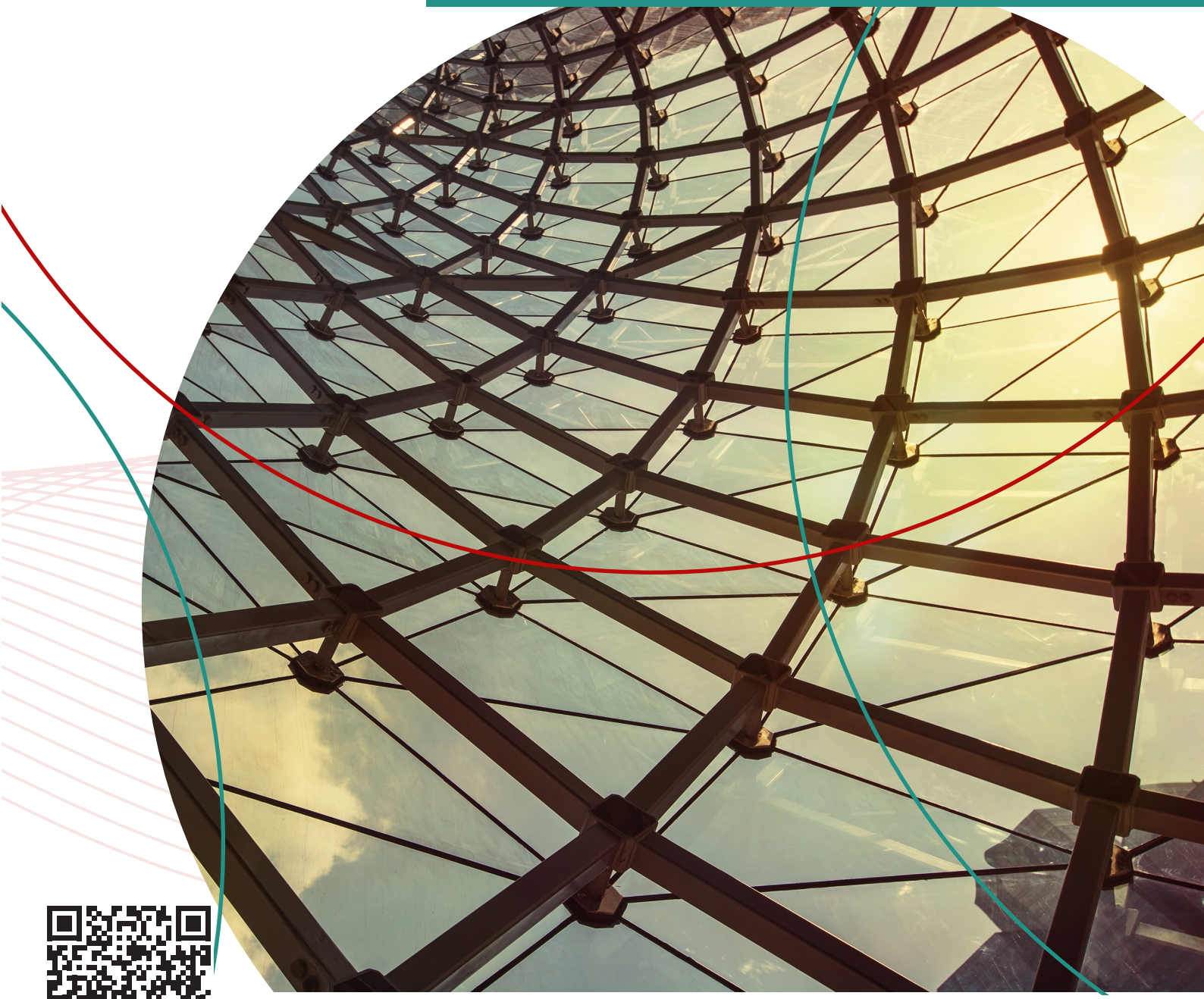
POLICY STUDY
October 2021

A EUROPEAN FORMULA FOR GLOBAL TAX REFORM

Robert Sweeney



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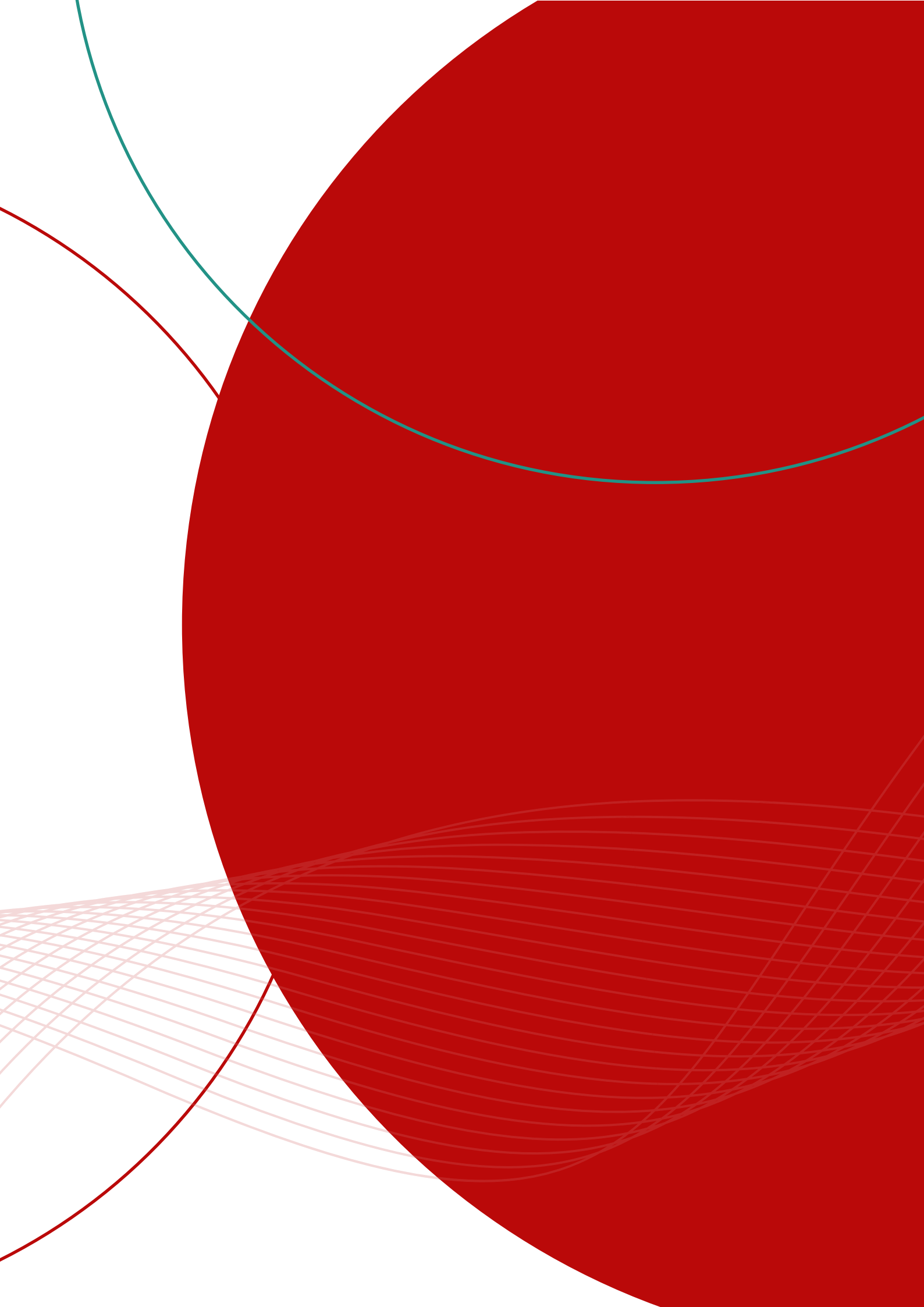

EXECUTIVE SUMMARY

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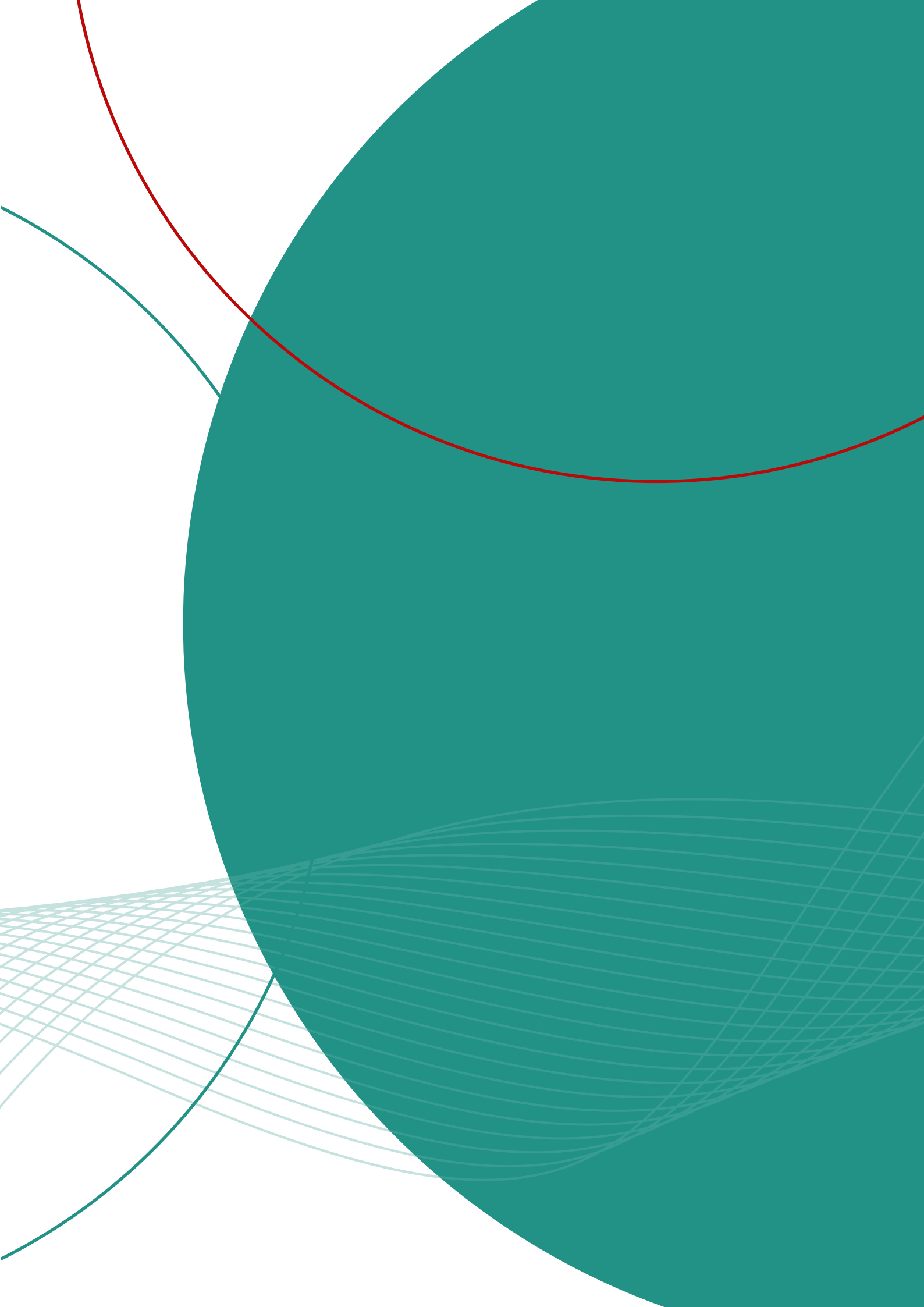
How should Europe deal with recent tax reforms?

Global tax reform is now firmly on the political agenda. Building on previous negotiations, countries across the world have recently agreed a number of changes to international taxation. These changes are significant in that they constitute another move toward global cooperation in international taxation. The agreement moves toward a minimum rate of taxation and allocates some taxing rights based on where companies' revenues are generated. The EU is sure to implement the agreement but also chart its own course. One option for the EU is to pursue a version of the Common Consolidated Corporate Tax Base (CCCTB).

This policy paper simulates the effects allocating taxing rights based on where the multinational companies' tangible assets, revenues, employees, and payroll costs are located. We examine the effects of allocating taxing rights based on these factors separately but also in combination, as CCCTB does. As we are interested in the effects on developing countries, especially in light of the recent global agreement, we assume the world moves toward the new system. We also simulate the effects of implementing these measures with minimum global effective rates of taxation of 15% and of 25%.

Our baseline results indicate that if formula apportionment was implemented globally, high-income countries and the EU would experience significant revenue increases. Under most allocation systems, developing countries would benefit less, and sometimes lose. Allocating on a revenue basis, as the recent agreement does, is regressive. CCCTB is more beneficial for developing countries, especially if payroll expenses are excluded. Despite the EU gaining in aggregate from CCCTB, most member states lose revenue. The CCCTB with a minimum tax rate of 25% would generate significant gains compared to no change in taxation and also compared to a minimum rate of 15%. Most EU countries gain revenue under CCCTB with a high rate. Formula apportionment with a high minimum effective tax rate would be a sensible policy for the EU. With increases in the minimum effective rate of taxation, developing countries continue to gain under a CCCTB-type allocation, but more. This is especially the case when payroll is excluded. CCCTB without payroll and with a high effective rate of taxation is therefore a sensible policy goal.



INTRODUCTION

The last decade has been a tumultuous period for European societies and economies. The global financial crisis, which morphed into the European debt crisis, was a once-in-a-generation event. Aside from the effects of austerity, mass unemployment and economic stagnation, the crisis left an enduring legacy on the public finances of member states. Now, less than a decade into the recovery, another once-in-a-generation event has come to pass. The arrival of Covid-19 has indeed constituted an even larger economic shock for countries of the EU and beyond, though the recovery is likely to be quicker. The complexion of that recovery, particularly the policies regarding how public finances are repaired, will be of enormous consequence in the years to come.

INTRODUCTION

The challenges faced by Europe, and indeed the world, are multiple. With major parts of member states' economies essentially locked down for much of the past year and a half, **getting people back to work is an immediate policy concern.** At the time of writing, unemployment in the EU remains elevated at around 7%, while youth unemployment is over 16% (Eurostat 2021). **Add to that the ongoing climate emergency and long-term demographic pressures**, and it becomes clear that **significant resource mobilisation will be necessary.**

To date, actions by central banks across the EU have enabled governments to deal with the crisis without having to resort to austerity. Billions of euros have effectively been 'printed' by the European Central Bank (ECB) and other institutions. Since these funds have substituted wages lost during the pandemic rather than complementing them, inflation has been of little concern. With Europe now reopening and people returning to work, continued support by the ECB and other central banks at current levels would, at some point, induce inflation. Revenue raising measures are therefore now required.

Whatever acceptance there may have been for austerity a decade or so ago, there is little appetite today for reductions in public spending and increases in taxation on low- and middle-income households. The political tide has turned in Europe with centrist and establishment parties losing ground. Some of that ground is now occupied by the hard and far right. At the same time, **the scale of tax avoidance undertaken by the rich and global corporates has been brought to the public consciousness through scholarly and campaigning work**, including more revelations of malfeasance in recent weeks. The upshot is that tackling corporate tax avoidance is likely to prove very popular with the public. Importantly, it seems that global policymakers are primed to act on that sentiment. While the EU and its member states are major players in crafting an agreement on this, further reforms at the EU-level are likely in the years to come.

Global tax reform is a politically fraught process, not only in the EU but also globally. Tax justice campaigners have long considered the current system, which assumes that each entity within a multinational group is a separate firm, disadvantages developing countries, and benefits high-income countries.

> *Some have called for the current regime to be replaced with a system known as formula apportionment, which treats the profits of multinationals in a unified way and then allocates those profits to jurisdictions on the basis of a formula.*

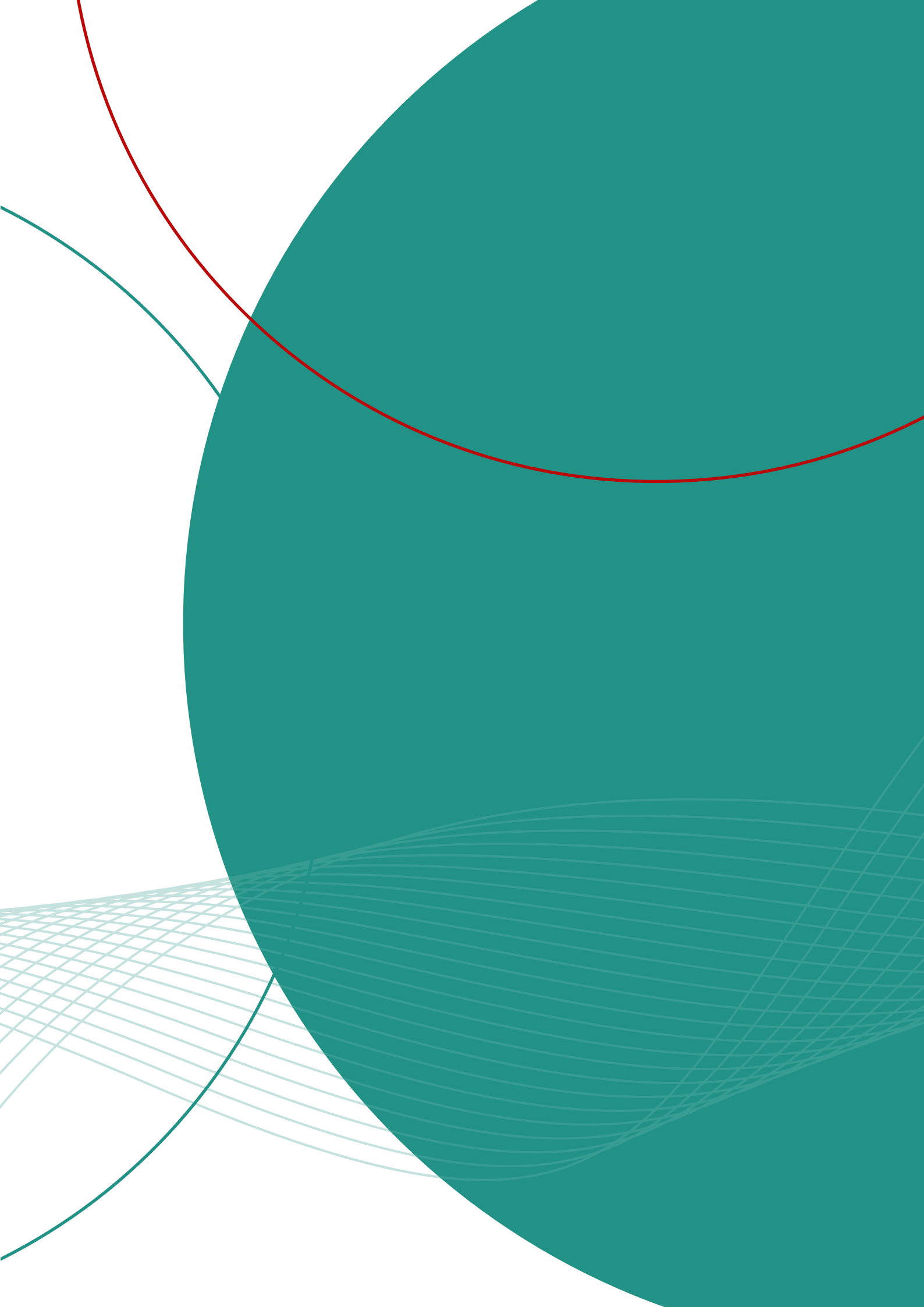
Campaigners have also called for the introduction of minimum tax rates globally to curb the so-called race to the bottom (ICRICT 2019).

This policy study examines the opportunity for the reform of international corporate taxation by implementing a formula apportionment approach to taxing rights. Using country-by-country reporting data (CbC data) from the Organisation for Economic Co-operation and Development (OECD), the focus of this study is on the EU, but the effects of any policy change on other countries, especially developing countries, are also considered. Particular attention is paid to implementing the European Commission's Common Consolidated Corporate Tax Base (CCCTB) proposal globally. The CCCTB is a specific type of formula apportionment, and a version of it likely to be a central part of the EU's tax reform agenda which is expected next year (European Commission 2021). Other forms of allocation are also considered, in conjunction with minimum effective rates of taxation. Our goal is to explore the path the EU might pursue in light of recently agreed reforms, but we also consider how such reforms would affect developing countries.

Our baseline results indicate that if formula apportionment was implemented globally, high-income countries and the EU would experience significant revenue increases. Although the EU would gain in aggregate, most of its member states would lose revenue, given their current rates of taxation. Under most allocation systems, developing countries would benefit less and sometimes lose. Nevertheless, the CCCTB is more beneficial for developing countries than other forms of allocation, especially if payroll expenses are excluded.

Implementing the CCCTB and a minimum effective tax rate of 15% would generate little marginal revenue compared to the CCCTB alone. The CCCTB with a minimum tax rate of 25% would generate significant gains compared to 15%, and most EU countries would then gain revenue. This holds for high-income countries generally, but developing countries would gain much less. **Formula apportionment with a high minimum effective tax rate would be a sensible policy for the EU. For developing countries, the benefits are less clear-cut**. An allocation that weighs the number of employees heavily would be most beneficial and is desirable. However, a CCCTB-type allocation with high tax rates still produces gains for developing countries, and would be preferable to revenue-based allocation despite high-income countries gaining more.

The layout of this policy study is as follows: the next section provides some context, introducing the global tax debate and outlining some of the mechanisms through which companies avoid taxation; the following section discusses formula apportionment – its advantages and disadvantages, and extant literature; the section after that sets out our analysis and is the substance of this policy study, describing the data, approach and results of our simulations; the penultimate section offers a discussion of the findings; the final section then concludes.



INTERNATIONAL CORPORATE TAXATION AND ITS DISCONTENTS

INTERNATIONAL CORPORATE TAXATION AND ITS DISCONTENTS

1.1 International and EU policy issues

The global tax reform debate has been on the political agenda for a number of years and has been gaining momentum in recent times. Revelations and leaks about the various schemes that multinational companies and individuals employ to avoid taxation have left a lasting impression on public consciousness. The need to raise revenue to deal with the financial crisis helped spark reform through the OECD/G20 Base Erosion and Profit Shifting Project (BEPS) project in 2013. The central goal of the BEPS process was to prevent profit shifting and related tax avoidance schemes and to levy taxation on entities where economic value or profits are generated. The process led to a series of recommendations, many of which have subsequently been implemented. Although it provided for many useful reforms, the project stalled under Donald Trump's presidency of the USA. The election of Joe Biden, however, has provided the process with a new lease of life.

Further reforms to global taxation are still being negotiated which means that the precise character and complexity of any new system that might emerge is still uncertain. In June this year, the G7 countries agreed on a high-level framework for tax reform, which was subsequently endorsed by the vast majority of the 135+ jurisdictions negotiating through the OECD/G7 process. Another high-level plan was then agreed in October and signed by 136 out of 140 jurisdictions by the same actors. Pillar 1 of this OECD/G7 agreement proposes to reallocate a share of the taxing rights based on revenue and on where the goods or services are consumed, as opposed to where the economic value is generated as happens under the current system. In particular, the taxing rights of 25% of profits when the profit margin exceeds 10% can be relocated to the countries from which the revenues derive. This is a limited move towards formula apportionment. Pillar 2 of the agreement provides for the introduction of a minimum effective corporate tax rate of 15%. Pillar 1 applies to companies with revenue in excess of €20 billion at first, and €10 billion over the long term. Pillar 2 is to apply to companies with annual revenue exceeding €750 million and is applicable in each country in which the company operates. Further amendments are likely as the agreement is finalised.

The OECD agreement also contains an exemption, or 'carve-out'. Companies will be able to reduce the amount of profit subject to the minimum tax by 10% of their payroll and 8% of tangible assets in each country. This would apply for the initial years of the agreement, after which a rate of 5% exemption would apply to payroll and assets.

The agreement has been criticised on a number of fronts. The 'carve-out' regime proposed in the October agreement was very similar to that in the June agreement, which was estimated to reduce the tax intake by 15%, a figure that rises to 21% if a higher minimum effective rate of taxation is agreed on.[1] The agreement also incentivises multinationals to move assets and employees to tax havens (Barake et al 2021a). Indeed, tech companies may end up paying less tax in some jurisdictions because the agreement could see the dismantling of existing digital services taxes, which now operate in several European countries (TaxWatch 2021). These are taxes levied unilaterally by countries on tech companies and are based on the sales/revenue generated within its borders. They have proliferated in recent years as multilateral progress stalled.

1 In the June agreement, companies were allowed to reduce the amount of profit subject to a minimum tax by 7.5% for both payroll and assets initially – and then by 5% over the long term, as with the October agreement.

> *If taxation based on where economic value or profits are generated is to continue to be a strong feature of a new system, then apportioning taxation rights based on revenue but not on other factors such as the location of employment or assets makes little sense.*
>
> Faccio 2021

More generally, **as revenues of the largest multinationals are overwhelmingly generated in developed countries, any reallocation of taxing rights that is based on this metric will advantage developed countries and will disadvantage developing ones**. Developing countries have called for smaller multinationals to be subject to the tax and for a move away from revenue-based reallocations.

Civil society organisations have criticised the October deal for its impact on developing countries (Boland-Rudder and Woodman 2021). They claim that the process is highly secretive, relegates developing countries to bystander status in negotiations, and does not effectively tackle the race to the bottom as many developing countries have tax rates well in excess of 15% (GATJ 2021; Ryding 2021).

With Germany, France, Italy, and the EU separately being in both the G7 and the G20, and with 22 of the 38 OECD countries being in the EU, the EU is at the forefront of international tax reform. However, **corporate tax reform at the EU level has been quite limited**. Taxation is considered the preserve of national sovereignty and reforms require unanimous agreement among member states. A limited number of directives have been passed, which mainly restrict withholding taxes being applied on flows between related companies within the EU. The Court of Justice of the European Union has also been a source of law through its rulings on cases, but it has seemed less inclined to give rulings in recent years (Devereux et al 2021: 88-89).

One set of arrangements that would overhaul corporate taxation in the EU is the CCCTB. This allocates the taxing rights of a multinational to countries using a formula. As shown more fully below, the CCCTB adds all the income (profits) of the different entities that comprise the multinational and then allocates that income to different member states, which subsequently apply their own tax rates. Income is allocated to a country in proportion to the share of the multinational's assets, revenue, employees and wages in that country. The CCCTB was first proposed in 2011 and then again in 2015, with Ireland and the UK being the main objecting countries. Another modified version was proposed in 2021 under the so-called Business in Europe: Framework for Income Taxation (BEFIT) proposal. Due to be pursued next year, the BEFIT proposal formally withdraws the CCCTB but introduces a modification of it by incorporating intangible assets into the formula (European Commission 2021). **The new momentum behind international tax reform globally and the exit of the UK from the EU now provide greater space for meaningful reform at the EU level.**

The next section looks at profit shifting under the current system and some of the strengths and weaknesses of formula apportionment.

1.2 Profit shifting and separate accounting under the current system

A web of national law and international treaties between countries determines the level of corporate taxation today, as well as how and where it takes place. A number of concepts are useful in understanding the distribution of taxing rights (Beer et al 2020). One is how multinational corporations (MNCs) generate income. The main way is through the sale of goods and/or services – so-called active income. The other is through investing and includes dividend income, interest income and rental income – so-called passive income. If, say, Apple generates most of its earnings from sales of iPads and iPhones then it is through active income that Apple is profitable. If some of the proceeds of those sales are invested in financial assets and this is a significant source of earnings, then passive income is also important.

Another key concept is the distinction between source and residence countries. The source country refers to the physical location of production, where the workforce and tangible assets are located. The country of residence is the country where the company is deemed to have its home, typically the place where it is incorporated or controlled. Source countries conventionally have primary taxing rights on active income, and residence countries have the right to tax passive income. Take a car company that is headquartered in Germany but has a plant in the Czech Republic. The Czech Republic may tax the active income whereas Germany may tax the passive income.[2]

The current system of corporate taxation requires separate accounting for different entities in a multinational group. Overseas subsidiaries of companies are treated as distinct firms and corporate taxation is then levied on the profit that the subsidiary generates, with limited reference to its role in the overall group structure. This incentivises an MNC to overstate the profits of subsidiaries in low-tax jurisdictions and understate profits in high-tax jurisdictions. To prevent this from occurring, companies are required to follow the arm's length principle for transactions between entities within a group. Under this principle, the prices charged to a related entity within the group should be the same as if the group was transacting with an unrelated, outside third party.

Despite the safeguards offered under the arm's length principle, the current system is imperfect and several channels remain through which MNCs avoid tax (European Commission 2021; Cooper and Nguyen 2020). This includes transfer mispricing, which happens when prices do not follow the arm's length principle and are overstated in low-tax countries. A related avoidance mechanism is debt shifting, where interest charged on loans from related parties in low-tax countries is artificially high, inflating the subsidiary's profits in the low-tax country and lowering them elsewhere. Locating intellectual property in low-tax jurisdictions so that profits from its use are attributed there is a third mechanism. Exploiting differences or 'gaps' in tax treaties is a fourth. In this case, differences in residency rules between countries can lead to an entity being taxable nowhere.[3] The rise of the tech economy provides greater opportunities for avoidance and makes policing it more difficult. This is because intellectual property is by its nature often unique, making it is difficult to ascertain prices in an arm's length transaction.

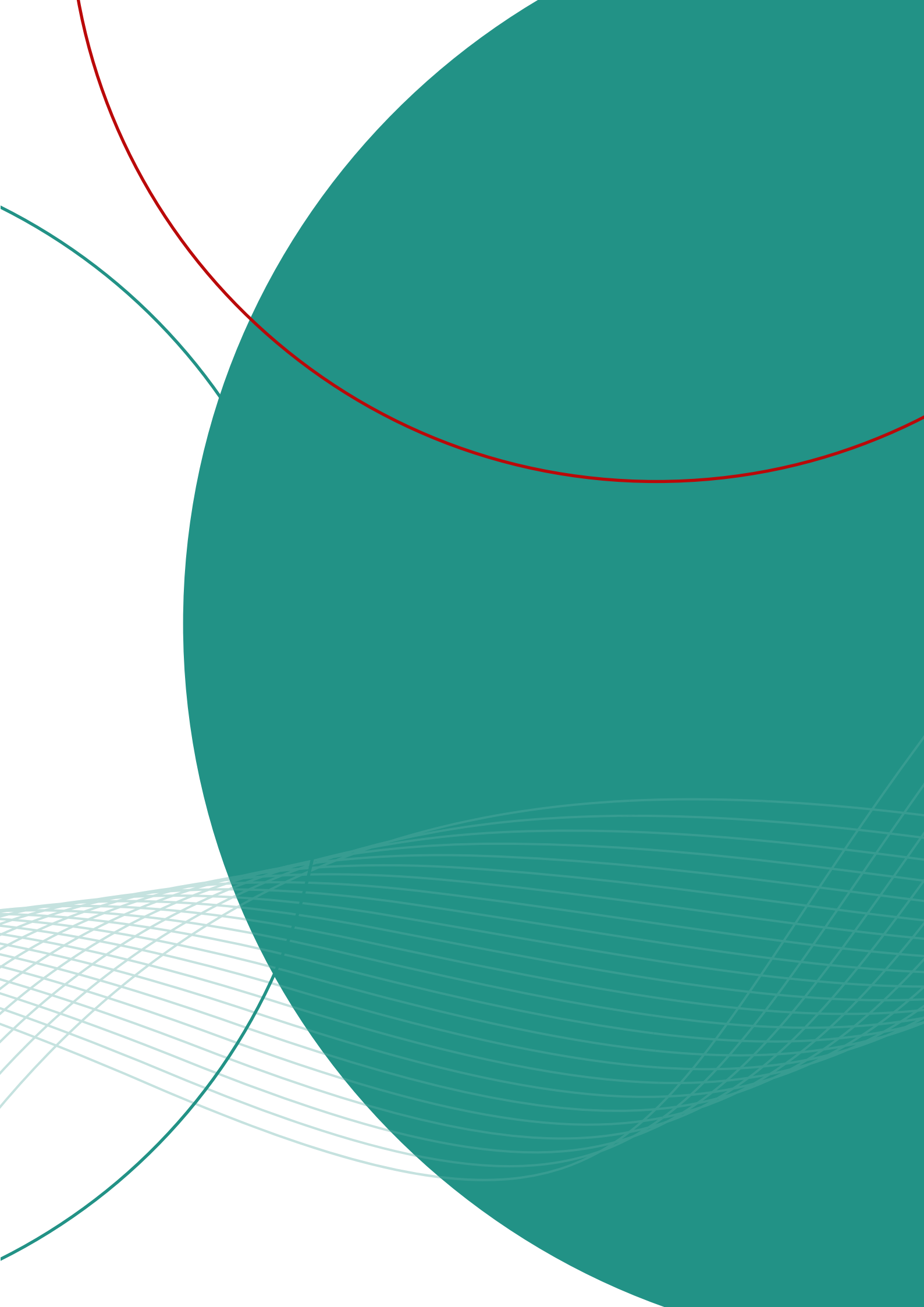
Estimates of the amount of profit shifted are

2 The system is made complicated by the different types of tax systems countries have. Countries with worldwide tax systems such as the USA (until recently), Ireland and the BRICS also tax their multinational corporations (MNCs) on their overseas active income to the extent that the source or host country's corporate tax rate is lower than the residence or home country's rate. Countries that have territorial taxation systems, as do most European countries, exempt such earnings.

3 This can arise if one country deems an entity to be resident for tax purposes based on its country of incorporation whereas another country uses the test of effective control. A parent company that is headquartered in a country which uses the incorporation test can set up a subsidiary in a country which uses the control test and control the subsidiary from the headquarters country. As the subsidiary fails the tax residency test in both countries, it may be tax resident nowhere.

significant – at between $240 billion and $600 billion globally (Crivelli et al 2021: 3). Revenues lost depend on the country, as some countries win and others lose. As a share of national income, the biggest losers are high corporate tax countries such as the USA, France and Brazil (Beer et al 2020). As a share of total tax revenue, including non-corporate tax revenue, developing countries lose the most given their relatively underdeveloped capacity to collect labour, consumption, and other taxes.

Aside from the arm's length principle, a variety of other rules have emerged to curb international corporate tax avoidance. The evidence is that strong anti-avoidance measures are an effective means of tackling profit shifting and tax avoidance (Johansson et al 2016). However, these measures come at a price as there are administrative and financial burdens imposed on the tax authorities and companies that respectively police and abide by the rules. **As new opportunities for avoidance arise, new rules are layered onto the existing set, making the system ever more complex.** This is particularly a problem for smaller companies that may be less adept and less resourced to game the system. Tax authorities are constantly playing catch up and there is an inevitable lag between opening and closing loopholes. As alluded to above, the digitalisation of the economy is a case in point as the largest tech companies have been able to avoid and defer their full tax obligations.



FORMULA APPORTIONMENT

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2.1 Concepts and rationale

The basic idea of formula apportionment is that profit at the group level of the MNC is first calculated and then attributed to different jurisdictions using a formula. These jurisdictions are then free to apply their own country- or jurisdiction-level of corporate tax.[1] Variables included in the formula are chosen to reflect those factors that are the ultimate sources of profit. These variables thus include payroll costs and tangible assets, with the assumption that labour and capital are the ultimate generators of profit. The variables also include revenue, partly a result of politics but also based on economic arguments. Digitalisation of the economy means that companies can generate large revenues in countries without any physical presence there. Aside from its direct impact, revenue can be a source of future profit as companies acquire their customers' data when these customers use the companies' digital platforms. The inclusion of revenue in the formula can therefore be justified on profit generation and other grounds.[2] Intangible assets are usually excluded because they are easy to relocate and difficult to value.

To illustrate how formula apportionment works, take the hypothetical example of allocating taxing rights solely according to revenue. If MNC A operates in only two countries and generates 70% of its revenue in Country 1 and the remaining 30% in Country 2, then 70% of the total profits of MNC A is deemed to be generated in and so taxable in Country 1, at whatever the corporate tax rate is in that country. The remaining 30% is taxable in Country 2 at Country 2's tax rate. Additional variables are easily added to the formula, and this is typically done.

The CCCTB proposal follows a three-factor formula and weighs tangible assets, revenue, and labour market factors equally. Within labour market factors, there are two equally weighted sub-factors, payroll expenses and the number of employees. The formula is:

$$\text{Share}_i = \frac{1}{3} * \frac{assets_i}{total\ assets} + \frac{1}{3} * \frac{sales_i}{total\ sales} + \frac{1}{3} * (\frac{1}{2} * \frac{payroll_i}{total\ payroll} + \frac{1}{2} * \frac{employees_i}{total\ employees})$$

where Share_i refers to the share of an MNC's total or global profits that Country i is entitled to tax, $assets_i$ refers to the value of tangible assets in Country i, and total assets refers to the value of the MNC's tangible assets in all countries. Similarly, $sales_i$, $payroll_i$ and $employees_i$ refer to the value of sales, the payroll expense and the number of employees that the MNC has in Country i.[3] Again, the weights and number of variables in the formula can easily be altered.

For formula apportionment to be workable, a common tax base is necessary. Allowing certain expenses to be deductible in some countries but not in others would be distortionary, as different rules on expense deductions might influence where a company locates. This is contrary to the spirit of formula apportionment which is designed so that production decisions are based on productivity, not tax factors. The CCCTB proposal had common rules for expensing depreciation but did not reach agreement on pension expenses (Hentze 2019).

1 Allocating tax rights according to a formula is not a recent innovation but is and has been used in countries such as the USA and Canada to allocate to different regions and states.

2 It can also be justified on allocative efficiency grounds. If taxing rights are accorded to the country where tangible assets are located, for instance, this may induce companies to locate their assets in low-tax countries, regardless of whether these low-tax countries are the most productive location. Such incentives do not arise when taxing rights are based on the location of revenue.

3 Suppose 70% of revenue is in Country 1 as before and 100% of the assets, payroll and employees are also located there. Country 1 is entitled to tax 1/3*100% +1/3*70% + 1/3(1/2*100% + 1/2*100%) = 90% of the total profits of the company.

A key aspect of formula apportionment in general, and of the CCCTB proposal in particular, is the consolidation of profit at group level. This means that not only are the profits of individual subsidiaries or units in each country added up, but also the losses. As a result, when an MNC has several loss-making units, these losses offset the profits made in other jurisdictions, lowering group profit and ultimate tax revenues. Unused losses are then brought forward to be offset against a group's profit in future periods. **This contrasts with the current system whereby losses are generally only allowed to be brought forward and offset against the future profits of a unit within the country where that unit is located, not internationally against the profits of different units within the group.** We discuss this in more detail below within the context of the limitations of the data set we use.

Formula apportionment offers several advantages over separate accounting based on the arm's length principle. One of these advantages is that **formula apportionment greatly simplifies the calculation of the tax burden in a country as it removes the need for a series of often complicated arm's length calculations based on a complex system of rules.** By requiring a single, group-level calculation of corporate profit, it is no longer advantageous to shift and overstate profits in low-tax jurisdictions. Formula apportionment therefore removes many of the schemes and loopholes that MNCs exploit to minimise their tax burden. **It is also more difficult to misrepresent the value of assets, revenue and labour costs in a region than it is to overstate or understate profits.**

Like any system of taxation, formula apportionment has its shortcomings. **Allocating taxing rights based on the location of factors of production opens up new avenues for avoidance.** Indeed, it incentivises companies to relocate those factors of production to low and no-tax jurisdictions. The share of global profits to which those countries are entitled will consequently increase as per the formula, after which those countries' low tax rates can then be levied. This is most obviously the case for the workforce and tangible assets which, although less easily shifted than paper profits, are not immobile. Consumers are more immobile still, but avenues for avoidance can open up if MNCs set up and channel sales through entities in tax havens. Additionally, **formula apportionment may also encourage mergers with companies in low-tax countries, as a way of reallocating group profits there. Such problems, however, can be mitigated if formula apportionment is accompanied by minimum effective tax rates.** Indeed, a minimum EU-wide tax rate of 25% was proposed as part of the CCCTB.

2.2 Literature on formula apportionment

The literature on formula apportionment is not expansive, but a number of studies have analysed the consequence of moving towards it. An early estimate found that US corporate tax revenue would increase by 38% after apportioning by assets, sales, and payroll. The effects of loss consolidation were not, however, considered (Shackelford and Slemrod 1998). An updated analysis still finds positive revenue effects, but the effects are much more modest (Clausing and Lahav 2011).

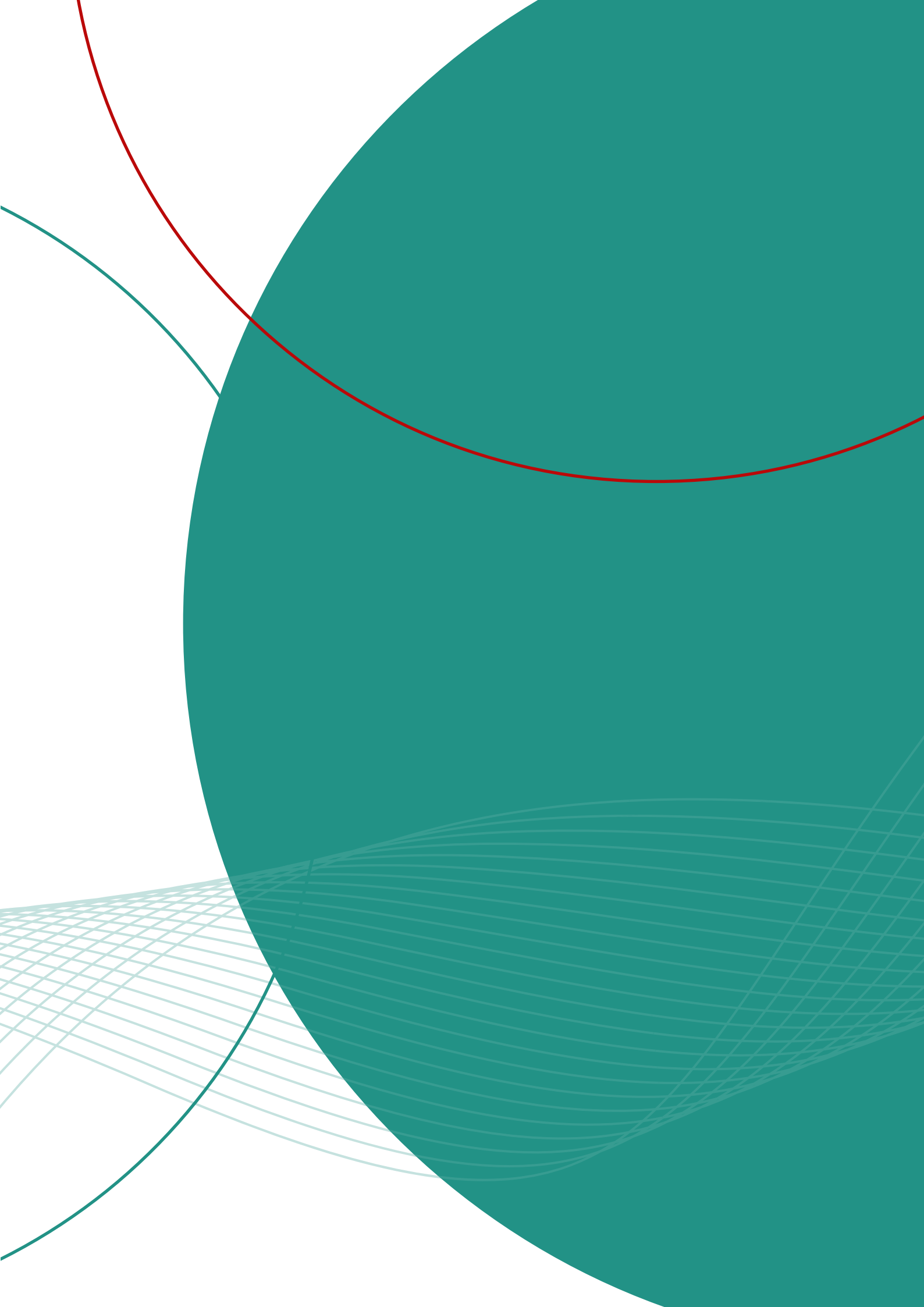
Fuest et al (2006) examine the effect of formula apportionment on EU-15 countries. They use a data set of German MNCs for the period 1996-2001 and equally weighted assets, sales, and number of employees. They find that without loss consolidation larger countries tend to gain, and smaller countries tend to lose. With loss consolidation, both large and small countries lose, but large countries lose less. Overall, tax revenue in the EU falls by 20%. Devereux and Loretz (2008) examine formula apportionment in all 25 pre-2007 EU member states, again using firm-level data. They examine a number of formula variations and allow for international loss consolidation. When participation is voluntary, as it was in the CCCTB when it was first proposed, corporate tax revenue falls by 2.5%. When participation is compulsory, it increases by 2% with larger countries more likely to benefit. Aside from the different data set and apportionment factors used, the results of Devereux and Loretz differ from those of Fuest et al as those of the former are long-term results – the tax base in the first year is likely

to be significantly lower as losses accumulated for several years are offset against international profits.

Cobham and Loretz (2014) apply a similar methodology but internationally and with a keen eye on the impact on developing countries. They find that the overall tax base would fall by 12% and that developing countries would be most affected. However, tax revenues would rise overall with high-income and high-tax countries gaining the most revenue. This is also found by de Mooij et al (2021) – a fall in the global tax base after consolidation of losses, but an overall increase in tax revenue. Developed countries tend to benefit when tax is apportioned on the basis of employment and sales. Developing countries benefit strongly when tax is apportioned on the basis of employment, but they lose when payroll and assets are weighted more. Faccio and Fitzgerald (2018) calculate the effects of formula apportionment using information on Vodafone, which publishes country-by-country data in its accounts. Using a three-factor formula with sales, assets, and payroll, developing countries lose profits slightly, but gain if the number of employees is used instead. In both scenarios high income countries are the main beneficiaries. Within the EU, Faccio and Fitzgerald (ibid) find that Luxembourg is the main loser and Germany the main winner under the CCCTB, although payroll data is not available.

Cobham et al (2021) make the most recent attempt to model the effects of formula apportionment in general, and the CCCTB in particular. Like the analysts behind most of the literature, they use microdata from the Orbis database – but from between 2007 and 2015. Cobham et al (ibid) find that the tax base falls by around a fifth if formula apportionment is used, but they do not explicitly model the tax revenue implications. They question the benefits of international loss consolidation, although they do not discuss how the global financial crisis may have been unusual in creating large losses.

Overall, most studies therefore find that the tax base (the amount of income that is subject to taxation) falls when using formula apportionment. This fall is counterbalanced by redistribution of that base from low to high-tax countries so that corporate tax revenues tend to increase overall. Large and high-tax countries benefit, and low-tax countries lose. Developed countries tend to gain more than developing countries, which are disadvantaged when the reallocation of corporate tax is based on payroll and sales.



ANALYSIS

ANALYSIS

3.1 Data

In this policy study **we calculate the revenue implications of formula apportionment coupled with minimum effective tax rates.** The emphasis is on the EU, but we also consider the implications of any policy change for developing countries. We assume that the whole world moves toward formula apportionment so that the global profits of all large MNCs are subject to it, and we examine the revenue implications if (i) there is no change in the current headline rates of corporate taxation; (ii) a minimum effective rate of taxation of 15% is implemented globally; and (iii) a minimum effective rate of taxation of 25% is implemented globally. We then repeat the analysis but only include data for positive profits. We use a number of formula variations, including the CCCTB. We choose to apportion the global profits of MNCs in the baseline simulation as we are also interested in the effects of formula apportionment on developing countries of the Global South, not just on the EU member states. As a robustness check, we simulate the effects of the CCCTB applied to EU profits and allocated to EU member states only.

To perform the analysis, we rely on OECD country-by-country data, which were first made available last year. We use data from 2017 which, as well as being more recent, are likely to contain fewer errors and inconsistencies than the 2016 data. Under BEPS Action 13, all companies with group revenue of €750 million or above are required to provide a detailed breakdown of their activities in countries, including tax havens. The OECD CbC data are presented in aggregated form and provide information on multinationals headquartered in 27 OECD countries. Indeed, the CbC data provide a number of variables of interest to this study, including information on revenue, profits, tangible assets and tax paid. Specifically, the total number of employees employed by French multinationals in Belgium is shown, for instance. This data set is therefore an important step forward in understanding the global operations of MNCs.

An advantage of using OECD CbC data is that the data set is comprehensive and consistent. Many studies on global profit shifting and formula apportionment rely on firm-level accounting data from the Orbis database of Bureau van Dijk. Because the Orbis database relies on information in public registries, information is sparse in many of the most interesting countries such as Bermuda, Ireland, and Switzerland (Tørsløv et al 2018). If data are missing or inaccurate, then profits will be apportioned to countries incorrectly. As CbC data are compiled by an official agency and are designed to illuminate MNC operations in a variety of countries, this problem does not arise. Moreover, many studies use data sets in such a way that they double count the income of affiliated entities, in part because the data set does not allow disaggregation (Blouin and Robinson 2020). Again, this is unlikely to be a problem with OECD CbC data (Garcia-Bernardo and Jansky 2021).

The main drawback of OECD CbC data for this study is that they are macro-level or aggregated data. This creates problems in apportioning data and consolidating losses. Consider the following scenario, illustrated in the table below. Suppose Company A has global profits of 100 and all its assets are in Country 2. Company B has 0 global profits and all of its much larger asset base is in Country 1. If we apportion profits according to assets, Country 2 should receive all of Company A's profits, of 100. Country 1 should receive all of Company B's profits, which are 0. However, with aggregated data, we do not see the company breakdown, but we see that Country 1 has 90 out of 100, or 90% of total assets of the two countries, and Country 2 has 10 of 100, or 10%. Country 1 is therefore incorrectly apportioned profits of 90 instead of 0, and Country 2 is incorrectly apportioned profits of 10 instead of 100.

	Country 1	Country 2
Company A assets	0	10
Company B assets	90	0

Table 1: Formula apportionment and macro data.

	Country 1	Country 2
Company A profits	100	100
Company B profits	20	-70

Table 2: Loss consolidation and macro data.

This is obviously an extreme example designed for illustrative purposes. If Company A had profits of 1 and Company B had profits of 9, which is a more realistic scenario, then aggregation would not be a problem. But to the extent that profits are systematically out of sync with the factors of production that generate them, we must live with the problem. Moreover, if B were a subsidiary of A, then it would be appropriate to add the profits and then apportion on the basis of total assets. In that case macro or aggregated data would not be a problem.
Problems also arise with loss consolidation, despite the data set disaggregating between companies that generate positive profits and companies that generate negative profits, or losses. Suppose Company A has profits of 100 in Country 1 and 100 in Country 2, and Company B has profits of 20 in Country 1 and profits of -70 (that is, a loss) in Country 2. Company A and Company B are unrelated in the sense that A does not directly hold shares in B, or control it, and vice versa. Company A's total profit of 200 should be apportioned to Countries 1 and 2 (in accordance with its share of assets, for instance). Company B should not be subject to any taxation as the profit of 20 in Country 1 is offset by the loss of -70 in Country 2. The remaining loss of -50 should be carried forward to the next year to offset whatever worldwide profits Company B has then. Total profits of 200 should be apportioned.

With aggregated data, the information can be presented in two forms. When both positive and negative profits are presented together, Country 1 will be shown to have profits of 120 (100+20) and Country 2 will have profits of 30 (100-70). In this case, 150 of total profit will be apportioned when the formula is applied, underestimating the correct amount by 50. This is a form of international loss consolidation, but it consolidates the losses against the profits of different companies, as opposed to entities in the same group. If we filter the data for positive profits only, Country 1 will still display profits of 120 but Country 2 will show profits of 100, as the -70 has been excluded. In this case 220 in total profit will be apportioned, an overestimation of the correct amount by 20. Our analysis will present the results from both, all profits and positive profits, so the correct result will lie within the range.

As the OECD CbC data set is still in its infancy, it suffers from other problems. Indeed, despite being superior to other data sets, the coverage is still imperfect. Sometimes the data are aggregated by region instead of by country. For instance, the data might show the profits, assets and so on of UK MNCs in "Europe", but sometimes there will be information on some European countries while the remainder of these countries will be aggregated under "Other Europe".

Furthermore, because of insufficient guidelines given to the national agencies from which the data are collected, some double counting remains. Profits assigned to "Stateless Entities" are often counted elsewhere, such as in the domestic or foreign profits of US multinationals. Following Barake et al (2021b) and Garcia-Bernardo and Jansky (2021), we drop "Stateless Entities" from our calculations. Inter-company dividends may appear multiple times, which cannot be addressed at this stage. It is anticipated that this will be less of an issue in future years.

Although the OECD data set has information on the number of employees, it does not contain payroll data. We attempt to address this by multiplying the

number of employees by the average monthly wage in the country. This gives country-by-country payroll data, but as if average earnings paid by different parent companies in different countries were the same for a given destination or source country.[1] Average monthly wage data is in the first instance taken from the International Labour Organization (ILO), with the 2017 value sometimes imputed using GDP growth rates and previous or subsequent year wage data. When the country was missing from the ILO data set, other sources such as Salary Explorer were used to supplement this. This source was leaned on for small low- and lower-middle income countries in particular. It sometimes returned figures for salaries that seemed implausibly high and so caution is warranted when interpreting the payroll results for these countries. It is for this reason that we produce results for the CCTB with and without payroll data.

When apportioning by revenue, we use unrelated party revenue. This is revenue derived from entities that are not within the group. However, revenue comprises not only sales, but also income from interest and asset disposals. If revenue is to be included in an apportionment formula on the basis of being a source of profit, then it would be better to use sales data. These data are not available and, in any event, are not the preferred metric in EU proposals. For assets, we use tangible assets. Data on the rate of corporate taxation are in the first instance taken from the KPMG global corporate tax rate survey, and then from OECD data (which are mostly based on KPMG data) and finally from the World Bank.

3.2 Revenue effects of formula apportionment (all companies)

Table 3 below presents the baseline results. It shows the ratio of corporate tax revenue under different types of formula apportionment-to-corporate tax revenue under the current system. Data were used for companies with both positive and negative profits, and thus the results allow for aggregate loss consolidation. Following Devereux and Loretz (2008), taxable income is calculated as taxes paid on a cash basis divided by the statutory rate of corporate taxation. By construction then, when the corporate tax rate is applied to this measure of taxable income, it will match the data for taxes paid as they appear in the data set. This would not be the case if the profit figure in the data set was used, which is based on profit as it appears in the financial statements of MNCs.[2]

It should be emphasised that these simulations assume no behavioural changes on the part of companies, as most other studies also assume. As discussed, companies will likely reallocate assets, workers and even revenue to low-tax countries in order to minimise their tax bill. The results that follow should therefore be considered as a first round effect, and not a final equilibrium outcome.

Our results show that Luxembourg, Belgium and Greece are the main beneficiaries when corporate income is apportioned according to assets. With a value of 3.27, Belgium's corporate tax intake would be over three times its current level if the world moved towards formula apportionment based on the location of tangible assets. Belgium has a highly developed system of production, which includes the export of chemicals and other advanced goods. Greece has a variety of relatively low value-added industries and exports. The presence of Luxembourg as a major beneficiary is surprising, given its economy's reliance on financial services. One would therefore not expect Luxembourg to be a major destination of MNC tangible assets. The fact that Ireland and Cyprus are major losers is not surprising. Hungary is less frequently implicated as a tax haven, but at 9% it has the lowest rate of corporate taxation in the EU.

1 For example, it assumes that US MNCs and French MNCs have the same average monthly pay in, say, Greece.
2 Although closely related to taxable income, accounting profit is different as items that can be expensed for the purposes of producing financial statements do not necessarily match what national tax authorities allow to be expensed.

When corporate profits are allocated on the basis of revenue, the higher-income countries are winners within the EU. This includes Belgium, France and Austria, with Spain and Sweden winning less. Surprisingly, Greece, Estonia and Croatia also do very well. It should be kept in mind that revenue includes asset sales and interest income, not just income from sales. Ireland and Hungary are again losers, along with Denmark and Finland.

Greece and Eastern European countries are the main winners when apportioning on the basis of employees. This is very much in line with expectations, as many of the higher-income EU countries have shifted production eastwards. Ireland, Cyprus and Malta lose fourth fifths or more of their bases, while Denmark is also heavily hit. Payroll allocation is similar to that of employees but is scaled up or scaled down by wages. For the first

	Asset	Revenue	Employees	Payroll	CCCTB1	CCCTB2
Austria	1.43	1.37	1.35	0.89	1.38	1.31
Belgium	3.27	2.78	1.98	2.53	2.68	2.77
Bulgaria	0.71	0.63	2.06	0.41	1.14	0.86
Croatia	2.35	2.76	5.42	2.71	3.51	3.06
Cyprus	0.37	0.42	0.17	0.14	0.32	0.32
Czech Rep.	0.62	0.66	1.36	0.59	0.88	0.75
Denmark	0.6	0.62	0.33	0.7	0.52	0.58
Estonia	2.12	2.62	5.89	2.57	3.54	2.99
Finland	0.64	0.65	0.64	0.66	0.64	0.65
France	1.94	1.79	1.81	2.3	1.85	1.93
Germany	0.9	0.82	0.79	1.18	0.83	0.9
Greece	3.28	2.23	4.26	0.39	3.25	2.61
Hungary	0.24	0.21	0.5	0.2	0.32	0.27
Ireland	0.46	0.51	0.2	0.23	0.39	0.39
Italy	0.84	0.91	0.75	0.72	0.83	0.83
Latvia	0.65	0.71	1.28	0.33	0.88	0.72
Lithuania	0.62	0.68	2	0.67	1.1	0.88
Luxembourg	3.23	0.74	0.17	0.33	1.38	1.41
Malta	0.84	0.97	0.18	0.12	0.66	0.65
Netherlands	1.19	1.01	0.65	0.91	0.95	0.99
Poland	0.99	0.96	1.86	0.89	1.27	1.11
Portugal	0.75	1.02	1.72	0.65	1.16	0.98
Romania	0.96	0.85	2.83	0.74	1.55	1.2
Slovak Rep.	0.84	0.81	2.1	0.85	1.25	1.04
Slovenia	1.41	1.25	2.08	1.46	1.58	1.48
Spain	1.5	1.16	1.33	1.32	1.33	1.33
Sweden	1.25	1.14	0.8	0.45	1.06	1
EU	1.3	1.14	1.09	1.24	1.18	1.2
High	1.24	1.26	1.05	1.28	1.18	1.22
Upper middle	0.89	0.9	1.22	0.79	1	0.93
Lower middle	1.05	0.89	1.99	0.62	1.31	1.08
Low	1.49	0.5	1.51	0.76	1.17	1.05

Table 3: Formula apportionment among profit and loss-making entities.

time, Germany wins, while Croatia does not do as well as it did before. Malta and Cyprus are again the most heavily hit.

As regards the CCCTB, the CCCTB1 does not include payroll, but has revenue, assets, and employees equally weighted. By contrast, the CCCTB2 includes payroll, and is as per Equation 1. Among the high-income countries Austria, Belgium, France and Spain are the main winners. Germany loses, as does Italy. Sweden gains, but not by much. Ireland is a major loser, as are Cyprus and Malta – which is consistent with their label as tax havens. The Netherlands only loses a little and Luxembourg's gains are counter to expectations, but their gains are clearly driven by winnings from the location of tangible assets. When the OECD deal is ultimately finalised, the Netherlands and Luxembourg may lose more as sales to consumers as opposed to revenue is set to be the apportionment factor. Croatia, Estonia and Greece also do very well. The CCCTB2 (including payroll) produces largely the same picture as the CCCTB1. Around half of the member states win and half of them lose.

EU tax revenue would increase by 20%, which is very similar to the increase that high-income countries experience overall. **On a global level, upper-middle income countries, which is the category with by far the most developing countries, lose when payroll is included in the CCCTB.** Upper-middle income countries are, moreover, overwhelmingly non-EU, but also include Bulgaria and Romania. Overall, their losses are driven by both payroll and revenue losses as the value of goods and services sold is obviously lower there, while it is higher in high-income countries. **Lower-middle and low-income countries gain, but not by much except when payroll is excluded, when the gains are then considerable for lower-middle and low-income countries.** This seems to be driven by large gains from apportioning on the basis of the number of employees. It may also be driven by the fact that profits are reallocated from lower- to higher-tax poor countries.

Figure 1 below shows the effects of combining the CCCTB (including payroll) with minimum effective tax rates of 15% and of 25%. For countries whose corporate tax rate exceeds 25%, such as France, this

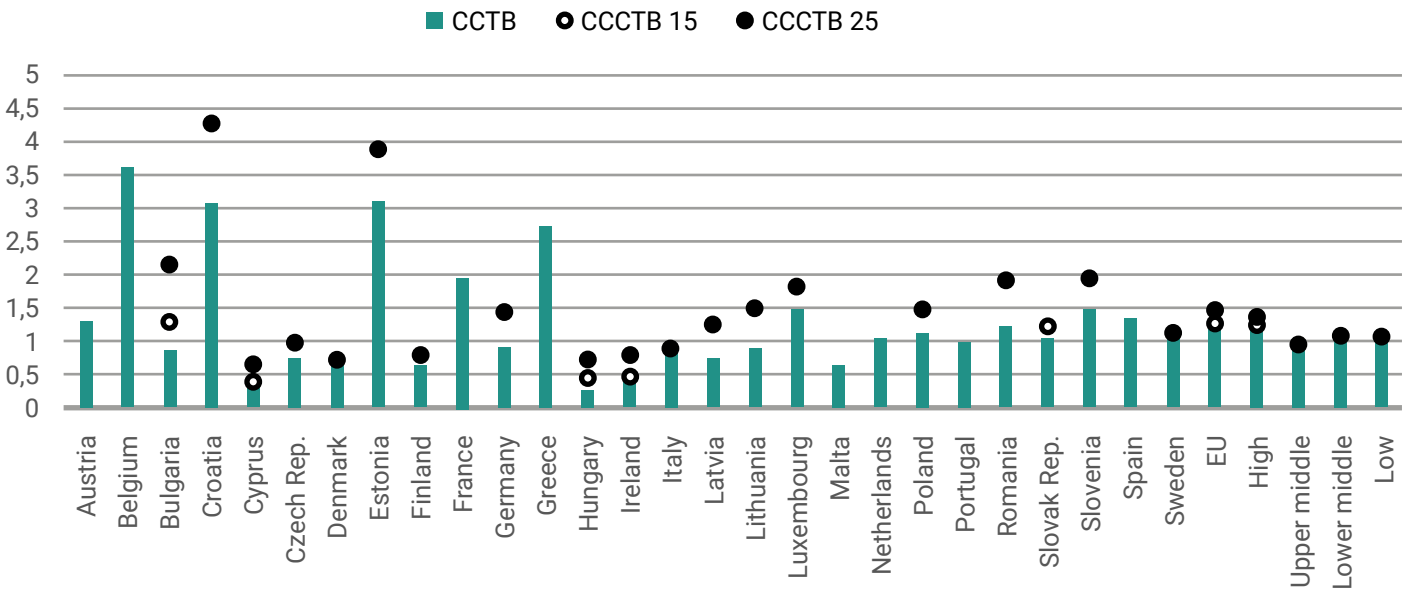


Figure 1: CCCTB and tax revenues among all companies.
Notes: The figure is CCCTB2. That is, it includes payroll, but the results are very similar when for CCCTB1.

does not arise and thus no results are shown other than the baseline blue bars, which are as per Table 3. Similarly, for countries whose tax rate is between 15% and 25%, a situation moving towards 15% does not arise and no results for that rate are shown.

As can be seen, implementing a tax rate of 15% does not imply an increase for most countries, so no change is apparent. A 15% tax rate does, however, have revenue-increasing effects in Ireland, Hungary, Cyprus and particularly Bulgaria. **For the EU as a whole, the increase in tax revenues is quite modest. Moving to the CCCTB increases the EU tax intake by a fifth, or 1.20 times.** Combining the CCCTB with a 15% rate results in a tax intake that is just 1.21 times the intake under the current system. Similarly, for high-, upper-middle, lower-middle, and low-income countries the increase is small – less than a percentage point.

> *Moving toward a 25% tax rate would be more substantive. The majority of countries now win and most experience large increases in their tax intake, with the increase dependent on how much of a change 25% represents.*

As well as the countries that experience a significant revenue increase when 15% is implemented, Germany and many smaller countries also experience significant increases with a 25% rate. **For the EU as a whole, the tax intake is now 1.4 times the current intake.** For high-income countries, the CCCTB with 25% is 1.33 times the current arrangements compared to 1.22 times if there is no tax increase. Upper-middle income countries continue to lose as the CCCTB with 25% results in a tax intake that is 0.95 times the current intake (compared to 0.93 without any tax increases). **Lower-middle and low-income countries obviously do better under the CCCTB with 25%, as they were already winning under the CCCTB without a minimum tax.** But the increase in tax from the CCCTB with 25% versus just the CCCTB is modest – less than a percentage point increase when measured against current arrangements.

3.3 Revenue effects of formula apportionment (positive profit companies)

Table 4 below presents the results from using data for companies with positive profits only. This eliminates loss consolidation between entities. The table depicts the corporate tax revenue intake for different types of formula apportionment-to-corporate tax revenue under the current system, except now without aggregate loss consolidation.[3] The results are very similar to those in the previous simulations. Naturally, the tax revenues are somewhat higher, as loss consolidation does not reduce profits. In other studies, the effects of loss consolidation are generally higher. The lack of divergence between the results in our study could be explained by the problems of using aggregate data, as already discussed. It could also be because global profitability was healthy in 2017.[4]

3 It should be remembered that there was aggregate loss consolidation in the previous section – in other words, the country-level profit figure is the sum of positive and negative profits among all entities within a country. So if Apple made a loss in Spain it would be offset or subtracted from the profits that Nike and other US companies make in Spain when calculating total profits of US MNCs in Spain.

4 It might be tempting to attribute the relatively small divergence to the fact that only one year of data is used (2017). Ordinarily, that means unused losses (losses prior to 2017) have not been carried forward. With aggregate as opposed to micro data, however,

	Asset	Revenue	Employees	Payroll	CCCTB1	CCCTB2
Austria	1.44	1.38	1.35	0.91	1.39	1.32
Belgium	4.31	3.6	2.59	3.32	3.5	3.62
Bulgaria	0.72	0.64	2.08	0.41	1.14	0.87
Croatia	2.38	2.79	5.51	2.77	3.56	3.1
Cyprus	0.39	0.44	0.17	0.15	0.33	0.33
Czech Rep.	0.62	0.66	1.37	0.6	0.88	0.76
Denmark	0.69	0.72	0.37	0.78	0.59	0.66
Estonia	2.22	2.77	6.05	2.64	3.68	3.11
Finland	0.64	0.66	0.64	0.67	0.65	0.65
France	1.97	1.84	1.89	2.41	1.9	1.99
Germany	0.92	0.83	0.8	1.21	0.85	0.92
Greece	3.46	2.34	4.5	0.4	3.44	2.75
Hungary	0.24	0.21	0.5	0.2	0.32	0.27
Ireland	0.46	0.51	0.2	0.23	0.39	0.39
Italy	0.87	0.93	0.77	0.74	0.86	0.85
Latvia	0.69	0.75	1.33	0.35	0.92	0.76
Lithuania	0.65	0.71	2.06	0.69	1.14	0.91
Luxembourg	3.33	0.83	0.18	0.37	1.45	1.48
Malta	0.84	0.97	0.18	0.12	0.66	0.65
Netherlands	1.3	1.04	0.68	0.97	1.01	1.06
Poland	1.01	0.98	1.91	0.91	1.3	1.13
Portugal	0.76	1.03	1.74	0.66	1.17	0.99
Romania	1	0.87	2.89	0.75	1.59	1.23
Slovak Rep.	0.84	0.81	2.11	0.86	1.26	1.05
Slovenia	1.42	1.26	2.1	1.47	1.59	1.49
Spain	1.53	1.18	1.36	1.35	1.36	1.35
Sweden	1.25	1.15	0.81	0.45	1.07	1.01
EU	1.38	1.21	1.15	1.32	1.25	1.27
High	1.27	1.29	1.08	1.31	1.21	1.25
Upper middle	0.9	0.92	1.24	0.8	1.02	0.95
Lower middle	1.05	0.9	2	0.62	1.32	1.09
Low	1.54	0.51	1.55	0.8	1.2	1.08

Table 4: Formula apportionment among profit-making entities.

The results in Table 4 are very similar to the results with loss consolidation. The main exceptions to the trend are Belgium and Denmark. In Belgium, for instance, the CCCTB results using positive profits are 3.50 and 3.62, compared to those of 2.68 and 2.77 in Table 3. At the regional level, the EU and high-income

this is less of a problem. This is because losses are consolidated between different companies within a country, so that losses carried forward are unlikely. These would only happen if there were net aggregate losses across all companies from a given parent country in a given source country (eg, if the Swedish subsidiaries of all German companies were loss-making in aggregate).

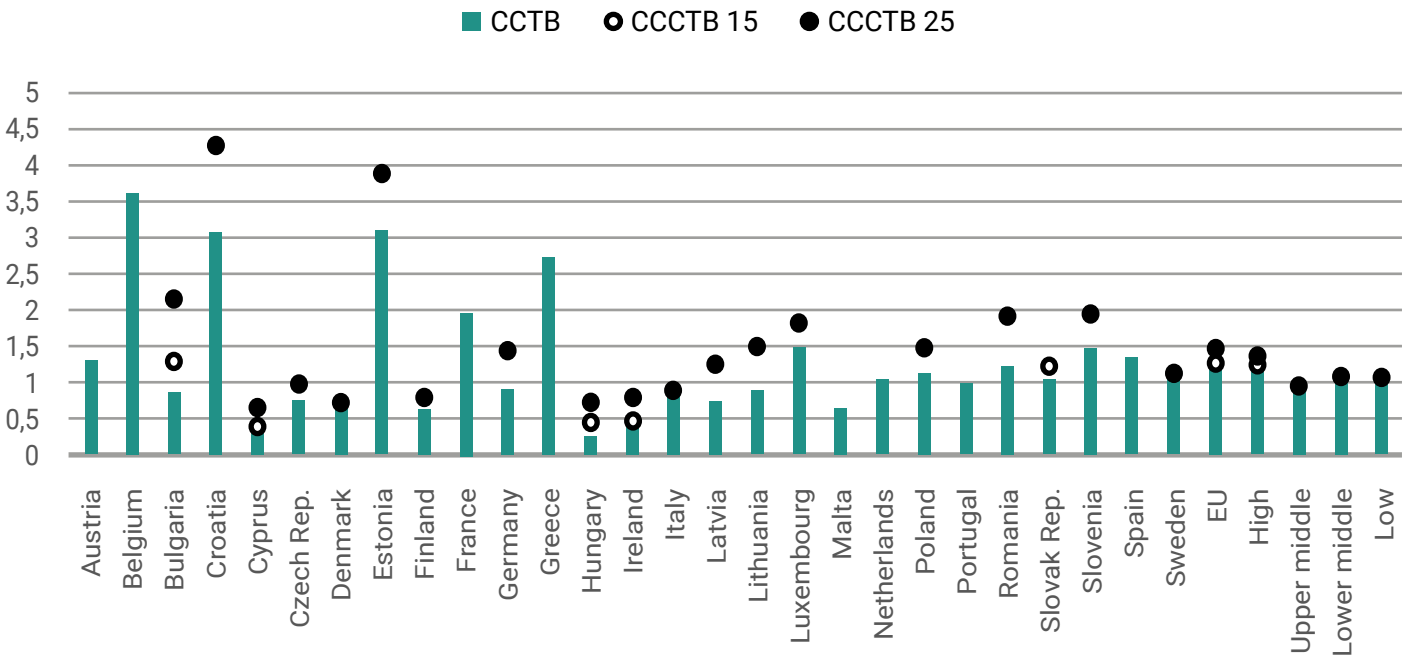


Figure 2: CCCTB and tax revenues among positive profit companies.

countries continue to be the main winners, whereas upper-middle income countries are the main losers. The fact that they lose even in the absence of loss consolidation points to the fact that developing countries are likely to suffer under such a regime, at least if current rates of taxation remain unchanged and payroll is included as an apportioning factor.

For completeness, we reproduce Figure 1, but using data on positive profit entities only. Again, the results in Figure 2 are qualitatively the same as in Figure 1 for each country and region. As before, there is very little increase in revenue when moving to the CCCTB with a minimum rate of 15% versus just the CCCTB. For instance, the CCCTB with a minimum rate of 15% results in a tax intake that is 1.28 times the current intake whereas without the minimum tax it is 1.27. When a minimum rate of 25% is implemented, however, the EU tax take is 1.47 times the current intake. For other areas the increase is less impactful except for high-income countries, which experience a ten percentage-point increase compared to both the CCCTB with no tax change and that with a 15% minimum tax. Upper-middle income countries continue to lose.

3.4 Robustness checks

Our analysis has so far assumed global apportionment – in other words, the **global** profits of MNCs are added and then apportioned on the basis of a formula, with all countries of the world participating. A limited form of global apportionment on the basis of revenue is set to go ahead through Pillar 1 of the OECD agreement. The assumption of global apportionment is necessary to measure the impact on developing countries of any global tax deal, especially when considering alternatives to revenue apportionment.

Any subsequent EU-level agreement is unlikely to be based on apportionment of global profits. Rather, a CCCTB-type arrangement through the BEFIT process is likely to propose apportionment of EU profits – in other words, the EU profits of US, German and other MNCs will be allocated to EU member states based on those member states' shares of EU revenue, assets, payroll, and so on. As a check on our findings, and in the place of any future EU-level deal, we examine the impact that this has.

Figure 3 below compares the ranking of countries using apportionment of EU profits and apportionment of global profits using the CCCTB with payroll. As we move from left to right on the horizontal axis, countries do progressively better in terms of their tax intake under a system of global apportionment of profits. Similarly, as we move up the vertical axis, countries do better when EU profits are apportioned. Hungary, for instance, ranks bottom for both measures. This means that Hungary loses more revenue (as a share of its current intake) than any other country under CCCTB apportionment of the global profits of MNCs. It also loses more revenue than any other country if the EU profits of MNCs are apportioned to EU member states under CCCTB apportionment. In general, the countries are lined up in a fairly linear fashion. This means that those countries that win (lose) under apportionment of global profits also win (lose) under apportionment of EU profits.

The main exception is Greece, which does very well under the global CCCTB, but quite poorly under the EU CCCTB. It seems that the MNCs where Greece has a disproportionate amount of assets, employees and other factors of production have much higher global profits than they do EU profits. However, over all countries, the results are quite similar.

Aside from EU versus global apportionment, another factor that could affect our results is the measure of income used. Some studies favour the use of accounting profit as per companies' financial statements as the tax base (for example, Cobham et al 2021). As discussed, we favoured inferring taxable income by dividing tax paid by the headline rate of taxation. As a robustness check, it is useful to compare results using the two different measures.

Like Figure 3, Figure 4 below compares the ranking of countries using the two measures. As we move

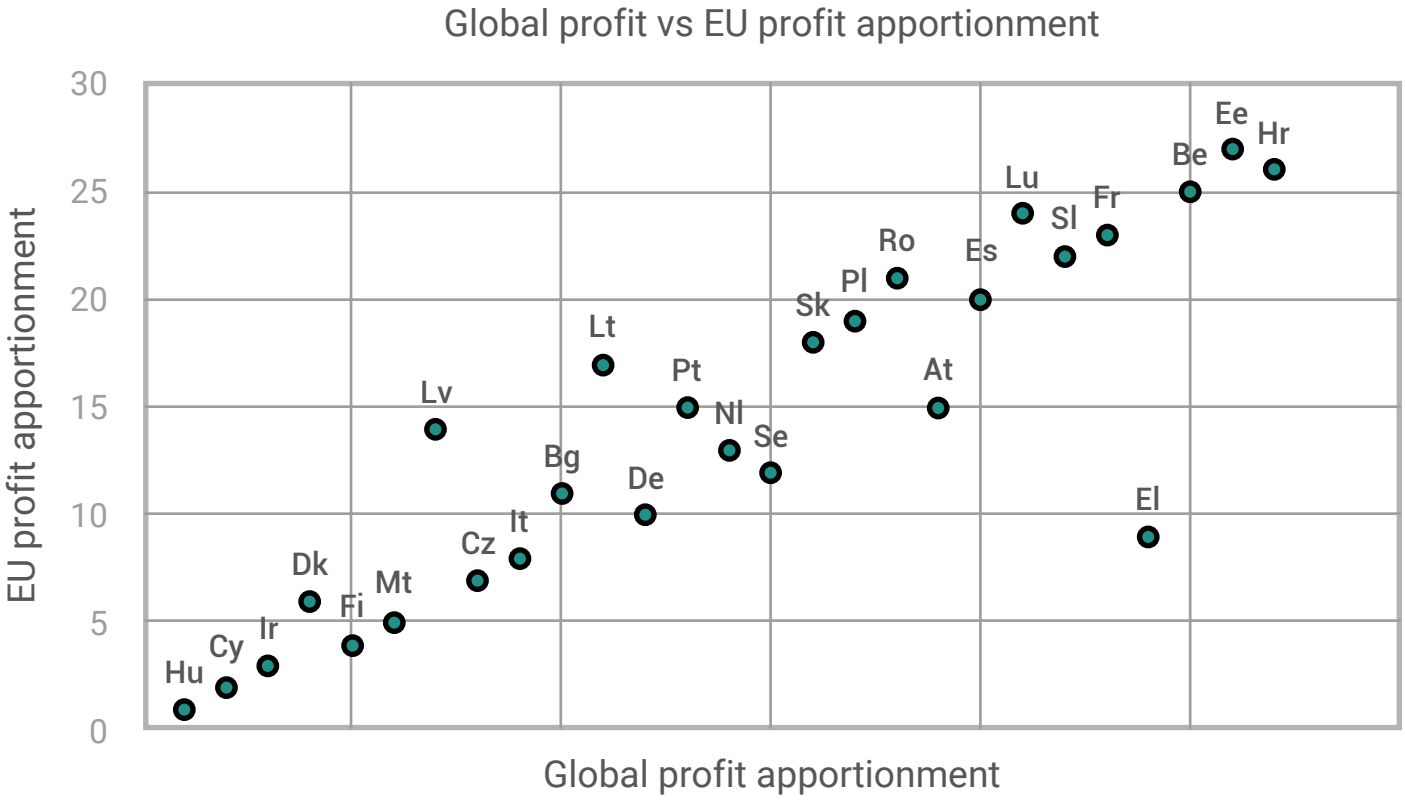


Figure 3: Country rankings using under-apportionment of global and EU profits.
Note: Country codes are as per Eurostat codes.

from left to right on the horizontal axis, countries do progressively better in terms of their tax intake when taxable income is used as the base. Similarly, as we move up the vertical axis, countries do better when accounting profit is used as the base. Hungary once more ranks bottom for both measures. This means that Hungary loses more revenue (as a share of its current intake) than any other country whether we use accounting profit or taxable income as the tax base.

Again, the countries line up in a fairly linear fashion – in other words, countries that rank high or low when one measure is used do so when the other measure is used. Hungary, Cyprus and Ireland are the three lowest ranking countries on both measures. The

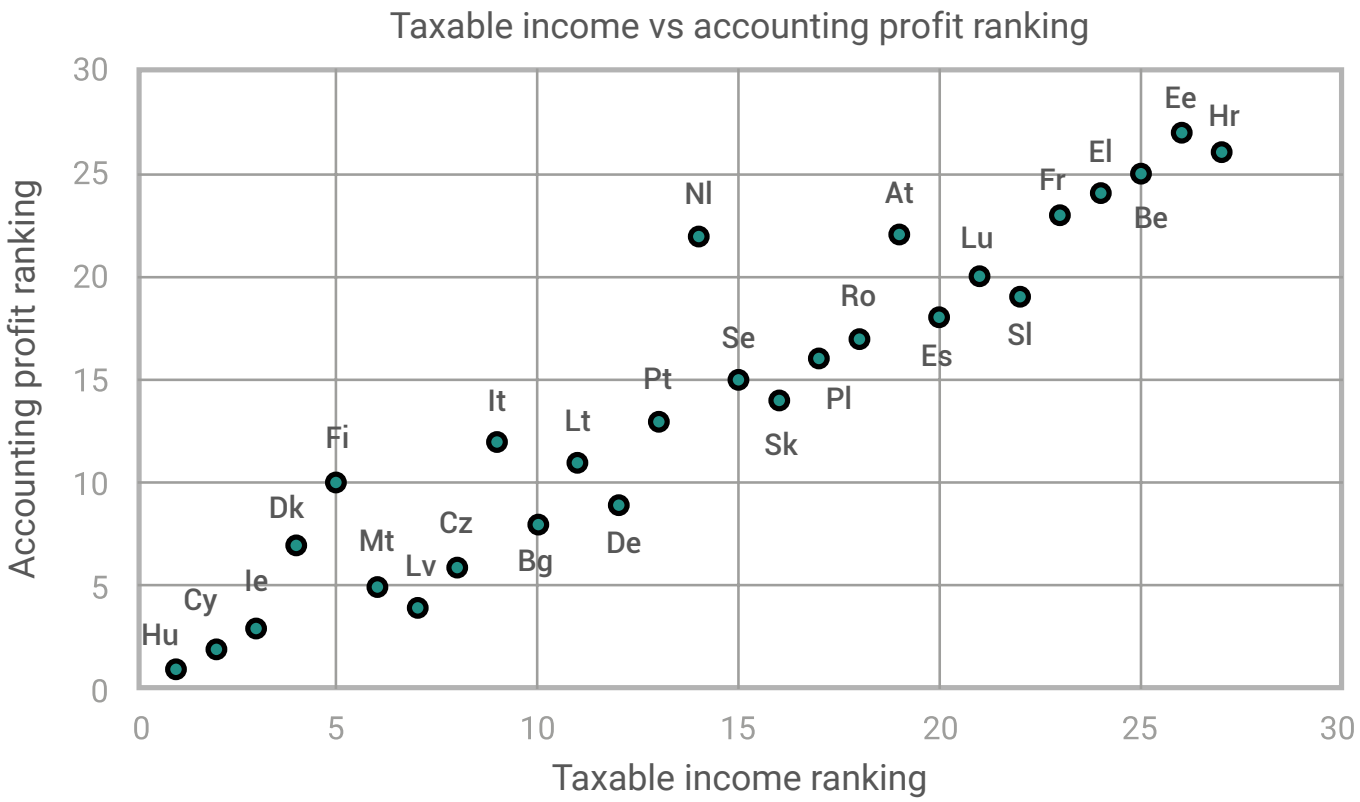
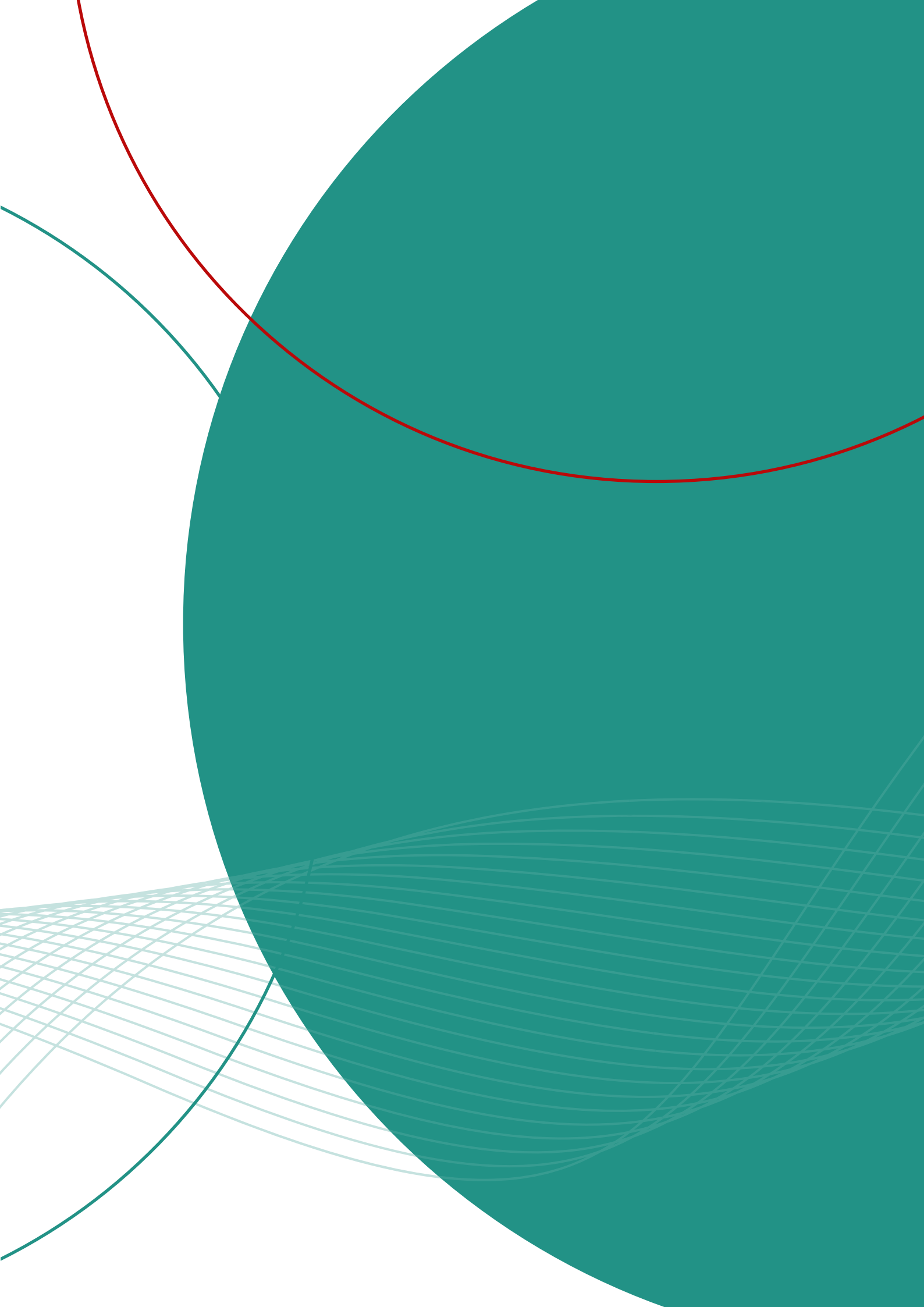


Figure 4: Country rankings using different bases.
Note: Country codes are as per Eurostat codes.

Netherlands is the main exception as it performs considerably better when accounting profit is used – a ranking of 22 as compared to 14 under taxable income. There is almost no change in Luxembourg's ranking.[5]

5 In terms of level as opposed to ranking, the tax intake for the EU as a whole is around 50% higher when accounting profit is used as the base. Similar results apply to other regions except for lower-middle income countries, where the change was much smaller. The CCCTB using accounting profit as the base produced significant gains for all regions, which we felt was implausible.



DISCUSSION

DISCUSSION

This report has considered options for the EU in the ongoing debate around global tax reform, and what the implications would be if the EU was to implement formula apportionment. At the time of writing, negotiations are still in progress, **but agreement is converging towards a global minimum effective rate of taxation of 15%, applicable to companies with revenue in excess of €750 million.** Furthermore, reallocation of taxing rights based on revenue is now very likely. The latter reform is, of course, a type of formula apportionment.

Reallocating taxing rights based on revenue is likely to benefit high-income countries in general and the EU in particular.

> *If the world was to introduce formula apportionment of taxing rights based on revenue, our baseline simulation indicates that the corporate tax intake in the EU would increase by around a fifth.*

Within the EU, higher-income countries such as Austria, Belgium, France, Spain and Sweden would all see significant gains, although Greece, Estonia and Croatia would do so as well. Importantly, all classes of developing countries would lose, with low-income countries losing half of their tax revenue. In other words, **apportioning on the basis of revenue is highly regressive.**

As global negotiations evolve and ultimately come to a conclusion, the EU is sure to ratify whatever reforms come out of them. It is also likely to chart its own course, and formula apportionment based on the CCCTB has been a longstanding ambition. The main obstacle to that ambition has been British and Irish recalcitrance. With the UK no longer part of the EU, and with the momentum behind international reform, the political space for change has once again opened.

Our baseline results indicate that **a global CCCTB, either with or without payroll, would increase tax revenues within the EU by around a fifth.** When only positive profit companies are considered, this would increase to around a quarter or more. **However, around half of the EU member states would lose, as would upper-middle income developing countries, the category with the most developing countries.** The marginal revenue effects of combining the CCCTB with a 15% minimum effective tax rate would be modest. This is in contrast to the CCCTB combined with a 25% minimum rate, when the majority of member states would then see increases in their corporate tax revenue. Developing countries would still be unlikely to see much benefit if payroll was included as an apportioning factor.

These results are consistent with previous studies on the topic. Large, high-tax countries tend to win, and low-tax countries tend to lose. **High-income countries are winners and developing countries either lose or see fewer benefits than high-income**

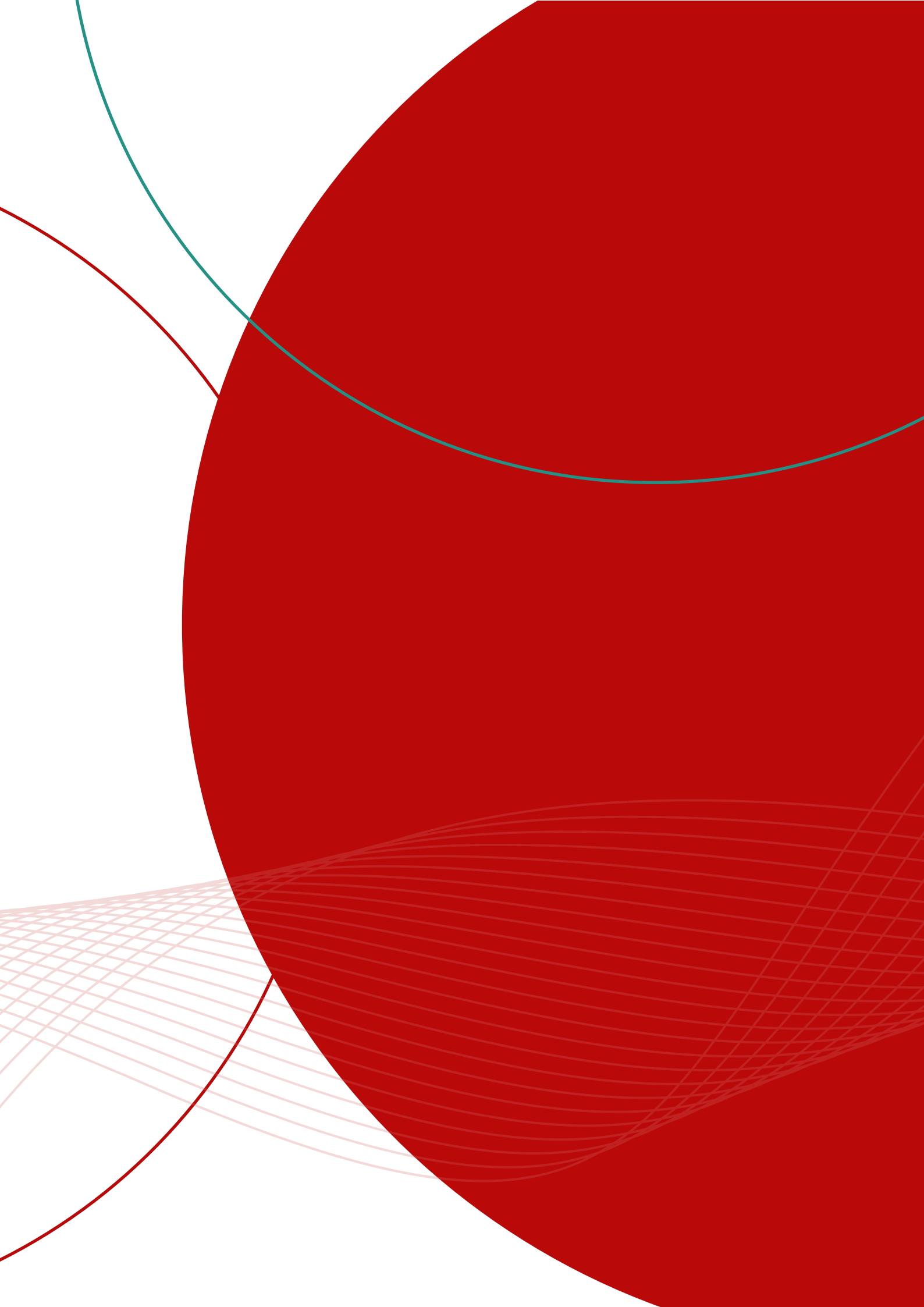
countries, particularly when revenue and payroll are included. Some anomalies nevertheless remain in our results, such as the massive gains by Luxembourg when allocating according to tangible assets while losses for the Netherlands are relatively marginal. Croatia, Estonia and Greece all do exceptionally well. An increase in revenue is also observed when companies with negative profits are eliminated from the data set. This study focused on the change in revenue, not the change in the tax base as other studies do.

> *"Formula apportionment along the lines of the CCCTB makes sense for the EU. However, this needs to be complemented by a high minimum effective rate of taxation for it to be advantageous for the majority of member states."*

We therefore **recommend that EU-level reforms consider formula apportionment and that this be combined with a minimum rate of 25%. For developing countries, the CCCTB without payroll offers a more progressive way to allocate global taxing rights.** The current drive to apportion some taxing rights based on revenue is therefore not progressive and should be resisted. It should be kept in mind that the taxing rights of 25% of the profits of large MNCs when the profit margin exceeds 10% are set to be reallocated on the basis of revenue. We there recommend replacing revenue-based allocation under the recent OECD agreement with CCCTB without payroll.

Although not the topic of this study, we concur with Barake et al (2021a) that the proposed exemptions under current proposals constitute an unacceptable reduction in tax revenues. **As discussed, companies may be able to reduce the amount of profits subject to a minimum tax by 10% of payroll and 8% of assets. We recommend that this exemption be abolished. We also recommend that the threshold for companies to be subject to reforms be lowered from revenues of €750 million to €500 million.**
Using CbC data has its advantages for this analysis, but the obvious weakness is that CbC data are not available in microdata form. As banks are now required to report on a country-by-country basis, there is little plausible rationale for non-financial entities not having to do so as well. **We recommend that financial reporting on a country-by-country basis be extended to all corporations with revenues in excess of €500 million.**

Significant changes to the system of international corporate taxation are now an inevitability. What those changes look like for the world and for the EU is yet to be finalised. **Any new system should minimise profit shifting, ensure that companies pay their fair share, and that countries receive their fair share.** It is therefore important to consider the effects of policy change within and outside the EU. The recently agreed regime, which reallocates taxing rights based on revenue, is unlikely to benefit developing countries. On its own, formula apportionment based on the CCCTB may **not be a major change but, accompanied by other reforms, it offers a realistic way forward for the EU.**



BIBLIOGRAPHY, AUTHORS, ABOUT FEPS & PARTNERS

BIBLIOGRAPHY

Barake, M., Neef, T., Chouc, P.E. and Zucman, G. (2021a) 'Minimizing the minimum tax? The critical effects of substance carve-outs', Note No 1, *EU Tax Observatory*.

Barake, M., Neef, T., Chouc, P. E. and Zucman, G. (2021b) 'Collecting the tax deficit of multinational companies: Simulations for the European Union', Report No 1, *EU Tax Observatory*.

Beer, S., de Mooij, R. and Liu, L. (2020) 'International corporate tax avoidance: A review of the channels, magnitudes, and blind spots', *Journal of Economic Surveys*, 34(3): 660-688.

Blouin, J. and Robinson, L. A. (2020) 'Double counting accounting: How much profit of multinational enterprises is really in tax havens?' (SSRN 3491451).

Boland-Rudder, H. and Woodman, S. (2021) '136 countries agree to global minimum tax for corporations in 'historic' OECD deal', blog, International Consortium of Investigative Journalists, 8 October (www.icij.org/investigations/paradise-papers/136-countries-agree-to-global-minimum-tax-for-corporations-in-historic-oecd-deal/?utm_campaign=Sprout&utm_content=&utm_medium=social&utm_source=twitter)

Clausing, K. A. and Lahav, Y. (2011) 'Corporate tax payments under formulary apportionment: Evidence from the financial reports of 50 major US multinational firms', *Journal of International Accounting, Auditing and Taxation*, 20(2): 97-105.

Cobham, A. and Loretz, S. (2014) 'International distribution of the corporate tax base: Implications of different apportionment factors under unitary taxation', *International Centre for Tax and Development*, Working paper 27.

Cobham, A., Jansky, P., Jones, C. and Temouri, Y. (2021) 'An evaluation of the effects of the European Commission's proposals for the Common Consolidated Corporate Tax Base', *Transnational Corporations*, 28(1): 29-50.

Cooper, M. and Nguyen, Q. T. (2020) 'Multinational enterprises and corporate tax planning: A review of literature and suggestions for a future research agenda', *International Business Review*, 29(3), 101692.

Crivelli, E., de Mooij, R. A., De Vrijer, J. E. J., Hebous, S. and Klemm, A. (2021) 'Taxing Multinationals in Europe', Washington DC: International Monetary Fund Departmental Papers, No 21/12.

de Mooij, R. D., Liu, L. and Prihardini, D. (2021) 'An assessment of global formula apportionment', *National Tax Journal*, 74(2): 431-465.

Devereux, M. P. and Loretz, S. (2008) 'The effects of EU formula apportionment on corporate tax revenues', *Fiscal Studies*, 29(1): 1-33.

Devereux, M.P., Auerbach, A.J., Keen, M., Oosterhuis, P., Schon, W. and Vella, J. (2021) *Taxing profit in the global economy: a report of the Oxford International Tax Group*, Oxford: Oxford University Press.

European Commission (2021) 'Communication from the Commission to the European Parliament and the Council: Business Taxation for the 21st Century', COM (2021) 251 final, Brussels, 18 May.

Eurostat (2021) 'Euro area unemployment at 7.6%', Euro indicators 98/2021 (https://ec.europa.eu/eurostat/documents/2995521/11563247/3-01092021-AP-EN.pdf/e045fa11-8a9e-6e60-6967-19088d96af8a?t=1630482630262)

Faccio, T. (2021) 'Taxing multinationals in the European Union: the 2021 global tax deal and beyond', Policy brief , FEPS, Brussels, July (www.feps-europe.eu/attachments/publications/feps%20

fes%20tasc%20policy%20brief%20faccio.pdf)

Faccio, T. and Fitzgerald, E. V. (2018) 'Sharing the corporate tax base: equitable taxing of multinationals and the choice of formulary apportionment', *Transnational Corporations*, 25(2).

Fuest, C., Hemmelgarn, T. and Ramb, F. (2006) 'How would formula apportionment in the EU affect the distribution and the size of the corporate tax base? An analysis based on German multinationals', Discussion Paper Series 1: Economic Studies No 20/2006, Deutsch Bundesbank.

Garcia-Bernardo, J., and Janský, P. (2021) Profit Shifting of Multinational Corporations Worldwide, *Institute of Development Studies*.

GATJ (2021) 'The 'deal of the rich' will not benefit developing countries', Position statement, Global Alliance for Tax Justice (www.globaltaxjustice.org/en/statement-%E2%80%9Cdeal-rich%E2%80%9D-will-not-benefit-developing-countries)

Hentze, T. (2019) 'The challenge of moving to a Common Consolidated Corporate Tax Base in the EU', IW-Report (No. 2/2019).

ICRICT (2019) 'International corporate tax reform: towards a fair and comprehensive solution', Position paper, *Independent Commission for the Reform of International Corporate Taxation*.

Johansson, Å., Skeie, Ø. B. and Sorbe, S. (2017) 'Anti-avoidance rules against international tax planning: A classification', OECD Economics Department Working Papers No 1356.

Ryding, T. (2021) 'Eurodad: OECD tax deal is unfair and fails to solve the problem', Press release, 8 October, European Network on Debt and Development (www.eurodad.org/eurodad_oecd_tax_deal_is_unfair_and_fails_to_solve_the_problem)

Shackelford, D. and Slemrod, J. (1998) 'The revenue consequences of using formula apportionment to calculate US and foreign-source income: a firm-level analysis', *International Tax and Public Finance*, 5(1): 41-59.

TaxWatch (2021) 'Will the OECD's global tax deal raise more from tech companies?', Briefing, TaxWatch (www.taxwatchuk.org/wp-content/uploads/2021/09/DST_rate_Vs_Pillar1_FINAL.pdf)

Tørsløv, T. R., Wier, L. S. and Zucman, G. (2018) 'The missing profits of nations', Working paper 24701, *National Bureau of Economic Research*, USA.

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Global tax reform is a politically fraught process, not only in the EU but also globally. The current corporate tax system, which assumes that each entity within a multinational group is a separate firm, creates big imbalances among EU countries as well as with respect to developing countries. Political momentum has built up to replace this current regime with a system known as formula apportionment, which treats the profits of multinationals in a unified way and then allocates those profits to jurisdictions on the basis of a formula. On top of this, the introduction of a global minimum tax rate to curb the so-called race to the bottom is also under discussion.

This policy study examines the opportunity for the reform of international corporate taxation by implementing a formula apportionment approach to taxing rights. Using country-by-country reporting data (CbC data) from the OECD, the focus of this study is on the EU, but the effects of any policy change on other countries, especially developing countries, are also considered. Particular attention is paid to implementing the European Commission's Common Consolidated Corporate Tax Base (CCCTB) proposal globally. The CCCTB is a specific type of formula apportionment, and a version of it likely to be a central part of the EU's tax reform agenda which is expected next year.

The goal is to explore the path the EU might pursue in light of recently agreed reforms, but we also consider how such reforms would affect developing countries.

Baseline results indicate that if formula apportionment was implemented globally, high-income countries and the EU would experience significant revenue increases. The CCCTB is also more beneficial for developing countries than other forms of allocation, especially if payroll expenses are excluded.

Implementing the CCCTB and a minimum effective tax rate of 15% would generate little marginal revenue compared to the CCCTB alone. The CCCTB with a minimum tax rate of 25% would generate significant gains compared to 15%, and most EU countries would then gain revenue.

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