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Pillar Two: House of Cards or Bedrock of the Digitalized International Tax Landscape?

An examination of anticipation effects in the reported effective tax rate of multinational enterprises in the European Union

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Abstract

Following the increase in societal unrest surrounding the avoidance of taxes by corporations and the ultra-rich, tax avoidance has become a political hot topic. Under this guise, the Organisation for Economic Cooperation and Development has drawn up “Pillar Two” to combat tax avoidance internationally. This research aims to shed light on whether the announcement of a global initiative to combat tax avoidance, before it has taken effect, has led to an increase in reported effective tax rates in European Union-based multinational enterprises between 2018 and 2022. This is researched by applying ordinary least squares regressions employing fixed effects on company-level micro-data. By regressing the effective tax rate on firm size, the applicability of Pillar Two and low-taxing jurisdictions, this research finds a positive and significant influence of the announcement of Pillar Two on the effective tax rate in low-taxing jurisdictions. This means that anticipation effects can be observed in firm behaviour, as firms rush to restructure their operations around the new minimum tax.

Keywords: Pillar Two, Effective Tax Rate, European Union, Tax Planning, Tax Avoidance

JEL Codes: H26, K34

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1 – Introduction

On April 3rd, 2016, the International Consortium of Investigative Journalists ("**ICIJ**") shocked the world with the revelation of the now infamous Panama Papers (ICIJ, 2016). Already in 2015, the ICIJ received confidential information on Mossack Fonseca, a once prestigious law firm. Having done research for the better part of a year, the organization decided to publish their findings in a bombshell report on offshore tax planning. Although not necessarily prohibited, the usage of offshore tax havens by the world's richest raised questions on the ethics of these seemingly limitless possibilities to avoid taxes (The Guardian, 2016).

More importantly, the report raised questions on how exactly these persons manage to hide their finances in low-taxing jurisdictions. Mossack Fonseca helped 14,000 clients in hiding their finances from the public eye and avoiding taxes or – even worse – evading taxes by hiding their finances from the tax authorities (The New York Times, 2016b). Using complicated international structures making use of shell companies, foundations and hybrid entities, investment income was either taxed at (very) low rates or even was not taxed at all. On the other hand, Mossack Fonseca found ways to distribute money to – for example – children or relatives without incurring gift or estate taxes, in the form of estate planning.

Since the Panama Papers, public opinion has shifted drastically in favour of tax reform to finally counter tax evasion by the ultra rich (The New York Times, 2016a). There has been widespread prediction that the revelation by the ICIJ would inspire others to further speak out against tax evasion, be it in the way of further leaks or in the way of shifting public opinion. Further leaks were not long in coming, as on November 5th, 2017, over thirteen million documents relating to offshore investments and tax avoidance were released (ICIJ, 2017). Examples of aggressive tax planning published in the Paradise Papers include the now infamous Dutch CV/BV-structure, one of the prime examples of hybrid entity abuse.

In the wake of the publication of these aggressive structures and their incurred public outcry, many jurisdictions worldwide implemented measures to combat tax avoidance in some way. Notable examples include the Anti Tax Avoidance Directive ("**ATAD**") and ATAD 2 on the European Union ("**EU**") level, but also the Global Intangible Low-Taxed Income ("**GILTI**") implemented by the United States ("**US**") (Council of the EU, 2016; Council of the EU, 2017; IRS, 2017). On a global level, however, the Organization for Economic Cooperation and Development ("**OECD**") published their Project on Base Erosion and Profit Shifting ("**BEPS**") in February 2013 to address the widespread extent of corporate tax planning (OECD, 2013).

The OECD has since then developed a wide range of measures to address aggressive tax structures, the most notable of such being Pillar One and Pillar Two. Pillar One addresses the

allocation of taxing rights among jurisdictions arising from the digitalisation of the economy (OECD, 2015). Pillar Two, on the other hand, ensures that corporations pay their fair share of tax. It does so by mandating a worldwide corporate minimum effective tax rate ("**ETR**") of 15% on excess profits. Reference is made to **Appendix A1** and **Table A1** in Appendix A2 for a Timeline on the development and implementation of Pillar Two and the associated Model Rules. Initially, the IF aimed for implementation of Pillar Two by 2023, later postponing this to 2024.

As will become clear in the theoretical framework, firms can be expected to engage in tax planning to minimize tax expense, in order to maximize after-tax income. Therefore, firms could be assumed to structure their operations differently, to avoid paying additional tax. This restructuring, however, does not proceed overnight. The moment Pillar Two was likely to be adopted is the moment firms could potentially start restructuring, in order to be prepared when time comes. It cannot be denied that the global effort to ensure a minimum level of taxation is applaudable. However, in the light of both the Panama and Paradise Papers, it could be argued that tax planning simply takes on new forms in the adapted legal framework. Corporations might structure their operations around Pillar Two to circumvent actually paying their due amount of taxes. This leads to the following research question:

To what extent has the announcement of the Pillar Two Blueprint led to an increase in effective tax rate for multinational European Union-based enterprises between 2018 and 2022?

As highlighted in the introduction, public opinion has drastically shifted towards a cry for countering tax evasion by the ultra rich (The New York Times, 2016a). The OECD has tried to give body to this by the creation of the Pillar Two Model Rules, under which multinational enterprises ("**MNEs**") must pay their fair share of taxes on excess profits. However, as illustrated by the various scandals and aggressive structures discussed earlier, wealthy individuals and corporations seem to have the tendency to minimize their taxation expense. In this light, it could be argued that corporations could try to structure their businesses in such a way to minimize their exposure to top-up taxation under Pillar Two. This research investigates exactly that, and thus contributes to the social discussion on the effectiveness of the introduction of a global level of minimum taxation. Using the outcomes of this research, policymakers can further crystallize provisions, implement clawbacks or introduce anti-abuse rules to ensure that corporations do, in the end, pay their fair share of taxes.

The extant literature surrounding tax planning often centres around the (strategic) implications of tax planning, the management of risks arising from tax planning and the

environment in which it takes place (Mulligan, 2008). More concretely: the external, financial implications such as the reported ETR, internal control measures and, for example, lobbying or public pressure, respectively. The influence of large corporations on tax laws that directly affect them must not be underestimated – but neither should the influence of public perception on tax planning practices. Whereas Mulligan (2008) states that US multinationals tend to display conservatism in their tax planning practices, Abdul Wahab & Holland (2012) find no such relationship. Instead, the authors find that (aggressive) tax planning effectively reduces shareholder firm value. The authors do, however, point out that even "legitimate" tax planning activities reduce firm value, in line with the findings of Mulligan (2008) with regard to public perception.

Other research finds that European multinationals are more likely to shift new profits to low-taxing jurisdictions than they are to high-taxing jurisdictions (Dharmapala & Riedel, 2013). Contradictorily, Dharmapala (2014) deems the magnitude of BEPS to be smaller than often imagined. Other authors even state that changes in statutory tax rates are reflected in multinational and domestic firms to the same extent – thus also deeming the magnitude of BEPS to be relatively small (Dyreng et al., 2014).

This research is, however, relatively old. More importantly, the research dates back to before the discoveries made by the ICIJ surrounding tax evasion. More recent research, such as by Beuselinck & Pierk (2024), finds that large MNEs engage in both profit shifting and local tax planning in order to minimize the ETR at the group level. Huizinga & Laeven (2008) also underscore the prominence of tax planning by demonstrating the level of profit shifting in the EU around the turn of the century. Cooper & Nguyen (2020) even find that firms have significant and increasing options to engage in profit shifting, while also being more inclined to do so.

The extant literature did, however, not deem (global) reforms in tax policy to counter tax planning likely (Wilde & Wilson, 2018). Less than four years later, however, the OECD released their Model Rules surrounding Pillar Two, aiming to address the problems arising from global BEPS. The ex-post effects of this new ruleset, which – should have – entered into force in the EU in early 2024, are not yet noticeable. However, the ex-ante effects of MNEs restructuring or shifting profits between jurisdictions can be examined. This research contributes to the literature by examining whether the announcement of the Pillar Two Blueprint by the OECD has led to an increase in ETR for MNEs located in the EU, before the entry into force.

By conducting ordinary least squares regressions using fixed parent entity- and year-effects, this research finds that large firms, on average, report lower ETRs than smaller firms. Furthermore, however, extremely large MNE groups that are in-scope of the Blueprint report, on average, higher ETRs than those that are not. Finally, jurisdictions that are considered "low-taxing" for Pillar Two-purposes – e.g., with an ETR below 15% –, report, on average, higher ETRs in 2021 and 2022. This leads the research question to be answered positively, as the announcement of the Blueprint seems to coincide with an increase in ETR for which this research finds no other possible explanation.

After this introductory chapter, Chapter 2 elaborates on generally applicable definitions used throughout this research, while also outlining the existing literature surrounding tax planning. Chapter 2 concludes with the hypotheses that are researched in the later chapters. Chapter 3 explains the source of the data and what variables are used from this source. The transformations the data undergo are further discussed, after which the chapter concludes with a description of the data and its characteristics. Next, Chapter 4 discusses the methodology of the research, including the framework under which the hypotheses are rejected or whether they fail to be rejected. Chapter 5 gives the results of the regressions performed, using which Chapter 6 answers the research question. Based on this answer, policy implications, limitations of the research and recommendations for further research are given.

2 – Theoretical Framework

2.1 – Definitions

On October 14th, 2020, the OECD published the Blueprint on Pillar Two ("**the Blueprint**"), wherein the OECD/G20 Inclusive Framework on BEPS ("**the Inclusive Framework / the IF**") committed itself to address BEPS (OECD, 2020). Although the commitment does not oblige members of the IF to actually implement the Two-Pillar Solution, the commitment does mean that the members endorse said implementation by other members. The Blueprint lays out the possibility for IF members to "tax back" in case of insufficient taxation by other states, ensuring that MNEs pay a minimum level of tax of 15% on excess profits. This minimum level of taxation is to be achieved by a combination of the Income Inclusion Rule ("**IIR**"), the Undertaxed Payments Rule ("**UTPR**") and the Subject to Tax Rule ("**STTR**"). In order to properly understand the impact of the Blueprint and the later Model Rules, this paragraph provides a brief summary of these rules.

The Blueprint aims to apply on MNE groups with a reported consolidated revenue of at least EUR 750M, based on the applicable financial accounting standard of the ultimate parent entity ("**UPE**"). It is no coincidence that this revenue threshold is the same as for the Country by Country ("**CbC**") Reporting rules, as the Blueprint heavily draws upon information available from these CbC Reports. Bar various exceptions, all entities of the MNE group that are consolidated by the UPE, and their permanent establishments or branches are subject to Pillar Two as Constituent Entities ("**CEs**"). The minimum level of taxation is based on the excess profits, which is ultimately derived from the Financial Accounting Net Income or Loss ("**FANIL**"). Further adjustments are made to bring the FANIL more in line with regular tax bases, such as – for example – the well-known re-addition of expensed stock-based compensation to compute taxable income (OECD, 2020).

After the FANIL has been adjusted, the so-called Global Anti-Base Erosion ("**GloBE**") Income or Loss ("**Net GloBE Income**") remains. After the current tax expense has also been adjusted in numerous ways, for example to include deferred tax expense and to exclude unpaid current tax expense, the Adjusted Covered Taxes remain. The GloBE Income and Adjusted Covered Taxes of all CEs are aggregated on a jurisdictional basis. By dividing the jurisdictional Adjusted Covered Taxes by the Net GloBE Income, the jurisdictional ETR can be calculated (OECD, 2020).

$$Jurisdictional\ ETR = \frac{Jurisdictional\ Adjusted\ Covered\ Taxes}{Jurisdictional\ Net\ GloBE\ Income}$$

If this jurisdictional ETR falls below the minimum tax rate of 15%, the jurisdiction is considered low-taxing for the group, meaning that Top-up Taxation ("**TuT**") is due. The TuT percentage due in a jurisdiction is equal to the positive number, if any, following from the equation:

$$TuT\ Percentage\ =\ 15\% - Jurisdictional\ ETR$$

The TuT is due over the excess profits, which is calculated by subtracting the Substance-Based Income Exclusion ("**SBIE**") from the Net GloBE Income. The SBIE is a percentage of the jurisdictional Tangible Fixed Assets ("**TFAS**") and the Eligible Payroll Expenses ("**Payroll**"). The SBIE ensures a reduction of the tax base with regard to deemed substantive returns on substance-based activities. Thus, in a stylized situation, the TuT amounts to:

$$TuT\ =\ TuT\ Percentage * Excess\ Profits$$

The IIR is the main expected source of TuT, whereas the UTPR serves as a backstop. The IIR works in a comparable way to more "traditional" Controlled Foreign Companies ("**CFC**") measures, wherein (intermediate) parent entities are taxed on the income of undertaxed CFCs. Under the IIR, an (intermediate) parent entity is taxed on the undertaxed excess profits of its subsidiaries. Various provisions – which, for simplicity, are out of scope for this research – ensure that no economic or juridical double taxation takes place (OECD, 2020).

Under circumstances, it is possible that the amount of TuT due is not (fully) levied under the IIR. For example, MNEs might structure their holding structures in such a way that no IIR-implementing jurisdictions hold Low-Taxed Constituent Entities ("**LTCEs**"). In these cases, the UTPR ensures that entities are denied deductions or otherwise imposed taxation such that an additional cash tax expense arises. In order to accommodate developing countries, the STTR ensures that deductible payments between group entities (e.g., interest) can be denied deduction by developing countries to protect their tax bases. Under the rule order, the IIR always takes precedence over the UTPR. However, the total amount of TuT levied by the IIR or UTPR is always first reduced by the amount levied under the STTR (OECD, 2020).

The Blueprint has been succeeded and further crystallized by the GloBE Model Rules ("**Model Rules**") on December 20th, 2021 (OECD, 2021). These Model Rules largely follow the Blueprint, with a very notable difference being the introduction of the Qualified Domestic Minimum Top-up Tax ("**QDMTT**"). In a comparable manner to the STTR, the QDMTT is aimed at protecting the tax base of jurisdictions. This is realized by allowing low-taxing jurisdictions to tax LTCEs up to the minimum tax rate of 15% using the following formula:

$$QDMTT\ TuT\ per\ Entity\ =\ 15\% - Entity\ level\ ETR$$

The Model Rules also do not completely resemble the calculations of the Adjusted Covered Taxes as laid out in the Blueprint by allowing in-scope entities to simply use the reported tax expense in the financial statements as a starting point. Even though the Blueprint is thus not implemented or transposed into national law while the Model Rules are, the general structure and targets between the rulesets are the same.

2.2 – Literature

As defined by Beuselinck & Pierk (2024), global tax planning refers to the usage of tax strategies using the tax regulations in the jurisdictions where the firm is active. Firms engage in tax avoidance by manipulating income such that it arises in low-taxing jurisdictions, while costs arise in high-taxing jurisdictions. The authors point out that the four most prevalent methods of tax planning include profit shifting, debt shifting, (relocating) intangible assets, and (using) hybrid instruments.

Earlier research has found that MNEs are prone to shift income from high-taxing jurisdictions towards lower-taxing jurisdictions, such as, for example, the United States (Collins et al., 1998). This is often done by manipulating transfer prices in the jurisdictions where the MNE is active, thus effectively shifting profits among jurisdictions. This, of course, reduces the ETR of the MNE group as a whole. This is further confirmed by Huizinga & Laeven (2008), who underscore that European MNEs engage in transfer pricing manipulation to shift profits between jurisdictions. The authors find that especially Germany – among the highest statutory corporate tax rates – and Hungary – the lowest statutory corporate tax rate – experience these effects.

Another way companies engage in tax planning is through intercompany ("**IC**") loans between high- and low-taxing jurisdictions, better known as debt shifting (Newberry & Dhaliwal, 2001). By using IC loans under terms that are not necessarily at arm's length ("**AAL**"), deductible interest payments lower the corporate tax base in high-taxing jurisdictions. This income then arises in jurisdictions with lower statutory tax rates, thus reducing the ETR at the group level. The authors find that US MNEs engage in this behaviour. On a European Level, in the controversial *Lexel* case, the CJEU ruled that AAL IC loans must be respected by tax authorities, and thus cannot be subject to interest deductibility restrictions (CJEU, 2021). This has proven to be a severe blow for tax authorities in combatting debt shifting and might be overturned in the upcoming *X BV* case (CJEU, 2024).

A way of tax planning explicitly mentioned in the Blueprint, is the relocation of intangible assets. Dischinger & Riedel (2011) find that European firms shift intangibles to group entities

subject to a relatively lower tax rate. These often highly profitable assets are brought to low-taxing jurisdictions in order to charge royalty payments, such as usage fees, to high-taxing jurisdictions. This, again, has the consequence of reducing the group-wide ETR, while also reducing the marginal tax rate on highly profitable intangible assets.

The final possibility of tax planning being discussed is the usage of hybrid instruments. Hybrid instruments are defined by Hardeck & Wittenstein (2018) as either hybrid organizational forms or hybrid financial instruments. Mismatches surrounding organizational forms can arise due to, for example, the well-known United States' "Check-the-box" ("**CTB**") election, whereby entities are taxed as either corporations or partnerships. The earlier-mentioned Dutch CV/BV-structure has been one of the most infamous examples of hybrid organizational mismatches, whereby income could remain untaxed indefinitely. Hybrid financial instruments are classified differently in the jurisdictions of the payor and the payee, such as, for example, interest (deductible) versus dividends (untaxed).

All these methods of tax planning, however, share the same denominator whereby these methods are only open for MNE groups, compared to entities active in any single jurisdiction (Wilde & Wilson, 2018). The abovementioned tax planning strategies can, of course, only take place when the group makes use of the tax systems of multiple jurisdictions. Sucahyo et al. (2020) find that large corporations are more likely to engage in tax avoidance due to their economic influence. This is in line with the introduction of the OECD Blueprint, which presupposes that large MNE groups do not pay their fair share of tax. Kimsen et al. (2019), however, find that no relationship exists between tax avoidance and firm size, proxied by firm value. This leads to the first two hypotheses to be researched, being:

(H1A) *Relatively larger firms are, on average, subject to a lower ETR than relatively smaller firms.*

(H1B) *Firms in-scope of the GloBE Blueprint report, on average, a lower ETR than firms not in-scope.*

Although audit fees still provide accounting firms their main source of income, fees relating to tax services are the second-highest source (Abdul Wahab & Holland, 2012). These services comprise tax compliance to an ever-increasing extent, although the traditional view of tax services relates to tax planning or tax avoidance. Tax planning is both an important source of revenue for large accounting firms, as it is as an important method of minimizing the tax expense for companies. The British Tax Authorities even estimate that the Corporation Tax Gap between 2022 and 2023 to amount to 13.9% of the total tax liability, amounting to GBP 13.7B (HMRC, 2024). This means that, due to tax planning, tax avoidance and the non-

payment of taxes due, corporations manage to collectively reduce their tax liability by billions. The Corporation Tax Gap reached a minimum between 2011 and 2022 at 6.5% or GBP 3.1B and remained relatively constant at around 9% or GBP 5.5B until 2019. From 2019 onwards, however, the Tax Gap has hovered around 13% to 14% of the total tax liability. Thus, from 2019 on out, the Tax Gap has increased with 63.5% from GBP 8.5B to GBP 13.9B (HMRC, 2024). Abdul Wahab & Holland (2012), however, critique the methodology of this estimation, claiming that the actual Tax Gap probably lies significantly higher than reported. The exponential increase raises questions on whether the increase can be attributed to increased scrutiny by tax authorities, or to an actual increase in tax-avoidant behaviour by firms.

The latter is exactly what Dischinger & Riedel (2011) and Dharmapala & Riedel (2013) expect. According to Dischinger & Riedel (2011), corporations have increasingly shifted intangible assets to low-taxed subsidiaries in recent years. By doing so and charging royalty fees to other group entities, MNEs can effectively shift profits from high-taxing to low-taxing jurisdictions. To further build on the controversy surround the *Lexel* and pending *X BV* cases, the authors indicate that the AAL nature of royalties is especially hard to assess for tax authorities. By moving intangibles – and thus the related income – to subsidiaries in low-taxing jurisdictions, MNE groups minimize the tax on the rents these assets generate. Thus, the group increases after-tax income.

Dharmapala & Riedel (2013) furthermore claim that MNEs make strategic use of transfer pricing or debt financing between group entities in order to engage in tax arbitrage. The authors discover that increases in the profits of parent entities are directly related to subsequent increases in the profits of subsidiaries subject to lower statutory corporate income tax ("**CIT**") rates. These increases are found to be, relatively, significantly larger when compared to subsidiaries subject to higher statutory CIT rates. In short, companies are expected to engage in profit shifting if the marginal tax saving on the earnings increase exceeds the shifting costs, which comprise, among others, the tax advisory costs, publicity costs and costs of defending the position taken against the tax authorities (Dharmapala & Riedel, 2013).

Continuing on the work of Beuselinck & Pierk (2024) and Huizinga & Laeven (2008), it follows that companies projected to be subject to top-up taxation under Pillar Two will engage in tax planning strategies discussed above to maximize after-tax income. Through profit and/or debt shifting, the usage of intangible assets and/or hybrid instruments, companies try to avoid tax liabilities arising under regular corporate income taxation. The very nature of Pillar Two does not lead to differing expectations surrounding the behaviour of firms to the new minimum tax – several EU jurisdictions have even transposed the Pillar Two Directive directly into their respective national CIT legislation. Thus, companies are expected to engage in tax planning

behaviour similarly to the way the do for “regular” CIT purposes; however, instead of simply minimizing taxable income across jurisdictions, this behaviour would reveal itself in the form of reported increases in ETR in jurisdictions where this lies below the minimum tax rate of 15%. After all, this would minimize the TuT due, as discussed under paragraph 2.1. This leads to the second and final hypothesis to be researched:

(H2) *Low-taxing jurisdictions show, on average, an increase in ETR in the years following the announcement of the GloBE Blueprint*.

3 – Data

3.1 – Sourcing of data

The data used is sourced from Bureau van Dijk's ("**BvD**") AMADEUS database ("**Amadeus**"). Amadeus contains information on more than 21 million European companies in both the public and private sector. The data stems from regulatory filings made by the entities to local governments, excluding banks or insurance companies. Amadeus provides data on the companies, their shareholders as either natural persons or their parent entity, their stock price and their financial information. With regard to the financial information, Amadeus categorizes companies into size classifications as either "Very large" ("**VL**"), "Large" ("**L**"), "Medium" ("**M**") or "Small" ("**S**") based on operating revenue, total asset size and number of employees. Furthermore, data on the headline statutory CIT rates is sourced from the OECD Data Explorer. The OECD maintains data on OECD (non-) members on taxation, finance, society and other topics.

3.2 –Description of variables

As laid out in the research question, this research spans from 2018 onwards to 2022. Thus, financial data is collected throughout said period. This is done such that there are two years prior to the introduction of the Blueprint and two years afterwards. This research uses data on VL, L and M S companies in order to properly account for all (multinational) groups operating in the EU. The data is split among Financial data and Owner – Subsidiary data.

Financial data is collected on the BvD ID Number ("**ACCNR**"), the jurisdiction where the entity is located ("**CNTRYCDE**"), operating revenue of the entity ("**OPRE**"), the reporting year of the data ("**CLOSDAT_year**"), the total assets ("**TOAS**"), the total tangible fixed assets ("**TFAS**"), the total payroll costs ("**STAF**") the profit or loss before tax ("**PLBT**") and the taxation expense ("**TAXA**"). All monetary amounts are denoted in the local currency. The BvD ID Number is a numerical variable. The jurisdiction where the entity is located is the country's ISO code, which is renamed ("**COUNTRY**"), similarly to the variable denoting the reporting year ("**YEAR**").

Owners – subsidiary data is collected on all companies listed in Amadeus, based on their BvD ID Number. This means that entities are listed based on their ACCNR. This data is supplemented with the relevant Subsidiary BvD ID Number ("**SUBS_BVDEPNR**"). Thus, this data contains information on the subsidiaries an entity has in a given year.

The headline statutory CIT rates ("**CIT**") are collected from the OECD Data Explorer and denote the top combined marginal tax rate. The rates lie on the interval [0 ; 1], centring around or above .15, e.g. 15%.

3.3 – Transformation of data

The Financials data is merged with the Owners – subsidiary data on a many-to-many basis. Observations without accompanying Financials data are excluded. All data in the same jurisdiction in the same year is aggregated with other data attributable to the same parent entity. Parent entities not located in the EU are excluded from the dataset, although European subsidiaries from outside the EU are included. This is due to the fact that a "EU-foreign" parent entity would not apply the IIR, although a "EU-domestic" parent entity would apply the IIR on its "EU-foreign" subsidiaries.

To create unique IDs that can be used to link parent entities to their subsidiaries, numerical IDs are encoded from the variable ACCNR ("**ID**") and CNTRYCDE ("**COUNTRY**"). These are used to create a unique ID ("**UNID**") per ID and COUNTRY. Aggregated entities with zero or missing values for any variable are dropped. Similarly to Huizinga & Laeven (2008), loss-making firms are also excluded from the dataset. The natural logarithm ("**LOGAS**") is taken of the total assets, while the ratio ("**RATIO**") is also taken of the taxation expense to the total amount of firm assets. All amounts are recalculated, if applicable, from the local currency to Euro by multiplying all monetary variables by the respective exchange rate ("**EXCHRATE2**").

In order to conduct the regression, the ETR ("**ETR**") must be computed by dividing the Adjusted Covered Taxes by the Net GloBE Income. This variable, in principle, lies on the interval [0 ; 1], denoting an effective level of taxation of either 0% or 100%. In rare circumstances, for example involving temporary differences between commercial and tax bases, negative ETRs can arise. In other rare cases, for example involving fiscal "claw-back" provisions, ETRs of more (less) than 100% (0%) can arise. These outliers are excluded, as this research only takes into account observations where the ETR lies on the interval [0 ; 1]. This is, again, in following of Huizinga & Laeven (2008).

The ETR of entity *i* in year *t* is calculated by adjusting the operating income for the Substance-Based Income Exclusion ("**SBIE**"), as laid out under the Model Rules. This effectively means that the Operating Profit or Loss is reduced by 8% of the local tangible assets and 10% of the local payroll costs. This yields the following formula:

$$ETR_{i,t} = \frac{Taxation\ Expense_{i,t}}{GloBE\ Income_{i,t}}$$

Whereby:

$$GloBE\ Income_{i,t} = Operating\ Profit\ or\ Loss_{i,t} - 10\% * Payroll\ Costs_{i,t} - 8\% * Tangible\ Fixed\ Assets_{i,t}$$

The observations are separated using a threshold based on their operating revenue. In the same way that the Blueprint makes a distinction between Groups that are "in-scope", all companies that report a consolidated operating revenue of at least EUR 750M in two of the previous four years are considered "in-scope". This is reflected by a dummy variable ("**SCOPE**").

The data is finally divided into two groups. Based on the average ETR in the period preceding the announcement of the Blueprint (c.q., 2018 through 2020), jurisdictions are classified as either low-taxing or high-taxing. This is denoted by a dummy variable ("**LOW**") that takes on one if the average ETR is below 15%, and otherwise zero. A complete overview of relevant variable names used throughout this research is included in **Table A2** in Appendix A3.

3.4 – Descriptive statistics

After all these adjustments have been made to the data, the following observations can be made from **Table 1**. Firstly, due to all the changes made to the data, 2,904,020 observations remain. This means that, over the five-year period, 580,804 parent entities are followed to ensure that a balanced sample is used. Secondly, it appears that the average operating revenue is heavily skewed to the right. The average operating revenue amounts to more than EUR 7 with a very large standard deviation of EUR 273M, although only .05% of the parent entities meet the Pillar Two threshold in at least two out of four previous years. This is in line with the expectation that Pillar Two only applies to a very small subset of extremely large corporations.

The average ETR of all firms in the period 2018 to 2022 equals 23.0%. In 13.1% of all EU-jurisdictions where the corporations are active is there an average pre-Pillar Two ETR of less than 15%. This is also broadly in line with the expectation, given that most EU Member States include a headline statutory CIT rate of >15%. Notable exceptions, of course, are Hungary (9%), Ireland (12.5%) and Lithuania (15%). For a more in-depth overview of the data, further reference is made to **Table 1**.

Table 1 – Descriptive statistics of the variables used throughout the research

Variable	Mean	Standard Deviation	Minimum	Maximum	Observations
OPRE*	7.29	273.43	0	199,968.7	2,904,020
PLBT*	.9257	152.84	0	241,523.6	2,904,020
TAXA*	.1467	5.82	0	4,262.2	2,904,020
TFAS*	.6912	26.95	0	21,480.53	2,904,020
TOAS*	6.11	251.27	0	153,684.1	2,904,020
LOGAS	12.74	2.06	-.8727	25.76	2,904,020
RATIO	.040	.406	0	369	2,904,020
STAF	.5032	7.23	0	3,083.03	2,904,020
GLOBE	.6991	53.97	0	34,863.29	2,904,020
ETR	.2299	.1644	0	1	2,904,020
SCOPE	.0005	.0231	0	1	2,904,020
LOW	.1306	.3369	0	1	2,904,020

Notes: variables denoted with an asterisk are displayed in millions to enhance legibility. Variables without an asterisk denote dummy variables and thus display percentages. The dataset consists of 580,804 parent entities that are followed for five years, from 2018 onwards to 2022.

The data can be divided in a per-jurisdiction basis to further understand the structure. After the data transformation, a very skewed distribution can be found, as **Figure 1** highlights. With 633,475 and 551,665 observations over the five-year period, respectively, Romania and Italy are the Member States with the highest observation count. On the other hand, Malta and Cyprus are the Member States with the lowest observation count, with respectively 360 and 385 observations. Most Member States hover between 5,000 to 17,500 observations, with Spain (297,765), Sweden (274,925), Hungary (236,385), and the Netherlands (2,280) being notable exceptions.

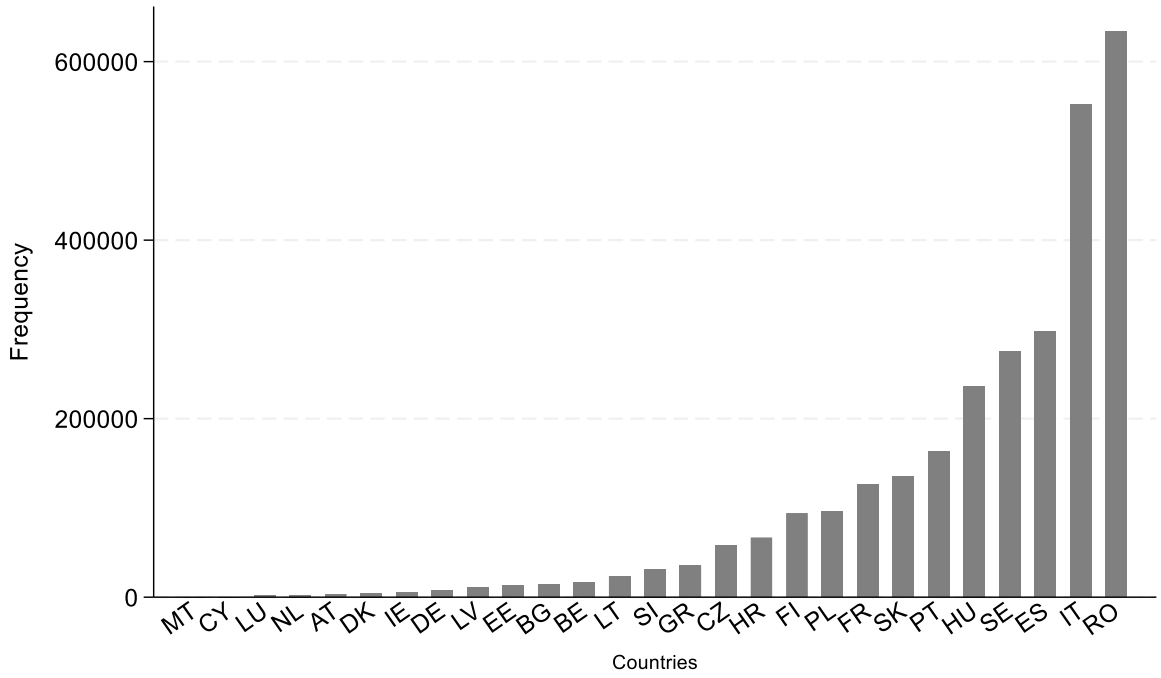

Figure 1 – Summary of number of groups per EU Member State
Notes: this figure illustrates a total of 2,904,020 parent entities divided among the 27 EU Member States over the five-year period from 2018 to 2022.

The 2,904,020 groups can be further divided between groups that are in-scope for the Pillar Two Directive and those that are not. Effectively, a distinction is made between groups that report operating revenues of more than EUR 750M in at least two of the four previous years and those that do not. A graphical representation of the distribution of the 1,546 in-scope parent entities among Member States can be found in **Figure 2**.

Immediately noticeable is the skewed distribution: France (327), Italy (170), Germany (154) and Spain (108) report the most in-scope entities, while other countries hover between 20 and 80 entities. It is unsurprising that the largest economies in the EU report the most in-scope entities. Cyprus, Estonia, Greece and Malta, however, report zero in-scope entities between 2018 and 2022. The lack of significant numbers in-scope entities in Ireland, the Netherlands and Luxembourg is rather surprising, given the frequent usage of these jurisdictions in international holding structures.

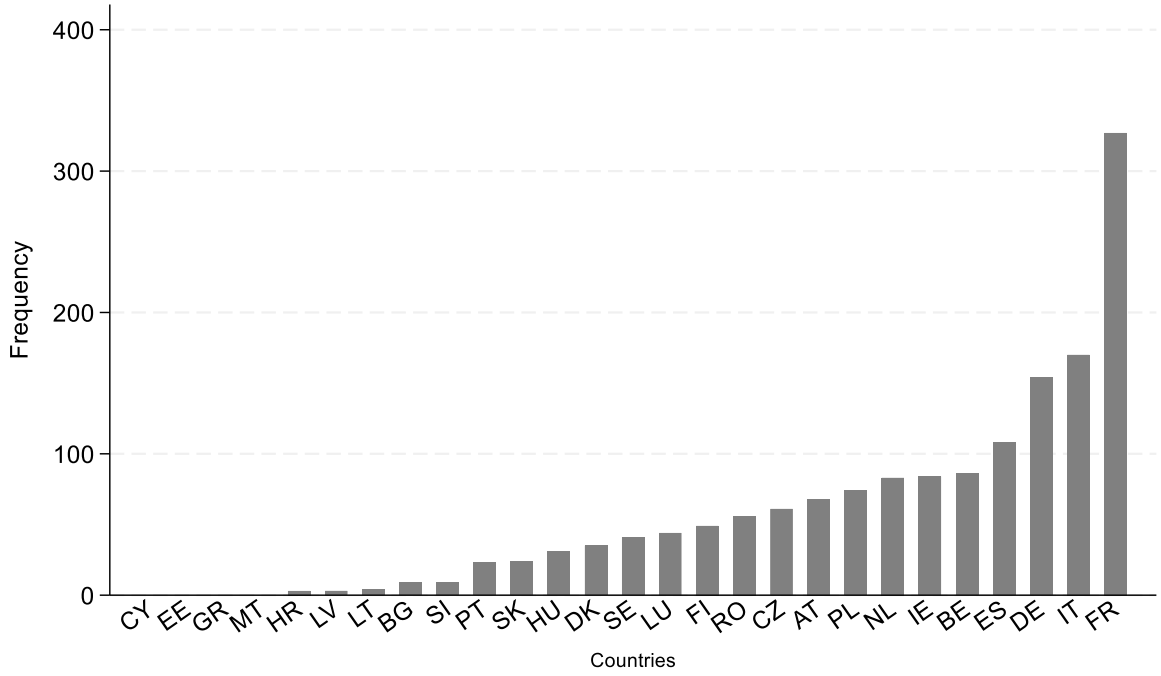

Figure 2 – Summary of in-scope groups per EU Member State

Notes: this figure illustrates a total of 1,546 in-scope parent entities divided among the 27 EU Member States over the five-year period from 2018 to 2022.

4 – Methodology

4.1 – General Methodology

To determine the relationship between the variables collected, this research uses Ordinary Least Squares ("**OLS**") in a fixed effects ("**FE**") model. The relationship between the ETR and the various treatment variables is captured by using FE panel analysis in Stata. The general regression equation for the model used is:

$$Y_{i,t} = \beta_0 + \beta_j X_{j,i,t} + a_i + u_{i,t}$$

Herein $Y_{i,t}$ denotes the expected outcome variable of entity i in year t and β_j denotes the coefficients of the included vector of variables X_j per entity i in year t. The intercept β_0 denotes the expected outcome variable on the assumption that all other variables are equal to 0, while $u_{i,t}$ denotes the error term of entity i in year t. Intercept a_i denotes the entity-level fixed effects, which capture all time-invariant characteristics of entity i. The hypotheses are tested using the above-mentioned regression equation, whereby attention is paid to the significance of any given coefficient, along with its size and sign.

Like Dharmapala & Riedel (2013), the impact of firm size is controlled for by including the natural logarithm of the total assets. Similarly to Abdul Wahab & Holland (2012), the results are made more robust by including the lagged ETR and the ratio of taxation expense to the total assets. Finally, in a similar way as Dischinger & Riedel (2011), the impact of the applicable local headline statutory CIT rate in a given year is controlled for.

4.2 – Hypothesis 1A

In order to test Hypothesis 1A, the regression equation equals:

$$\widehat{ETR}_{i,t} = \hat{\beta}_0 + \hat{\beta}_1 LOGAS_{i,t} + \hat{\beta}_2 LETR_{i,t} + \hat{\beta}_3 RATIO_{i,t} + \hat{\beta}_4 CIT_{i,t} + \hat{a}_i$$

Whereby the treatment variable for Hypothesis 1A is the natural logarithm of total firm assets, in order to proxy firm size. A significant and negative coefficient thus implies a negative correlation between firm size and reported ETR, which would not give reason to reject Hypothesis 1A. In order to make the results more robust, various regressions are performed with and without the above-mentioned control variables. The regression controls for company- and year-fixed effects. By including the lagged value of the ETR, autocorrelation in the ETR is controlled for. The regression sample exists of all 580,804 firms, although the inclusion of the lagged ETR reduces the sample by one year. This means that the sample is reduced by one-fifth. Hypothesis 1A is rejected if no significant and negative coefficient is found for the natural logarithm of total assets at the 10%-, 5%- or 1% level.

4.3 – Hypothesis 1B

On the other hand, in order to test Hypothesis 1B, the regression equation becomes:

$$\widehat{ETR}_{i,t} = \hat{\beta}_0 + \hat{\beta}_1 SCOPE_{i,t} + \hat{\beta}_2 LOGAS_{i,t} + \hat{\beta}_3 LETR_{i,t} + \hat{\beta}_4 RATIO_{i,t} + \hat{\beta}_5 CIT_{i,t} + \hat{a}_i$$

Whereby the treatment variable for Hypothesis 1B is the dummy variable SCOPE, denoting whether the firm is in-scope of the GloBE Blueprint. As mentioned earlier, firms are considered in-scope if they report revenues of, at minimum, EUR 750M in at least two out of the four previous years. A significant and negative coefficient implies a negative correlation between large, in-scope firms and reported ETR. This would not give reason to reject Hypothesis 1B.

In order to make the results more robust, various regressions are performed with and without the above-mentioned control variables. The regression controls for company- and year-fixed effects. By including the lagged value of the ETR, autocorrelation in the ETR is controlled for. The regression sample exists of all 580,804 firms, although the inclusion of the lagged ETR reduces the sample by one year. This means that the sample is reduced by one-fifth. Hypothesis 1B is rejected if no significant and negative coefficient is found for the in-scope dummy at the 10%-, 5%- or 1% level.

4.4 – Hypothesis 2

Finally, to test the Hypothesis 2, the regression equation reads:

$$\widehat{ETR}_{i,t} = \hat{\beta}_0 + \hat{\beta}_1 LOW_{i,t} + \hat{\beta}_2 LOGAS_{i,t} + \hat{\beta}_3 LETR_{i,t} + \hat{\beta}_4 RATIO_{i,t} + \hat{\beta}_5 CIT_{i,t} + \hat{a}_i$$

Whereby the treatment variable for Hypothesis 2 is the dummy variable LOW, denoting whether the jurisdiction where the firm operates is considered low-taxing under the GloBE Blueprint. As discussed before, jurisdictions are considered low-taxing if they report an average ETR in the three previous years of less than 15%. A significant and positive coefficient implies a positive correlation between (previously) low-taxing jurisdictions and reported ETR in 2021 and 2022. This, in practice, would thus mean that firms report an increase in ETR in low-taxing jurisdictions after the GloBE Blueprint was announced. This would not give reason to reject Hypothesis 2.

To make the results more robust, various regressions are performed with and without the above-mentioned control variables. The regression controls for company- and year-fixed effects. By including the lagged value of the ETR, autocorrelation in the ETR is controlled for. The regression sample exists of all 310 in-scope parent entities. Hypothesis 2 is rejected if no

significant and positive coefficient is found for the low-taxing jurisdictional dummy at the 10%-, 5%- or 1% level.

5 – Results

5.1 – General Remarks

Throughout the following paragraphs, multiple regressions are discussed. Prior to these results, however, some general remarks must be made regarding the validity and robustness of the results. **Table A3** in Appendix A4 shows the correlation matrix between the various treatment and control variables. Although almost all correlations are significant at the 1% level, there does not appear to be a high correlation (e.g., above .75 or below -.75, respectively). Multicollinearity issues thus do not appear likely.

Furthermore, to further increase the robustness of the results, various regressions are performed with and without multiple control variables. As the next paragraphs show, these do not appear to alter the coefficients of the treatment variables in meaningful terms, further supporting the robustness of the findings.

5.2 – Hypothesis 1A and 1B

The regression results of Hypotheses 1A and 1B are shown in **Table 2**. Again, Hypothesis 1A tests the correlation between firm size – proxied by the natural logarithm of total firm assets – and reported ETR. On the other hand, Hypothesis 1B tests the relationship between being in-scope for Pillar Two and reported ETR.

Model 1 and Model 6 show the relationship between the ETR and, respectively, firm size and being in-scope of the GloBE Blueprint. Models 2-5 and 7-11 add the various control variables, being the lagged ETR, the ratio of tax expense to total assets and the applicable headline CIT rate. For Hypothesis 1B, the natural logarithm of total firm assets is also added as a control variable. The most complete model, being Model 5, gives Regression Equation 1 for Hypothesis 1A:

$$(1) \qquad \widehat{ETR}_{i,t} = .467 - .024LOGAS_{i,t} - .097LETR_{i,t} - .001RATIO_{i,t} + .395CIT_{i,t} + \hat{a}_i$$

In Equation 1, the intercept equals .467, meaning that an entity where all variables except the natural logarithm of total assets are equal to zero reports an expected ETR of .467, or 46.7%. If the logarithm of total assets increases with 1%, the ETR decreases, on average, with .024, or 2.4 percentage points. The coefficient does not greatly differ in size, sign or significance between Model 5 and Models 1-4, further improving the robustness of the results.

Furthermore, a negative correlation exists between the predicted ETR and the lagged ETR and the ratio of taxation expense to total assets, although a positive relationship exists between the headline statutory CIT rate and the predicted ETR. These coefficients can be directly interpreted as leading to an increase (decrease) of the predicted ETR by their amount when

they increase by one. All coefficients are significant at the 1% level. The adjusted R^2 equals .628, meaning that 62.8% of the variation in the data can be explained through Model 5.

Hypothesis 1A predicts that relatively larger firms report, on average, lower ETRs than relatively smaller firms. The significant coefficient of the natural logarithm of total assets at the 1% level signals a negative correlation between firm size – proxied by total assets – and the predicted ETR. This means that Hypothesis 1A fails to be rejected.

For Hypothesis 1B, the most complete model, being Model 11, gives Regression Equation 2:

$$(2) \quad \widehat{ETR}_{i,t} = .467 - .003SCOPE_{i,t} - .024LOGAS_{i,t} - .097LETR_{i,t} - .001RATIO_{i,t} + .394CIT_{i,t} + \hat{a}_i$$

Like in Equation 1, the intercept in Equation 2 equals .467. This again means that an entity where all variables except the natural logarithm of total assets are equal to zero reports an expected ETR of .467, or 46.7%. Entities in-scope of Pillar Two report, on average, an ETR that is .003 or .3 percentage point lower than entities that are not in-scope. The coefficient greatly differs in size and sign between Model 11 and Models 6-10, while it is not significant in any of them. There does not appear to be a significant effect of being in-scope of Pillar Two on the ETR.

If the logarithm of total assets increases with 1%, the ETR decreases, on average, with .024, or 2.4 percentage points. Furthermore, a negative correlation exists between the predicted ETR and the lagged ETR and the ratio of taxation expense to total assets, although a positive relationship exists between the headline statutory CIT rate and the predicted ETR. These coefficients can be directly interpreted as leading to an increase (decrease) of the predicted ETR by their amount when they increase by one. All other coefficients are significant at the 1% level. The adjusted R^2 equals .628, meaning that 62.8% of the variation in the data can be explained through Model 11.

Hypothesis 1B predicts that firms in-scope of the GloBE Blueprint report, on average, a lower ETR than those firms that are not. The coefficient of the in-scope dummy, however, is negative but not significant. This means that Hypothesis 1B is rejected, as no correlation can be deduced from the data. In-scope firms seem to report similar ETRs compared to their out-of-scope counterparts.

Table 2 – Regression results of Hypotheses 1A and 1B

	Hypothesis 1A					Hypothesis 1B					
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11
SCOPE						-.001	-.004	-.005	-.001	.002	-.003
						(.004)	(.004)	(.005)	(.004)	(.004)	(.005)
LOGAS	-.015***	-.023***	-.015***	-.015***	-.024***		-.015***				-.024***
	(.000)	(.000)	(.000)	(.000)	(.000)		(.000)				(.000)
LETR		-.097***			-.097***			-.095***			-.097***
		(.001)			(.001)			(.001)			(.001)
RATIO			-.001***		-.001***				.000		-.001***
			(.000)		(.000)				(.000)		(.000)
CIT				.348***	.395***					.317***	.394***
				(.008)	(.009)					(.008)	(.009)
Constant	.421***	.545***	.422***	.352***	.467***	.230***	.421***	.249***	.230***	.162***	.467***
	(.002)	(.003)	(.002)	(.003)	(.004)	(.000)	(.002)	(.000)	(.000)	(.002)	(.004)
Parent-Entity Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year Fixed Effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	2,904,020	2,904,020	2,323,216	2,904,020	2,323,216	2,904,020	2,904,020	2,323,216	2,904,020	2,904,020	2,323,216
Adj. R^2	.609	.628	.609	.610	.628	.608	.609	.626	.608	.608	.628

Notes: models 1 through 5 relate to Hypothesis 1A, while models 6 through 11 relate to Hypothesis 1B. The regression sample exists of 580,804 parent entities over the five-year period from 2018 to 2022, yielding 2,904,020 possible observations. Inclusion of the Lagged Effective Rate reduces the sample by one year (i.e., one-fifth), yielding a total of 2,323,216 observations to be used. Standard-errors are reported between parentheses. Asterisks denote significance of results at either the 10% level (*), 5% level (**) or 1% level (***).

5.3 – Hypothesis 2

The regression results of Hypothesis 2 are shown in **Table 3**. As discussed before, Hypothesis 2 tests the correlation between the reported ETR in low-taxing jurisdictions and the announcement of the GloBE Blueprint in 2020.

Model 1 shows the relationship between the ETR and whether a jurisdiction can be considered low-taxing when looking at the previous three years. As discussed earlier, jurisdictions with an average reported ETR below 15% in the previous three years can be considered low-taxing. Models 2-6 add the various control variables, being the natural logarithm of total assets, the lagged ETR, the ratio of tax expense to total assets and the applicable headline CIT rate. The most complete model, being Model 6, gives Regression Equation 3 for Hypothesis 2:

$$(3) \quad \widehat{ETR}_{i,t} = .063 + .045LOW_{i,t} - .003LOGAS_{i,t} - .187LETR_{i,t} + .602RATIO_{i,t} + 1.239CIT_{i,t} + \hat{a}_i$$

In Equation 3, the intercept equals .063, meaning that an entity where all variables except the natural logarithm of total assets are equal to zero reports an expected ETR of .063, or 6.3%. If the logarithm of total assets increases with 1%, the ETR decreases, on average, with .003, or 0.3 percentage points. Jurisdictions that are considered low-taxing based on the average jurisdictional ETR in the three previous years, report, on average, an ETR that is .045 or 4.5 percentage points higher than high-taxing jurisdictions. The coefficient does not greatly differ in size, sign or significance between Model 6 and Models 1-5, further improving the robustness of the results.

Furthermore, a negative correlation exists between the predicted ETR and the lagged ETR, although a positive relationship exists between the ratio of tax expense to total assets and the headline statutory CIT rate, and the predicted ETR. These coefficients can be directly interpreted as leading to an increase (decrease) of the predicted ETR by their amount when they increase by one. However, since the coefficient of the logarithm of total assets is not significant, no clear relationship to the ETR that differs from zero can be established. All other coefficients are significant at the 1% level. The adjusted R^2 equals .668, meaning that 66.8% of the variation in the data can be explained through Model 6.

Hypothesis 2 predicts that low-taxing jurisdictions show an increase in predicted ETR in the years following the announcement of the GloBE Blueprint in 2020. The significant coefficient of the low-taxing jurisdictional dummy at the 1% level signals a positive correlation between jurisdictions that report an average ETR below 15% and the predicted ETR in 2021 and 2022. This means that Hypothesis 2 fails to be rejected.

Table 3 – Regression results of Hypothesis 2

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
LOW	.051***	.051***	.057***	.048***	.043***	.045***
	(.013)	(.013)	(.013)	(.013)	(.013)	(.012)
LOGAS		-.001				-.003
		(.010)				(.010)
LETR			-.173***			-.187***
			(.030)			(.030)
RATIO				.741***		.602***
				(.195)		(0.192)
CIT					1.102***	1.239***
					(.236)	(.233)
Constant	.268***	.297	.315***	.249***	.001	.063***
	(.003)	(.209)	(.009)	(.006)	(.057)	(.209)
Parent-Entity Fixed Effects	✓	✓	✓	✓	✓	✓
Year Fixed Effects	✓	✓	✓	✓	✓	✓
Observations	1,501	1,501	1,501	1,501	1,501	1,501
Adj. R^2	.644	.643	.655	.649	.651	.668

Notes: the regression sample exists of 310 in-scope parent entities over the five-year period from 2018 to 2022, yielding 1,546 possible observations. 45 singleton observations are dropped from the regression analysis, resulting in 1,501 observations being used. Standard-errors are reported between parentheses. Asterisks denote significance of results at either the 10% level (*), 5% level (**) or 1% level (***).

6 – Conclusion and Discussion

Given the recent controversy surrounding the avoidance of taxes by the ultra-rich and corporations, the OECD IF has come up with the GloBE Blueprint and the later Model Rules. Under the motto "I'll tax if you don't", jurisdictions that implement Pillar Two impose, at a minimum, a taxation of 15% on the excess profits of large MNE groups. Since the announcement of the Blueprint, firms can be expected to try to minimize their additional tax expense. That is why the following research question has been studied throughout this thesis:

To what extent has the announcement of the Pillar Two Blueprint led to an increase in effective tax rate for multinational European Union-based enterprises between 2018 and 2022?

Prior literature surrounding tax planning states that large MNEs are prone to shift income from high-taxing jurisdictions towards low-taxing jurisdictions. The four most prominent methods of tax planning (profit shifting, debt shifting, the relocation of intangible assets and the usage of hybrid instruments), however, can only be applied by (large) MNE groups, compared to single jurisdiction-based entities. This is confirmed by the OECD in the GloBE Blueprint, which presupposes that large MNEs do not pay their fair share of tax – although it does not apply to single jurisdiction-based entities. This leads this research to hypothesize that (H1A) larger firms are, on average, subject to lower ETRs, and (H1B) firms "in-scope" of the GloBE Blueprint are, on average, subject to lower ETRs.

Furthermore, an increase in tax-avoidant behaviour by firms is shown in recent years. By increasingly shifting intangible assets to subsidiaries located in low-taxing jurisdictions, rents are taxed at low CIT rates, while expenses are deducted at high CIT rates. Furthermore, by making strategic use of intra-group debt financing and transfer pricing, profits are shifted to low-taxing jurisdictions. As Pillar Two functions, effectively, as another corporate income tax, the expectation is thus that MNEs now start to structure their operations in such a way that the TuT liability is minimized. This is done by raising the ETR in jurisdictions where the ETR lies below 15%, leading this research to hypothesize that (H2) low-taxing jurisdictions show, om average, an increase in ETRs in the years following the announcement of the GloBE Blueprint.

This research uses company-level data from the Amadeus Database of BvD and data on headline statutory CIT rates from the OECD Data Explorer. This leads to a sample of 580,804 parent entities followed over a five-year period from 2018 to 2022, with the announcement of the GloBE Blueprint in 2020. In total, 310 parent entities report operating revenues that exceed EUR 750M and are thus "in-scope" for the Blueprint.

The relationship between the ETR and the treatment variables of the various hypotheses is tested using an OLS FE model, controlling for parent entity- and year-fixed effects. The treatment variables of the various hypotheses are, respectively, the natural logarithm of total assets (H1A), a dummy denoting whether the MNE group is "in-scope" of the Blueprint (H1B), and a dummy denoting whether the jurisdiction where the MNE group operates is considered low-taxing (H2). Under Hypothesis 1A, the influence of the lagged ETR, the ratio of taxation expense to total assets and the headline statutory tax rate in the jurisdiction is controlled for. These control variables are also added in the regression equations of Hypotheses 1B and 2, while these also control for the natural logarithm of total assets.

As discussed under the results, a significant and negative coefficient of the natural logarithm of total assets can be found. An increase of 1% in this logarithm leads to an expected increase, on average, of 2.4 percentage points in the ETR. After performing various other regressions to check the robustness of the results, no noteworthy differences are found in this coefficient. Hypothesis 1A cannot be rejected, as it appears that larger firms are, on average, indeed subject to a lower ETR.

Furthermore, the results show a negative coefficient for the in-scope dummy. On average, parent entities that are "in-scope" of the Blueprint report an ETR that is .3 percentage point lower than their out-of-scope counterparts. This coefficient, however, is not significant. Thus, no clear relationship differing from zero can be established. Various other regressions conducted for robustness purposes also do not provide significant results. Hypothesis 1B is rejected, as in-scope firms appear to be, on average, subject an equal ETR as their counterparts.

Finally, the results show a significant and positive coefficient for the low-taxing dummy. Jurisdictions that can be considered "low-taxing" in the three years preceding the announcement of the Blueprint report an ETR that is, on average, 4.5 percentage points higher in 2021 and 2022 than their counterparts'. This is fully in line with the expectation of the literature, although instead of shifting income to decrease the ETR, firms now do so to increase the ETR. Again, other regressions performed for robustness purposes do not alter the coefficient meaningfully. Hypothesis 2 fails to be rejected, as low-taxing jurisdictions show an increased ETR following the announcement of the Blueprint.

Thus, to answer the research question, it can be concluded that the announcement of the Blueprint has led to firms reporting higher ETRs in jurisdictions that can be considered low-taxing between 2018 and 2020. Firms appear to have reacted to the Blueprint by restructuring

their operations from 2020 on out, in order to minimize their additional TuT arising under Pillar Two.

This research, of course, has various shortcomings. As laid out by Dharmapala & Riedel (2013), firms often engage in profit shifting through the strategic use of debt across group entities. In order to further demonstrate the existence of actual tax planning taking place, the research should have included intercompany debt as a control variable. This variable could then be interacted with the low-taxing dummy, in order to demonstrate whether an increase or decrease in intercompany debt corresponds with an increase or decrease in ETR in low- and high-taxing jurisdictions, respectively. This data, however, is not publicly available. Further research could alleviate this shortcoming by, for example, including the ratio of debt to total assets of the MNE group instead of company-level intercompany debt. Interpreting these results would have to be done with great caution, as an increase in debt can, of course, also be attributed to external debt-shields.

Building on Dischinger & Riedel (2011), the same argument can be made for the inclusion of intangible assets. Since firms often engage in profit shifting through the usage and relocation of intangible assets to offshore tax-havens, tax planning could be demonstrated by including intangible assets as a control variable. An interaction term between this new variable and the low-taxing dummy could explicitly uncover the discussed tax planning. Again, however, this data was not available; since Amadeus only covers European firms, no data is available on offshore tax havens. Further research might base the method around Ireland, with its 12.5% CIT rate and wide range of tax treaties as singular proxy for tax-havens. Ideally, however, further research would also include tax-havens such as Barbados, Vanuatu or Anguilla. The presence of large amounts of intangible assets in such tax havens could signal that the MNE group engages in tax planning through the usage of intangibles.

Combined with the above-mentioned suggestions for further research, the outcomes of this research can provide tax authorities with clear guidelines on the behaviour that can be expected to be displayed by firms. By paying special attention to large MNE groups that are in-scope of the GloBE Blueprint and its successor, the Model Rules, tax authorities – especially in the EU – can cooperate to combat tax planning by large MNEs. By doing so, tax avoidance can be further challenged in order to ensure that the new minimum tax is more than a compliance obligation.

If nothing in life is certain, except death and taxes, then let us hope that Pillar Two will be remembered for its impact on taxation – and not as a dead letter.

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Appendix

A1 – Timeline

February 2013 –The OECD Base Erosion and Profit Shifting ("**BEPS**") Project is launched in order to address harmful practices employed by firms to minimise or eliminate their tax liabilities.

October 2020 – The OECD releases the Pillar Two Blueprint ("**The Blueprint**"). This Blueprint sets out the proposed rules, provided by an extensive commentary on the aimed effects of the proposed rule system.

July 2021 – The OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting, the Inclusive Framework ("**IF**"), provides a Statement on the Two Pillar Solution ("**the Statement**"), which is updated in October 2021. This addresses both Pillar One (which is out of scope for this research) and Pillar Two. The Statement addresses the overall design of the Global anti-Base Erosion Rules ("**GloBE Rules**") around the Income Inclusion Rule ("**IIR**"), the Undertaxed Payments Rule ("**UTPR**") and the Subject to Tax Rule ("**STTR**"). The Statement clarifies that the GloBE Rules are not mandatory to adopt by IF Members, although any adoption must strictly adhere to the OECD Model Rules and Commentary.

December 2021 – The IF publishes the OECD Model Rules on Pillar Two ("**Model Rules**"). These rules form the basis of the worldwide implementation of BEPS 2.0.

March 2022 – The IF releases the OECD Commentary on Pillar Two ("**the Commentary**").

December 2022 – The EU adopts the Pillar Two EU Directive ("**the Directive**"). This Directive is based on the Model Rules, although it also brings purely domestic groups in-scope. Transposition of this Directive into national law ensures applicability of the Model Rules in the Member States.

December 2022 – The IF publishes the Safe Harbours and Penalty Relief document. This document, most importantly, further clarifies how the safe harbours are to be applied. Given that the transitional safe harbours are likely to shield most, if not all, companies from a top-up tax liability arising in the first fiscal years, this guidance is especially important.

Throughout 2023 – The OECD releases the February, July and December Administrative Guidance, and either the Pillar Two EU Directive or the OECD Model Rules are transposed into national law. Through the transposition of the Directive into national law, most Member States have the Model Rules in place for fiscal years starting December 31st, 2023. Although

no significant top-up tax liabilities are expected to arise in the first years, Pillar Two has been implemented.

May 2024 – The OECD releases the Consolidated Commentary. This comprehensive updated version of the Commentary includes all previously released Administrative Guidance.

June 2024 – The OECD releases the June Administrative Guidance.

A2 – Implementation by European Union Member State

Table A1 – Implementation of the EU Pillar Two Directive by Member State.

Member State	Implementation date	IIR	UTPR	DMTT
Austria	December 2023	31/12/2023	31/12/2024	31/12/2023
Belgium	December 2023	31/12/2023	31/12/2024	31/12/2023
Bulgaria	January 2024	01/01/2024	01/01/2025	01/01/2024
Croatia	December 2023	31/12/2023	31/12/2024	31/12/2023
Cyprus	Draft: March 2024	31/12/2023	31/12/2024	01/01/2025
Czech Republic	December 2023	31/12/2023	31/12/2024	31/12/2023
Denmark	January 2024	01/01/2024	01/01/2025	01/01/2024
Estonia	February 2024	31/12/2029	31/12/2029	Unclear
Finland	December 2023	31/12/2023	31/12/2024	31/12/2023
France	December 2023	31/12/2023	31/12/2024	31/12/2023
Germany	December 2023	31/12/2023	31/12/2024	31/12/2023
Greece	April 2024	31/12/2023	31/12/2024	31/12/2023
Hungary	November 2023	31/12/2023	31/12/2024	31/12/2023
Ireland	December 2023	31/12/2023	31/12/2024	31/12/2023
Italy	December 2023	31/12/2023	31/12/2024	31/12/2023
Latvia	June 2024	31/12/2029	31/12/2029	Unclear
Lithuania	June 2024	31/12/2029	31/12/2029	31/12/2029
Luxembourg	December 2023	31/12/2023	31/12/2024	31/12/2023
Malta	February 2024	31/12/2029	31/12/2029	Unclear
Netherlands	December 2023	31/12/2023	31/12/2024	31/12/2023
Poland	Draft: April 2024	01/01/2025	01/01/2025	01/01/2025

Portugal	Announcement: April 2024	Unclear	Unclear	Unclear
Romania	December 2023	01/01/2024	01/01/2025	01/01/2024
Slovakia	December 2023	31/12/2029	31/12/2029	Unclear
Slovenia	December 2023	31/12/2023	31/12/2024	31/12/2023
Spain	Draft: December 2023	31/12/2023	31/12/2024	31/12/2023
Sweden	January 2024	31/12/2023	31/12/2024	31/12/2023

Notes: distinction is made between the Income Inclusion Rule ("**IIR**"), Undertaxed Payments Rule ("**UTPR**") and Domestic Minimum Top-Up Tax ("**DMTT**"). Implementation date includes either "Draft" if the legislation has not yet been enacted, "Announcement" if the legislation has not yet been drawn up or only the date if the legislation has been enacted.

A3 – Description of Regressed Variables

Table A2 – Variable descriptions

Variable name	Description
ETR	Effective tax rate
LETR	Lagged value of the effective tax rate
SCOPE	Dummy variable denoting whether the parent entity is "in-scope" of the GloBE Blueprint. This is the case if the parent entity reports, on a consolidated basis, operating revenues of at least EUR 750M in at least two out of the four preceding years
LOW	Dummy variable denoting whether the jurisdiction is considered "low-taxing" in the previous three years. This is the case if the average effective tax rate between 2018 and 2020 does not amount to at least 15%
LOGAS	Natural logarithm of the total assets
RATIO	Ratio of tax expense relative to the total assets
CIT	Corporate income tax rate in the jurisdiction in the given year
OPRE	Operating revenue
PLBT	Profit or loss before taxes
TAXA	Taxation expense
TFAS	Tangible fixed assets
TOAS	Total assets
STAF	Total payroll costs
GLOBE	Net GloBE Income. This is derived by subtracting the SBIE from the operating profit or loss. Effectively, the operating profit or loss is reduced with 10% of payroll costs and 8% of the tangible fixed assets

A4 – Correlation between Treatment and Control Variables

Table A3 – Correlation matrix

	ETR	SCOPE	LOW	LOGAS	LETR	RATIO	CIT
ETR	1.000						
SCOPE	.007***	1.000					
LOW	-.326***	.001	1.000				
LOGAS	.306***	.087***	-.157 ***	1.000			
LETR	.657***	.008***	-.407***	.312***	1.000		
RATIO	.014***	-.001***	-.016***	-.037***	.016***	1.000	
CIT	.480***	.010***	-.314***	-.361***	.477***	.009***	1.000

Notes: correlation matrix of the treatment- and control variables used throughout this research. Asterisks denote significance of results at either the 10% level (*), 5% level (**) or 1% level (***).