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Identifying Profit-Shifting to Tax Havens Using Country-By-Country Report Statistics

Identificación del traslado de beneficios a paraísos fiscales utilizando las estadísticas país por país

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Abstract

Profit-Shifting is an aggressive tax planning activity that erodes public revenues worldwide. Using statistics based on recent Country-by-Country Reports, this article identifies both descriptively and econometrically the existence of such activity by large Spanish multinationals in EU tax havens. Moreover, the paper shows that the application of the minimum Effective Tax Rate of 15% to profits generated in other EU countries by these large multinationals, within the Two-Pillar solution of the OECD/G20 Inclusive Framework, could increase Spanish tax revenue by around 2- 17% of annual corporate income tax.

Keywords: Profit-Shifting, Country-by-Country Reports, EU Tax Havens.

Resumen

El traslado de beneficios es una actividad de planificación fiscal agresiva que merma los ingresos públicos a nivel mundial. Utilizando las estadísticas basadas en los recientes informes país por país, este artículo identifica la existencia de dicha actividad llevada a cabo por las grandes multinacionales españolas en los paraísos fiscales de la UE, de forma tanto descriptiva como econométrica. Además, el artículo muestra que la aplicación de un tipo impositivo efectivo mínimo del 15% sobre los beneficios generados en otros países de la UE por estas grandes multinacionales, en el contexto de la solución basada en los dos pilares proveniente del marco inclusivo OCDE/G20, podría incrementar los ingresos fiscales de España en torno al 2-17% del Impuesto sobre Sociedades anual.

Palabras clave: Traslado de Beneficios, Declaraciones país por país, paraísos fiscales de la UE.

JEL Classification / Clasificación JEL: F23, H25, H26, H87.

1. INTRODUCTION

Profit-Shifting (P-S) is an aggressive tax planning activity mainly conducted by multinational enterprises (MNEs), consisting of using intra-group transactions to artificially transfer profits from high-taxed to low-taxed jurisdictions through strategies that manipulate prices or payment flows at market conditions. For instance, the transfer pricing strategy manipulates intra-group prices, the thin-capitalisation strategy manipulates debt interest payments, and the strategic location of intellectual property manipulates royalty payments.

P-S originates in the mismatch between an evolving economy and a hundred-year-old international tax system. While this system continues based on separate accounting[1] and the arm's-length principle for intragroup transactions,[2] MNEs create value globally. Moreover, while the system still requires the physical presence of a company in a jurisdiction for it to tax the benefits generated in its territory, the economy is increasingly digital. All of this facilitates aggressive tax planning activity by MNEs, which take advantage of the tax loopholes arising from the variety of tax systems worldwide. For governments, the new characteristics of the economy make it difficult to identify where MNEs generate profits, but they also try to take advantage of the mismatch between the new economic setting and the outdated International Tax System and to attract real economic activity and book profits to their jurisdiction through tax incentives and low effective tax rates.

P-S activity has become a red-hot topic in recent years because of the rapidly evolving environment and the weakness of public revenues to finance collective needs worldwide. Among other negative consequences, P-S reduces fairness and equity worldwide, at both the macro- and micro-level. From a macro perspective, profits are not reported and taxed in the jurisdictions where they are generated. From a micro perspective, the limited tax burden paid by some companies might undermine compliance by all taxpayers (Fuest and Neumeier, 2023). Moreover, since profits are now taxed at lower tax rates, this aggressive activity causes tax revenue losses all over the world, which otherwise

1 The Separate Accounting System consists of the allocation of taxing rights between the residence and the source countries by Double Taxation Treaties or subsidiarily, the domestic tax law, so as to each one can apply its own tax rules.

2 The arm's-length principle states that the price agreed in an intragroup transaction must be the same as the price agreed in a similar transaction between two unrelated parties, i.e., the price agreed at market conditions.

could be used to improve or expand the provision of public services. Tørsløv, Wier and Zucman (2022) estimated that P-S reduced corporate income tax revenue "by 18% in the European Union, 14% in the US, 5% in other OECD countries, and 5% in developing countries" (p.26) for 2015. More recently, Wier and Zucman (2022) have found that the global corporate tax loss derived from P-S has gone from less than 0.1% of corporate tax revenue in the 1970s to 10% in 2019. A similar figure was obtained by Alstadsæter et al. (2023) for 2022, which additionally finds that US MNEs are responsible for about 40% of global P-S.

Specifically, there is evidence that MNEs artificially shift their profits to tax haven territories (Castillo-Murciego and López-Laborda, 2023; Tørsløv, Wier and Zucman, 2022), which are typically identified by their favourable tax conditions for foreign investors, among other characteristics (Dharmapala and Hines, 2009; Dharmapala, 2020 and 2023); i.e., MNEs book profits in tax havens beyond what can be explained by their real activity in these territories (Castillo-Murciego and López-Laborda, 2023; Tørsløv, Wier and Zucman, 2022). Specifically, Alstadsæter et al. (2023) claims that about 35% of profits generated outside the home country of MNEs were shifted to tax havens in 2022. In this vein, the aim of this article is to identify P-S by large Spanish MNEs to EU countries considered as tax havens in some (admittedly unofficial) tax haven lists[3] (hereafter, EU tax havens), with the novelty of using recent statistics based on Country-by-Country Reports (CbCRs). According to Fuest, Hugger and Neumeier (2022), the EU tax haven countries are Cyprus, Ireland, Luxembourg, Malta, and The Netherlands.

CbCR is one of the four minimum standards agreed by the members of the Inclusive Framework within the Base Erosion and Profit Shifting (BEPS) project, which was launched by OECD and G20 countries in 2013 to tackle P-S. By 2015, 15 actions were developed and one of them was action 13, related to transfer pricing documentation and CbCRs. These reports try to contribute reducing P-S by increasing financial transparency (Johannesen and Larsen, 2016), and are mandatory for MNEs with consolidated turnover of at least €750 million.[4] The main advantage of the information provided by CbCRs, compared to the Bureau van Dijk's Orbis database -the most popular database about companies' financial information- is the country coverage, especially regarding tax haven territories.

This case study for Spain represents, then, a first step to leveraging the new data set coming from CbCRs. Because of their country coverage, CbCRs can be very useful for improving the estimates of P-S, but also the effectiveness of the actions taken to prevent this activity, particularly the new Two-Pillar plan agreed by the OECD. As is well known, as of October 2021, a historical agreement was reached by 135 countries and jurisdictions to reform international income tax rules. This agreement is based on a Two-Pillar plan

3 See, for instance, Menkhoff and Miethe (2019).
4 See Hoopes, Robinson and Slemrod (2023) for a review of corporate tax disclosure and its effects.

(OECD, 2020a and 2020b). Pillar One introduces some innovative elements to the current International Tax System concerning profit allocation rules to deal with the digitalisation issue. Specifically, Pillar One allocates taxing rights to market jurisdictions regardless of a physical presence in them, affecting some of the largest MNEs. Pillar Two (also known as the "Global Anti-Base Erosion" or GloBE rules) seeks to put an end to P-S (and reduce tax competition) by establishing a minimum Effective Corporate Income Tax rate of 15%, which large MNEs ultimately have to pay to their country of residence on a Country-by-Country basis.

Moreover, the results obtained in this paper may be extended to other countries, especially those also applying a Territorial Tax System for taxing foreign profits when repatriated,[5] which are most of the OECD countries. These countries allow MNEs to appropriate the tax savings derived from P-S at the end of the day.

The structure of the rest of the article is as follows. Section 2 briefly discusses the scant literature based on CbCRs to identify P-S and evaluate proposals against this aggressive tax planning activity; section 3 describes the new dataset and its advantages and shows the descriptive and econometric results regarding the existence of P-S to EU tax haven countries; section 4 examines the consequences in terms of tax revenue from the application of the Minimum Effective Tax Rate, within the Two-Pillar solution from the OECD/G20 Inclusive Framework; and section 5 concludes.

2. Literature review

The literature on P-S is plentiful.[6] But only a few recent papers have used data taken from CbCRs to examine this aggressive tax planning activity and the possible effects of implementing solutions that seek to prevent it.

Within the international empirical economic literature, Fuest, Hugger and Neumeier (2022) was the first paper to use individual information of German MNEs' operations aggregated at tax jurisdiction level for the period 2016-2017. With a sample of 333 German MNEs and their operations worldwide, it found a tax revenue loss of €1.6 billion per year derived from P-S to tax havens, mainly European ones. To reach this result, it first estimates a regression model based on multinational and country level characteristics to examine the relationship between the global distribution of profits, and corporate income taxes and tax havens. Then, based on these estimates, it calculates the amount of shifted profits and the corresponding tax revenue loss.

5 The Territorial Tax System consists of exempting multinationals from the residence tax when profits are repatriated to the home country and then allowing them to take advantage of the lower tax they paid abroad. This is the opposite to the practice of countries applying a Worldwide Tax System, which tax foreign profits when repatriated after giving a tax credit for taxes paid abroad, usually with an upper ceiling.

6 See Beer, De Mooij and Liu (2020) for a recent review.

Bratta, Santomartino and Acciari (2021) uses firm-level CbCRs of worldwide MNEs having at least one subsidiary in Italy for 2017. It discovered the existence of nonlinear responses to taxation and found that linear specifications underestimate P-S in countries with corporate tax rate differentials very different from the average, while they over-estimate P-S in countries with corporate tax rate differentials similar to the average. It also found a global tax revenue loss of €245 billion in 2017, the distribution of artificially shifted profits being highly concentrated in a few countries: investment hubs. Based on these results, it concludes that policies establishing a minimum level of taxation may be very effective in reducing P-S.

Using macro data based on CbCRs for 2017, García-Bernardo, Janský and Tørsløv (2021), identifies the most important tax havens for US MNEs, i.e., those countries with low effective tax rates and high profits not aligned with economic activity. These comprise Bermuda, Ireland, and The Netherlands. Also based on aggregate CbCR data from the OECD for year 2017, and using a new methodology that takes into account the non-linear relationship between the location of profits and tax rates, García-Bernardo and Janský (2023) finds that 70-83% of artificially shifted profit is deviated to countries with an effective tax rate (ETR) below 10%.

The revenue effects of the application of the consensus solution involving Pillar One and Pillar Two have been estimated by various authors and institutions, such as the OECD (2020c) and the IMF (2022). Using CbCRs' OECD statistics for year 2017, Barake et al. (2021a) have estimated an increase of 18% of corporate income tax revenue for Spain derived from the application of a 15% minimum corporate effective tax rate. This result corresponds to the most optimistic scenario, in which carve-outs[7] for economic substance envisaged in the OECD agreement are not applied and it is calculated by computing the "tax deficit". The tax deficit refers to the difference between what a company currently pays in corporate income taxes and what it would have to pay if it were subject to the minimum Effective Corporate Income Tax rate in each country where it operates, i.e., on a Country-by-Country basis.[8]

3. Data and empirical analyses

To identify P-S to EU tax havens we use two kinds of analyses: descriptive and econometric. Both are based on Spanish Country-by-Country statistics provided by the Spanish Tax Agency for 2018 to 2020. Spanish CbCRs are required since 2016, but they are not available to the public. The most disaggregated information disclosed by the Spanish Ministry of Finance is

7 The carve-out for economic substance is one of the potential loopholes that have been added to the agreement and can greatly weaken the estimated potential additional corporate income tax revenues (Barake et al., 2021b; Alstadsæter et al., 2023).

8 Similarly, the Spanish Tax Agency has calculated the maximum tax revenue for Spain from the application of Pillar Two at a minimum effective tax rate of 15% at 2,300 million euros in 2018, i.e., 0.2% of GDP and 9% of corporate tax revenue (Comité de Personas Expertas, 2022).

country-level information on the global activities of the Spanish qualifying MNEs for 2018 to 2020. Moreover, this information is limited to EU members (for other countries, information is available at continent level), which greatly restricts our analysis. Also, García-Bernardo, Janský and Tørsløv (2021) uses Country-by-Country statistics based on macro data.

Our database thus comprises EU country-level financial information on the activities of Spanish MNEs that are required to submit the CbCR ("Model 231"), i.e., those with consolidated turnover of at least €750 million. They constitute an annual number of around 120 Spanish qualifying MNEs.[9]

A summary of the Country-by-Country statistics published by the Spanish Ministry of Finance is in Table A1 in the Appendices.[10] Specifically, there is information about the total values of the following variables: number of entities of Spanish MNEs, unrelated revenues, related party revenues, total revenues, profit before income tax, corporate income tax (either accrued or paid)[11], positive corporate income tax (either accrued or paid)[12], stated capital, accumulated earnings, tangible fixed assets other than cash, and number of employees.

Statistics on CbCRs by jurisdiction at the headquarter level for Spain and most of the world countries are also published for the period 2016 to 2018 by the OECD (only 2017 and 2018 for Spain). For this alternative data source on CbC statistics, the available financial variables are the same as those shown on the Spanish webpage except for the variable positive corporate income tax (either accrued or paid), which is a variable created and calculated by the Spanish Tax Agency. Additionally, the OECD webpage provides data on the kind of business activity of the MNEs in the corresponding tax jurisdiction.

As claimed above, the main strength of CbCRs is the country coverage and the information about revenues from intra-firm transactions they provide. In contrast, the popular Bureau van Dijk's Orbis database presents a great deal of missing data for tax haven jurisdictions because it relies on information in public business registries, which do not exist in some countries or present incomplete information. According to Tørsløv, Wier and Zucman (2022), only 17% of the global profits of MNEs could be traced in Bureau van Dijk's Orbis database in 2012. Fuest, Hugger and Neumeier (2022) found that the Orbis database only covers 35% of German MNEs' subsidiaries located in non-havens, assuming data based on CbCRs is complete. This figure is 26% for subsidiaries located in European tax havens (information on activities in Cyprus, Liechtenstein, Malta, and Switzerland is completely missing) and zero

9 Specifically, 122 in 2018, 124 in 2019, and 126 in 2020.

10 https://sede.agenciatributaria.gob.es/Sede/estadisticas/estadisticas-impuesto/declaracion-pais-pais-multinacionales-matriz-espanola.html.

11 Accrued corporate income tax encompasses only operations belonging to the corresponding period; paid corporate income tax is the income paid on a cash basis.

12 Positive corporate income tax is a variable calculated by the Spanish Tax Administration from corporate income tax (either accrued or paid, as appropriate). The amount of the tax is added from those jurisdictions whose net corporate tax has a positive value.

for subsidiaries located in tax havens outside Europe. Bratta, Santomartino and Acciari (2021) compared CbCR with Orbis data for the largest MNEs having at least one subsidiary in Italy and verified the low coverage of US MNEs, of non-US MNEs located in the United States, and of MNEs operating in low-tax and investment-hub countries. García-Bernardo, Janský and Tørsløv (2021) inferred a higher quality of country-level information about MNCs' tax payments and profits, as well as better country coverage, comparing the new data based on Internal Revenue Service CbCRs with a set of data sources with information about US MNEs, both public (BEA's and Eurostat's foreign affiliate statistics and controlled foreign corporation data provided by the IRS) and private (company balance sheet information, Bureau van Dijk's Orbis, and Standard & Poor's Compustat).

Additionally, in a recent study, Aliprandi and von Zedlitz (2023) found that in general terms the figures shown in CbCRs present a high level of reliability in comparison to respective consolidated financial data, though there is room for improvement to make these reports completely useful for policymakers and the general public.

3.1. Descriptive results

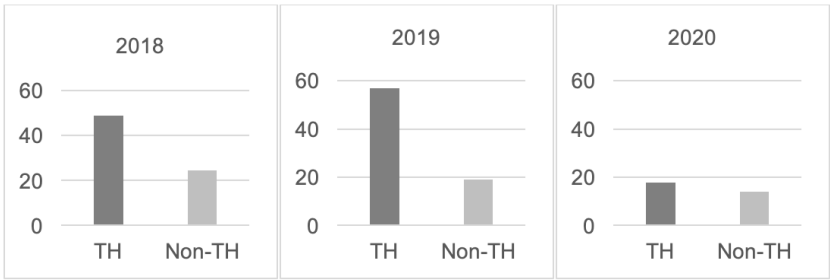
Figures 1 to 4 show the results for the descriptive analysis, which seem to be consistent with P-S to EU tax haven countries.

In average terms, Figure 1 and Figure 2 show a highly disproportionate ratio of Pre-Tax Profits to indicators of real economic activity for tax haven countries in comparison to non-havens, these ratios being especially high for years 2018 and 2019.[13] Thus, it seems that reported profits are not aligned with real economic activity in these territories, which could be an indication of the presence of P-S.

Figure 3 shows a higher percentage of related-party revenues in tax havens than in non-havens. This is also in line with aggressive tax planning activity, since P-S strategies use intra-group transactions to manipulate market conditions and report higher (lower) revenues and lower (higher) expenses in low (high) tax countries. Lastly, Figure 4 brings to light a lower corporate effective tax rate in tax havens than in non-havens, which is in line with P-S toward the former territories. There is an exception for the effective tax rate calculated from the paid tax for 2020. This peculiarity, as well as those observed in the previous figures (albeit minor) make the year 2020 an outlier, which could be related to the coronavirus pandemic.

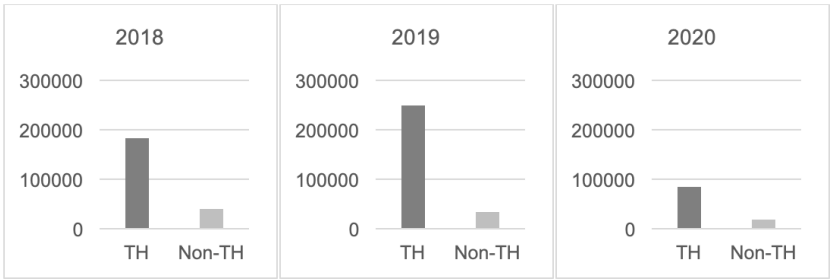
13 For German MNEs the ratio of returns to tangible assets is approximately 39% in European tax havens and profit per employee is about 134 thousand euros (Fuest, Hugger and Neumeier, 2022).

Figure 1. Average Pre-Tax Profits to Tangible Fixed Assets (%) of Spanish MNEs in Tax Haven and Non-Haven EU countries (excluding Spain), 2018-2020



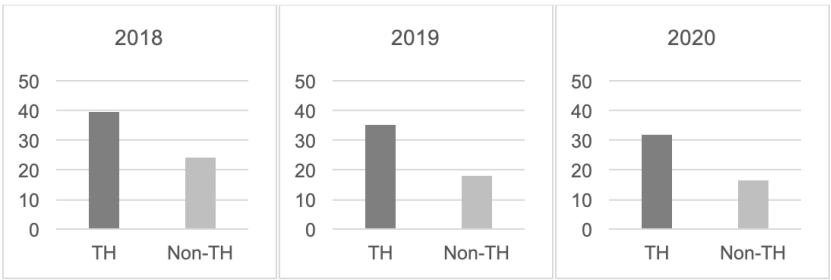
Source: By the authors, data from the Spanish Ministry of Finance.

Figure 2. Average Pre-Tax Profits to Number of Employees of Spanish MNEs in Tax Haven and Non-Haven EU countries (excluding Spain), 2018-2020



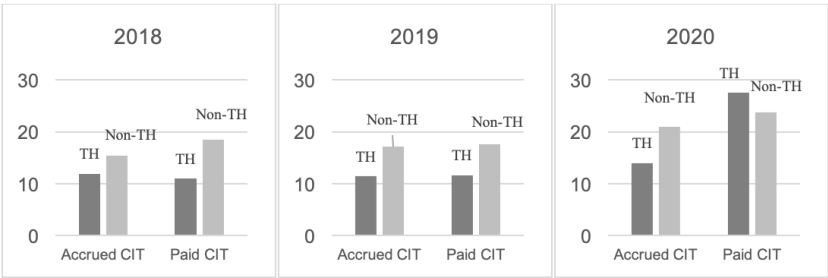
Source: By the authors, data from the Spanish Ministry of Finance.

Figure 3. Average Related party revenues to total revenues (%) of Spanish MNEs in Tax Haven and Non-Haven EU countries (excluding Spain), 2018-2020



Source: By the authors, data from the Spanish Ministry of Finance.
Note: Related revenues are estimated by the ratio between revenues with related entities and total revenues.

Figure 4. Average Effective Corporate Income Tax Rate (%) of Spanish MNEs in Tax Haven and Non-Haven EU countries (excluding Spain), 2018-2020



Source: By the authors, data from the Spanish Ministry of Finance.
Notes: (1) Effective Corporate Income Tax Rate is estimated by the ratio between positive Corporate Income Tax (either, accrued or paid) and Pre-Tax Profits. (2) Estonia is excluded from these estimates for 2018 and Slovenia for 2020 regarding estimates based on paid taxes, because their ETR are outliers (i.e., the ETR is higher than 1,000% in both cases).

3.2. Econometric results

Two kinds of empirical approaches, direct and indirect, have been used in the empirical literature to identify the existence of P-S. The direct approaches consist of identifying particular P-S strategies, while indirect methods are based on the expected results of P-S. Our econometric analysis to identify P-S follows the Hines and Rice (1994) indirect approach, which bases the existence of P-S on finding a negative relationship between corporate income taxes and reported profits in a territory, after controlling for the real economic activity in the corresponding territory. Using this approach and the Bureau van Dijk's Amadeus database, Castillo-Murciego and López-Laborda (2017) found evidence consistent with P-S between Spain and other countries carried out by Spanish MNEs, and EU and OECD foreign MNEs owning Spanish affiliates during 2005-2014.

Particularly, in this article we estimate the following econometric specification, which uses the same dependent and control variables as Fuest, Hugger and Neumeier (2022), but at macro level:

$$y_{it}=\beta_0+\beta_1*th_{it}+\beta_2*lg(employees_{it})+\beta_3*lg(assets_{it}) +\beta_4*lg(unrelatedrev_{it})+\beta_5*lg(gdppc_{it})+\beta_6*lg(pop_{it})+\beta_7*corruption_{it}+u_{it} \quad (1)$$

The dependent variable (Y_{it}) is alternatively defined as the log of Pre-Tax Profits or the log of Related Revenues of qualifying Spanish MNEs in EU country *i* and year *t*. The main independent variable is the binary variable tax haven (th_{it}), which takes the value of one when the country *i* is a tax haven, and the value of zero otherwise. We consider that this variable is more indicative of the incentive

to shift profits than indicators of the tax rate, because it focuses on a group of territories that, in addition to favourable tax conditions for foreign investors, have other positive features, such as strong governance and institutions; i.e., they have robust political and legal systems and low levels of corruption (Dharmapala, 2023).[14] We expect to find a positive coefficient for this variable regarding the two dependent variables. As to Pre-Tax Profits, tax havens offer the most favourable taxes for foreign investors and other non-tax incentives to artificially shift profits to, and then, to report disproportionately high pre-tax profits there. With regard to Related Revenues, MNEs use strategies such as the location of Intellectual Property or financial services in tax havens to carry out P-S, which lead to disproportionately high related revenues in these territories.

The control variables are firm-level and country-level characteristics. Regarding firm-level variables, while Fuest, Hugger and Neumeier (2022) had individual data for MNEs, though aggregated at country level, we have macro data. Thus, our firm-level characteristics refer to the characteristics of all firms operating in the corresponding country. These firm-level characteristics are the log of the number of employees of Spanish qualifying MNEs in country *i* and year *t* (lg(employees$_{it}$)), the log of tangible fixed assets (lg(asset$_{it}$)), and the log of unrelated revenues (lg(unrelatedrev$_{it}$)). Country-level characteristics are the log of the GDP per capita of country *i* and year *t* (lg(gdppc$_{it}$)), the log of the population (lg(pop$_{it}$)), and the Corruption Perceptions Index (corruption$_{it}$).[15]

The descriptive statistics of the model variables are in Table A2 in the Appendices. Table 1 displays the estimated coefficients for the model variables using a Pooled Linear Regression Model.[16]

Results seem to be consistent with P-S to EU tax haven countries. The estimated coefficient for the tax haven variable is positive and statistically significant for the two models incorporating alternative dependent variables. Thus, Pre-Tax Profits and Related Revenues seem to be higher in tax haven than in non-haven EU countries, after controlling for firm and country-level characteristics influencing them. Specifically, reported profits by large Spanish MNEs in EU tax havens exceed reported profits in EU non-tax havens by a notably high percentage: 154%. Similarly, intra-firm revenues in EU tax havens exceed intra-firm revenues in EU non-tax havens by 177%.

Regarding control variables, Table 1 shows that the only variables that seem to be statistically significant are unrelated revenues, as an indicator of

14 The main independent variable in the baseline specification of Fuest, Hugger and Neumeier (2022) is the statutory and, alternatively, the effective tax rate. Subsequently, they incorporated a tax haven dummy variable into their model, and found that the tax semi-elasticity lost a great deal of its importance in favour of the tax haven variable.

15 GDP per capita based on purchasing power parity, and population, are taken from the World Development Indicators database: https://databank.worldbank.org/source/world-development-indicators. Corruption Perceptions Index is taken from Transparency International: https://www.transparency.org/en/cpi/2021?gclid=CjwKCAjw6MKXBhA5EiwANWLODHA9HDPs-7WychBgLQoTcaIVH78EW4QU_by8teBpNxdiWM_OpBym7RoCaPYQAvD_BwE.

16 Results are not estimated using country Fixed Effects because in such a case it would not be possible to identify the effect of the tax haven variable.

Table 1. Results

Variable	(1) Log (Pre-Tax Profits)	(2) Log (Related Revenues)
th_{it}	1.5473*** (0.4275)	1.7751*** (0.4317)
$lg(employees_{it})$	-0.3103 (0.2665)	0.5796* (0.3166)
$lg(asset_{it})$	0.1523 (0.2045)	0.1249 (0.2487)
$lg(unrelatedrev_{it})$	1.0158*** (0.2740)	0.0724 (0.3745)
$lg(gdppc_{it})$	-0.8995 (0.5937)	1.0717 (0.6605)
$lg(pop_{it})$	0.2004 (0.1870)	0.3245 (0.2204)
$corruption_{it}$	0.0252** (0.0097)	0.0078 (0.0137)
N	79	77
R^2	0.9118	0.9003

Source: By the authors.
Notes: (1) ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively. Robust Standard Errors are in brackets.

the importance of the country *i* as a market country; corruption, for the model using pre-tax profits as dependent variable; and the number of employees, for the model using related revenues, all of them having a positive impact on the dependent variable. These results could further reinforce the importance of P-S activity in explaining reported profits in a country, in addition to the real economic and other reasons that affect the overall distribution of pre-tax profits and related revenues of MNEs. However, we should be cautious in interpreting the results due to the small number of observations in the sample.

Additionally, we conducted two robustness tests, the results of which are provided in the Appendices. Table A3 shows the estimated results including Belgium as an EU tax haven country (Tørsløv, Wier and Zucman, 2022). Results are similar, but the magnitude of the effect of the tax haven variable on dependent variables is slightly smaller. Table A4 illustrates the estimates for the period 2017-2020, where Country-by-Country statistics for year 2017 comes from the OECD database. Fundamental results are substantially maintained.

4. Simulation of the effects of OECD Pillar Two implementation

Using the same methodology as Barake et al. (2021a), and the statistics about CbCRs from the Spanish Ministry of Finance for 2018 to 2020, Table 2 shows the maximum increase in corporate income tax revenue for Spain from the establishment of the tax rate of 15% to profits generated in EU countries by

large MNEs on a Country-by-Country basis.[17] In total, results seem to indicate that the Spanish government could have collected annual additional revenues of around 2 to 17% of positive corporate taxes (depending on the year and on the accrued or paid taxes)[18] coming from the EU countries.

Table 2: Maximum Additional Revenues for Spain from the application of the Minimum Effective Corporate Income Tax: 2018-2020

Country	Additional CIT 2018, in million € and as a % of EU CIT (in brackets)		Additional CIT 2019, in million € and as a % of EU CIT (in brackets)		Additional CIT 2020, in million € and as a % of EU CIT (in brackets)	
	Accrued CIT	Paid CIT	Accrued CIT	Paid CIT	Accrued CIT	Paid CIT
Belgium						6.9944 (0.4272)
Bulgaria	0.5210 (0.0169)	0.4010 (0.0135)	1.3467 (0.0479)	1.4557 (0.0556)	0.7096 (0.0575)	0.3586 (0.0219)
Croatia			0.1343 (0.0048)			
Cyprus		1.9296 (0.0048)				
Denmark	11.0042 (0.3579)	7.3242 (0.2475)				
Estonia			0.0098 (0.0003)	0.0088 (0.0003)	0.0913 (0.0074)	0.0983 (0.0060)
Germany				131.6176 (5.0283)		
Hungary	2.1969 (0.0715)	1.6459 (0.0556)	2.6775 (0.0952)	2.6635 (0.1018)	1.1621 (0.0942)	
Ireland	79.1202 (2.5734)	28.9422 (0.9779)	82.5594 (2.9367)	79.8844 (3.0519)	7.9947 (0.6484)	1.6227 (0.0991)
Latvia	0.1552 (0.0050)	0.0632 (0.0021)		0.1556 (0.0059)		
Lithuania	0.8983 (0.0292)	0.7103 (0.0240)	0.2456 (0.0087)	1.2296 (0.0470)	0.5057 (0.0410)	0.5567 (0.0340)

(Continúa)

17 Council Directive (EU) 2022/2523, of 14 December 2022 (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022L2523) implementing GloBE in the European Union establishes that the minimum level of taxation will be applied for both large MNEs and large domestic groups starting in 2024. Considering also the effect that the application of Pillar Two could have on subsidiaries of Spanish-parent MNEs that pay corporate income tax in Spain, the Spanish Tax Agency has estimated a maximum potential collection of 0.45% of GDP, based on 2018 data (Comité de Personas Expertas, 2022).

18 For EU countries (Spain excluded), positive accrued corporate taxes were 3,074,590 thousand euros for 2018, 2,811,273 thousand euros for 2019 and 1,233,037 thousand euros for 2020; and positive paid corporate taxes were 2,959,632 thousand euros for 2018, 2,617,523 thousand euros for 2019 and 1,637,136 thousand euros for 2020.

Country	Additional CIT 2018, in million € and as a % of EU CIT (in brackets)		Additional CIT 2019, in million € and as a % of EU CIT (in brackets)		Additional CIT 2020, in million € and as a % of EU CIT (in brackets)	
Luxembourg	27.6598 (0.8996)	43.0848 (1.4557)		28.5679 (1.0914)		18.9101 (1.1551)
Malta	15.9709 (0.5194)	22.4789 (0.7595)	13.8234 (0.4917)		10.0550 (0.8155)	
Netherlands			151.0129 (5.3717)	44.9039 (1.7155)	18.0435 (1.4633)	
Portugal	34.1497 (1.1107)	150.5797 (5.0878)		137.4518 (5.2512)		
Romania			1.4226 (0.0506)	5.2016 (0.1987)	2.1031 (0.1706)	
Slovakia	2.2643 (0.0736)		2.8954 (0.1030)	1.6544 (0.0632)	2.2135 (0.1795)	
Slovenia	0.5486 (0.0178)	0.2126 (0.0072)	0.1239 (0.0044)	0.0409 (0.0016)		
Sweden	19.0404 (0.6193)					
United Kingdom		13.4040 (0.4529)				
TOTAL	193.5292 (6.2945)	270.7762 (9.1490)	256.2513 (9.1151)	434.8354 (16.6125)	42.8783 (3.4775)	28.5407 (1.7433)

Source: By the authors. Notes: (1) Additional (Accrued or Paid) Corporate Income Tax is estimated by making the product between the Tax Deficit (Accrued or Paid) and Pre-tax profits. The Tax Deficit (Accrued or Paid) is the difference between 15% and (Accrued or Paid) ETRs (see note 1 of Figure 4). (2) Estonia is excluded from these estimates for 2018 and Slovenia for 2020 regarding estimates based on paid taxes, because their ETR are outliers (i.e., the ETR is higher than 1,000% in both cases).

In each one of the three years considered, and irrespective of taking accrued or paid taxes for the calculation of the effective tax rate, Ireland is always in the top three as a source of additional tax revenue. Table 2 also shows that there are some EU countries not identified as tax havens that might also generate extra revenues for Spain from the application of the minimum tax rate. Indeed, only 7 out of 27 EU countries (including the United Kingdom until 2020) apply effective corporate tax rates higher than 15% in any of the three years. According to these results, it appears that low effective corporate tax rates are not only related to tax havens, i.e., additional tax revenues could come from either tax havens or non-haven countries. However, while estimated additional revenues from non-havens come, in general terms, from real profits, those from tax havens are mainly based on book profits, i.e., tax havens are territories with low effective tax rates and high profits not aligned with real economic activity (García-Bernardo, Janský and Tørsløv, 2021).

5. Concluding remarks

This article has obtained descriptive and econometric results consistent with Profit-Shifting (P-S) by large Spanish MNEs to EU tax-haven countries, using the recent statistics based on Country-by-Country Reports (CbCRs). Pre-tax profits and related revenues reported in EU tax havens seem to be disproportionately high in comparison to economic activity in these jurisdictions. While the use of statistics on CbCRs is the main strength of the present article and represents a first step in the exploitation of this new data on Spanish MNEs, it also constitutes its main limitation due to the scarcity of information available to the public on these reports to date.

The main advantage of these statistics is the country coverage. While the Bureau van Dijk's Orbis database is missing a great deal of unconsolidated data regarding some jurisdictions, CbCRs contain country-level information on MNCs' tax payments and finances. However, the available statistics are currently very limited for Spain. The most disaggregated statistics published by the Spanish Ministry of Finance on these reports are total financial values by jurisdiction, which does not allow us to consider multinational-level characteristics. Moreover, country-level data is only available for EU countries, which further limits the number of observations in the sample.

Therefore, a natural extension of this research should be to replicate the above analyses later, using more years and individual data on the activities of Spanish MNEs operating worldwide when available. Indeed, Spain and Italy are the EU countries with the highest number of CbCRs disclosed by multinationals (Aliprandi et al., 2022; Aliprandi and Borders, 2023), and some of these Spanish MNEs provide an excellent level of corporate tax transparency (Godar et al., 2022).[19] Additionally, due to the transposition of Directive 2021/2101,[20] large Spanish MNEs will have the obligation to publish their CbCR on the MNE website for the fiscal years starting from June 2024.

Based on the 2018-2020 CbCR information, we have also calculated the additional tax revenue that Spain would have gained if the minimum effective tax rate of 15% (without carve-outs) established by the GloBE rules had been applicable. Considering only profits obtained by Spanish MNEs in EU countries (Spain excluded), it seems that the establishment of this minimum tax rate could have originated extra tax revenue for the Spanish public treasury of up to 17% of positive corporate taxes annually. Again, this analysis is also a first step regarding the possible consequences of the application of Pillar Two.

19 See https://taxobservatory.shinyapps.io/company_cbcr_data/.

20 Directive (EU)2021/2101 of the European Parliament and of the Council of 24 November 2021 (https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32021L2101&from=EN) requires country-by-country reports of multinational groups operating in the EU with a total consolidated revenue of at least EUR 750 million to be publicly available starting with fiscal year 2025. The Directive has been transposed in Spain by Law 28/2022 of 21 December on the promotion of the start-up ecosystem.

An important issue that could affect the final result of the application of Pillar Two on tax revenue is the behavioural response of MNEs. They may, for instance, reduce investment and employment in some countries because of the increase in the effective cost of capital, or relocate real activity to low-tax territories to take advantage of carve-out rules (Suárez Serrato, 2018; IMF, 2022). This and other behavioural responses of MNEs may change predictions about the tax revenue consequences of the proposal, and are likely to have other unintended general economic consequences worldwide.

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Appendices

Table A1. Country-by-Country statistics for Spanish MNEs: 2018-2020

Non-detailed data	-Total value of variables by effective tax rate level (accrued and paid). -Ratios about tax contribution, profitability, and economic substance by effective tax rate level (accrued and paid). -Territorial distribution of multinationals, entities, and income by effective tax rate level (accrued and paid): Spain, EU countries (Spain excluded) and non-EU countries. -Tax contribution of territories by effective tax rate level (accrued and paid): Spain, EU countries (Spain excluded) and non-EU countries. -Profits and economic substance of territories by effective tax rate level (accrued and paid): Spain, EU countries (Spain excluded) and non-EU countries.
Detailed data by jurisdiction	-Total value of variables by country (UE-28) or continent. -Ratios related to profitability and economic substance by country (UE-28) or continent. -Average of total value of variables by country (UE-28) or continent. -Percentage of variables' total value by country (UE-28) or continent.

Source: By the authors, data from the Spanish Ministry of Finance.

Table A2. Descriptive Statistics: 2018-2020

Variable	Obs	Mean	Std. Dev.	Min	Max
Pre-tax Profits (thousand €)	80	509,000	1,110,000	4	7,180,000
Related revenues (thousand €)	80	997,000	1,660,000	-165,000	5,840,000
Employees	80	12,952.05	24,640.68	4	129,401
Assets (thousand €)	80	2,300,000	5,930,000	30	39,400,000
Unrelated revenues (thousand €)	80	3,820,000	8,040,000	-3,782,000	45,800,000
GDP pc (thousand €)	80	37.2250	15.7565	18.5159	95.5078
Population (thousand)	80	16,700	22,800	484,630	83,200
Corruption	80	64.3625	14.24047	42	88
Tax haven	80	0.1875	0.3928	0	1

Source: By the authors.

Table A3. Results. Extended Tax Haven lists

Variable	(1) Log (Pre-Tax Profits)	(2) Log (Related Revenues)
th_{it}	1.1500*** (0.3251)	1.2414*** (0.3911)
$lg(employees_{it})$	-0.4002 (0.2604)	0.4840 (0.3176)
$lg(asset_{it})$	0.2912 (0.1964)	0.3057 (0.2359)
$lg(unrelatedrev_{it})$	0.9659*** (0.2827)	-0.0131 (0.3749)
$lg(gdppc_{it})$	-0.7458 (0.6058)	1.3186** (0.6608)
$lg(pop_{it})$	0.1304 (0.1766)	0.2346 (0.2211)
$corruption_{it}$	0.0222** (0.0095)	0.0041 (0.0142)
N	79	77
R^2	0.9094	0.8943

Source: By the authors.
Notes: ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively. Robust Standard Errors are in brackets.

Table A4. Results. period 2017-2020

Variable	(1) Log (Pre-Tax Profits)	(2) Log (Related Revenues)
th_{it}	1.6284*** (0.3331)	1.8595*** (0.3495)
$lg(employees_{it})$	-0.1396 (0.2117)	0.2242 (0.2765)
$lg(asset_{it})$	-0.0063 (0.1218)	0.0414 (0.1798)
$lg(unrelatedrev_{it})$	1.0237*** (0.2148)	0.4705 (0.2853)
$lg(gdppc_{it})$	-0.7759 (0.4784)	0.7324 (0.6077)
$lg(pop_{it})$	0.1802 (0.1331)	0.3904** (0.1853)
$corruption_{it}$	0.0260*** (0.0086)	0.0040 (0.0116)
N	101	99
R^2	0.9152	0.8899

Source: By the authors.
Notes: ***, ** and * denote statistical significance at 1%, 5% and 10% levels, respectively. Robust Standard Errors are in brackets.