

Revenue Effects of the Global Minimum Tax Under Pillar Two

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In October 2021, 137 countries and jurisdictions agreed to implement a major reform of the international corporate tax system, i.e., a global minimum tax of 15% on the profits of large multinational companies. This article presents simulations of the revenue effects of the global minimum tax. Two possible scenarios are considered regarding who collects the minimum tax: The country in which the headquarters are located based on the income inclusion rule (IIR) or the host country of foreign affiliates as laid out under the qualified domestic minimum top-up tax (QDMTT). The Organization for Economic Cooperation and Development's (OECD's) tabulated country-by-country report (CbCR) statistics are complemented with data by Tørsløv, Wier, and Zucman (2020). Based on a sample of eighty-three parent countries, it is estimated that headquarters countries could collect a total revenue of EUR 179 billion globally. The EU Member States could receive EUR 67 billion from a 15% minimum top-up tax. Carve-outs, provisions that decrease the tax base for real economic activity, reduce the potential tax revenues by approximately 14% to 22% over the entire sample. Under the current agreement, the European Union can expect a total tax revenue of EUR 55 billion yearly. The analysis accentuates how the distribution of revenues varies depending on which country has the priority to collect. Under the IIR in which the headquarters country collects the top-up tax, a country receives more revenues when it hosts more headquartered multinationals. With qualified domestic top-up taxes that give the host country of the foreign affiliate the priority to collect the top-up tax, low-tax jurisdictions that have attracted affiliates of many multinationals could be among the main beneficiaries of the reform. Static estimates that take the distribution of profits and taxes paid as given, are presented. Thereafter possible behavioural effects that may affect the estimates are discussed.

Keywords: International taxation, tax deficit, global minimum tax.

I INTRODUCTION

Globalization has afforded new opportunities for multinational corporations to reduce their tax bills. As countries compete to attract investments, they may have incentives to reduce their corporate tax rates. In addition, multinational companies can record earnings in jurisdictions where they can minimize their tax bill where they often employ a small number of workers and own few tangible assets by shifting paper profits to tax havens. International capital mobility and profit shifting have led to a substantial decline in the taxes effectively paid by multinationals globally. This evolution is unlikely to be sustainable, neither politically nor economically.

Multinationals have possibilities to book their profits in low-tax countries, but governments can choose to tax those offshore profits. Since 2019, the Organization for Economic Cooperation and Development (OECD) has been considering a minimum corporate tax rate for multinational companies' profits. In October 2021, 137 countries and jurisdictions agreed

on the implementation of a 15% global minimum tax via the OECD's Pillar Two proposal. This agreement was detailed in the OECD's Model Rules and transposed into a draft directive by the European Commission in December 2021.

This article estimates how much countries could collect from a global minimum tax of 15% on large multinational companies' profits. Two different scenarios are considered. First, the revenues are collected by the country in which the headquarters of the multinational are located (in the following referred to as headquarters country) which is comparable to the income inclusion rule (IIR) of the OECD/G20 agreement. In a second scenario, the host country where the affiliate of the multinational company has its tax residence and profits are recorded collects the additional tax revenues. The latter case corresponds to the qualified domestic minimum top-up tax (QDMTT) that was first introduced in the OECD's Model Rules of December 2021 under which the QDMTT has priority over the IIR. All results in this study are first-round

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effects, i.e., before behavioural adjustments of multinationals and tax jurisdictions to the reform.

This study finds that the global revenue potential of a 15% global minimum tax is approximately EUR 179 billion. This number decreases to EUR 139–165 billion when substance-based carve-outs are introduced and depends on the income deduction rates. For the EU, the revenues from Pillar Two are estimated to be around EUR 55 billion under the IIR. This amounts to almost 16% of corporate tax revenues or 4% of the total healthcare expenditure.

Whether it is the headquarters country that collects the tax revenues (under the IIR) or the source country (under the QDMTT) changes the geographical distribution of revenues among countries. Under the ‘headquarters scenario’, a country that has more headquartered multinationals receives more revenues generated by the global minimum tax especially if the multinationals are engaged in aggressive tax planning. In the second scenario, the host country where the affiliate operates would have the priority to collect the top-up tax revenue. In this context, countries that have attracted the affiliates of tax-aggressive multinational companies would benefit the most before behavioural adjustments.

Until recently, it was difficult to estimate the revenues from a minimum tax due to the lack of publicly available information on the profits recorded by corporations in tax havens.¹ This has begun to change in recent years with the publication of two new macroeconomic datasets: The tabulation of multinational companies’ country-by-country reports (CbCR) (published by the OECD) and foreign affiliate statistics (FATS) (published by Eurostat in the EU, for instance). These new data grant additional knowledge about the location of multinationals’ profits (in particular, how much is reported in tax havens globally) and to estimate the effective tax rates to which these profits are subject.

This study adds to a body of literature that estimates the revenue potential of a global minimum tax. It is closely related to Clausing et al. (2021) who estimate how much additional revenue the United States could collect from applying a 21% minimum tax on the undertaxed profits of their headquartered multinationals.² The Economic Impact Assessment of the OECD (2020) provides a global revenue estimate of approximately USD 150 billion, a similar approximate calculation as that of this article, without presenting country-by-country estimates. Devereux et al. (2020) present revenues estimates from Pillar Two from the IIR. This article contributes to this debate with country-by-country revenue estimates of the global minimum tax agreed under Pillar Two. This work is probably the

first to simulate revenues of a minimum tax based on the latest agreements of July and October 2021 as well as the OECD’s Model Rules and the European Commission’s directive proposal of December 2021. This work is also based on three reports by Baraké et al. (2021). The results are further discussed in light of those studies in the results section.

This article is structured as follows. Section 2 details the Pillar II proposal, section 3 describes the underlying data, and section 4 continues by outlining our methodology. Section 5 provides revenue estimates for the scenarios outlined above. Section 6 discusses the results considering prior studies, the incentive effects of Pillar Two, their potential implications on revenue gain estimates, and further considerations. Section 7 concludes. This article is supplemented by two online appendices. Online Appendix 1³ provides more details on methodology and robustness checks. Online Appendix 2⁴ simulates revenue estimates after possible behavioural adjustments by multinational companies.

2 THE PILLAR TWO PROPOSAL

The OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting has proposed a two pillar solution to address the tax challenges arising from the digitalization of the economy, i.e., Pillar One and Pillar Two. The former consists of the reallocation of residual profits to jurisdictions based on the market share or end user while the latter introduces a global minimum tax. Their proposal seems to be initially introduced as a package to address the digitalization of the economy, however, each is currently being discussed separately, especially since the design of Pillar One is still being developed.

The Pillar Two proposal consists of introducing a minimum top-up tax of 15% on undertaxed profits on a country-by-country basis in each jurisdiction where a multinational is operating. Under the IIR, the headquarters country of a multinational enterprise (MNE) will be able to collect revenues from affiliates in each partner country that have an ETR lower than 15%. With the introduction of the QDMTT, the priority of collecting the revenues can be shifted to the source country from where the affiliate operates. There are also two rules in the design of Pillar Two, i.e., the under-taxed payment rule (UTPR) and the subject to tax rule (STTR). The UTPR functions as a backup in case the IIR is not applied by a country, and the STTR applies on some undertaxed payments. This article will focus on the main rules which are the IIR and the QDMTT.

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¹ This article considers the following jurisdictions as tax havens: Andorra, Anguilla, Antigua and Barbuda, Aruba, Bahamas, Bahrain, Barbados, Belgium, Belize, Bermuda, Bonaire, British Virgin Islands, Cayman Islands, Curacao, Cyprus, Gibraltar, Grenada, Guernsey, Hong Kong, Ireland, Isle of man, Jersey, Lebanon, Liechtenstein, Luxembourg, Macau, Malta, Marshall Islands, Mauritius, Monaco, the Netherlands, Panama, Puerto Rico, Seychelles, Singapore, Sint Maarten, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Switzerland, Turks and Caicos. This corresponds to the list established by Thomas R. Tørsløv, Ludvig S. Wier & Gabriel Zucman, *The Missing Profits of Nations*, NBER Working Paper Series, No. 24701 (2018).

² See also Emmanuel Saez & Gabriel Zucman, *The Triumph of Injustice – How the Rich Dodge Taxes and How to Make Them Pay* (New York, NY: WW Norton 2020), Ch. 6.

³ https://drive.google.com/file/d/13RBGWxU10_sFKPnm3GOuaeU8Hlpyhp3/view

⁴ <https://drive.google.com/file/d/1uzVAdAnNMhVGC0cW87rvqSVbPAKk9Hap/view>

An important aspect of the design of Pillar Two are carve-outs. Substance-based carve-outs allow for a reduction in the tax base in which the top-up tax will apply. It will subtract 8% of the carrying value of tangible assets and 10% of payroll or employee compensation from profits. In a transition period of ten years, the amount of excluded income will be declining to reach 5% of tangible assets and 5% of payroll. The concept behind the substance-based carve-outs is to apply the top-up tax on affiliates with no genuine economic activity and less extensively on affiliates with economic activity. This article models first-year (8% of assets and 10% of payroll) and long-run (5% of assets, 5% of payroll) carve-outs.

These rules will apply to MNEs with an annual global turnover of EUR 750 million and above. Government entities, international organizations, non-profit organizations, pension funds, or investment funds that are ultimate parent entities (UPE) of an MNE group or any holding vehicles used by such entities, organizations or funds are not subject to the global anti-base erosion (GloBE) model rules.

Currently, the Pillar Two agreement has not yet been implemented in any country. In the United States, the existence of global intangible low taxed income (GILTI) would mean that it is either going to be adapted in or going to coexist with Pillar Two. The latter scenario seems to be more probable, and the taxes from the GILTI would be treated as covered taxes. This would give the United States the priority for collecting the tax revenues of its MNEs with respect to the source countries. In the EU, there has been no progress on the proposed directive implementing the global minimum tax because the veto of one member country is sufficient for stopping the directive.

3 DATA

OECD's CbCR statistics. The benchmark data source is the tabulations of multinational corporations' CbCRs published by the OECD for the financial years of 2016 and 2017. This dataset provides aggregate information on the profits that multinational enterprises record and the taxes that they pay in their headquarters country and in foreign jurisdictions. Currently, thirty-eight countries provide such information for their headquartered multinationals. All of the computations are based on the subsample of profit-making entities of this dataset which excludes two reporting jurisdictions (Poland and Latvia). The calculations use both income years to compute average effective tax rates and profits recorded in 2017 to estimate potential revenue.⁵ The Online Appendix, section B.1 provides

some additional methodological insights regarding the computation of average effective tax rates, and Figure B.1.1 plots the distribution of pre-tax profits across effective tax rate brackets.

The availability of country-by-country data marks an important milestone in the analysis of globalization. They are currently the only systematic source on the taxes effectively paid by multinational companies in each of the countries from where they operate. These data, however, are still in their infancy and suffer from a number of limitations. In particular, in the first years of reporting, some profits are double-counted. Profits assigned to 'stateless entities' (particularly substantial for US multinationals) are often also counted elsewhere (either under US domestic profits or in a non-US jurisdiction). This issue is addressed by entirely omitting stateless entities. Further, the double-counting of intra-firm dividends in CbCR statistics can inflate profits before tax and artificially reduce effective tax rates as these dividends are generally subject to no or light taxation (Horst and Curatolo, 2020). When a multinational from Country A owns an affiliate in Country B that itself owns an affiliate in Country C, dividends paid by C to B are not considered part of B's revenue, however, they are sometimes counted as part of B's profit. This problem applies primarily to domestic observations as intra-firm dividends generally accrue to the headquarters. There is no way to systematically address this issue at this stage, but the domestic pre-tax profits are adjusted to exclude intra-firm dividends whenever tax administrations provide the relevant information (this is the case for the Netherlands, Sweden, and the United Kingdom).⁶ Finally, possible inconsistencies for a few parent-partner pairs indicated by excessive profit-to-revenue margins or large fluctuations in profits between years were identified.⁷ For these observations, the problematic observations were replaced with what is observed for the same parent-partner pair in the other presumably non-distorted financial year, applying nominal gross domestic products (GDP) growth rates for the sake of comparability.

Tørsløv, Wier, and Zucman (2018, 2019). In this article, the OECD's CbCR data was complemented with estimates by Tørsløv, Wier, and Zucman (2018, 2019) for the income years of 2016 and 2017. The dataset details the amount of profit that multinationals record in tax havens, broken down by the headquarters country, the amount that companies report there, and their effective tax rate. These estimates are obtained by combining FATS from which Tørsløv et al. infer the amount of profits reported in tax havens globally and direct investment statistics on an ultimate ownership basis. From that,

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⁵ Please note that 2016 and 2017 data waves might overlap. The 2016 CbCR data encompasses fiscal years that began between 01 Jan. 2016 and 01 Jul. 2016 (and thus end between 31 Dec. 2016 and 30 Jun. 2017). The 2017 data comprises fiscal years that end between 01 Jan. 2017 and 31 Dec. 2017 (OECD, *Important Disclaimer Regarding the Limitations of the Country-by-Country Report Statistics* (2021), <https://www.oecd.org/tax/tax-policy/anonymised-and-aggregated-cbcr-statistics-disclaimer.pdf>). This partial overlap should not introduce any bias since this data is not used for regression or other prediction models. It may, however, make the comparison of the results for the two fiscal years difficult (see Appendix B.5 for instance).

⁶ A rule-of-thumb extrapolation of this adjustment to other headquarters countries is proposed in the Online Appendix B.4 that accompanies this study.

⁷ This is the case for the Belgian 2016 and 2017 country-by-country data as well as for the Singaporean 2017 data. For more details, see the Online Appendix.

they subsequently deduce the headquarters countries of the parent companies that record profits in tax havens.⁸

Importantly, the resulting database is free from the double-counting of foreign profits identified by Blouin & Robinson (2019) in some of the studies that aim at estimating the scale of multinationals' profit shifting. Indeed, as a measure of corporate profits in the data maintained by the Bureau of Economic Analysis (BEA), Tørsløv et al. do not use the 'net income' variable that includes equity income but rather focus on 'profit-type return'. The latter variable is obtained from the former with a series of adjustments that notably exclude equity income and is provided in the BEA's Value Added Tables.

This dataset is more comprehensive than the OECD's CbCR statistics which allows us to considerably expand the original sample of thirty-six headquarters countries to eighty-three jurisdictions. For EU Member States, the database includes, for instance, estimates of the amount of profits recorded by Hungarian and Portuguese multinational companies in tax havens. This information is currently unavailable in country-by-country statistics.

The Tørsløv et al. database and the OECD's CbCR statistics are generally consistent. Both indicate that approximately 40% of multinationals' foreign profits that are recorded outside of their headquarters location country are reported in tax havens. The OECD's 2017 CbCR statistics indicate a total of USD 684 billion of profits are documented in tax havens; this is 40% of the amount of multinational profits allocated in these data (USD 1,716 billion). This number is slightly larger than that obtained from Tørsløv et al. (2019) who focus on profits artificially shifted to tax havens and estimated a share of 36%.

ORBIS. The European Commission's directive proposal to implement Pillar Two in Member States expands the minimum tax liability beyond multinational companies to purely domestic enterprises without foreign subsidiaries that earn revenues exceeding the EUR 750 million turnover threshold. To estimate revenue gains from these purely domestic companies, the ORBIS database of Bureau Van Dijk (BvD) was used. It is based on public business registries and comprises micro-data on companies' financial and operating metrics as well as on their domestic and international ownership structure.⁹ One hundred and eighty two purely domestic companies are identified in EU Member States over the 2016–2021 period. The identified firms are those that have available consolidated financials and whose consolidated turnover meets the EUR

750 million threshold. Due to missing values, the top-up tax liabilities can be computed for only 170 of them.

Auxiliary data sources. Four auxiliary data sources are mobilized in this study. First, data on the mean nominal monthly earnings of employees from the International Labour Organization (ILO, 2021) to enrich each observation with a proxy for annual payroll expenses.¹⁰ Second, statutory corporate income tax rates used to impute missing effective tax rates are taken from KPMG's corporate tax rates table (2021). Third, exchange rates are taken from the time series of the European Central Bank (2021). Fourth, the estimates are upgraded from the income year of 2017 to 2021 based on the nominal growth rates of the EU and worldwide GDP observed in the World Economic Outlook Database (International Monetary Fund, October 2021).

4 METHODOLOGY

The agreement on the global minimum tax under Pillar Two concretely established a minimum tax rate of 15%. Multinationals that have a consolidated revenue above EUR 750 million in at least two of the last four fiscal years are in scope. The global minimum tax should apply to pretax profits as reported in the company's financial accounts with a number of standardized adjustments eliminating common gaps between accounting and taxable income. This tax base can be reduced by what is known as **substance-based carve-outs** that amount to a percentage of the carrying value of tangible assets and payroll expenses that the multinational company records in the subsidiary country. Over a transition period of ten years, carve-out rates will decrease from 8% of the value of tangible assets and 10% of payroll to a long-run rate of 5% on payroll and tangible assets. This provision reduces the top-up tax liability in countries with substantial activity while the full top-up tax of 15% applies in countries with no genuine economic activity. The tax liability will be globally determined for each multinational company. However, the database that is used only provides aggregate information at the headquarters country p to subsidiary jurisdiction j level. The tax base is thus computed here under long-run carve-out rates as follows:

$$\text{Tax Base}_{pj} = \text{Profits}_{pj} - 5\% (\text{Payroll}_{pj} + \text{Tangible Assets}_{pj}) \quad [1]$$

For which Profits_{pj} indicates the profits before tax of the subsidiaries of multinationals headquartered in country p

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⁸ In general, foreign affiliate statistics contain similar information as that of country-by-country report statistics. A notable difference between both data sources is that CbCR data only comprise multinational enterprises with a global turnover of EUR 750 million and more while foreign affiliate statistics do not apply such a threshold.

⁹ The empirical literature on corporate tax planning has extensively used this database, including studies on the revenue potential of the global minimum tax (Michael P. Devereux, François Bares, Sarah Clifford, Judith Freedman, Irem Güçeri, Martin McCarthy, Martin Simmler & John Vella, *The OECD Global Anti-Base Erosion Proposal* (Oxford University Centre for Business Taxation 2020)), OECD, *Tax Challenges Arising from Digitalisation – Economic Impact Assessment : Inclusive Framework on BEPS*, OECD/G20 Base Erosion and Profit Shifting Project (Paris: OECD Publishing 2020).

¹⁰ Since employees of multinational companies are likely to earn above-average wages, the final payroll estimates are upgraded by a 20% premium. This upgrade factor can be compared with the multinational wage premium estimates identified or gathered by Fredrik Heyman, Fredrik Sjöholm & Patrik Tingvall, *Is There Really a Foreign Ownership Wage Premium? Evidence from Matched Employer-Employee Data*, 73(2) J. Int'l Econ. 355–376 (2007), Rita Almeida, *The Labor Market Effects of Foreign Owned Firms*, 72(1) J. Int'l Econ. 75–96 (2007), or Khadija Van der Straaten, Niccolò Pisani & Ans Kolk, *Unraveling the MNE Wage Premium*, Journal of International Business Studies (2020), SSRN, <https://ssrn.com/abstract=3717151>. For instance, the latter find a wage premium associated with working for a multinational company of 32% using micro-level data from over 40,000 employees in thirteen countries. As they control for variables such as education or firm size, this estimate may even be a lower bound for the 'naïve' upgrade factor that is applied.

operating in partner jurisdiction j ; similarly, $Payroll_{pj}$ denotes the payroll expenses of those subsidiaries in partner jurisdiction j , and $Tangible\ Assets_{pj}$ indicates the carrying value of their tangible assets. Pretax profits and the number of employees are drawn directly from the OECD's CbCR data. Tangible assets are also available, however, the variable can include inventories (OECD, 2020) that were factored out from the tangible assets component of carve-outs in previous versions of the rules. No adjustment has been made, but further guidance on this aspect might make a correction necessary. In that case, the results displayed below would overestimate the effect of the substance-based income exclusion and (to a lesser extent) understate revenue gains. For payroll expenses, the ILO's mean earnings data were mobilized (see section 2). Section B.2 of the Online Appendix provides additional practical indications regarding the integration of substance-based carve-outs, and a discussion regarding the inclusion of inventories in their tangible assets component in Section B.6.

In the agreements of July and October 2021, the IIR is the primarily tool used for revenue collection. It allows the headquarters country of a multinational to apply the minimum top-up tax when its affiliates encounter an effective tax rate below 15%. The model rules of December 2021 introduced a new collection mechanism. Under the QDMTT, host jurisdictions, i.e., jurisdictions where multinationals' foreign subsidiaries record (undertaxed) profits, have the priority to collect the tax revenues over headquarters countries.

In the simulations, the focus is on the IIR and the QDMTT, and other aspects of the model rules are abstracted: First, from the STTR that would have priority over the IIR and QDMTT; second, from the interaction with Pillar One; and third, from the collection of revenues through the UTPR. Multinationals' and tax jurisdictions' behavioural responses are also abstracted. Some of the behavioural effects that could influence the revenue gains and their distribution are discussed in section 5.

In the headquarters scenario, i.e., under the full implementation of the IIR, tax revenues that can be collected by the headquarters country p are estimated as follows:

$$Revenue_p = \sum_j^J (15\% - ETR_{pj}) \times Tax\ Base_{pj} \quad [2]$$

$Tax\ Base_{pj}$ is given by equation (1) for the subsidiaries of multinationals headquartered in parent country p in partner jurisdiction j ; ETR_{pj} is the average effective tax rate that those subsidiaries encounter.¹¹ In the headquarters scenario,

headquarters countries fully collect the additional revenues from the global minimum tax while subsidiary countries do not obtain any extra revenue. Following the European Commission's directive proposal, EU Member States are assumed to impose the top-up tax not only on foreign low-taxed profits but also on those recorded domestically. Stated otherwise, Equation [2] includes country p in the right-hand-side sum if and only if p is an EU Member State.

Under the full implementation of the QDMTT, partner jurisdictions j where subsidiaries are located would collect the full revenues from the minimum tax:

$$Revenue_j = \sum_p^P (15\% - ETR_{pj}) \times Tax\ Base_{pj} \quad [3]$$

The next section provides revenue estimates for the implementation of each of the two scenarios outlined in Equations (2) and (3). It is likely, however, that some but not all host countries will implement the QDMTT which would lead to a hybrid case.

CbCR statistics provide detailed information on profits, taxes paid as well as the number of employees and the amount of tangible assets that the subsidiaries of multinationals headquartered in country p record in partner jurisdiction j . Tørsløv et al. (2018, 2019) only provides data on the profits of the subsidiaries of multinationals headquartered in country p operating in tax havens and in the headquarters country. To compute revenue estimates as detailed above, several assumptions have been made. First, a 10% effective tax rate is assumed in all of the tax havens. This is a rather conservative assumption. Using the same tax haven classification as in Tørsløv, Wier, and Zucman (2018, 2019), an average ETR in tax havens of approximately 5% is found.¹² Second, the minimum tax revenue from non-haven jurisdictions is imputed by assuming that the ratio of revenue gains from tax havens to non-tax havens observed in CbCR data applies to the extended sample. For details on the imputations, see the Online Appendix (Appendix B.3).

Due to the structure and detail of the underlying data, the estimates might lead to under- and overestimating additional revenues. On the one hand, the tabulated OECD CbCR data used in this study delivers downward-biased revenue estimates because of heterogeneity in effective tax rates within each country pair. Entities paying high corporate income taxes may compensate for those in the scope of the minimum tax within a jurisdiction.¹³

Notes

¹¹ The effective tax rate will be calculated on a country-by-country basis. This avoids undertaxed profits being blended with taxes paid in high tax countries. Income taxes paid are divided by pretax profits for each parent-partner jurisdiction pair to compute the effective tax rates. To stabilize effective tax rates, average tax rates over the two available income years of 2016 and 2017 are used:

$$ETR_{pj} = \frac{(tax\ paid_{p,j,2016} + tax\ paid_{p,j,2017})}{(profits_{p,j,2016} + profits_{p,j,2017})}$$

With the available data, some adjustments included in the model rules definition of 'adjusted covered taxes' cannot be made, e.g., none of the income tax variables in country-by-country report statistics include deferred taxes or controlled foreign company (CFC) tax payments cannot be accounted for.

¹² This ETR of 4.8% is a profit-weighted average based on 271 parent-partner observations where the partner is a tax haven for the income year of 2017. The ETRs are average across 2016 and 2017 in order to stabilize them. Outliers are winsorized. The unweighted average amounts to approximately 7%. Thus, the assumption of 10% will probably result in a lower-bound estimate for revenues from tax havens in the database by Tørsløv, Wier, and Zucman (2018,2019).

¹³ For example, imagine that half of French multinationals have an effective tax rate of 20% (euro-weighted) in a partner country, and the others have an effective tax rate of 10% in the same country. The average effective tax rate reported in tabulated statistics for French multinationals in this country is 15% and, thus, the estimated top-up tax liability is 0. In reality, the true revenue gain is positive since the multinationals with a less-than-15% effective tax rate report undertaxed profits.

On the other hand, the revenue gain estimates in this study can be biased upwards via five main mechanisms.

First, the double-counting of intra-firm dividends in CbCR statistics can inflate profits before tax and artificially reduce effective tax rates as discussed above. This potential bias is corrected whenever the required information is available (*see* section 2). Second, the revenue effects of Pillar One are not considered; however, the OECD's Economic Impact Assessment (2020) finds only marginal effects related to its application. Third, newly multinational companies for which the model rules apply exemptions, are not distinguished in the data. Further, the *de minimis* exclusion can only be partially modeled.¹⁴ Fourth, while Pillar Two will only apply to multinational companies with a global turnover of EUR 750 million and above, Tørsløv et al. (2018, 2019) data are not restricted to meet this criterion. This might lead to the inclusion of revenues from smaller companies not subject to Pillar Two. Five, in the 'headquarters scenario' (Equation 2), the specific treatment of partially owned entities under the IIR are disregarded.¹⁵ The full top-up tax amount is systematically attributed to the headquarters location country regardless of the ownership structure of the multinational companies. This simplification is imposed by the aggregate CbCR data that is mobilized. Its effect on the estimated aggregate revenue gains depends on whether the top-up tax amount that is attributable to minority shareholders and remains outside the scope of the IIR is collected through the UTPR (*see* Noked (2022) for a further discussion). If so, the computations in this study do not overestimate the total revenues to be collected from partially owned entities but cover the effect of both the IIR and the UTPR. If this is not the case, then the aggregate revenue gain estimates for the first scenario include top-up taxes that will not be collected. The effect of this simplification should be limited. The order of magnitude of the estimates in this study should not be systematically biased in either direction considering all of those factors and their significance for the resulting revenue estimates.

5 RESULTS

5.1 Headquarters Scenario: Full Implementation of the IIR

The revenue effects of a 15% global minimum tax are first presented with and without carve-outs as collected by headquarters countries. The full implementation of the IIR would entail that the headquarters country of the multinational company collects the difference when the affiliate of a multinational has an effective tax rate of less than 15%. The revenues are expressed in EUR billion as a share of projected corporate tax revenues in 2021 (absent a change in the tax law) and as a share of current health spending.

The findings suggest that the EU would collect approximately EUR 67 billion from a 15% minimum tax without carve-outs. For comparison, this amount represents around 19% of the corporate tax revenues currently raised in the EU and 5% of current healthcare expenditures.¹⁶ Substantial revenue gains are also expected for the other headquarters countries covered in the OECD's country-by-country statistics. Under the IIR, countries that headquarters many large profit-shifting MNEs are expected to draw the largest revenue gains. It is found that the United States is by far the country that would benefit the most under this scenario with estimated revenues of about EUR 58 billion. Western European countries also appear among the primary beneficiaries of the global minimum tax. In this group, Germany would collect almost EUR 13 billion of additional revenues, Spain about EUR 5 billion, France EUR 4 billion, and Italy approximately EUR 3 billion. Other non-EU countries that would collect significant tax deficit revenues are Canada (EUR 9 billion), Japan (EUR 6 billion), and the United Kingdom (EUR 7 billion). Additionally, some lower-tax jurisdictions that have attracted a number of headquarters over the last decades are attributed substantial revenues from the minimum tax. This is the case in particular for Ireland collecting more than EUR 12 billion, Luxembourg receiving EUR 6 billion, and Switzerland with EUR 3.5 billion of additional revenue. Poland would obtain most of its revenue gains, almost EUR 4 billion, from the undertaxed profits booked domestically by its multinationals, as discussed in more detail below.

Notes

¹⁴ According to Art. 5.5 of the OECD's Model Rules, if an in-scope multinational company reports sufficiently low revenue and profits in a specific jurisdiction, it would be free from any top-up tax related to the corresponding income. More precisely, for the exemption to apply, the constituent entity must record an average revenue below EUR 10 million and average profits less than EUR 1 million with the average being computed over the last three income years. As they only provide information at the country pair level and not at the level of constituent entities, the data are not granular enough to incorporate the *de minimis* exclusion. The top-up taxes are brought to zero for all of the country pairs that display aggregate revenue and profits below their respective threshold, however, this affects the results only marginally and the tabulation of country-by-country report statistics implies that the impact of the exclusion is underestimated.

¹⁵ Consider the foreign affiliate of a multinational company with a tax base (profits before tax net of substance-based carve-outs) of USD 1,000 and an effective tax rate of 10%. The total amount of top-up tax associated with low-taxed entity is therefore 5% * USD 1,000 = USD 50. If the affiliate is fully owned by the head of the multinational group, the entire amount is collected by the headquarters country under the IIR. However, if the group head only owns 80% of the shares, the top-up tax collected by the headquarters country will only be 80% * USD 50 = USD 40. The 80% factor would correspond to the 'inclusion ratio' mentioned in the model rules. The implications of this scenario are further discussed in the Online Appendix with more context and a tentative assessment of the scale of the overestimation induced (*see* s. D).

¹⁶ The Online Appendix, Table A.3.1 presents the benchmark revenue gain estimates expressed as a share of the corporate income tax revenues currently collected and the current healthcare expenditures.

Revenue Effects of the Global Minimum Tax

Table 1 Revenues of a 15% Global Minimum Tax With and Without Carve-Outs Under the Income Inclusion Rule (Headquarters Scenario) in 2021 EUR Billion.

<i>Parent Country</i>	<i>No Carve-Out</i>	<i>Year 1: 8% of Tangible Assets, 10% of Payroll</i>	<i>After Year 10: 5% of Tangible Assets & Payroll</i>
Austria	3.1	1.7	2.3
Belgium	4.0	3.0	3.4
Cyprus	0.2	0.2	0.2
Czech Republic	0.1	0.0	0.1
Denmark	1.8	1.4	1.6
Estonia	0.1	0.1	0.1
Finland	1.5	1.2	1.3
France	4.0	3.3	3.6
Germany	13.3	8.0	10.1
Greece	2.2	1.5	1.7
Hungary	0.6	0.3	0.4
Ireland	12.6	11.1	11.7
Italy	3.1	2.4	2.7
Latvia	0.2	0.1	0.1
Luxembourg	5.9	4.6	5.1
Malta	0.1	0.1	0.1
Netherlands	2.4	1.8	2.0
Poland	3.8	2.0	2.7
Portugal	0.1	0.0	0.0
Romania	0.1	0.0	0.1
Slovakia	0.0	0.0	0.0
Slovenia	0.0	0.0	0.0
Spain	5.3	2.6	3.6
Sweden	2.7	2.0	2.3
EU total	67.1	47.4	55.2
<i>Change in %</i>		<i>-29.3%</i>	<i>-17.8%</i>
Argentina	0.1	0.1	0.1
Australia	1.8	1.4	1.6
Bermuda	1.3	1.1	1.2
Brazil	1.5	1.3	1.4

<i>Parent Country</i>	<i>No Carve-Out</i>	<i>Year 1: 8% of Tangible Assets, 10% of Payroll</i>	<i>After Year 10: 5% of Tangible Assets & Payroll</i>
Canada	9.1	6.7	7.6
Chile	0.0	0.0	0.0
China	6.2	3.4	4.4
India	0.6	0.4	0.4
Indonesia	0.1	0.1	0.1
Isle of Man	0.1	0.1	0.1
Japan	6.0	4.8	5.2
Korea	0.0	0.0	0.0
Malaysia	0.5	0.3	0.3
Mexico	0.4	0.4	0.4
Norway	0.3	0.2	0.2
Peru	0.1	0.1	0.1
Singapore	0.7	0.5	0.6
South Africa	3.0	2.4	2.6
Switzerland	3.5	3.0	3.2
United Kingdom	7.0	5.1	5.9
United States	58.1	52.1	54.4
OECD	162.6	127.8	141.2
<i>Change in %</i>		<i>-21.4%</i>	<i>-13.2%</i>
Full sample	179.1	139.2	154.5
<i>Change in %</i>		<i>-22.3%</i>	<i>-13.7%</i>

This table present estimations of revenue gains under the headquarters scenario. When the affiliate of an MNE has an ETR below 15%, the headquarters country of the MNE collects the difference. Results are presented without carve-outs with first year carve-outs (8% of tangible assets and 10% of payroll) and long-run carve-outs (5% of tangible assets and payroll). The sample is restricted to countries with available data.

The substance-based income exclusion included in the international agreements of July and October 2021 and in the OECD's Model Rules substantially reduces potential revenues, as shown in Table 1. In a transition period of ten years, carve-outs will decrease from 8% of the carrying value of tangible assets and 10% of payroll in the first year to a long-run, constant rate of 5% on payroll and assets. In the EU, with the carve-out rates of the first year of implementation,

estimated revenue gains are reduced by approximately 29% from EUR 67 to 47 billion. With first-year carve-outs, the estimate of EUR 139 billion (in 2021) of global revenue gains from the minimum tax is broadly in accordance with the USD 150 billion (or about EUR 127 billion) estimate provided by the OECD.¹⁷ With the long-run carve-out rates of 5% for both assets and payroll, revenue gains would decrease from the initial EUR 67 billion to EUR 55 billion in the EU. Thus, EU

Notes

¹⁷ The ECB's USD-EUR market exchange rate for 2021 of 1.18274 is used for this study. According to the press release that accompanied the joint statement of Oct. 2021, 'the global minimum tax agreement [...] will see countries collect around USD 150 billion in new revenues annually'. However, the methodologies used to obtain the results and this figure cannot be compared as the content of the proposal has changed substantially since the release of the OECD's Economic Impact Assessment in Oct. 2020.

countries would increase their revenues by almost EUR 55 billion or 16% of current corporate income tax revenue under the benchmark estimation in this study, a 15% minimum tax rate, and long-run carve-outs.¹⁸

The estimated tax revenues reflect how much headquarters countries can collect from their multinationals' foreign affiliates but also from EU Member States' domestic affiliates. For the EU, the majority of additional tax revenues are collected from foreign profits. However, a substantial part of total revenues, between 20% and 40%, comes from revenues from the undertaxed profits of multinational companies in the headquarters country (for the 15% minimum tax with long-run carve-out rates of 5%). This high share of domestic revenue arises from a small number of countries including Germany, Ireland, Luxembourg, and Poland. Further country-specific reasons for their high domestic revenues are discussed in Appendix B.4. The revenue gains from EU multinationals' foreign affiliates can be further broken down into tax havens and non-havens from which the EU would gain about EUR 11 billion, and non-haven partner jurisdictions would acquire almost EUR 23 billion of a total of EUR 55 billion under the benchmark estimation, i.e., approximately 40% of total revenue.¹⁹ The main contributing jurisdictions to these non-haven revenues are Australia with EUR 2.7 billion, the United Kingdom with EUR 7.7 billion, the United States with EUR 4.6 billion as well as some blended jurisdictions such as 'Other Europe' with EUR 5.4 billion and 'Other Americas' with EUR 4.5 billion. For a detailed breakdown by jurisdiction type, see Table A.1.1 in the Online Appendix.

Several countries have expressed interest in a more ambitious global minimum tax. The findings suggest that revenues increase more than proportionally with an increase in the minimum tax rate. With a 21% minimum rate, the European Union would have collected approximately EUR 118 billion in 2021 (as opposed to EUR 55 billion with a 15% minimum tax rate). Moving from 21% to 25% would increase the revenue potential up to EUR 166 billion. This non-linearity was identified by Devereux et al. (2020) in their empirical findings. As they explain, two concomitant effects are relevant when the minimum effective tax rate is raised: The top-up tax rate applied to profits already in scope increases, and more profits are considered as undertaxed and thereby fall in the scope of the global minimum tax. Table A.2.1 in the Online Appendix demonstrates how varying minimum tax rates would affect the revenue gains.

The Online Appendix offers further results with different adjustments to the benchmark estimates in this study. Specifically, in Appendix B.4 the effect of possible double-counting of intra-firm dividends on the study's estimates is discussed. Using a simple rule-of-thumb adjustment based on countries that provide corrected profit aggregates, all of the headquarters country profits uniformly decrease by about 40%. With this adjustment, the European Union would still gain approximately EUR 42 billion per year from a 15% minimum tax with 5% carve-outs. Particularly, Germany would half its overall revenue from EUR 10 billion to EUR 5 billion per year. The resulting revenue estimates can be considered as lower bound estimates.²⁰

5.2 Headquarters v. Subsidiary Country Collection

The model rules of December 2021 introduced a new revenue collection mechanism with QDMTTs. Under the latest rules, the host country where the multinational has an undertaxed affiliate would have the priority to collect the Pillar Two minimum tax. Therefore, a country would collect revenues if it has a substantial number of affiliates taxed at an effective rate below 15%.

Table 2 compares the revenues collected under the IIR (headquarters country collection) with the revenues under the QDMTT (subsidiary country collects). Low-tax countries that have attracted multinational affiliates would gain the most under the QDMTT (before behavioural adjustments). Luxembourg collecting about EUR 12.5 billion and the Netherlands approximately EUR 14 billion would account for almost half of the total EU revenues. Bermuda (EUR 8 billion), the Cayman Islands (EUR 11 billion), Puerto Rico (EUR 5 billion), Singapore (EUR 8 billion), Switzerland (EUR 8 billion), and the United Kingdom (EUR 7 billion) are among the countries that would collect most tax revenues from QDMTTs. However, it should be noted that the distribution of revenue gains estimated in this second scenario is probably not robust to companies' and jurisdictions' responses to the minimum tax. Typically, as the (close to) 15% floor reduces profit shifting incentives, the high estimate for the Cayman Islands might be overestimated and should be carefully interpreted. Potential behavioural responses are reviewed, and their expected effects on revenue gains are analysed in section 5.

Notes

¹⁸ All following discussions in this subsection are based on this benchmark scenario.

¹⁹ In the category of non-tax havens, jurisdictions are included that are not deemed tax havens and also blended jurisdictions since, in CbCR data, some partner jurisdictions are only specified as 'Other Europe' or 'Other Americas'. Additionally, several parent jurisdictions only have a continental split into profits that are recorded and taxes paid in Africa, the Americas, Europe, etc.

²⁰ See the Online Appendix for further country estimates. This is a rule-of-thumb correction that can be considered as a lower bound. Since the guidelines were ambiguous in the initial years of CbC reporting, some countries might already have excluded intra-firm dividends while others have not. It is assumed that all countries double-count intra-firm dividends in the adjustment in this study.

In contrast, revenues collected by the United States would significantly fall from EUR 54 billion to EUR 3 billion when moving from the headquarters collection to the host country collection. The United States indeed hosts the headquarters of many large multinationals that report sizable

earnings in foreign low-tax jurisdictions while profits recorded in the United States are generally taxed at a rate above 15%. China, France, Germany, and Japan where multinationals' affiliates usually encounter effective tax rates higher than 15% would see their tax deficit shrink as well.

Table 2 Revenues of a 15% Global Minimum Tax With Carve-Outs of 5% on Tangible Assets and Payroll Under the Income Inclusion Rule (Headquarters Collection) and the Qualified Domestic Top-Up Tax (Host Country Collection) in 2021 EUR Billion

<i>Parent Country</i>	<i>Headquarters Country Collection (Income Inclusion Rule) in 2021 EUR bn</i>	<i>Host Country Collection (Qualified Domestic Min. Top-Up Tax) in 2021 EUR bn</i>
Austria	2.3	2.6
Belgium	3.4	3.3
Cyprus	0.2	0.4
Czech Republic	0.1	0.0
Denmark	1.6	1.0
Estonia	0.1	0.1
Finland	1.3	1.0
France	3.6	0.2
Germany	10.1	5.5
Greece	1.7	0.1
Hungary	0.4	0.5
Ireland	11.7	4.5
Italy	2.7	0.8
Latvia	0.1	0.1
Luxembourg	5.1	12.5
Malta	0.1	0.8
Netherlands	2.0	14.1
Poland	2.7	2.7
Portugal	0.0	0.2
Romania	0.1	0.1
Slovakia	0.0	0.0
Slovenia	0.0	0.0
Spain	3.6	2.1
Sweden	2.3	1.7
EU total	55.2	54.1
<i>Change in %</i>		<i>-1.9%</i>

Revenue Effects of the Global Minimum Tax

<i>Parent Country</i>	<i>Headquarters Country Collection (Income Inclusion Rule) in 2021 EUR bn</i>	<i>Host Country Collection (Qualified Domestic Min. Top-Up Tax) in 2021 EUR bn</i>
Argentina	0.1	0.0
Australia	1.6	2.4
Bermuda	1.2	8.1
Brazil	1.4	0.3
Canada	7.6	0.2
Chile	0.0	0.4
China (People's Republic of)	4.4	0.5
India	0.4	0.0
Indonesia	0.1	0.1
Isle of Man	0.1	0.1
Japan	5.2	0.0
Korea	0.0	0.0
Malaysia	0.3	0.1
Mexico	0.4	0.0
Norway	0.2	0.0
Peru	0.1	0.2
Singapore	0.6	7.9
South Africa	2.6	0.0
Switzerland	3.2	8.1
United Kingdom	5.9	7.3
United States	54.4	3.4
Total for CbC reporting	141.2	88.5⁺
<i>Change in %</i>		<i>-37.3%</i>
Andorra	0.0	0.0
Bahamas	0.1	0.2
Bahrain	0.0	0.1
Barbados	0.0	0.0
British Virgin Islands	5.1	1.4
Cayman Islands	1.9	11.4
Curacao	0.0	0.0
Gibraltar	0.1	0.0

<i>Parent Country</i>	<i>Headquarters Country Collection (Income Inclusion Rule) in 2021 EUR bn</i>	<i>Host Country Collection (Qualified Domestic Min. Top-Up Tax) in 2021 EUR bn</i>
Guernsey	0.0	0.1
Hong Kong	1.5	4.1
Jersey	0.1	2.4
Macau	0.1	0.1
Panama	0.1	0.2
Puerto Rico	0.0	5.3
Total for tax havens	36.7	85.8
<i>Change in %</i>		<i>134.2%</i>
Total other jurisdictions	0.7	36.1
Full sample total	154.5	154.5*

This table presents estimations of revenue gains under the headquarters and the QMDTT scenarios. Under the headquarters scenario, it is the country where the MNE is headquartered that collects top-up taxes whereas they are collected by the host country under the QMDTT. Estimations are presented with long-run carve-outs.

* It is assumed in the simulation in this study that the global revenue sum is the same under both scenarios. Please note that not all jurisdictions in the sample were included as the table would be unreasonable. Therefore, the sum is higher than that of indicated country-specific revenues in the table. Smaller differences are due to rounding.

+ CbCR reporting country comprises all of the countries above except for Cyprus, Czechia, Estonia, Hungary, Latvia, Malta, Poland, Portugal, and Slovakia.

Initially, revenues would be distributed among a greater number of countries under the QMDTT compared to the IIR under which revenues seem to be concentrated among a few countries. That is because most of the large multinationals are headquartered in a few countries, especially in developed economies, with the United States extremely in the lead. Table 3 breaks down global revenue gains based on countries' level of development using the UN classification. G7 countries alone would collect approximately EUR 90 billion in the headquarters scenario while it would fall to EUR 17 billion under host country collection. Developing countries' gains seem very limited under the IIR; with QMDTTs, they would experience an increase in their potential tax revenues. The EUR 155 billion total would be distributed among 190 jurisdictions and seven regions with the QMDTT compared with eighty-three countries with the headquarters methodology, based on the current sample in this study.

These comparisons, and particularly the revenue gains under the host country scenario, must be interpreted with the understanding that they may not be completely accurate since they represent potential revenue before any behavioural adjustments by multinational companies or governments. It is likely that multinationals allocate less

profits to low-tax jurisdictions when the incentive margin decreases due to the minimum tax.

This table presents the distribution of tax revenues by country classification. The headquarters and QMDTT scenarios are presented with carve-outs in the long-run. The total number of countries with the host country scenario includes 190 countries and seven aggregated regions: Asia, Other Asia, and Other Africa that are classified as developing and America, Other America, Europe, and Other Europe that are designated as developed.

Entirely Domestic Companies. The European Commission's directive proposal extends the scope of the minimum tax to include 'large-scale purely domestic groups', i.e., companies with a consolidated turnover of at least EUR 750 million but without any foreign affiliates. Based on ORBIS data, 182 EU purely domestic companies are identified for which consolidated financials exist and which of their consolidated turnover meets the 750 million EUR threshold (see Appendix 4). More than 75% of these companies are operating in Germany (63), Italy (42), France (20), and the Netherlands (18). However, overall revenues from these are marginal with around EUR 35 million.²¹ Beyond the limited number of firms subject to the proposed extension of the minimum

Notes

²¹ This amount is based on the financials of 170 large-scale purely domestic groups for which sufficient consolidated data could be obtained. The authors also have the individual financials of the parent companies of seventy-nine other purely domestic groups. Including them in the sample yields overall revenues of approximately EUR 54

Table 3 Revenues of a 15% Global Minimum Tax With Carve-Outs of 5% on Tangible Assets and Payroll by Country Classification Under the Income Inclusion Rule and the Qualified Domestic Top-Up Tax in 2021 EUR Billion

Classification	Headquarters Scenario (Income Inclusion Rule)		Host Country Scenario (Qualified Domestic Top-Up Tax)	
	Number of Countries	Revenue in 2021 EUR bn	Number of Countries	Revenue in 2021 EUR bn
Developed	34	133.4	41	95.5
of which G7	7	89.5	7	17.4
Developing	48	21	108	49.2
In transition	1	0.2	13	0.1
Least developed	0	0	35	0.1
Undetermined	-	-	-	10.5
Total	83	154.5	197	154.5

tax, two factors may explain these low revenue gains. First, large-scale purely domestic groups encounter relatively high median and mean effective tax rates of 27% and 25%, respectively, over the sample. Second, substance-based carve-outs have a significant impact on these firms with the long-run (first year) carve-out rates whereby the tax base is reduced by 22% (38%) on average.

6 DISCUSSION

6.1 Estimates in Light of Related Studies

The estimates in this study contribute to a growing literature on the revenue effects of a global minimum tax and, more precisely, Pillar Two. In this subsection, the results are related with prior estimates and discuss differences in methods and results.

The OECD's (2020) Economic Impact Assessment was the first that modelled revenues from Pillar Two under the IIR. They find global revenues of USD 40 to 48 billion for a 15% minimum tax rate without carve-outs before any behavioural adjustments. This is much lower than the global estimates in this study. However, due to the uncertainty of the coexistence with the GILTI, their estimates exclude revenues from US MNEs entirely even though it is the main beneficiary country under the IIR. Additional revenues of EUR 58 billion are estimated for

the United States in this article. Further differences might arise from slightly various methodologies, e.g., in computing the ETRs.

The OECD (2021) provides an updated estimate in a press release accompanying the global tax agreement of Pillar Two: The agreed minimum tax will likely generate additional revenues of approximately USD 150 billion (or about EUR 127 billion). This is broadly in accordance with this study's full sample estimates. Additional revenue of EUR 139 billion EUR (in 2021) is estimated with first year carve-outs.²² Unfortunately, the revised OECD (2021) estimates are not broken down into country-by-country revenues from Pillar Two.

Devereux et al. (2020) estimate the potential revenues from a global minimum tax on a country-by-country basis using the database compiled by Tørslov, Wier, and Zucman (2020). They assume a 10% minimum effective tax rate without carve-out provisions and find that this would generate additional revenues of about USD 32 billion (almost EUR 34 billion, constant 2021) globally or about 1.7% of worldwide corporate income tax revenues. The estimates in this study are significantly higher due to several reasons. First, a minimum tax rate of 15% is assumed. A higher tax rate leads to a larger scope of MNEs falling under revenue collection and increases tax revenues more than proportionally. For a 15% minimum rate, Devereux et al. (2020) find additional revenues of approximately USD 57 to 69 billion in 2012 (about EUR

Notes

million (+53%). These amounts should be considered as indicative of the order of magnitude of the potential revenue gains from the extension rather than very robust estimates. See s. C of the Online Appendix for results that are more detailed and comments on the methodology.

²² The ECB's USD-EUR market exchange rate for 2021 of 1.18274. According to the press release that accompanied the joint statement of Oct. 2021, 'the global minimum tax agreement [...] will see countries collect around USD 150 billion in new revenues annually'. However, the methodologies used to obtain this study's results and this figure cannot be compared as the content of the proposal has changed substantially since the release of the OECD's Economic Impact Assessment in Oct. 2020.

61 to 74 billion, constant 2021).²³ Second, following the directive proposal of the European Commission, the revenues drawn by EU Member States from the under-taxed profits of domestic subsidiaries are included. This accounts for EUR 28.4 billion (constant 2021) in this study's benchmark computations without carve-outs.²⁴ Eventually, despite differences in the estimated amounts of revenue gains, comparable conclusions are drawn regarding the distributional consequences of Pillar Two. In particular, the largest economies are expected to draw the most additional tax revenues as they host numerous large multinational companies. However, some smaller low-tax jurisdictions that have attracted many headquarters also benefit substantially from the global minimum tax (especially Hong Kong and Panama in Devereux et al. (2020)).

There are a number of studies that focus on some specific countries. For the United States, Clausing et al. (2021) estimate possible tax revenues from a 21% minimum tax rate of USD 48 billion (2021 current) yearly based on internal revenue service (IRS) data. It is different from the value found in this article of about EUR 89 billion (constant 2021) yearly. The dissimilarities might be because Clausing et al. (2021) only attribute two-thirds of their estimated revenues of USD 61 billion to the United States and account for reduced profit shifting.

Laffitte et al. (2021) provide model-based revenue estimates for France, Germany, and the United States based on a bilateral balance of payments and a model that takes into account direct tax gains from the top-up tax, indirect tax gains due to a reduction in profit shifting, and possible tax losses due to relocation of production sites. For a global minimum tax of 15% without carve-outs, they find that France could generate additional revenues of EUR 6 billion annually in the short run which decreases to EUR 2 billion after behavioural adjustments.

For Germany, they find revenues of EUR 8 billion annually in the short term and about EUR 3 billion after modelled behavioural responses. The order of magnitude is approximately in accordance with the results in this study. For France, additional revenues are found of EUR 4 billion annually without carve-outs and EUR 3.6 billion with carve-outs, both slightly lower amounts that might come about because tax gains from repatriated profits are not considered. For Germany, a higher revenue

is estimated, of EUR 13 billion annually before carve-outs and EUR 10 billion with carve-outs. This study's higher estimates might arise from taking into account tax revenues from undertaxed profits in the headquarters country and non-havens jurisdictions while Laffitte et al. (2021) focus on undertaxed profits in offshore centres. Revenues from non-haven jurisdictions and revenues in the headquarters country in the case of Germany are significant in this study's estimations. In general, differences in estimates are expected here due to the various data sources and different underlying models.²⁵

Overall, this study's estimates show a similar order of magnitude to prior studies. Significant differences in revenue estimates arise primarily due to the modelling of different estimates of the agreement. Specifically, revenue from the minimum tax in EU headquarters jurisdictions (as laid out in the EU directive draft), revenues from non-tax havens with low ETRs, and tax havens are included. Many related studies only estimate revenues from offshore centres and tax havens. This work is most probably the first to provide country-specific revenue effects of the global minimum tax based on the OECD's Model Rules and the EU Directive draft of December 2021 including the IIR as well as the QDMTT and the negotiated carve-out provisions.

6.2 Results in Light of Firms' Behavioural Responses

The first-round estimates of the revenue gains from a global minimum tax before any behavioural adjustments by multinational companies or governments are presented. However, the global minimum tax is likely to profoundly affect agents' incentives with consequences for the distribution of profits or even for corporate income tax systems.

First, the global minimum tax will likely reduce the intensity of multinational companies' profit shifting. Many studies have identified how lower tax rates make some jurisdictions particularly attractive for multinational companies and drive upwards the amount of pre-tax profits recorded there. Several studies have found a semi-elasticity of profits with respect to tax rate differentials of approximately -0.8 to -1 (Heckemeyer and Overesch, 2017; Johansson, Skeie, Sorbe and Menon, 2017; Beer et al. 2020; Dharmapala 2014). Stated differently, a one-percentage-point reduction in the tax rate of a jurisdiction

Notes

²³ For this conversion, the ECB's market exchange rate is used to convert USD into EUR for 2012 (1.2847887) and the World Economic Outlook nominal GDP growth rate in EUR between 2012 and 2021 (as multiplier 1.374317).

²⁴ Further discrepancies might arise from the fact that Devereux et al.'s, *supra* n. 7 sample includes loss-making and profit-making entities while database in this study is restricted to the positive profits sample. Additionally, Devereux et al.'s, *supra* n. 7 central results are based on 2012 data while the computations in this study are on 2017 data and the results are transposed to 2021 accounting for inflation and for the increases in multinational companies' profits.

²⁵ Two further studies, albeit with a slightly different simulation to this study, are the first to estimate revenue losses of profit shifting using micro CbCr data. Fuest et al. (2020) estimate a profit shifting model based on the German micro CbCr data. They find that paper profit-shifting by German MNEs above and below the EUR 750 million threshold to tax havens induced a tax revenue loss of EUR 5.7 billion yearly. Barbara Bratta, Vera Santomartino & Paolo Acciari, *Assessing Profit Shifting Using Country-by-Country Reports: A Non-linear Response to Tax Rate Differentials*, DF Working papers, 11/2021 (2021) use Italian CbCr data and find revenue losses (by using the difference of the tax paid on profits shifted to the counterfactual of taxation in the headquarters country) of EUR 26 billion for France, EUR 6 billion for Germany, and EUR 1 billion for Italy. However, note that this a very different simulation to revenue gains under the global minimum tax.

with respect to other jurisdictions is associated with a 0.8% to 1% increase in pretax profits reported by multinationals in this jurisdiction. More generally, there is a stronger incentive to record profits in the destination of the shifted income when there is a significant difference in corporate income tax rates between that country and the country where the company is located. Moreover, Bratta et al. (2021) find that the response to changes in tax rate differentials is nonlinear with much higher responses in tax havens. More precisely, they find that profits booked in a low-tax country would decrease by almost 6% (compared to 0.8%-1% above) if this jurisdiction increases its tax rate by 1 percentage point. A 15% global minimum tax therefore substantially reduces the company's profit shifting incentive, in particular to tax havens, by curtailing the tax rate differential. This issue is discussed further and revenue estimates after behavioural adjustments of firms will be provided in Online Appendix 2.

Past estimates of the responses of pretax profits to tax rate differentials, however, may be limited to anticipate the reaction of multinational companies to a structural change in the international tax system like Pillar Two. Via its GILTI provision, the US Tax Cut and Jobs Act of 2017 introduced a minimum tax on the global profits of some multinationals for the first time. Despite very significant differences with the GloBE proposal (e.g., with respect to the minimum effective tax rate, the absence of 'jurisdictional blending', or substance-based income exclusions), the GILTI is probably the only precedent available to study companies' responses to a global minimum tax. Analysing its effects, Garcia-Bernardo, Janský, and Zucman (2021) find that the share of foreign pretax profits recorded by US multinational companies in tax havens remained stable from 2015 to 2020 at approximately 50–60%. Overall, the effective tax rate faced by US multinationals on their foreign income did not increase after the introduction of the GILTI. While differences between the two rules make it impossible to draw any assertive conclusion, this result does question the reduction in the intensity of multinationals' profit shifting that may be expected from the GloBE proposal. However, Clausing (2020) contends that, if the GILTI was on a country-by-country level as the proposal of the minimum tax, it would reduce profit shifting more substantially than at the MNE level where blending between income from low and high countries could eliminate GILTI payments.

If multinational companies respond by repatriating a part of their profits from tax havens to higher-tax

jurisdictions, this would reduce the amount of undertaxed corporate income and thus aggregate revenue gains from the global minimum tax. The effect on the geographical distribution of revenues, however, is ambiguous because it depends on where multinationals redirect their profits and on the heterogeneous intensity of profit shifting activities across headquarters countries.²⁶ Under the IIR, the reduction of potential revenues might also occur if MNEs move their headquarters to another country. This depends on whether some countries would offer incentives such as tax credits. However, a number of countries have an existing penalty fee for MNEs that wish to change their headquarters.

Second, substance-based carve-outs also affect the incentives of multinational companies and tax jurisdictions.²⁷ Indeed, carve-outs shield part of the undertaxed profits from the global 15% minimum tax in proportion to payroll expenses and tangible assets. Profits can be taxed at an effective rate significantly smaller than 15% even after Pillar Two applies with an adequate amount of genuine economic activity in a jurisdiction and a sufficiently low effective tax rate. To minimize their global tax payments, companies could therefore concentrate both their pre-tax profits and their real economic activity (i.e., employees and tangible assets) in low-tax jurisdictions. Governments may also have a stronger incentive to provide preferential tax treatments to multinational companies that generate real economic activity in their territory via the development of special low-tax economic zones, for instance. While carve-outs do not impact the effectiveness of the global minimum tax to curb pure paper profit shifting, the effect on tax planning practices and international tax competition is more ambiguous. Importantly, for this study's analysis, behavioural responses involving the substance-based income exclusion may affect both the aggregate revenue gains from the global minimum tax and their distribution.

6.3 Results in Light of Possible Governments' Responses

Third, the global minimum tax could induce governments' responses in terms of investment attracting policies that might counteract the reduced profit-shifting intensity. In their theoretical work, Janeba & Schjelderup (2022) suggest that the minimum tax would reduce profit shifting, however, the tax might increase the importance of attracting actual foreign investments. This would result

Notes

²⁶ The OECD's Economic Impact Assessment (OECD, *Tax Challenges Arising from Digitalisation – Economic Impact Assessment : Inclusive Framework on BEPS*, OECD/G20 Base Erosion and Profit Shifting Project (Paris: OECD Publishing 2020)) of Oct. 2020 developed a methodology to take into account a reduction in the intensity of profit shifting activities in their revenue estimates for Pillar Two.

²⁷ Michael P. Devereux, John Vella, Martin Simmler & Heydon Wardell-Burrus, *What Is the Substance-Based Carve-Out Under Pillar 2? And How Will It Affect Tax Competition?*, Econ. Pol. Pol'y Brief 39 (Nov. 2021), on the one hand, and Johannes Becker & Joachim Englisch, *GloBE Minimum Taxation: Calculating the Local ETR With Carve-Outs*, Kluwer International Tax Blog (2021), link on the other have engaged in a more thorough discussion of the expected effects of substance-based carve-outs on international corporate income tax competition. This study mainly focuses on the effects on revenue gains and their distribution.

in intensified tax competition through possible tax credits. Johannesen (2022) argues that the net welfare effect of the minimum tax will only be unambiguously positive if the policy succeeds in effectively ending profit shifting. If it fails this goal, it might lead to a reallocation of funds from non-haven firms to tax haven governments via the increase in equilibrium tax rates in tax havens.²⁸

Further, the model rules released by the OECD in December 2021 introduced the possibility for host countries to collect the top-up taxes via QDMTTs. This gives the host country the priority of collection over the headquarters country. Depending on the design constraints imposed on QDMTTs, the total revenues collected by that means may differ from IIR revenue gains due to partially owned entities (Noked, 2022). Additionally, as emphasized in the comparison of the two scenarios in this study (section 4), it would change their distribution. Two polar cases are presented – first, a full implementation of the IIR without any collection under the QDMTT and, second, the case in which all jurisdictions adopt a QDMTT. In theory, host countries have a straightforward incentive to implement a domestic minimum tax, i.e., they would simply collect top-up taxes that multinational companies are required to pay under the global minimum tax.²⁹ Devereux et al. (2022) go even further and contend that jurisdictions are incentivized to tax multinational companies solely through the QDMTT in a competitive international tax environment. In practice, however, a hybrid case between both polar cases is more likely to be implemented depending on the administrative cost of introducing these instruments and the discretionary decisions of governments.³⁰ A portion of multinationals' undertaxed profits would be taxed first by host countries through the QDMTT. Thereafter, the IIR would become relevant whenever QDMTTs do not close the gap to a 15% effective rate. This would give headquarters countries the possibility to collect part of the minimum tax revenue. Last, the UTPR would eventually apply if there is remaining income that has not been collected by the host or the headquarters country.³¹

Fourth, some countries might want to adopt the QDMTT in order to collect the revenues but offer tax credits at the same time to preserve their competitiveness. Not all countries will implement the QDMTT because it would either be expensive for them or because they are not aware of it. However, those who do implement the QDMTT by raising the ETR might be incentivized to

introduce some tax credits in order to maintain a level of tax competition. It should be noted that the 15% minimum tax is still a lower tax rate than those in many countries as the average corporate statutory rate is approximately 21% in the EU (KPMG 2021). Thus, there is a possibility that there are no multinationals from countries with a rate close to 15%. Countries with very low tax rates would be mostly affected unless they introduce some other incentives. The effectiveness of Pillar Two might be weakened by the introduction of such forms of tax credits by low tax jurisdictions. Since Pillar Two harmonizes the corporate tax rate among the different countries, some jurisdictions might introduce tax credits to offset the top up taxes that an MNE must pay. The country that introduces them thereby preserves its fiscal competition feature without visibly having a low tax rate. This might lead to a tax credit competition among countries who would like to compete over attracting MNE's. Incentives such as tax holidays, free trade zones, and land and infrastructure paid for by governments to attract firms will be attractive to some countries in the wake of the global minimum tax according to Janeba and Schjelderup (2022).

It should be noted that the OECD model rules further differentiate between 'qualified refundable tax credits' that shall be treated as income in the computation of GloBE income and 'non-qualified refundable tax credits' that are treated as a reduction to covered taxes in the refund period. The result of this is that the use of the non-qualified tax incentives or tax credits – because they reduce covered taxes – may ultimately reduce the ETR of an entity below 15% (Ferreira Liotti et al., 2022). In that case, the UTPR could be used, allowing other countries to collect the benefits of the tax credits and incentives granted by some governments.

6.4 Further Considerations

Fifth, the distribution of revenue gains from the global minimum tax will depend on the treatment of US multinational companies' GILTI top-up tax payments. The model rules do not specify the conditions of the coexistence between Pillar Two and the GILTI. One possibility is that the GILTI will be treated as an IIR. In this case, the host country collection via a QDMTT would have priority over the GILTI, and potential revenues would correspond to the host country collection described in Table 2. However, if

Notes

²⁸ N. Johannesen, *The Global Minimum Tax*. In: *Journal of Public Economics* (2022 forthcoming) only takes into account the IIR.

²⁹ This idea is developed further in the Online Appendix.

³⁰ A few countries are already explicitly considering the introduction of a qualified domestic top-up tax. This is the case, for instance, in the United Kingdom (HM Treasury, *OECD Pillar 2 – Consultation on Implementation* (2022), open consultation document, link) or Switzerland (Conseil fédéral, *Rapport explicatif relatif à l'arrêté fédéral sur une imposition particulière des grands groupes d'entreprises (Mise en œuvre du projet conjoint de l'OCDE et du G20 sur l'imposition de l'économie numérique)* (2022), online access link (reference available in French, German and Italian)). Specialized press articles also mention Hong Kong or Singapore. Additionally, the United Arab Emirates has announced the introduction of a new corporate income tax system that includes a 15% rate on the earnings of multinational companies in the scope of Pillar Two.

³¹ The UTPR was not simulated in this study.

taxes paid under the GILTI are included in the ‘adjusted covered taxes’ of the GloBE proposal, this would raise the effective tax rates computed for US multinational companies and thereby reduce – possibly down to zero if the minimum effective tax rate retained for the GILTI is sufficiently high – the top-up taxes to be collected by host countries under the QDMTT. Revenues from the undertaxed profits of US multinational companies would then be collected by the United States regardless of whether the host jurisdiction has introduced a QDMTT. In this case, the estimates for the full implementation of the QDMTT (Table 2, right column) in which all host countries collect the global minimum tax would severely underestimate the revenue gains for the United States. There would also be an overestimation of the revenue gains for the jurisdictions where US multinational companies book undertaxed profits. Hence, the only way for the source country to retain these revenues would be to raise its corporate income tax rate.

Last, it is worth mentioning that the revenues from the global minimum tax might decrease if Pillar One is introduced along with Pillar Two. This would occur due to the fact that some revenues would have been redistributed according to Pillar One and thus taxed which would raise the ETR. This would be limited to the approximately 100 largest and most profitable MNEs that are in scope of Pillar One, according to the OECD.

7 CONCLUSION

In October 2021, 137 countries and jurisdictions agreed on the implementation of a major reform of the international corporate tax system, i.e., a global minimum tax of 15% on large multinational companies’ income. This article presents simulations of the revenue effects of the global minimum tax. While the minimum tax rate of 15% and carve-out rates are set, who collects the tax seems to be more ambiguous. On the one hand, the IIR gives headquarters countries the right to tax the undertaxed affiliates of their multinationals; on the other hand, the QDMTT gives the priority to host jurisdictions to collect top-up taxes from the subsidiaries that are recording profits in their territory. This article simulates the first-round revenue effects of the full implementation of both rules in a static framework. The geographical distribution of revenue gains among countries heavily depends on which jurisdiction is granted the priority or access to apply the minimum tax.

A global minimum tax of 15%, for which the headquarters country collects the additional revenues, would generate about EUR 67 billion for the EU and around EUR 179 billion for the eighty-three parent countries in this study’s sample. This amount decreases substantially with the carve-outs established in the model rules. With the long-run carve-out rates of 5% for both tangible assets and payroll, EU revenue gains would decrease by about 18% from initially EUR 67 billion to EUR 55 billion. Nonetheless, the total revenues of a global minimum tax would still amount to an increase in current corporate income tax revenues of almost

16% for the EU. The largest beneficiaries of the IIR would be the United States that would collect extra revenue of more than EUR 50 billion and large European countries such as Germany collecting about EUR 13 billion or the United Kingdom with about EUR 7 billion. Adding to that, some low-tax jurisdictions that have attracted a number of headquarters over the last decades would gain substantial revenues from the minimum tax like, for example, Ireland with more than EUR 12 billion and Luxembourg with EUR 6 billion. Under the full implementation of the IIR, revenues would be unequally distributed across the globe. Developed and high-income countries would gain more extra revenues from the global minimum tax than developing and low-income countries.

If all countries implement a QDMTT, revenues would only be collected in countries where undertaxed affiliates operate. In that case, the potential revenues of many large western countries like France, Germany, and the United States would substantially decrease. However, revenues would accrue for approximately 197 jurisdictions in the world. In both scenarios, the least developed countries gain no or very limited revenues.

All of the estimates in this study are first-round effects before the behavioural responses of multinationals or governments. These would particularly affect the geographical distribution of revenues. The magnitude of behavioural responses is unknown. While studies suggest that an increase in taxation in low-tax countries could trigger a strong decrease in profits that are recorded in those jurisdictions, the example of the GILTI – the closest attempt until now at a systematic minimum taxation for multinationals – has shown very limited effects on the effective tax rate and profit shifting patterns of multinationals.

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9 APPENDIX I. HEADQUARTERS SCENARIO

REVENUE GAINS BY TYPE OF PARTNER JURISDICTION

Table A1 15% With Carve-Outs Split in Domestic, Non-tax Havens, Tax Havens (5.3) in 2021 Billion EUR

<i>Parent Country</i>	<i>Total Revenue Gains in 2021 EUR bn</i>	<i>From Tax Havens</i>	<i>From Foreign Non-havens</i>	<i>From Domestic Profits</i>
Austria	2.2	0.0	0.5	1.8
Belgium	3.3	1.1	1.3	0.9
Cyprus	0.2	0.1	0.1	0.0
Czech Republic	0.1	0.0	0.0	0.0
Denmark	1.5	0.4	0.2	1.0
Estonia	0.1	0.0	0.0	0.1
Finland	1.3	0.0	0.4	0.9
France	3.5	3.5	0.1	0.0
Germany	9.9	3.4	1.6	5.0
Greece	1.7	0.0	1.6	0.0
Hungary	0.4	0.0	0.0	0.4
Ireland	11.5	0.0	9.0	2.5
Italy	2.6	0.6	1.3	0.8
Latvia	0.1	0.0	0.0	0.1
Luxembourg	5.0	1.1	2.3	1.7
Malta	0.1	0.0	0.0	0.1
Netherlands	2.0	0.0	0.0	2.0
Poland	2.7	0.0	0.0	2.6
Portugal	0.0	0.0	0.0	0.0
Romania	0.1	0.0	0.0	0.1
Slovakia	0.0	0.0	0.0	0.0
Slovenia	0.0	0.0	0.0	0.0
Spain	3.6	0.4	2.1	1.0
Sweden	2.3	0.0	2.2	0.1
EU total	54.2	10.6	22.8	20.9
As a % of the total	...	19.5%	42.0%	38.5%

This table presents estimations for the additional revenues collected by EU Member States under the headquarters scenario. Revenue gains are decomposed depending on the nature of the jurisdiction where the undertaxed profits are booked.

These can be reported domestically, in a foreign tax haven, or in a foreign non-haven jurisdiction. The latter include the regional aggregates reported by some parent countries in the tabulated country-by-country report statistics.

10 APPENDIX 2. EFFECT OF THE MINIMUM RATE

Table A2 Overview of the Headquarters Scenario for Different Minimum Effective Tax Rates in 2021 EUR Billion

	<i>Revenue Gains (EUR bn) Depending on the Minimum Effective Tax Rate Retained</i>			
<i>Parent Country</i>	15%	21%	25%	30%
France	3.6	13.5	21.2	31.4
Germany	10.1	24.6	35.5	49,6
EU total	55.2	117.9	165.7	228.0
<i>Change in %</i>		114%	40%	38%
United States	54.4	88.7	114.3	149.4
CbCR-reporting	141.2	273.3	373.5	504.9
<i>Change in %</i>		94%	37%	35%
Full sample	154.5	295.2	416.4	574.9
<i>Change in %</i>		91%	41%	38%

This table presents revenue gain estimates for the headquarters scenario, while varying the minimum effective tax rate from 15% to 30%. Carve-outs of 5% of tangible assets and 5% of payroll are applied. The more-than-proportional increase in additional revenues with the minimum rate is due to the combination of two mechanisms, i.e., when the minimum rate increases, top-up taxes levied on profits already in the scope of the rule increase and more profits are deemed undertaxed, thereby falling into the scope of the rule.

11 APPENDIX 3: HOST COUNTRY COLLECTION (QDMTT) FOR OTHER JURISDICTIONS

Table A3 Revenues QDMTT Scenario for Other Jurisdictions With More Than EUR 1 Million

<i>Country</i>	<i>Host Country Collection (QDMTT) in 2021 EUR bn</i>
Mauritius	1.083
United Arab Emirates	0.606
Chinese Taipei	0.202
Uruguay	0.102

<i>Country</i>	<i>Host Country Collection (QDMTT) in 2021 EUR bn</i>
Morocco	0.061
Egypt	0.058
Costa Rica	0.050
Russia	0.049
Serbia	0.048
Thailand	0.047
Venezuela	0.044
Qatar	0.040
Dominican Republic	0.034
Ecuador	0.034
Equatorial Guinea	0.030
Myanmar	0.028
New Zealand	0.028
Viet Nam	0.027
Israel	0.025

Revenue Effects of the Global Minimum Tax

<i>Country</i>	<i>Host Country Collection (QDMTT) in 2021 EUR bn</i>	<i>Country</i>	<i>Host Country Collection (QDMTT) in 2021 EUR bn</i>
Ukraine	0.024	Nigeria	0.004
Ghana	0.023	Lebanon	0.004
Paraguay	0.022	Iraq	0.003
Papua New Guinea	0.019	Cambodia	0.003
Algeria	0.018	Senegal	0.003
Iran	0.017	Greenland	0.003
Philippines	0.016	Bosnia and Herzegovina	0.002
Kuwait	0.015	Gabon	0.002
Sri Lanka	0.015	Eswatini	0.002
Zambia	0.014	Bangladesh	0.002
Burkina Faso	0.014	American Samoa	0.002
Kazakhstan	0.013	Mali	0.002
Botswana	0.013	Mongolia	0.002
Oman	0.013	Tunisia	0.002
Laos	0.013	Colombia	0.002
Saudi Arabia	0.013	Cabo Verde	0.001
Turkey	0.012	Brunei Darussalam	0.001
Congo	0.010	Yemen	0.001
Micronesia	0.009	Palau	0.001
Côte d'Ivoire	0.009	Guam	0.001
Uganda	0.008	Europe	13.782
South Sudan	0.008	Americas	5.094
Mozambique	0.008	Africa	1.863
Monaco	0.007	Asia	1.792
Liechtenstein	0.007	Undetermined	10.540
United States Virgin Islands	0.006		
Liberia	0.006		
Bolivia	0.005		
Georgia	0.005		

This table presents the revenue gain estimates for the host country (QDMTT) scenario for other jurisdictions not detailed in Table 2. Only jurisdictions with revenues above EUR 1million are shown. Results are presented with long term carve-outs.

12 APPENDIX 4: LOCATION AND REVENUE POTENTIAL OF LARGE-SCALE PURELY DOMESTIC COMPANIES IN THE EU

Table A4.1 *Distribution of EU Large-Scale Purely Domestic Groups Across Headquarters Countries*

<i>Country Name</i>	<i>Number of Purely Domestic Groups</i>	<i>Share of Total</i>
Germany	63	34.6%
Italy	42	23.1%
France	20	11.0%
Netherlands	18	9.9%
Spain	7	3.8%
Finland	7	3.8%
Poland	5	2.7%
Austria	4	2.2%
Belgium	4	2.2%
Denmark	4	2.2%
Greece	2	1.1%
Ireland	2	1.1%
Romania	2	1.1%
Luxembourg	1	0.5%
Sweden	1	0.5%
Total	182	100%

This table shows how this study's sample of large-scale purely domestic groups is distributed across EU Member-States. In total, 182 such companies were identified from the ORBIS database based on consolidated financials. The sample used in this study allow to estimate a tax deficit for 170 countries.

Table A4.2 *Potential Revenue Gains from EU Large-Scale Purely Domestic Groups (in 2021)*

<i>Parent Country</i>	<i>Revenue Gains (EUR m)</i>
France	0.1
Germany	3.0
Ireland	0.0
Italy	5.7
Netherlands	25.0
Spain	0.8
Sweden	0.5
Total	35.1

This table presents, for each EU Member State with positive tax deficits, the estimated revenue gains from the application of the minimum tax to large-scale purely domestic groups. A minimum rate of 15% and long-run carve-outs (5% of tangible assets and payroll) are assumed.