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Where do multinationals locate profits: Evidence from country-by-country reporting

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WHERE DO MULTINATIONALS LOCATE PROFITS: EVIDENCE FROM COUNTRY-BY-COUNTRY REPORTING

Tomáš Boukal

IES Working Paper 31/2024

$$\frac{1!}{(m-1)!} p^{m-1} (1-p)^{n-m} = p \sum_{\ell=0}^{n-1} \frac{\ell+1}{n} \frac{(n-1)!}{(n-1-\ell)! \ell!} p^{\ell} (1-p)^{n-1-\ell} = p \frac{n-1}{n} \sum_{\ell=0}^{n-1} \left[\frac{\ell}{n-1} + \frac{1}{n-1} \right] \frac{(n-1)!}{(n-1-\ell)! \ell!} p^{\ell} (1-p)^{n-1-\ell} = p^2 \frac{n-1}{n} +$$

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Where Do Multinationals Locate Profits: Evidence from Country-by-Country Reporting

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Abstract:

Multinational enterprises are increasingly using offshore locations to pay lower taxes on their profits. This behavior has distortive effects on the global economy, as the concentration of multinational activities mirrors global tax patterns. In this paper, I exploit the OECD country-by-country reporting statistics to analyze the determinants behind the location of profits. I find that profit allocation is sensitive to both effective tax rates and geographical proximity, confirming the significance of these factors in MNEs' tax planning strategies. Building on the work of Dharmapala and Hines (2009), this study also uncovers that MNEs are more likely to report profits to jurisdictions with superior governance quality, integrating both Global Governance Indicators and factors linked to financial secrecy. However, the findings indicate that tax haven jurisdictions exhibit a degree of reluctance when it comes to implementing recently introduced policies aimed at combating corruption and tax abuses.

JEL: F23, G15, G28, H26, H32

Keywords: international taxation, tax havens, country-by-country reporting, gravity models, governance quality

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1 Introduction

The recent leaks of confidential documents such as the "Panama Papers", "Paradise Papers", and "Pandora Papers" show how globalization and increased mobility of capital have induced demand in offshore dealings. The scale of shifted profits by multinational enterprises (MNEs) to tax havens characterized by a low level of taxation or financial secrecy provision has been thoroughly documented in the literature. As much as 30% to 40% of global foreign direct investment (FDI) is channeled through tax havens (Damgaard et al., 2024; Haberly and Wójcik, 2015b), and the estimated corporate profits shifted there amounts to 40% of global profits (Tørsløv et al., 2023). The geographical structure of global firm networks thus mirrors the geographical distribution of taxation more than the actual location of production or consumption activities Sigler et al. (2020) with offshore FDI exhibiting a sensitivity to physical distance that is comparable to that of the real FDI (Haberly and Wójcik, 2015b). The aggressive behavior of MNEs in seeking the lowest taxation possible (Buckley et al., 2015), is resulting in billions of corporate tax revenue lost (Garcia-Bernardo and Janský, 2024; Tørsløv et al., 2023).

Besides profit shifting, research has also considered financial secrecy and governance quality as significant factors in the attractiveness of offshore financial centers (Cobham et al., 2015; Janský et al., 2023). I connect the research of Dharmapala and Hines (2009) and the argument that jurisdictions with higher governance quality tend to attract more profits with better enforcement of financial secrecy and tax regulations. By intuition, these jurisdictions aim to avoid appearing on tax haven blacklists, which could negatively impact firm valuations and investment (Rusina, 2020). As a result, these jurisdictions often seek to implement the minimum required standards imposed by international bodies to remain appealing to multinational enterprises. This is evident in the recent adoption of beneficial ownership registers by prominent tax havens (Harari et al., 2020). Furthermore, recent studies have evaluated the effectiveness of transparency regulations aimed at curbing secrecy, such as the introduction of automatic exchange of information (Ahrens and Bothner, 2020; Hakelberg and Rixen, 2021).

In this paper, I address the key drivers behind the location of foreign profits. To uncover these determinants, I combine the research of financial geographers (Haberly and Wójcik,

2015a) who employed a gravity model to understand the behavior of multinational groups with the research methods from public economists, drawing on the seminal work of Hines and Rice (1994) and the semi-elasticity model. These works aim to separate profits (or its proxy) into two parts, real and shifted (offshore) profits. My intuition is similar. I develop a pseudo-maximum-likelihood estimator (PPML) gravity model analyzing the main determinants behind profits of country A directed to country B, when the real profits are explained by the standard gravity variables such as mass, proximity, or economic agreements. However, some offshore jurisdictions are able to attract more profits than what the gravity specification assumes. This proportion can be rationalized as “shifted” profits, for which I aim to account by introducing additional variables including taxation, secrecy, or quality of institutions.

I employ anonymized Country-by-Country Reporting (CbCR) data published by the OECD. The CbCR regulation applies to all large multinational enterprises with consolidated annual revenue of \$750 or above with headquarters in any country that has willingly embraced the regulation. The dataset offers a wide coverage of multinational activities, particularly bilateral profit and tax payments data. The CbCR data has been recently used to analyze the distribution of profits across jurisdictions (Hugger et al., 2023) as well as profit shifting at both the micro level in Germany (Fuest et al., 2022) and Italy (Bratta et al., 2024), and at the macro level (Garcia-Bernardo and Janský, 2024). In comparison to the previous works (Blanco and Rogers, 2014; Haberly and Wójcik, 2015b; Jha and Awate, 2024), CbCR data provide information on the real activity of MNEs such as profits, which thus does not have to be approximated by the FDI proxy that has been under critique (Linsi and Mügge, 2019). This is the first research to analyse the drivers of profits with data that convey substantially better geographical information about corporate activities (Wójcik, 2015). Secondly, with the much-improved information on MNEs activities, the work contributes also to the debate on the correct model specification. I build on the debate between Blouin and Robinson (2023), Bratta et al. (2024), and Garcia-Bernardo and Janský (2024) on the correct specification of the taxation rate. I introduce both the quadratic and logarithmic terms into my gravity specification and find the evidence in support of the higher orders for the tax parameter. Apart from the data extension, this work provides two main findings.

First, I build on the research of Dharmapala and Hines (2009) and find that multinationals locate more profits in better-governed countries with low effective tax rates. This is not necessarily the case for tax havens, for which we do not find significant results. Specifically, our results indicate that a one-unit increase in effective tax rates in well-governed countries is associated with a reduction in profits by approximately 5.2 units. Furthermore, the coefficient for governance quality is 0.09, suggesting that while better governance alone has a modest effect on profit location, its interaction with tax rates significantly amplifies the impact. Interestingly, the analysis shows that governance quality alone negatively affects the amount of profits. We largely attribute this to large economies, such as the BRICS members, whose share of the global corporate sector has been steadily growing.

Second, the model yields similar estimates when accounting for financial transparency and corruption. Both financial secrecy, measured by the Financial Secrecy Index (FSI) score, and corruption, assessed by the Corruption Perception Index (CPI), suggest that a higher level of profits is associated with more secretive countries. However, after incorporating effective tax rates to focus our analysis on tax havens, our results indicate that greater transparency, as measured by the CPI in jurisdictions with lower effective tax rates, is associated with an increase in profits. The results for the FSI score are mixed. I maintain that these findings do not directly contradict the existing literature that has used the FSI to evaluate the secrecy of countries (Cobham et al., 2015; Janský et al., 2023). Rather, when running the model with multiple specifications, the findings suggest a possible tax-bias in the FSI indicator. In this context, we focus on three key policies introduced largely in the last decade aimed at combating corruption and tax abuse: the Common Reporting Standard (CRS), the beneficial ownership register for companies, and the trust register. Evaluating these separately, we observe a steady increase in profits in jurisdictions that have adopted these policies. However, despite the widespread adoption of the CRS in tax havens, some jurisdictions have been more reluctant to implement transparency measures like the trust register.

The remainder of the article proceeds as follows. First, I present the data. Second, I continue with methodological exercise by specifying the model and constructing the individual variables. Third, I present the results and provide a summary of the findings. The

last section concludes.

2 Data

The research employs novel OECD (2024b) CbCR data to analyze the determinants behind the disproportionately higher attraction of profits from the side of tax havens. This data provides the currently best available information on MNEs' activities for many jurisdictions and enables high-quality cross-country comparisons. The CbCR regulation applies to all large MNEs with consolidated annual revenue of \$750 million or above with headquarters in any jurisdiction that has willingly embraced the regulation. MNEs are then required to disclose their financial data, which are aggregated by the country of operations to ensure anonymity and at last, published by the OECD. Compared to the previously public US Treasury CbCR data published by the Bureau of Economic Analysis (BEA) (2024), the OECD's CbCR data has significantly wider coverage, especially for developing and small economies. For example, in 2016, the BEA included only South Africa among African countries, while the CbCR covered 26 of them. Similarly, the coverage of tax havens is more extensive in the CbCR statistics. While the BEA only disseminates data for 12 tax havens, the CbCR offers activities of at least one country's data for 32 out of 40 widely recognized tax havens.¹

Despite the wide coverage and the fact that the initiative has been endorsed by many countries (also outside of the OECD), the scope of countries that are providing their data can be extended. While coverage has gradually improved over the years, with 38 and 45 countries present in 2017 and 2018 respectively, many countries still only provide aggregated data for categories such as "Foreign Jurisdictions Total," "America (Continent)," or "Asia," without disaggregating their data for individual tax jurisdictions. This issue is twofold. First, many countries avoid the specification of tax jurisdiction and include the activity of multinationals only in aggregated categories such as "Foreign Jurisdictions Total," "America (Continent)," or "Asia,". Table 6 illustrates this limitation when it shows how many individual tax jurisdictions a given country disaggregates its data. This issue is twofold. First, many countries avoid the specification of tax jurisdiction and include the activity of multinationals only in aggregated categories. Second, the aggregated categories serve for reporting in places with

¹The preferred tax haven list is adopted based on the research of Tørsløv et al. (2023)

minimal presence of their affiliates. As a result of this, the figures for small low income or developing countries can be on their lower bounds (Garcia-Bernardo and Janský, 2024).

In comparison with other data sources such as BEA, the OECD CbCR Statistics has been praised for its consistent definition of profits and taxes (Garcia-Bernardo and Janský, 2024). The primary issue with BEA data is the imputation of profits from net profits, and intra-group dividends, which may result in the double-counting of profits (Blouin and Robinson, 2023; Clausing, 2020). The CbCR data can still contain some double-counting of profit as a result of the inclusion of intercompany dividends (Garcia-Bernardo and Janský, 2024). Following the first release of the data, OECD (OECD, 2022) has taken partial measures to address the issue, and data for the year 2020 should be completely checked for double-counting. Based on the work of Hugger et al. (2023), we exclude the first year of reporting - 2016 - from our analyses, as the distortion of numbers was highest during that period. Garcia-Bernardo and Janský (2024) recommend additional measures to account for double-counting in CbCR, such as excluding stateless entities and adjusting domestic profits when empirical evidence suggests overestimation. I do not include any additional steps to correct for possible double-counting, as both the exclusion of domestic profits and stateless entities have been made in this study.

Table 1 displays the summary statistics for activities of foreign affiliates. I break down the activities based on the membership in OECD and tax haven status. As expected, the majority of the activities are represented by the OECD countries, which are responsible for 50.1% to 61.6% profit payments over the years. While the activities in terms of profit payments is considerable in tax havens, given the number of pairs in the sample, the sum of tax payments is proportionally smaller. More specifically, all tax havens account for around 15% of profit payments for the available years, but for the tax accrued the share is not higher than 6.7%. Thus already, the summary statistics display hints of profit shifting. This can be also seen from very low ETRs. For OECD tax havens, the ETRs range from 6.1 to 8.7 percent, for the groups of tax haven countries, the ETRs are almost half of that. The subsequent econometric exercise thus leads us to focus on two aims: i) identify the link between the level of taxation and profits, and ii) improve our knowledge about the drivers of profit shifting.

Table 1: Summary statistics, 2017-2021

| Year | | OECD Non-Tax Havens | OECD Tax Havens | Non-OECD Non-Tax Havens | Non-OECD Tax Havens | |
|-------------|-------------|------------------------|--------------------|----------------------------|------------------------|---------|
| 2017 | # Dyads | 291 | 80 | 799 | 139 | |
| | # Entities | 208,509 | 23,583 | 91,021 | 23,583 | |
| | Profit | Avg. (USD ml) | 13,367 | 6,375 | 1,735 | 3,774 |
| | | Total (USD ml) | 3,890,029 | 510,044 | 1,386,498 | 524,629 |
| | | Percent | 61.6% | 8.1% | 22.0% | 8.3% |
| | Tax Accrued | Avg. (USD ml) | 2181 | 436 | 302 | 113 |
| | | Total (USD ml) | 634,696 | 34,937 | 241,431 | 15,728 |
| | | Percent | 68.5% | 3.8% | 26.1% | 1.7% |
| | | Effective Tax Rate | 16.3% | 6.9% | 17.4% | 3.0% |
| | 2018 | # Dyads | 314 | 109 | 1,048 | 186 |
| # Entities | | 200,382 | 25,706 | 143,371 | 26,793 | |
| Profit | | Avg. (USD ml) | 13,373 | 6,768 | 1,945 | 3,264 |
| | | Total (USD ml) | 4,199,419 | 737,785 | 2,038,813 | 607,226 |
| | | Percent | 55.4% | 9.8% | 26.9% | 8.0% |
| Tax Accrued | | Avg. (USD ml) | 1,950 | 409 | 403 | 153 |
| | | Total (USD ml) | 612,535 | 44,689 | 423,378 | 28,603 |
| | | Percent | 55.2% | 4.0% | 38.2% | 2.6% |
| | | Effective Tax Rate | 14.6% | 6.1% | 20.8% | 4.7% |
| 2019 | | # Countries | 378 | 115 | 1,125 | 168 |
| | # Dyads | 206,762 | 25,302 | 177,930 | 33,783 | |
| | Profit | Avg. (USD ml) | 10,846 | 5,633 | 2,059 | 3,369 |
| | | Total (USD ml) | 4,100,070 | 647,871 | 2,317,455 | 566,106 |
| | | Percent | 53.7% | 8.50% | 30.4% | 7.4% |
| | Tax Accrued | Avg. (USD ml) | 1,473 | 378 | 392 | 167 |
| | | Total (USD ml) | 557,093 | 43,497 | 440,919 | 27,995 |
| | | Percent | 52.1% | 4.1% | 41.2% | 2.6% |
| | | Effective Tax Rate | 13.6% | 6.7% | 19.0% | 4.9% |
| | 2020 | # Countries | 376 | 110 | 1,101 | 180 |
| # Dyads | | 193,423 | 23,932 | 187,479 | 31,490 | |
| Profit | | Avg. (USD ml) | 8,254 | 4,989 | 1,810 | 2,642 |
| | | Total (USD ml) | 3,103,835 | 548,818 | 1,992,864 | 475,629 |
| | | Percent | 50.1% | 9.0% | 32.6% | 7.8% |
| Tax Accrued | | Avg. (USD ml) | 1396 | 387 | 356 | 133 |
| | | Total (USD ml) | 524,838 | 42,607 | 391,830 | 23,900 |
| | | Percent | 53.4% | 4.3% | 39.9% | 2.4% |
| | | Effective Tax Rate | 16.9% | 7.8% | 19.7% | 5.0% |
| 2021 | | # Countries | 404 | 119 | 1,262 | 203 |
| | # Dyads | 221,564 | 25,373 | 219,268 | 38,944 | |
| | Profit | Avg. (USD ml) | 12,047 | 4,978 | 2,441 | 3,156 |
| | | Total (USD ml) | 4,867,140 | 592,455 | 3,081,028 | 640,787 |
| | | Percent | 53.0% | 6.4% | 33.6% | 7.0% |
| | Tax Accrued | Avg. (USD ml) | 1858 | 435 | 501 | 154 |
| | | Total (USD ml) | 750,480 | 51,730 | 631,875 | 31,350 |
| | | Percent | 51.2% | 3.5% | 43.1% | 2.1% |
| | | Effective Tax Rate | 15.4% | 8.7% | 20.5% | 4.9% |

Note: This table provides summary statistics for main variables of interest of the OECD country-by-country dataset from the years of interest (2017-2021). The list of the preferred tax havens, which divide the columns on (non)tax-havens is based on the work of Tørsløv et al. (2023).

3 Empirical Strategy

I argue that the real profits of multinationals can be explained by gravity variables, such as the size of the economy or proximity. However, some tax jurisdictions may benefit from the global taxation and financial system to attract extra profits. To account for this, I introduce additional variables, such as taxation, governance and transparency. I estimate the model using the poisson pseudo-maximum-likelihood estimator (PPML). The method popularized by Silva and Tenreyro (2006) aims to counter the issue arising from the existence of zero values in trade flows and heteroskedastic residuals in log-linearized specifications of gravity models. The authors propose it as an alternative to the linear fixed effects model, which we use as a robustness check. I adopt a standard gravity framework as the most suitable empirical strategy. The application of the gravity equation in international finance has posed a significant challenge concerning the model's assumption of an inverse relationship for distance Portes and Rey (2005). They apply the gravity model to cross-border equity flow and argue that the gravity framework explains asset trade at least as well as the trade of goods. Although assets are generally considered weightless, and we should observe a lower impact of distance, research shows it is not the case Portes and Rey (2005), Okawa and Van Wincoop (2012). Thus, even for intangibles such as assets, higher distance reduces interactions between economic agents.

The same appears to hold for transactions booked in offshore locations. This has been empirically tested for FDI flows (Haberly and Wójcik, 2015b; Wei, 2000). Furthermore, the literature emphasizes the geographical relationship between offshore finance and socio-cultural (Buckley et al., 2015) or colonial ties (Eden and Kudrle, 2005; Haberly and Wójcik, 2015a). The gravity predictors together with the main factors behind profit shifting lead us to consider the following specification expressed in natural logarithm form:

$$\text{Profit}_{i,j,t} = \beta_0 + \beta_1 \text{Size}_{j,t} + \beta_2 \text{Proximity}_{i,j,t} + \beta_3 \text{Economic Agreements}_{i,j,t} + \beta_4 \text{Taxation}_{i,j} + \beta_5 \text{Governance}_{j,t} + \lambda_t + \alpha_i + \epsilon_{i,j,t} \quad (1)$$

where $\text{Profit}_{i,j,t}$ are profits of all multinationals headquartered in jurisdiction i and reported by its affiliates in destination jurisdiction j at time t with time-fixed effects λ_t , origin

country-fixed effects α_i to explain unobserved heterogeneity at country of origin level and error term $\epsilon_{i,j,t}$. In line with the methodology of Wei (2000), reused by Haberly and Wójcik (2015b), I prefer this specification over the inclusion of both origin and host country fixed effects. This is because the aim is to examine the determinants that drive the profits away from origin countries. In other words, I focus on the characteristics that define the attractiveness of offshore jurisdictions rather than the relative tax haven importance in the global economy. As a robustness check, I provide the specification with origin and host country fixed effects.

Regarding the vector of determinants, I split the term $\text{Size}_{j,t}$ into two components: one accounting for ‘mass’ – the size of the population at destination country j – and the second capturing the level of development – GDP per capita. I compile data for both from the World Bank (2024a) World Development Indicators.

The term $\text{Proximity}_{i,j,t}$ includes a set of bilateral geographical variables consisting of the following data from the CEPII gravity database. I measure the log of the geographical distance between these centers using data. To capture the reduction in communication barriers between agents, I incorporate a common language dummy, which I base upon the minority requirement of at least 10% of the inhabitants speaking the same language. Next, I provide a dummy for colonial relationships past the year 1945 and I include the dummy for contiguity.

The Economic Agreements $_{i,j,t}$ group consists of two variables. The first is the signature of a Regional Trade Agreement (RTA) as indicated by WTO (2022), which has been a commonly used explanatory variable in gravity models (Carrere, 2006). In addition to RTAs, I test the model with specific organization memberships, such as the OECD. Research identifies both groupings as significant concerning both economic geography and profit-shifting literature. Haberly and Wójcik (2015b) claim that jurisdictions hosting membership with the OECD are likely to book significantly more FDI. In addition, Janský et al. (2022) point to the hypocrisy of the OECD’s ambiguous policy towards the reduction of financial secrecy, as members find it easier to evade relevant information exchanges compared to non-members.

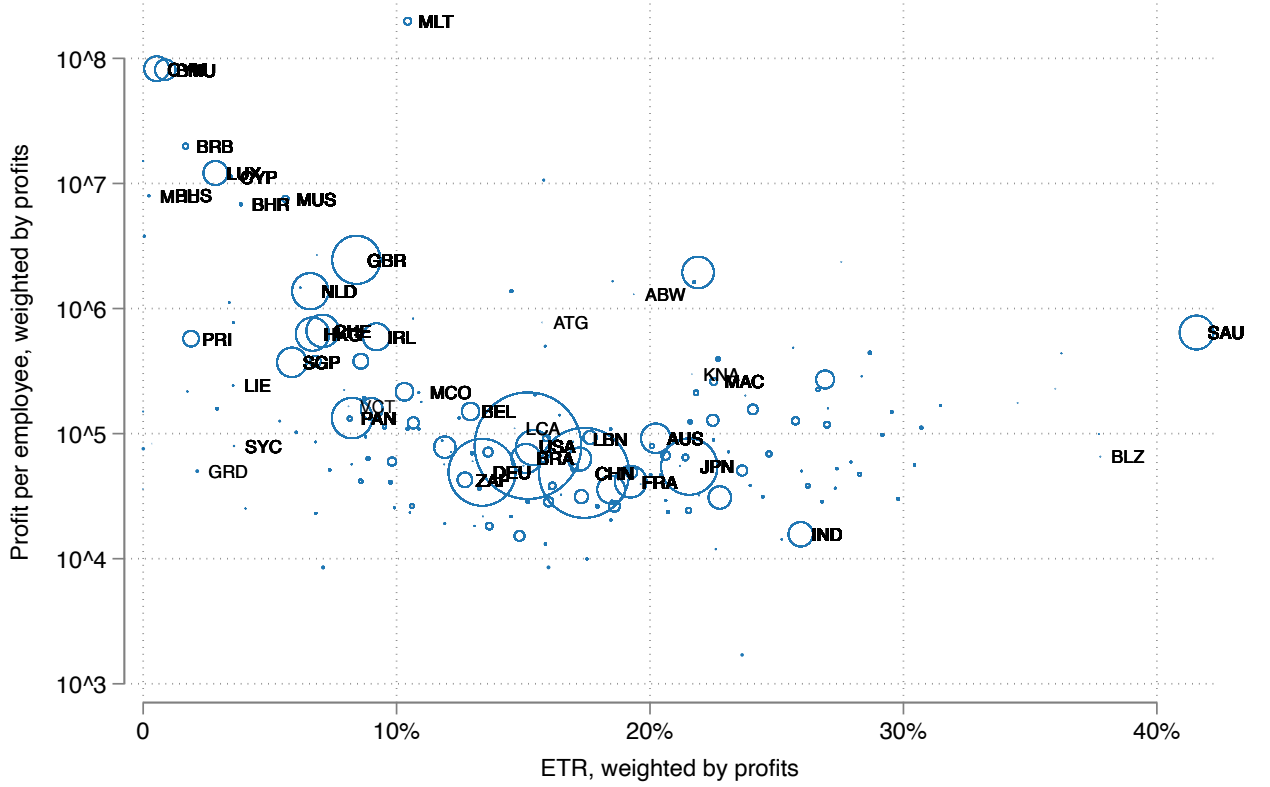
3.1 Taxation parameter

I account for $\text{Taxation}_{i,j,t}$ by introducing only one factor – the level of taxation. This variable is of sizeable importance as the literature identifies it as the major determinant behind the location of multinational’s profit. The research of Bilicka (2019) and Bachas et al. (2023) has shown that multinationals are able to achieve much lower taxation in comparison to standard statutory tax rates of countries. In addition, Garcia-Bernardo, Janský et al. (2023) have focused on the question of how much in taxes multinationals pay from empirical perspective and the work of Janský (2023) lays down the theoretical background on the effective rate of taxation. Based on these works, I decide to apply the backward-looking measurement of ETRs calculated as the weighted average of tax revenues divided by profit booked $\frac{\text{ETR}_j \cdot \pi_j}{\sum \pi_j}$ in the jurisdiction j , when the weight is profits booked. For their calculation, I also employ the OECD CbCR data. Figure 8 shows the distribution of ETR against the CIT rates for individual countries. The distributions confirm the shared narrative of profit shifting literature that is the corporate tax avoidance. The most obvious example of this are tax havens, where the distribution of CIT does not reflect the real level of taxation. Therefore, I apply ETRs as a main indicator accounting for taxation. I do not use other indicators, such as the existence of double-taxation treaties or the presence of zero withholding tax rates, as I argue that preferential tax regimes are already captured by the backward-looking effective tax rates.

In addition, I enter the debate over the correct specification of taxation in terms of the order of the relationship between profits and taxation. The base erosion and profit shifting literature has largely applied the quadratic relationship between profits and taxation following the approach of Hines and Rice (1994). This debate has been recently extended for new empirical evidence when Garcia-Bernardo and Janský (2024) advocate for the usage of logarithmic terms of ETR to appropriately account for profit shifting, thereby contradicting the approach of Blouin and Robinson (2023), who argue in favor of using linear terms. Nonetheless, the debate is also relevant to the financial geographers as Haberly and Wójcik (2015b) apply the logarithm term of CIT rates. The inclusion of higher orders of the tax parameter is also supported datawise. As previously noted by Tørsløv et al. (2023) and Garcia-Bernardo and Janský (2024), profits per economic activity exhibit a non-linear pattern. In

Figure 1 I plot the effective tax rates against profits per employee, revealing a highly non-linear relationship, with substantial excess profits reported in tax havens such as Bermuda and the Cayman Islands.

Figure 1: Nonlinear relationship between reported profits and ETRs



Note: The measures are based on data from OECD (2024b). The size of the bubble reports the amount of profits booked in a jurisdiction. All measures are calculated as the average for the years 2017-2021.

The debate over the correct specification of taxation term leads me to include quadratic and logarithmic term into baseline equation. I construct the logarithmic term in equation 3 as $\log(\text{Taxation}_{j,t} + t)$, where t is an offset parameter to prevent extremely large values in jurisdictions with near-zero effective tax rates when applying the logarithmic function. We use the value of 0.0023 for parameter t , based on the analysis by Garcia-Bernardo and Janský (2024):

$$\text{Profit}_{i,j,t} = \beta_0 + \beta_1 \text{Size}_{j,t} + \beta_2 \text{Proximity}_{i,j,t} + \beta_3 \text{Taxation}_{j,t} + \beta_4 \text{Taxation}_{j,t}^2 + \beta_5 \text{Governance}_{j,t} + \beta_6 \text{Economic Agreements}_{i,j,t} + \lambda_t + \alpha_i + \epsilon_{i,j,t} \quad (2)$$

$$\text{Profit}_{i,j,t} = \beta_0 + \beta_1 \text{Size}_{j,t} + \beta_2 \text{Proximity}_{i,j,t} + \beta_3 \text{Taxation}_{j,t} + \beta_4 \text{Taxation}_{j,t}^2 + \beta_5 \log(\text{Taxation}_{j,t} + t) + \beta_6 \text{Governance}_{j,t} + \beta_7 \text{Economic Agreements}_{i,j,t} + \lambda_t + \alpha_i + \epsilon_{i,j,t}. \quad (3)$$

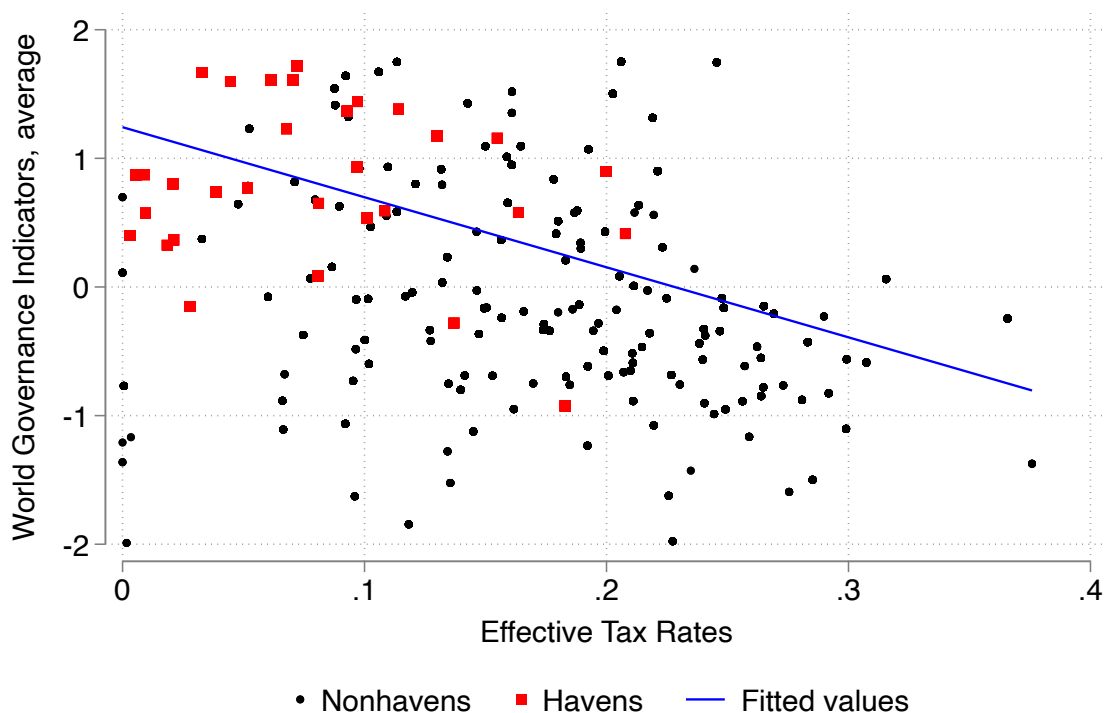
3.2 Governance and Transparency

The term $\text{Governance}_{j,t}$ builds on the argument by Dharmapala and Hines (2009) that tax havens are characterized by a high degree of governance quality. In the model, I initially adopt their approach by using the overall governance score, which is calculated as the average of all indicators from the World Bank (2024b) Worldwide Governance Indicators. As a robustness check, I apply the Rule of Law indicator, which is similarly derived from the Worldwide Governance Indicators. Since the argument does not rely on the presumption that higher profits are reported in countries with higher governance, but rather that tax havens, to attract foreign investment, are characterized by higher degrees of governance, we also introduce terms for tax havens and effective tax rates and provide results for their interaction with governance indicators. This relationship is clearly illustrated in Figure 2, where tax havens are shown as jurisdictions with both low ETRs and high governance quality. In Appendix Figure 9, we use the Rule of Law as a measure of governance and observe a similar pattern.

In this study, we establish a link between governance quality and transparency. Rusina (2020) demonstrate that multinationals have strong incentives to avoid jurisdictions listed on tax haven blacklists, leading them to be among the first to adopt minimal transparency and anti-money laundering regulations. This finding aligns with the research of Findley et al. (2012) and Haberly et al. (2024), which shows that tax havens have widely adopted global policies aimed at curbing corruption and financial secrecy. However, these adoptions are often superficial, existing primarily on paper, allowing a degree of secrecy to continue.

We account for secrecy by the Tax Justice Network (2022) Financial Secrecy Index. In particular, we use the Financial score, which is not affected by the weight of jurisdiction in the global financial markets. According to Cobham et al. (2015), the main advantage of the index is threefold. First, it offers a wider use than the classical dichotomy of tax-haven and non-

Figure 2: Governance quality and ETRs for tax havens and nonhavens.

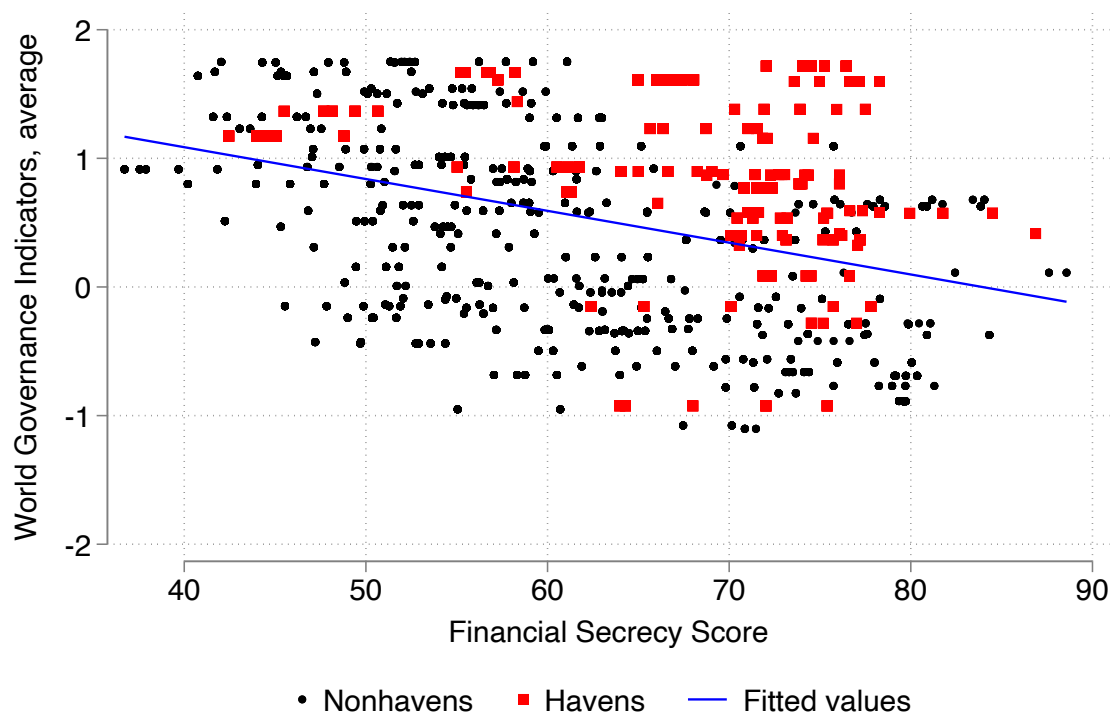


Note: Figure plots the average of [World Bank \(2024b\)](#) Worldwide Governance Indicators against effective tax rates of jurisdictions. The dots represent nonhavens jurisdictions. Tax havens are depicted by squares. All measures are calculated as the average for the years 2017-2021.

tax-haven countries, as jurisdictions can also specialize in providing financial services such as secrecy. Second, the empirical application of the secrecy index shows that secrecy is not just the domain of a few small island states with near-zero tax rates, which is usually the case for tax-havens. Third, the secrecy index can propose a different view on global corruption flows compared to existing indicators such as Transparency International’s Corruption Perceptions Index. The Financial Secrecy Index is published biannually, so to maintain the annual panel structure of our data, we interpolate the missing years by averaging the two closest years. Given the significant gaps in coverage of jurisdictions between the 2015–2018 and 2020–2022 releases, we assign the 2018 and 2022 scores to the years 2017 and 2021, respectively, if a jurisdiction’s score is missing. The persistence of some level of secrecy is evident in Figure 3, where the majority of tax havens cluster in the top right corner, indicating high levels of financial secrecy. As a consistency check for secrecy, we also run the regression with [Transparency International \(2024\)](#).

However, there is inconsistency over the years as the composition of the Financial Secrecy

Figure 3: Governance quality and Secrecy score for tax havens and nonhavens.



Note: Figure plots the average of World Bank (2024b) Worldwide Governance Indicators (average for the years 2017-2021) against the Tax Justice Network (2022) Financial Secrecy score for 2022. The dots represent nonhavens jurisdictions. Tax havens are depicted by squares.

Index evolves alongside developments in the global regulatory framework. Janský et al. (2022) propose a methodology to address this time-wise inconsistency. Instead, I focus Despite advancements in regulatory frameworks, there remains temporal inconsistency in the Financial Secrecy Index due to its evolving composition alongside global regulatory developments. Janský et al. (2022) propose a methodology to address this inconsistency. In this analysis, I instead focus on the recent adoption of three key policies introduced predominantly in the last decade to combat corruption and tax abuse: the Common Reporting Standard (CRS), the beneficial ownership register for companies, and the trust register. First, the CRS, approved by the OECD Council on July 15, 2014, represents a significant effort by jurisdictions to collect data from financial institutions and share it with other jurisdictions, with the first reports emerging in 2017.² Second, although the need for beneficial ownership transparency has been recognized for some time—evident from jurisdictions such

²For further details, see: OECD (2017), Standard for Automatic Exchange of Financial Account Information in Tax Matters, Second Edition, OECD Publishing, Paris, <https://doi.org/10.1787/9789264267992-en>.

as Bermuda as far back as the 1980s³—the significant advancement came with the EU’s 4th Anti-Money Laundering (AML) Directive of 2015. This directive mandates EU member states to establish central registers of beneficial ownership for companies and certain trusts (European Union, 2015) Furthermore, the G20 and the OECD’s Global Forum on Transparency and Exchange of Information endorsed beneficial ownership transparency in 2016.⁴ Given that many jurisdictions have either adopted only one of these registers or maintain separate registers for trusts and beneficial ownership, we assess these policies individually.

For each of the three indicators, I construct a dummy variable equal to one from the year of adoption onwards. For the Common Reporting Standard (CRS), I use data from OECD (2024a), specifically tracking the years corresponding to the “Commitment to First Exchanges” date. The quality of beneficial ownership availability worldwide has been assessed by Harari et al. (2020). I turn to jurisdiction level data on the evaluation of the availability of a central register for beneficial ownership of companies by using the Financial Secrecy Index by Tax Justice Network (2022). Specifically, I focus on the “Recorded Company Ownership” and “Companies, Beneficial Ownership, Registration” subindicators. Edge cases are identified using the Tax Justice Network’s (TJN) scoring, where a response of “Yes” is required. For trusts, I refer to the “Trusts, Registration” subindicator within the “Trust and Foundations Register” indicator Tax Justice Network (2022). Unlike the TJN’s approach, which demands registration for all types of trusts, I do not require that all domestic or foreign trusts be registered. Instead, I consider any type of trust registration sufficient, aligning more closely with the European Union’s directive, which primarily targets trustees of express trusts. Additionally, I include trusts registered via tax returns if a specific filing is required to recognize trusts. For the year of adoption, I use notes from TJN available for all subindicators. If the legislation comes into force at the end of the year (December), I record the adoption as occurring in the following year, as filing typically applies to the subsequent year.

³The Companies Act 1981 and the Exchange Control Act 1972 impose requirements for identifying the beneficial owners of companies.

⁴Beneficial ownership information has been since 2016 included in the report: OECD and Global Forum on Transparency and Exchange of Information for Tax Purposes, Terms of Reference to Monitor and Review Progress towards Transparency and Exchange of Information on Request for Tax Purposes.

4 Results

4.1 Main Results

This section presents the results of our econometric analysis, providing a comprehensive examination of the relationship between effective tax rates and the location of profits. Specifications 1 to 3 are estimated across a robust sample of 8,260 origin-to-destination country pairs. The results of the baseline specification, using the Poisson Pseudo-Maximum Likelihood estimator, are displayed in Table 7, while Appendix Table 7 provides insights from the linear fixed effects model for comparison. Columns 1, 2, and 3 explore different functional forms for effective tax rates, revealing the intricate dynamics at play. In columns 4 and 5, we introduce a robustness check by incorporating a dummy variable for OECD membership, ensuring that our findings are not overly influenced by data from OECD member countries.

The analysis uncovers a markedly non-linear relationship between effective tax rates and the location of profits, consistent with the findings of Garcia-Bernardo and Janský (2024). Moreover, the model shows evidence supporting a logarithmic relationship, suggesting that larger multinationals, facing proportionally lower costs of profit shifting, are more inclined to engage in this behavior. This implies that as the scale of a multinational’s operations increases, the incentive to shift profits intensifies, underscoring the complexities of tax policy design in a globalized economy, which enables multinationals to optimize their tax burdens.

The control variables included in our gravity model generally follow economic intuition. As expected, the profits booked by foreign affiliates are positively correlated with a country’s economic mass and level of development, as measured by GDP per capita. Additionally, proximity variables display the anticipated effects: profits located offshore tend to decrease with greater physical distance, while closer societal ties—such as shared language and colonial history—are associated with increased profit booking. These findings resonate with previous research, including the works of Portes and Rey (2005) and Okawa and Van Wincoop (2012), who apply the gravity framework to financial flows. However, our analysis diverges from the conclusions of Haberly and Wójcik (2015a) and Buckley et al. (2015), as we do not find colonial relationships to be a significant driver for the location of profits. This suggests that, in contrast to these earlier studies, the historical ties between countries may play a lesser

role in profit-shifting activities with the continuing globalization. Notably, the significance of economic agreements emerges only when we account for non-linear effects in taxation. The inclusion of a dummy variable for dual OECD membership reveals no significant effect, indicating that our results are not biased by the composition of the CbCR dataset, where the majority of reporting countries are OECD member countries.

Table 2: Baseline Specification, PPML

| Dependent var.: | Profit | (1) Linear RTA | (2) Quadratic RTA | (3) Logarithmic RTA | (4) Quadratic OECD | (5) Quadratic OECD & RTA |
|-----------------------|-------------------------------|----------------------|-----------------------|----------------------|-----------------------|--------------------------|
| Size | log(GDP capita _j) | 0.648*** (0.039) | 0.707*** (0.038) | 0.710*** (0.034) | 0.691*** (0.035) | 0.701*** (0.038) |
| | log(population _j) | 1.248*** (0.085) | 1.255*** (0.076) | 1.183*** (56.25) | 1.211*** (0.081) | 1.246*** (0.078) |
| Proximity | log(distance _{i,j}) | -0.298*** (0.072) | -0.276*** (0.068) | -0.283*** (0.070) | -0.287*** (0.076) | -0.258*** (0.071) |
| | language _{i,j} | 0.709*** (0.128) | 0.698*** (0.128) | 0.713*** (0.130) | 0.730*** (0.123) | 0.722*** (0.123) |
| | colony _{i,j} | 0.404 (0.321) | 0.254 (0.328) | 0.148 (0.345) | 0.177 (0.336) | 0.198 (0.331) |
| | contiguous _{i,j} | 0.337 (0.217) | 0.365* (0.208) | 0.286 (0.217) | 0.410** (0.208) | 0.349* (0.204) |
| Economic agreements | RTA _{i,j} | 0.151 (0.111) | 0.220** (0.109) | 0.242** (0.111) | | 0.214* (0.112) |
| | OECD _{i,j} | | | | 0.211 (0.139) | 0.200 (0.136) |
| Taxation | ETR _j | -9.266*** (0.790) | -21.256*** (1.891) | -2.463** (1.168) | -21.328*** (1.815) | -21.896*** (1.915) |
| | ETR _j ² | | 39.404*** (4.324) | | 39.373*** (4.090) | 40.638*** (4.288) |
| | log(ETR _j) | | | -0.728*** (0.106) | | |
| Governance | AVG WGI _j | -0.670*** (0.122) | -0.611*** (0.113) | -0.469*** (0.105) | -0.632*** (0.124) | -0.678*** (0.118) |
| Observations | | 8,260 | 8,260 | 8,260 | 8,260 | 8,260 |
| Pseudo R ² | | 0.6854 | 0.6983 | 0.6980 | 0.6978 | 0.6990 |
| Origin country FE | | Yes | Yes | Yes | Yes | Yes |
| Year FE | | Yes | Yes | Yes | Yes | Yes |

Note: ***, ** and * indicate significance at the 0.1%, 1% and 5% levels, respectively. Heteroskedasticity robust standard errors (using White estimator of variance) are in brackets.

The significance of the estimated coefficients for both the quadratic and logarithmic terms holds across a range of alternative specifications. First, the results remain consistent when incorporating different definitions of economic agreements or varying degrees of institutional participation. Even when applying a linear fixed effects model, as shown in Appendix Table 7, the significance of these terms persists, albeit with slightly smaller coefficients. However, a notable shift occurs when both origin and host country fixed effects are included, as illustrated in Appendix Table 8. Here, the significance of effective tax rates diminishes, suggesting that the fixed effects are capturing the variation previously attributed to these determinants. This indicates that between-country differences are primarily driving

the observed relationships, rather than within-country variation. Despite this, the small significance for the linear term and the lack of significance when using non-linear specifications suggest that these particular results should be interpreted with caution as it contradicts descriptive statistics, which clearly highlight the underlying patterns in the data. Lastly, the significance of the non-linear relationship between the location of profits and the effective tax rates of jurisdictions is further supported when considering alternative specifications of governance and transparency, which we will explore in the following section.

4.2 Effect of governance on location of profits

In the baseline model presented in Table 2, we find little evidence to support the notion that higher profits are located in countries with better governance. In fact, the results suggest the opposite: a significant negative coefficient indicates that a substantial share of profits is concentrated in poorly governed countries. However, this relationship does not hold in the OLS fixed effects specification, where governance itself is found to be insignificant. We largely attribute the negative relationship observed in the PPML model to the influence of large economies, such as the BRICS nations, whose share of the global corporate sector has been steadily increasing.

Building on the framework of Dharmapala and Hines (2009), which argues that tax havens are characterized by higher governance levels to attract foreign investment, rather than claiming a direct relationship between the amount of profits and level of governance, I introduce terms for tax havens, effective tax rates, and their interaction in Table 3. The results are similar to the graphical illustration presented in Figure 2 and Appendix Figure 9. The model shows that multinationals locate more profits in better-governed countries with low effective tax rates. Specifically, in column (2), the results indicate that a one-unit increase in effective tax rates in well-governed countries is associated with a reduction in profits by approximately 5.2 units. As the coefficient for governance quality is 0.09, it might suggest that while better governance alone has a modest effect on profit location, its interaction with tax rates significantly amplifies the impact. This is not necessarily the case for tax havens, for which we do not find significant results. On the other hand, the established results can be driven much more by the effective tax rates than governance. In columns 2 and 6, we see

the exact opposite to columns 4 and 8, as when we introduce tax haven dummies, the effect stays the same, but significance of the the interaction term can no longer be claimed.

Table 3: Effect of governance on location of profits, PPML

| | Average of WGI indicators | | | | Rule of Law (RoL) | | | |
|--|---------------------------|-------------------------|--------------------------|---------------------------|------------------------|-------------------------|--------------------------|---------------------------|
| | Baseline (1) | ETR interact. (2) | Haven Baseline (3) | Haven interact. (4) | ETR Baseline (5) | ETR interact. (6) | Haven Baseline (7) | Haven interact. (8) |
| ETR _j | -9.266*** (0.790) | -5.271*** (0.754) | | | -9.724*** (0.793) | -6.346*** (0.803) | | |
| Haven _j | | | 1.449*** (0.139) | 1.245*** (0.184) | | | 1.452*** (0.140) | 1.467*** (0.163) |
| Avg.WGI _j | -0.670*** (0.122) | 0.088 (0.152) | -0.575*** (0.125) | -0.615*** (0.133) | | | | |
| ETR _j * Avg.WGI _j | | -5.229*** (0.488) | | | | | | |
| Haven _j * Avg.WGI _j | | | | 0.152 (0.144) | | | | |
| RoL _j | | | | | -0.686*** (0.112) | -0.061 (0.165) | -0.456*** (0.114) | -0.453*** (0.114) |
| ETR _j * RoL _j | | | | | | -3.826*** (0.495) | | |
| Haven _j * RoL _j | | | | | | | | -0.010 (0.123) |
| Observations | 8,260 | 8,260 | 8,260 | 8,260 | 8,260 | 8,260 | 8,260 | 8,260 |
| Pseudo R ² | 0.6854 | 0.7009 | 0.6788 | 0.6790 | 0.6876 | 0.6973 | 0.6768 | 0.6768 |
| Origin FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Note: The specification includes all the variables used in the baseline model (1) This table distributes the results based on the governance indicator: Average of Worldwide Governance Indicators (Avg.WGI); or a single indicator from WGI - Rule of Law (RoL). In the respective rows, I then specify individual interaction terms between the governance indicator and tax havens (dummy equal to one if yes) or effective tax rates of jurisdictions.

The specification includes origin country and time fixed effects. ***, ** and * indicate significance at the 0.1%, 1% and 5% levels, respectively. Heteroskedasticity robust standard errors (using White estimator of variance) are in brackets.

4.3 Effect of transparency on location of profits

In Table 4, I explore the relationship between transparency and the location of profits in greater depth. The results across all specifications do not provide conclusive evidence that financial secrecy is a significant driver of profit allocation. Initially, the Financial Secrecy Index, as constructed by TJN, suggests a positive relationship between secrecy and profit location in column (1), providing support to the argument that secrecy provisions plays a role in the decision making of multinationals, as highlighted in the literature Cobham et al. (2015); Janský et al. (2022). However, when quadratic terms are introduced, the effect of financial secrecy diminishes, with the term becoming statistically insignificant in columns (2) and (3).

Table 4: Effect of transparency on location of profits, PPML

| | Financial Secrecy Score | | | Corruption Perceptions Index | | |
|-------------------------------|-------------------------|-----------------------|---------------------------|------------------------------|-----------------------|---------------------------|
| | Linear | Quadratic | Quadratic with Avg.WGI | Linear | Quadratic | Quadratic with Avg.WGI |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| ETR _j | -9.039*** (0.948) | -21.101*** (2.032) | -21.653*** (2.138) | -9.967*** (0.820) | -21.587*** (2.026) | -21.441*** (1.976) |
| ETR _j ² | | 39.631*** (4.585) | 40.206*** (4.780) | | 37.733*** (4.703) | 37.467*** (4.623) |
| FSI score _j | 0.011** (0.005) | 0.008 (0.005) | -0.001 (0.005) | | | |
| CPI Index _j | | | | -0.009** (0.114) | -0.012*** (0.004) | -0.008 (0.009) |
| Avg.WGI _j | | | -0.636*** (0.128) | | | -0.115 (0.199) |
| Observations | 6,621 | 6,621 | 6,621 | 7,964 | 7,964 | 7964 |
| Pseudo R ² | 0.6625 | 0.6755 | 0.6855 | 0.7102 | 0.7202 | 0.7202 |
| Origin FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes |

Note: The specification includes all the variables used in the baseline model (1) The results are distributed based on the transparency indicators: Financial Secrecy Index, Secrecy score (FSI score); or Corruption Perception Index . In the respective rows, I specify the main variables of interest - effective tax rates. In column (3, 6) the affect of the governance (measured as average of Worldwide Governance Indicators) - Avg.WGI - score is presented.

The specification includes origin country and time fixed effects. ***, ** and * indicate significance at the 0.1%, 1% and 5% levels, respectively. Heteroske-dasticity robust standard errors (using White estimator of variance) are in brackets.

In Table 4, columns (4-6), I extend the analysis by incorporating the Corruption Perception Index (CPI) to test the consistency of the results. Similar to the findings with the Financial Secrecy Index (FSI), the CPI indicates a negative and statistically significant relationship, suggesting that more profits are located in countries with higher levels of corruption. However, this may also reflect the fact that larger economies tend to exhibit higher levels of corruption, aligning with earlier results related to governance indicators. Notably, the significance of the CPI persists even after the introduction of quadratic terms. This persistence suggests that the unexplained variance is more effectively captured by the higher-order functions of effective tax rates rather than by the secrecy score alone, which may indicate a potential tax bias in the Tax Justice Network (2022) secrecy index.

To address the potential tax bias in our analysis, I introduce three distinct indicators to capture the impact of transparency-enhancing policies on the global distribution of profits. The adoption of these policies in tax havens is depicted in Figure 4. The data show that while some measures, such as the CRS, have been swiftly adopted, the implementation of registers, particularly trust registers, has lagged significantly. provides a broader perspective across

Figure 4: Adoption of policies in tax havens by amount of profits

Figure 5: CRS Adoption

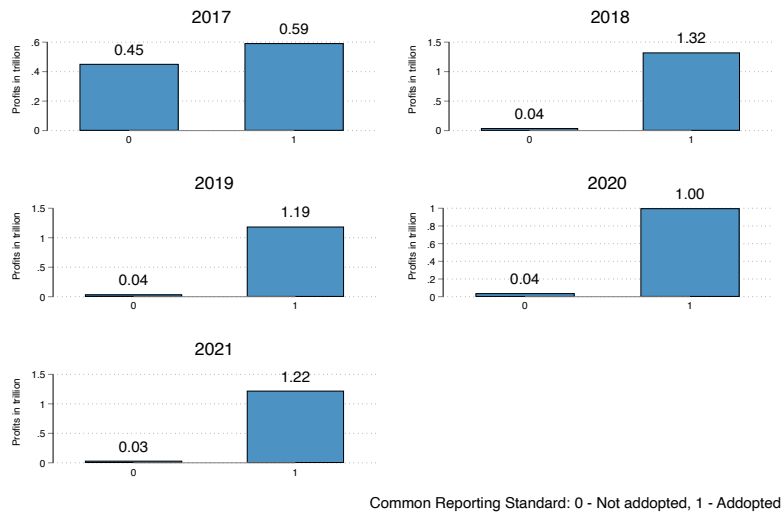


Figure 6: Register of Company Beneficial Ownership

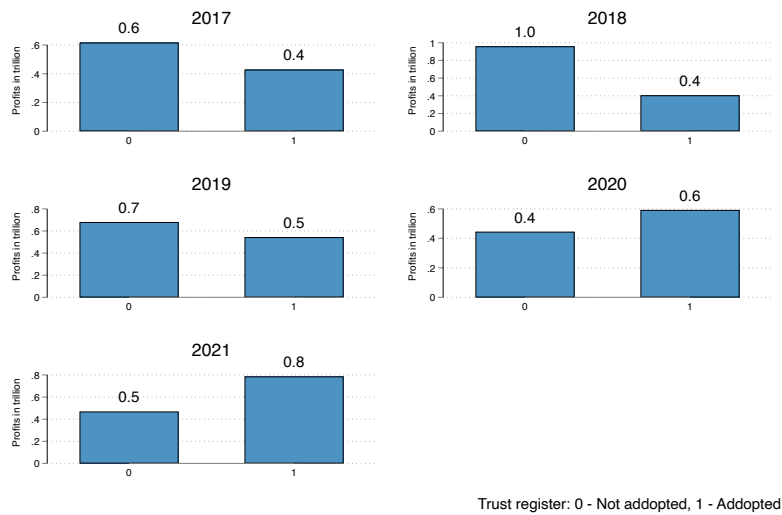


Figure 7: Register of Trusts

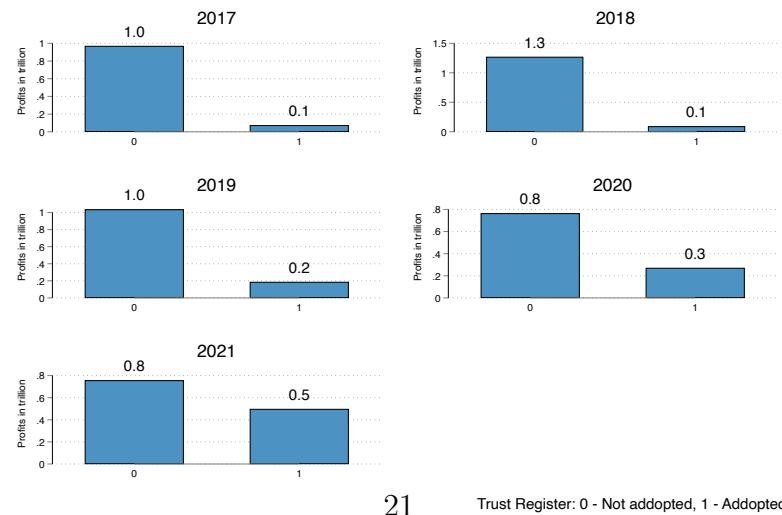


Table 5: Effect of transparency policy adoption on profit location, PPML

| | Composite policy adoption score | | | | Separate policy adoption | | | |
|---|--------------------------------------|----------------------|---------------------------|-------------------------------------|--------------------------------------|----------------------|---------------------------|-------------------------------------|
| | ETR _j ² (1) | ETR Interact. (2) | Haven _j (3) | Haven _j Interact. (4) | ETR _j ² (5) | ETR Interact. (6) | Haven _j (7) | Haven _j Interact. (8) |
| ETR _j | -21.4*** (1.844) | -7.75*** (1.220) | | | -19.9*** (2.026) | -7.4*** (1.517) | | |
| ETR _j ² | 40.04*** (4.208) | | | | 35.9*** (3.814) | | | |
| Haven _j | | | 1.42*** (0.139) | 1.52*** (0.216) | | | 1.37*** (0.123) | 1.5*** (0.276) |
| Policy score _j (<i>PS_j</i>) | -0.086** (0.034) | 0.036 (0.107) | -0.118*** (0.032) | -0.01*** (0.032) | | | | |
| ETR _j * <i>PS_j</i> | | -0.854 (0.609) | | | | | | |
| TH _j * <i>PS_j</i> | | | | -0.063 (0.079) | | | | |
| CRS _j | | | | | 0.380*** (0.122) | 0.55** (0.278) | 0.202* (0.115) | 0.232* (0.130) |
| UBO _j | | | | | -0.142 (0.097) | 0.174 (0.244) | 0.22** (0.094) | 0.412* (0.241) |
| TR _j | | | | | -0.365*** (0.093) | -0.92*** (0.285) | -0.72*** (0.106) | -0.52** (0.260) |
| ETR _j * CRS _j | | | | | | -1.225 (1.513) | | |
| ETR _j * UBO _j | | | | | | -2.266* (1.357) | | |
| ETR _j * TR _j | | | | | | 3.373** (1.378) | | |
| TH _j * CRS _j | | | | | | | | -0.204 (0.257) |
| TH _j * UBO _j | | | | | | | | 0.412* (0.241) |
| TH _j * TR _j | | | | | | | | -0.516** (0.260) |
| N | 7,293 | 7,293 | 7,293 | 7,293 | 7,293 | 7,293 | 7,293 | 7,293 |
| Pseudo R ² | 0.6788 | 0.6755 | 0.6598 | 0.6600 | 0.6876 | 0.6797 | 0.6737 | 0.6760 |
| Origin FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

Note: The specification includes all variables used in the baseline model (1). The results are organized based on individual policy adoptions as well as a composite adoption score, which aggregates these values. In the relevant rows, I highlight the primary variables of interest: effective tax rates and tax haven indicators. Additionally, the columns present interactions with effective tax rates (columns 2 and 6) and with tax havens (columns 4 and 8). The quadratic specification for effective tax rates is excluded from the visual overview as their introduction leads to a loss of significance in the interactions.

: CRS - dummy for year of commitment to first exchanges within Common Reporting Standard under OECD); UBO - dummy for Ultimate Beneficial Ownership register for companies by the year of adoption; TR - dummy for trust register (not necessarily of beneficial owners).

The specification includes origin country and time fixed effects. ***, ** and * indicate significance at the 0.1%, 1% and 5% levels, respectively. Heteroskedasticity robust standard errors (using White estimator of variance) are in brackets.

all jurisdictions, revealing even lower adoption rates, especially concerning the beneficial ownership register for companies. This pattern aligns with the findings of Findley et al. (2012) and Haberly et al. (2024), who demonstrate that tax havens are often among the first to adopt these policies, albeit sometimes more in form than in substance.

Table 5 aligns with Figure 4, illustrating the complexity in the adoption patterns of various anti-secrecy policies. The interaction between the composite policy adoption score

and effective tax rates reveals a negative relationship, suggesting that jurisdictions with lower tax rates, which adopt these transparency policies, tend to see an even greater concentration of profits. However, this effect lacks statistical significance, indicating that the relationship is not robust. Similarly, the interaction between these policies and tax haven status does not produce significant changes.

When examining the effects of individual policies, the results are mixed. Despite the widespread adoption of the automatic exchange mechanisms and its positive association with profit location, the analysis does not find compelling evidence that profits are concentrated in tax havens that have adopted this policy, whether measured by effective tax rates or tax haven status. However, the adoption of beneficial ownership registers for companies in tax havens does show a positive effect on the location of profits according to both metrics. In contrast, the adoption of trust registers in tax havens, or in jurisdictions with low effective tax rates, is associated with a reduction in profits. These findings suggest that jurisdictions and multinational corporations may be more responsive to policies that have been historically flagged as critical for global financial transparency, such as the CRS (Johannesen and Zucman, 2014). On the other hand, there appears to be a reluctance, particularly among tax havens or low-tax jurisdictions that aim to attract most of the profits, to adopt policies like trust registers. This reluctance aligns with an emerging literature that highlights how trusts can effectively circumvent the transparency requirements set by the CRS (Zagaris, 2020).

5 Conclusion

The main contribution of this study is to analyze the foreign profit destinations of multinational enterprises. To the best of my knowledge, this is the first study to investigate the drivers and factors of tax haven attractiveness using newly published OECD country-by-country reporting data. These data enable us to extend the current research as they offer comprehensive and reliable firm coverage and are thus an effective tool for enhancing global tax transparency. My analysis shows that the profit decisions of multinationals go beyond the standard gravity determinants.

From a financial perspective, the results underscore the central role of effective tax rates as the primary driver of profit attraction. Effective tax rates demonstrate a large predictive

power when the analysis finds support for nonlinear relationship supporting earlier studies on this topic (Garcia-Bernardo and Janský, 2024). Moreover, effective tax rates provide a more robust explanation for global profit variation, casting doubt on the significance of other factors like financial secrecy. Geographically, the analysis highlights the sensitivity of profit allocation to both physical and societal proximity, supporting the argument that even in the intangible realm of finance, multinational firms remain sensitive to distance (Buckley et al., 2015; Haberly and Wójcik, 2015b). These findings underscore the pivotal role of taxation and reinforce the notion that the global behavior of multinationals mirrors the global tax landscape (Sigler et al., 2020).

Even though the relationship between tax havens and the level of governance has been long established (Dharmapala and Hines, 2009), the analysis shows that the primary challenge lies in identifying causality between individual policies that may be connected to governance as well as to transparency. This study finds support that more profits are located in a jurisdiction that adopt particular policies such as the Common Reporting Standards introduced by the OECD in 2014. This outcome is expected, given the widespread global adoption of the policy. The results are more interesting for the beneficial ownership register for companies and trust registers. Specifically, the results suggest that higher adoption rates of beneficial ownership registers in tax havens is connected with increased profits in those jurisdictions, while the opposite is true for trust registers.

These findings highlight that despite the global adoption of certain transparency measures, such as automatic information exchange, some jurisdictions remain selective in their implementation of other transparency policies. Tax havens, in particular, appear to adopt only those measures that allow for some degree of secrecy to be maintained. This has important implications for emerging research on the effectiveness of automatic information exchange mechanisms and the use of vehicles like trusts to preserve financial secrecy (Ahrens and Bothner, 2020; Zagaris, 2020).

Overall, the results of this study carry significant policy implications. The ability of tax havens to attract substantially more profits indicates their successful integration into the global financial network, suggesting that multinationals have widely adopted a range of tax avoidance strategies, such as transfer pricing and treaty shopping. At a broader level, these

findings call for global coordination in response to the growing influence of tax havens on the behavior of multinational enterprises. While tax havens may appear to comply with transparency initiatives, governments must ensure that these policies are truly effective in reducing financial secrecy.

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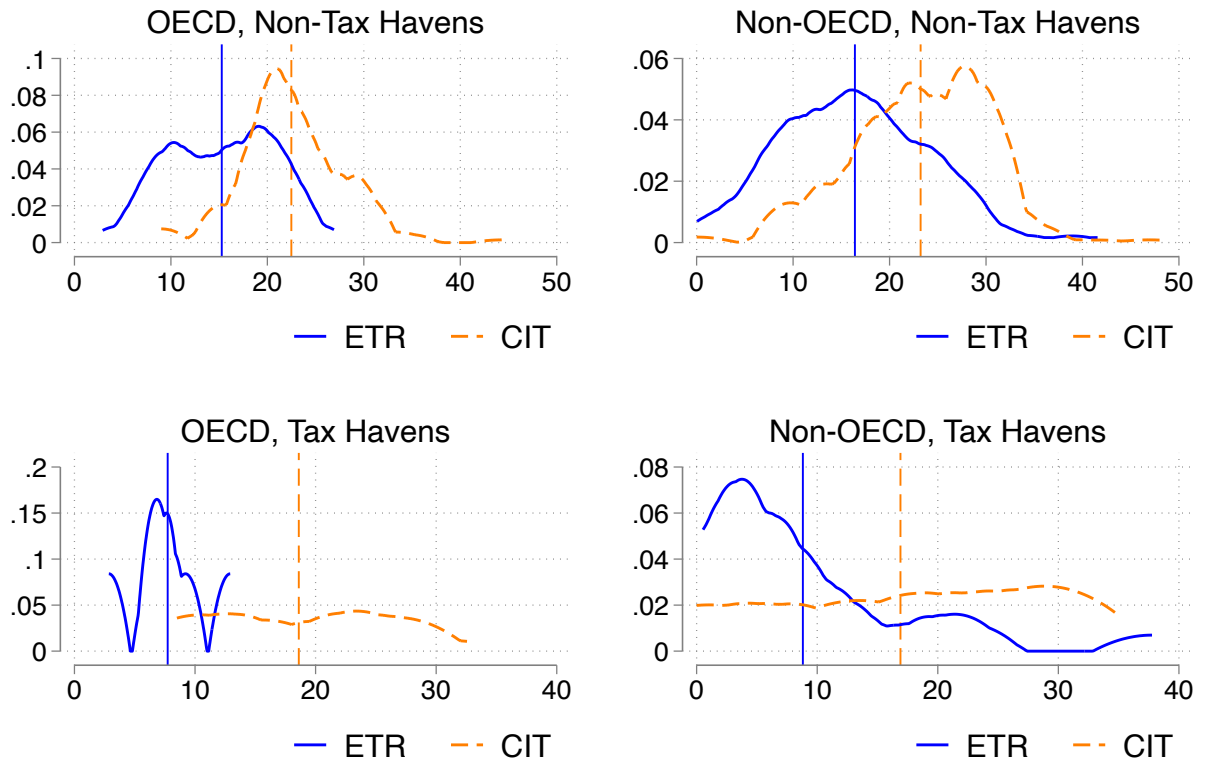
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6 Appendix

Figure 8: Density plot of ETRs and CIT rates in individual jurisdictions



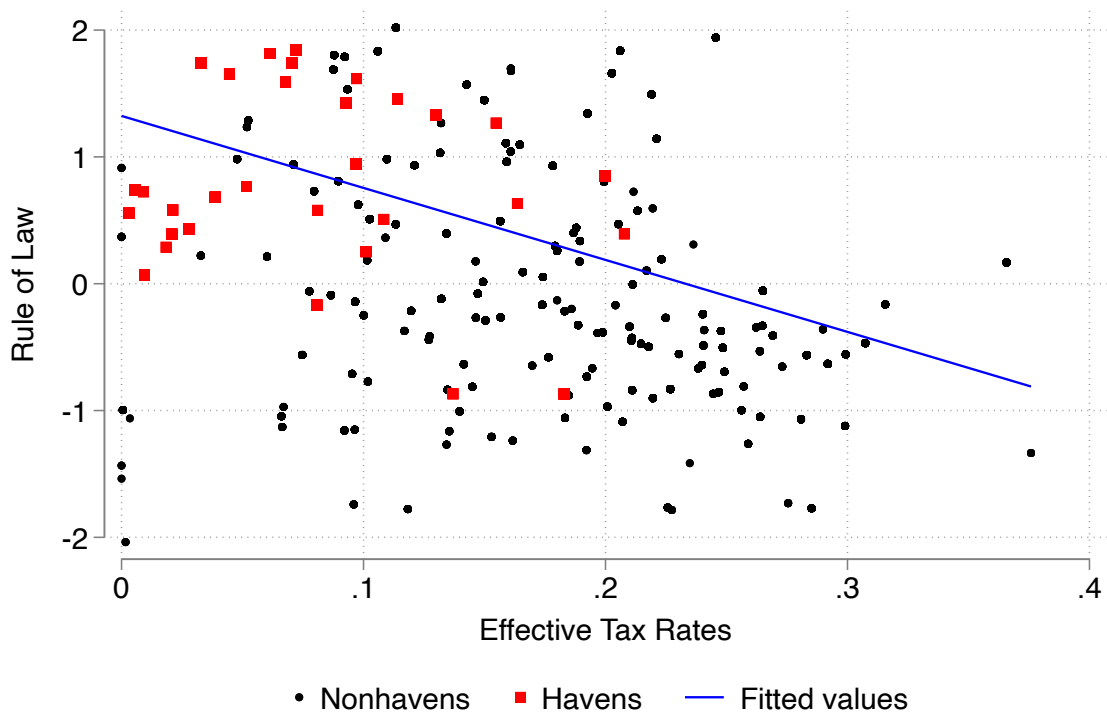
Note: Effective Tax Rates (ETRs) are calculated based on OECD (2024b) CbCR data, statutory Corporate Income Tax rates (CIT) are compiled from OECD (2024b). The vertical lines display the means of the given groups. The analysed period is 2017 to 2021, when only the countries which have valid record for both ETRs and CIT in a given year are taken into account.

Table 6: Representativeness of the OECD CbCR Data

| | | | | | | | | |
|---------|-------------|------------|-------------|------------|--------------|-------------|------------|--------------|
| Country | Argentina | Australia | Austria | Azerbaijan | Bahrain | Belgium | Bermuda | Brazil |
| 2017 | 14 | 75 | 0 | NA | NA | 15 | 94 | 36 |
| 2018 | 18 | 76 | 0 | NA | NA | 15 | 97 | 34 |
| 2019 | 17 | 78 | 0 | NA | NA | 19 | 100 | 35 |
| 2020 | 16 | 92 | 0 | NA | NA | 22 | 96 | 33 |
| 2021 | 18 | 83 | 0 | 34 | 32 | 28 | 93 | 35 |
| Country | Bulgaria | Canada | Cayman Isl. | Chile | China | Czech Rep | Denmark | Finland |
| 2017 | NA | 9 | NA | 4 | 119 | NA | 109 | 0 |
| 2018 | NA | 9 | 147 | 4 | 123 | 0 | 110 | 0 |
| 2019 | NA | 9 | 139 | 13 | 131 | 0 | 99 | 0 |
| 2020 | 4 | 9 | 138 | 12 | 133 | 0 | 101 | 0 |
| 2021 | 4 | 9 | 131 | 12 | 131 | 0 | 103 | 0 |
| Country | France | Germany | Greece | Hong Kong | Hungary | India | Indonesia | Ireland |
| 2017 | 84 | 154 | 0 | NA | NA | 162 | 40 | 0 |
| 2018 | 88 | 157 | 0 | 117 | 0 | 88 | 43 | 0 |
| 2019 | 84 | 154 | 76 | 136 | 0 | 88 | 70 | 0 |
| 2020 | 88 | 162 | 68 | 138 | 0 | 83 | 71 | 0 |
| 2021 | 91 | 161 | 68 | 142 | 0 | 90 | 82 | 0 |
| Country | Isle of Man | Italy | Japan | Korea | Latvia | Lithuania | Luxembourg | Macau |
| 2017 | 0 | 104 | 197 | 0 | 8 | NA | 85 | NA |
| 2018 | 0 | 102 | 133 | 0 | 10 | 4 | 84 | 0 |
| 2019 | 0 | 105 | 134 | 0 | 10 | 4 | 92 | 0 |
| 2020 | 0 | 102 | 135 | 0 | 10 | 4 | 98 | NA |
| 2021 | NA | 98 | 136 | 0 | 10 | 7 | 99 | NA |
| Country | Malaysia | Mauritiues | Mexico | Morocco | Netherlands | New Zealand | Norway | Panama |
| 2017 | 30 | NA | 95 | NA | 0 | NA | 0 | NA |
| 2018 | 23 | NA | 73 | NA | 27 | 0 | 59 | 33 |
| 2019 | 23 | 0 | 89 | NA | 24 | 0 | 61 | 50 |
| 2020 | 25 | 0 | 91 | NA | 27 | 0 | 59 | 48 |
| 2021 | 30 | 0 | 90 | 0 | 28 | 0 | 60 | 18 |
| Country | Peru | Poland | Portugal | Romania | Saudi Arabia | Singapore | Slovenia | South Africa |
| 2017 | 15 | 1 | NA | 5 | NA | 36 | 4 | 137 |
| 2018 | 123 | 2 | NA | 145 | 59 | 42 | 4 | 35 |
| 2019 | 12 | 0 | 34 | 145 | 97 | 48 | 4 | 22 |
| 2020 | 13 | 4 | 48 | 146 | 96 | 46 | 4 | 38 |
| 2021 | 13 | NA | 46 | 146 | 111 | 41 | 4 | 35 |
| Country | Switzerland | Tunisia | Turkey | UAE | UK | USA | Spain | Sweden |
| 2017 | 115 | NA | NA | NA | 0 | 140 | 114 | 0 |
| 2018 | 162 | NA | NA | NA | 0 | 140 | 115 | 0 |
| 2019 | 157 | NA | 52 | NA | 0 | 139 | 111 | 0 |
| 2020 | 139 | 9 | 45 | NA | 0 | 139 | 106 | 0 |
| 2021 | 135 | NA | 28 | 148 | 0 | 135 | 104 | 0 |

Notes: Values in cells denote number of tax jurisdiction for which a given country disaggregates their data. NA values indicate that a country has not presented data for the given year. If the tax jurisdiction has included the activity of multinationals only in aggregated category (the recognition of a jurisdiction is not possible), it is represented by “0”. The figures provided are not indicator specific, meaning even if observing null value for “Profit” indicator but non-null value for others, the observation is counted as 1.

Figure 9: Rule of Law and ETRs for tax havens and nonhavens.



Note: Figure plots the Rule of Law indicator from World Bank (2024b) Worldwide Governance Indicators against effective tax rates of jurisdictions. The dots represent nonhavens jurisdictions. Tax havens are depicted by squares. All measures are calculated as the average for the years 2017-2021.

Figure 10: Adoption of policies globally by amount of profits

Figure 11: CRS Adoption

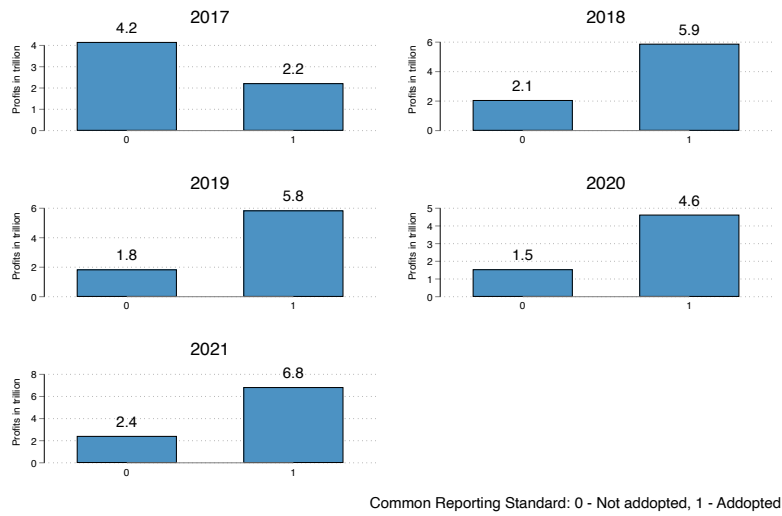


Figure 12: Register of Company Beneficial Ownership

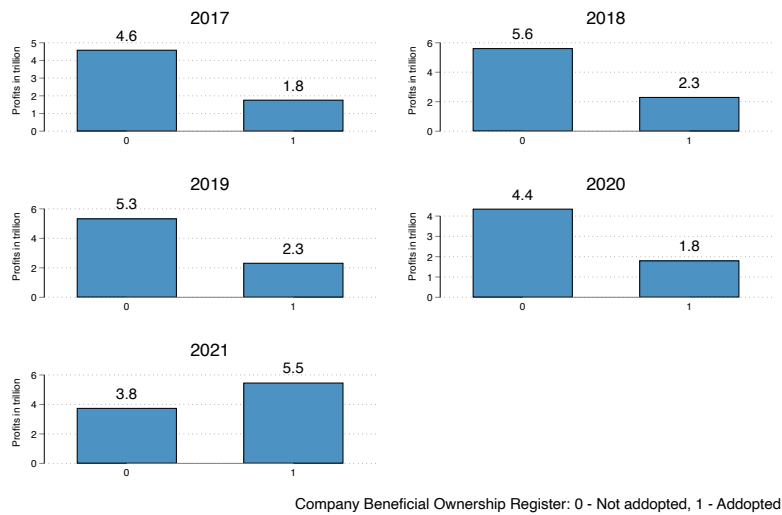


Figure 13: Register of Trusts

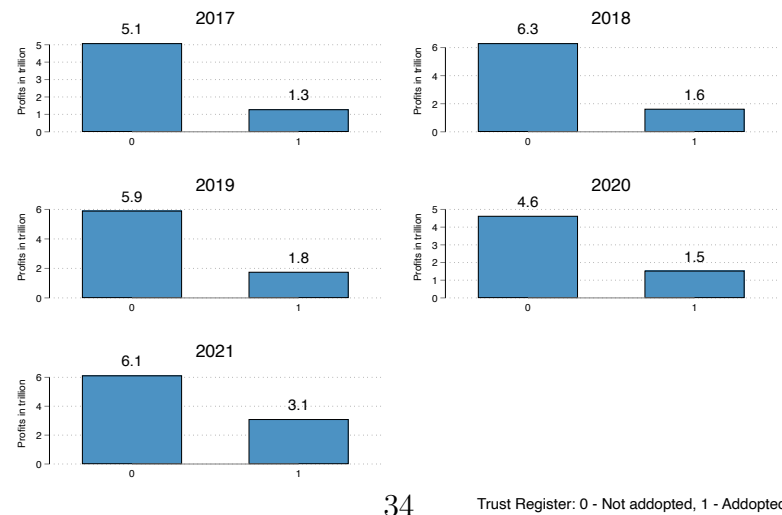


Table 7: Baseline Specification, OLS FE

| Dependent var.: | log(profit) | (1) Linear RTA | (2) Quadratic RTA | (3) Logarithmic RTA | (4) Quadratic OECD | (5) Quadratic OECD & RTA |
|-------------------|-------------------------------|----------------------|-----------------------|----------------------|-----------------------|--------------------------|
| Size | log(GDP capita _j) | 0.662*** (0.014) | 0.717*** (0.015) | 0.722*** (0.014) | 0.716*** (0.015) | 0.716*** (0.015) |
| | log(population _j) | 0.883*** (0.033) | 0.878*** (0.033) | 0.870*** (0.033) | 0.866*** (0.033) | 0.878*** (0.033) |
| Proximity | log(distance _{i,j}) | -0.281*** (0.031) | -0.296*** (0.030) | -0.317*** (0.030) | -0.352*** (0.029) | -0.294*** (0.031) |
| | language _{i,j} | 1.319*** (0.067) | 1.282*** (0.066) | 1.260*** (0.066) | 1.294*** (0.067) | 1.284*** (0.067) |
| | colony _{i,j} | 0.312*** (0.107) | 0.175 (0.107) | 0.189* (0.106) | 0.155 (0.107) | 0.171 (0.107) |
| | contiguous _{i,j} | 0.793*** (0.104) | 0.796*** (0.103) | 0.767*** (0.103) | 0.807*** (0.104) | 0.794*** (0.104) |
| | Economic agreements | RTA _{i,j} | 0.243*** (0.055) | 0.282*** (0.055) | 0.292*** (0.055) | |
| Taxation | OECD _{i,j} | | | | 0.085 (0.071) | 0.023 (0.072) |
| | ETR _j | -3.542*** (0.293) | -12.912*** (0.928) | 1.455*** (0.490) | -12.665*** (0.930) | -12.933** (0.930) |
| | ETR _j ² | | 25.664*** (2.413) | | 24.973*** (2.414) | 25.695*** (2.415) |
| | log(ETR _j) | | | -0.624*** (0.106) | | |
| Governance | AVG WGI _j | 0.030 (0.051) | 0.058 (0.051) | 0.110** (0.051) | 0.084 (0.053) | 0.054 (0.053) |
| Observations | | 8,260 | 8,260 | 8,260 | 8,260 | 8,260 |
| R ² | | 0.2731 | 0.2784 | 0.2777 | 0.2766 | 0.2791 |
| Origin country FE | | Yes | Yes | Yes | Yes | Yes |
| Year FE | | YES | Yes | Yes | Yes | Yes |

Note: ***, ** and * indicate significance at the 0.1%, 1% and 5% levels, respectively. Heteroskedasticity robust standard errors (using White estimator of variance) are in brackets.

Table 8: Robustness check: inclusion of origin and destination country fixed effects, OLS FE

| | Linear (1) | Quadratic (2) | Logarithmic (3) |
|------------------------|---------------|------------------|--------------------|
| ETR_j | -0.889* | -2.047 | -1.238 |
| | (0.463) | (1.527) | (0.757) |
| ETR_j^2 | | 2.835 | |
| | | (3.562) | |
| $\log(ETR_j)$ | | | 0.046 |
| | | | (0.079) |
| Average WGI_j | 0.660* | 0.650* | 0.664* |
| | (0.347) | (0.347) | (0.347) |
| Observations | 8,260 | 8,260 | 8,260 |
| R^2 | 0.3566 | 0.3566 | 0.3566 |
| Origin Country FE | Yes | Yes | Yes |
| Destination Country FE | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes |

Note: This table shows the results of the robustness checks. For sake of clarity, we do not include all the variables of control, which remain similar to Table 2. Heteroskedasticity robust standard errors (using White estimator of variance) are in brackets.

* $p < 0.05$,

** $p < 0.01$

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