	20.0	45.1	19.6	24.6	17.1	42.3
LOW INCOME	-0.3	0.3	0.7	0.6	0.9	-0.2	-0.1	0.1	0.4
TAX HAVEN	344.5	209.9	136.4	196.4	147.0	326.4	316.5	254.1	204.7
TOTAL	1420.5								
ABSOLUTE GAIN, \$BN		GFA - Sales	GFA - Sales + Emp	IMF - Sales	IMF - Sales + Emp	OECD (20%) - Sales	OECD (20%) - Sales + Emp	OECD - Sales	OECD - Sales + Emp
HIGH INCOME		110.2	88.2	120.0	105.2	14.8	11.8	74.0	59.2
UPPER MIDDLE INCOME		28.4	86.1	27.4	66.1	3.8	11.6	19.1	57.8
LOWER MIDDLE INCOME		-4.6	32.8	-0.2	24.9	-0.6	4.4	-3.1	22.0
LOW INCOME		0.6	1.0	0.9	1.2	0.1	0.1	0.4	0.7
TAX HAVEN ¹⁸		-134.6	-208.0	-148.1	-197.4	-18.1	-28.0	-90.4	-139.8
% GAIN		GFA - Sales	GFA - Sales + Emp	IMF - Sales	IMF - Sales + Emp	OECD (20%) - Sales	OECD (20%) - Sales + Emp	OECD - Sales	OECD - Sales + Emp
HIGH INCOME		11%	9%	12%	10%	1%	1%	7%	6%
UPPER MIDDLE INCOME		62%	188%	60%	145%	8%	25%	42%	126%
LOWER MIDDLE INCOME		-23%	162%	-1%	123%	-3%	22%	-15%	109%
LOW INCOME		n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TAX HAVEN ¹⁹		-39%	-60%	-43%	-57%	-5%	-8%	-26%	-41%

¹⁸ The following jurisdictions are classified as tax havens for the purposes of this analysis: Mauritius, Aruba, Bahamas, Barbados, Bermuda, British Virgin Islands, Cayman Islands, Curacao, Panama, St. Kitts and Nevis, Puerto Rico, St. Lucia, Trinidad and Tobago, Virgin Islands, Guam, Hong Kong, Macau, Saudi Arabia, Singapore, United Arab Emirates, Cyprus, Guernsey, Ireland, Jersey, Luxembourg, Malta, Monaco, Netherlands, Switzerland plus income currently attributed to "Stateless entities and other country".

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Figure 1 shows the projected revenue changes as a proportion of country groups' existing corporate income tax revenues. The figure shows the aggregate scale for the G7, EU and OECD groups of rich countries; the G24 and G77 groups of lower-income countries; and the G20 group of leading economies. In addition, the figure isolates the US, and looks at the G7 without the US; the OECD without the US; and the G20 excluding OECD members.

Figure 1: Projected revenue increases, % of current CIT revenue

There are a range of important points here, and we highlight six in particular.

First, the scale of benefits is potentially large. The higher projections of revenue gain, from addressing the tax abuse of US multinationals only, are substantial. A number exceed 5% of the total revenues currently raised through corporate income taxes. The full projection, using the complete OECD country-by-country dataset, can be expected to be significantly higher.

Second, compare the sales-only variants (the pale bars of each colour). Of the three full proposals (setting aside the 'OECD 20%' model for now), the OECD model is the least beneficial for all groups (with the narrow exception of the EU, where the IMF model is marginally less beneficial).

Third, if the US is set aside, all groupings benefit more from the options where apportionment is based on a combination of employment and sales, rather than sales alone. This holds for the IMF and OECD models, where these institutions have proposed to look at sales alone, as well as for global formulary apportionment approaches where ICRICT and others support a balanced formula including

employment. The differences are especially large for lower-income countries, with the balanced formula often yielding a benefit more than three times as great.

Fourth, the US appears as an outlier. As the headquarters country for the multinationals in the sample, this may point to a wider pattern. There may be particular features of OECD headquarters countries that means they are relatively poor at capturing tax base from their own multinationals' operations at present, and so would stand to gain more from rule changes. It is possible that the full set of country-by-country reporting data for all OECD members would show that all benefit more from a sales-only approach – which is true for the US here but not for the rest of the OECD or G7 nor for the EU. It is also possible that the proposed reforms are, in effect, most favourable to home countries rather than host countries.

Alternatively, or in addition, it is possible that the scale of the US market means it stands to benefit uniquely from a switch to a sales basis. In this case, the full OECD dataset might reflect the pattern here more closely, with the US gaining more than others and potentially remaining an outlier in benefiting most from a sales-only approach.

Fifth, the benefits from a watered-down OECD approach, on the lines of the variant modelled here which apportions only 20% of the assessed residual profit, are small and regressively distributed. For G7 countries as a whole, the redistribution is projected to yield just half a percentage point of current corporate income tax revenues (made up 0.8% for the US, and less than half that for the rest). For the G24 and G77 groups, the return is projected barely to exceed a tenth of a percentage point of current corporate income tax revenues; it is lower still for the non-OECD members of the G20.

Considerations of Equity

Traditionally, tax design is based on considerations of 'equity' as well as 'efficiency' – by which is meant the reduction of both administrative costs of collection and of negative incentive effects on production. By 'equity' is meant fairness as between taxpayers in different lines of business ('horizontal equity') on the one hand and

fairness between those of different levels of income or wealth ('vertical equity') on the other.

Of course, corporation tax is essentially a withholding tax on dividends (and capital gains) and thus within a single economy, highly progressive in nature.

Internationally, it becomes a developing country claim on developed country wealth-holders who could not otherwise be reached. It is, therefore, a progressive tax which increases equity both nationally and internationally.

Essentially, economic rents ('residual profits' in our models) arise from the global operations of MNEs, and thus cannot in fact be attributed to any one country as the 'economic presence' arguments (and apportionment weights) attempt to do. To the extent that they arise globally, they can only be taxed globally - as the unitary taxation model argues. By extension some part of the taxing rights in fact belong to the citizens of the world.

This notion is quite as radical and unrealistic as it might seem. The existing apportionment formulae (in the US, Canada and potentially the EU) were established in a *federal* context where a population-based entitlement is expressed through the expenditure of the tax revenue, while the central government commits to particular levels of health and education on the one hand, and the common provision of defense and law on the other. Further, the Sustainable Development Goals (SDGs) can be interpreted in a similar light as a common commitment by all governments to the economic entitlements of the global population ("we the peoples"). This too would mean that international equity should at least be a leading criterion in evaluation any proposed apportionment scheme.²⁰

Figure 2 shows the inter-country equity in tax base reapportionment on a per capita basis as an indicator of horizontal equity. Here the projected revenue increases for the OECD 20% model are shown for country groups, but this time in dollars per

²⁰ This cannot be achieved by simply adding another weight - for instance the inverse ratio of national income per capita to the global mean - to the apportionment formula because it would imply that a country (which administers taxing rights) could receive tax revenue from a MNE which is not in fact present in that country!

person in each group's population. The OECD's proposed sales-only approach would yield over \$8 per capita for the US; around \$4 per capita for other G7 members and \$2 per capita for the OECD without the US. For non-OECD members of the G20, and for the G24 and G77 groups, the projected benefit is between \$0.08 and \$0.18 per capita. Simply including employment in the formula would increase those projected benefits to between \$0.80 and \$1. (A full global formulary apportionment, on the basis of sales and employment, would yield a projected revenue benefit for these groups of between \$6 and \$7.40 per capita.)

Figure 2: Projected per capita revenue increases, OECD (20%) model

The variation at the country level and by income group (as figure 3 highlights) is potentially troubling. There is no usable data on low-income countries. Upper-middle income countries stand to gain under most models, albeit less than high-income countries. But lower-middle income countries would gain strongly under approaches that include an employment element in the apportionment, and would actually lose tax base, in aggregate, under approaches that rely on sales only – precisely those that benefit high-income countries most.

Figure 3: Projected revenue increases by income group, % of current CIT revenue

This variation should be especially concerning for governments that are members of the Inclusive Framework. It is one thing to be confronted with policy options that may not yield great gains, but quite another to be asked to go ahead in a direction that may actually lose revenues in some of the countries that most sorely need funds to support their sustainable development strategies.

Employment as an Apportionment Factor

It is evident from the discussion and evidence above that the inclusion of employment as a factor in the apportionment leads to a substantial increase in the taxing rights of developing countries under all the models considered. The inclusion of employment is also conceptually relevant, because more than sales it reflects a true 'nexus' of production in the economy. What is more, MNEs logically tend to locate employment in developing countries where possible because labour costs are lower. This indeed is why this factor has this effect. In the data base discussed here, the firms sampled employ some 16 million people.

However, there is an apparently logical concern that inclusion of an employment factor in tax apportionment could have an undesired negative consequence in the longer run for developing countries, despite the short-term gains in taxing rights. In the case where this increases the firm's tax burden – because the effective tax rate in that jurisdiction is high enough – there would be an incentive to either shift employment to another (lower tax) jurisdiction, or else shift employment locally to sub-contractors with probable loss of wage and other job benefits such as security. This secondary effect would be a further stimulus to tax competition between

developing countries, as well as worsening employment conditions. Much the same could be said of the use of capital assets as an apportionment factor – these can be shifted to other countries (at least by future investment) or sold to subcontractors so as to reduce the tax burden in that jurisdiction.

This of course is one of the attractions of the use of sales as the unique driver; sales are far less responsive to tax differences across markets, as the customers themselves are far less mobile than firm assets or employment. However, it is possible that it is possible that MNEs may try to avoid taxation by using “independent” distributing agents for their sales and it should not be forgotten that in the long run a sales-based corporation tax might well metamorphose into a sales tax (e.g.VAT).²¹ More positively, firms are interested in competitive unit labour costs rather than low wages as such. Further, much foreign investment is driven by natural resource availability (not only mining but also tourism) and access to large consumer markets. In consequence labour skills, productive infrastructure and efficient government are now widely recognized as the driver of MNE investment and thus employment generation.

Finally, an agreement on a global minimum tax would counter the effect of tax concessions in competing countries, by making base shifting – and by extension, the potentially negative effect on employment of these apportionment weights – ineffective.

5. Conclusions

Our analysis of a representative sample of Country by Country Reporting (CbCR) by large MNEs from the US has demonstrated that there are considerable differences between the IMF, OECD and global formulary apportionment models in terms of the reallocation of tax bases between economies.

Overall, the OECD approach favours OECD countries, while delivering little or no benefits for other groups such as the G24 and G77. Lower-middle income countries would, in the aggregate, suffer revenue *losses* if this approach is followed (in respect

²¹ Indeed this may well be the unstated ultimate objective of its supporters.

of US multinationals at least). A watered-down OECD approach, in which perhaps only 20% of an identified ‘residual’ profit is apportioned by sales, would yield much smaller benefits – just a fraction of a percentage point of current corporate income tax revenues for lower-income countries compared to 2 per cent for OECD countries on average and almost 4 per cent for the US; or from 8 cents to 18 cents per capita for lower-income country groups on average, compared to \$8 per capita for the US.

The use of a double apportionment factor (**sales and employment**) is preferable in all the models examined, from the point of view not only of lower-income countries but also of the G7 and OECD groups of countries, once the US is removed. Any concern that use of an employment weight would become an incentive for job-shedding by MNEs is probably exaggerated and could be countered by appropriate agreements on anti-base erosion taxes.

The main apparent ‘losers’ in the process of reapportionment are of course the tax havens, or profit-shifting hubs. However, the ‘loss’ is likely to be largely a nominal one because the MNE capital held there by MNEs is notional book value only, and lightly taxed if at all. In contrast, the income from ancillary financial services could be sustained by appropriate specialization (Foot, 2009). Moreover, the apportionment model would provide a tax base from local sales and employment by MNEs which could sustain fiscal revenue.

Whilst discussions continue within the Inclusive Framework to identify a “consensus” solution to redistribute taxing rights between countries, with a view to reach an agreement by 2020, this paper shows that different formulae will likely result in significantly different distributional outcomes among countries.

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