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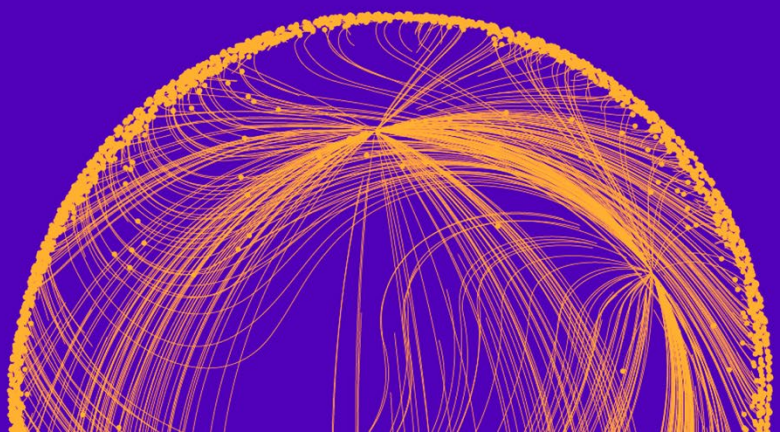
Svetlana Ledyaeva



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Abstract: This paper presents a comparative empirical analysis of multinational profit shifting using two principal data sources: the OECD Country-by-Country Reporting (CbCR) statistics and ORBIS firm-level financial data. We begin by systematically examining structural and reporting differences across the datasets, identifying substantial variation in coverage, consistency, and jurisdictional representation. While both sources yield broadly similar patterns of profit allocation at aggregate levels, significant divergences emerge at finer levels of disaggregation, with some jurisdictions exhibiting opposing trends. In general, CbCR data provide more comprehensive coverage of tax haven destinations—including European, traditional, and Asian havens—whereas ORBIS data disproportionately emphasize European havens, underreporting others. We estimate the determinants of profit shifting using harmonized panel regressions, focusing on statutory corporate tax rates, financial secrecy, and bilateral Tax Information Exchange Agreements (TIEAs). Across specifications, lower tax rates and higher secrecy scores are associated with increased profit allocation to tax havens, while TIEAs significantly reduce reported profits in these jurisdictions. Notably, estimates based on CbCR data align more closely with theoretical predictions and prior empirical findings, particularly in capturing the responsiveness to tax rate differentials. In contrast, ORBIS-based estimates appear attenuated, particularly for tax effects, suggesting potential underreporting in jurisdictions commonly associated with aggressive tax planning. These findings underscore the importance of dataset architecture and institutional context in empirical research on international tax avoidance.

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JEL codes: F23, H25, H26, C82

Key words: Profit shifting, Tax havens, CbCR, ORBIS, Corporate taxation, Comparative analysis

INRODUCTION

The international corporate tax landscape has undergone substantial reform in recent years, driven by growing concerns over base erosion and profit shifting (BEPS) by multinational enterprises (MNEs). While policy initiatives—most notably the OECD/G20 BEPS framework—have intensified scrutiny of cross-border tax practices, empirical research continues to face significant limitations due to fragmented data sources and inconsistent reporting standards. This study contributes to the literature by undertaking a systematic comparative analysis of multinational profit allocation using two prominent datasets: the OECD's Country-by-Country Reporting (CbCR) statistics and the ORBIS firm-level database.

The ORBIS database has become a cornerstone of empirical research on multinational tax behavior, offering unconsolidated firm-level financial data across jurisdictions. Its widespread use in the literature reflects its accessibility and breadth, with applications ranging from analyses of profit shifting and tax avoidance to studies of ownership structures and international investment (Cozza, Rabellotti, and Sanfilippo 2015; Jones and Temouri 2016; Gattai and Sali 2018; Aktaş and Gatta 2023Aminadav, Fonseca, and Papaioannou 2023; Bilicka, Devereux, and Güçeri 2023; Garcia-Bernardo, Janský, and Tørsløv 2023). However, ORBIS is not without limitations: its coverage is uneven across countries, and key financial indicators are frequently missing, particularly in jurisdictions characterized by limited disclosure requirements.

Unlike commercially sourced datasets, the OECD's Country-by-Country Reporting statistics provide a regulatory foundation for analyzing multinational profit allocation. Mandated under the BEPS Action 13 framework, CbCR requires large multinational enterprise groups to submit standardized, jurisdiction-level disclosures to national tax authorities. The dataset's regulatory origin ensures systematic coverage of large MNEs and mitigates reporting biases common in firm-level databases like ORBIS. Although relatively recent in empirical research, CbCR has gained prominence for its ability to capture the structural dimensions of profit shifting with greater precision (Fatica and Wildmer 2018; Fuest, Hugger, and Neumeier 2022; Fuest et al. 2025).

This paper contributes to the literature by harmonizing these two distinct data architectures and applying a unified empirical framework to assess multinational profit allocation. Using harmonized samples for the period 2016–2021, the analysis uncovers systematic discrepancies in reported profits,

particularly in transactions involving tax havens. While broad patterns of profit allocation are generally consistent at higher levels of aggregation, substantial divergences emerge at more granular levels. Statistical diagnostics confirm that ORBIS dataset systematically underreports profit flows relative to the CbCR. These discrepancies are persistent and statistically non-random, reflecting limitations in coverage, disclosure practices, and data completeness. The findings underscore the critical role of data architecture in shaping empirical observability and highlight the risks of relying exclusively on commercially sourced firm-level data in research on international tax avoidance.

The analysis identifies seven stylized facts characterizing the geography and structure of profit shifting. First, since 2018, profit flows involving tax havens have consistently exceeded those between non-haven jurisdictions, underscoring their central role in global tax planning. Second, a small number of parent countries—particularly the United States and China—dominate global profit shifting. Third, aggregate patterns are broadly consistent across datasets, but discrepancies emerge at disaggregated levels. Fourth, profit shifting is concentrated in a few jurisdictions with stable bilateral channels. Fifth, secrecy jurisdictions are unevenly represented, with ORBIS underreporting key havens. Sixth, dataset architecture shapes empirical visibility. Seventh, geographic patterns differ between CbCR and ORBIS, reflecting structural biases. These findings highlight the importance of regulatory data and limitations of commercial firm-level sources.

To further examine the determinants of multinational profit shifting, the study estimates a series of panel regressions using harmonized aggregated CbCR data alongside both aggregated and firm-level ORBIS data for the period 2016–2021. The empirical framework incorporates statutory corporate tax rates, bilateral tax information exchange agreements (TIEAs), and financial secrecy scores as key explanatory variables. Across specifications, the results consistently show that profit allocation to tax havens is positively associated with lower tax rates, higher secrecy, and the absence of TIEAs—findings that align with theoretical expectations and prior empirical literature.

A comparative assessment of the datasets reveals systematic variation in the magnitude of estimated effects. CbCR-based regressions exhibit the strongest responsiveness to tax rate differentials, reflecting the dataset's regulatory origin and comprehensive coverage of large multinational enterprises. In contrast, estimates derived from aggregated ORBIS data are notably attenuated, likely due to

structural underreporting and jurisdictional disclosure gaps. Firm-level ORBIS regressions, while offering greater granularity, yield coefficients that broadly mirror CbCR results but remain significantly smaller in magnitude.

This paper makes two key contributions to the literature on international profit shifting and multinational tax avoidance. First, it provides large-scale empirical evidence on how data architecture systematically shapes the visibility of secrecy jurisdictions and alters the perceived geography of profit shifting. By documenting these effects, the study contributes to the broader literature on the spatial organization of foreign direct investment, corporate control, and multinational activity (Buckley et al., 2015; Haberly and Wójcik, 2015a, 2015b; Sigler et al., 2020; Fonseca, Nikalexi, and Papaioannou, 2023). The analysis shows that structural features—such as disclosure requirements, reporting standards, and coverage thresholds—critically influence the empirical representation of tax haven activity, often leading to divergent conclusions depending on the data source employed. These findings underscore the importance of regulatory data in capturing the true scope and direction of profit shifting and call for greater scrutiny of commercially sourced firm-level datasets in empirical research on international taxation.

Second, the paper contributes to ongoing debates on international tax reform by quantifying the extent and determinants of profit shifting across jurisdictions (Dharmapala, 2008; Slemrod and Wilson, 2009; Elsayyad and Konrad, 2012; Gumpert, Hines, and Schnitzer, 2016; Fuest, Hugger, and Neumeier, 2022; Johannesen, 2022; Laffitte and Toubal, 2022). As governments implement global minimum tax rules and reallocate taxing rights under the OECD's Pillar One and Pillar Two initiatives, robust empirical evidence is essential for informing policy design. By leveraging multiple data sources and applying rigorous statistical techniques, this study offers a nuanced and policy-relevant assessment of the structural and institutional drivers of base erosion and profit shifting in the global economy.

The paper proceeds as follows. Section 2 conducts a statistical comparison of the OECD Country-by-Country Reporting (CbCR) and ORBIS datasets. Section 3 summarizes key stylized facts. Section 4 sets out the empirical framework. Section 5 presents baseline results using CbCR data. Section 6 compares these with ORBIS-based estimates, at both aggregate and firm levels. Section 7 concludes.

COMPARATIVE DATA DIAGNOSTICS: OECD CbCR VS. ORBIS

We first perform a comparative statistical analysis of MNCs profit-shifting as captured in the OECD Country-by-Country Reporting dataset and a harmonized sample derived from ORBIS firm-level data. The ORBIS sample is constructed to replicate the structural characteristics of the CbCR dataset, thereby enabling consistent cross-dataset comparisons of jurisdictional coverage, reporting intensity, and the distributional properties of multinational profits.

Comparative Statistical Analysis of the Datasets

The OECD CbCR dataset constitutes a central component of Action 13 under the OECD/G20 Base Erosion and Profit Shifting (BEPS) initiative. Pursuant to this framework, multinational enterprise groups with annual revenues exceeding EUR 750 million are required to submit standardized reports detailing their global operations. The CbCR data offers enhanced granularity, capturing key metrics including the number of employees, revenues from related and unrelated parties, profits, and taxes paid. Importantly, the data is geographically disaggregated by tax residency rather than legal incorporation, thereby providing a more accurate representation of MNEs' economic footprint across jurisdictions. While reporting practices vary across countries, the dataset includes information on principal business activities—such as manufacturing, intellectual property holding, and sales—enabling cross-country comparisons of MNE behavior (OECD 2023). A notable limitation, however, is the restricted temporal coverage: aggregated CbCR data is publicly available only for the period 2016–2021.

ORBIS is a global firm-level database maintained by Bureau van Dijk, a Moody's Analytics company, which provides comprehensive financial, ownership, and operational information on millions of companies worldwide. The data is sourced from a variety of publicly available and proprietary sources, including official company filings, financial statements, stock exchanges, government agencies, and regulatory bodies. It includes data on company revenues, profits, taxes, subsidiaries, ownership structures, and key financial indicators, making it a valuable resource for analyzing multinational corporations (MNC)' activities, including profit shifting, tax avoidance strategies, and transfer pricing.

Although ORBIS provides extensive firm-level data, its applicability for analyzing multinational enterprise activity is limited by considerable heterogeneity in data availability across jurisdictions. National differences in corporate disclosure requirements result in uneven coverage of MNEs, thereby constraining the database's representativeness. As highlighted by Fuest, Hugger, and Neumeier (2022), ORBIS exhibits substantial limitations in capturing profit-shifting behavior, particularly in jurisdictions characterized by opaque financial reporting and the absence of public business registries—features commonly associated with tax havens. Even in countries where ORBIS coverage is present, reporting obligations are typically confined to specific firm categories, such as large enterprises or entities with particular legal forms (Kalemli-Ozcan et al., 2015). Furthermore, critical financial indicators—including profits, assets, and employment—are frequently missing due to either minimal reporting requirements or restricted public access. These data deficiencies undermine the completeness and reliability of the ORBIS sample, posing significant challenges for empirical research on MNE behavior (Garcia-Bernardo, Janský, and Tørsløv, 2021).

The extent of this limitation is illustrated by Tørsløv, Wier, and Zucman (2023), who show that in 2012, only 17% of global MNE profits could be traced in ORBIS. The remaining 83% were either booked in subsidiaries not captured by the database or in entities for which profit data were unavailable. These findings underscore the need for caution when interpreting results based on ORBIS and highlight the importance of complementing this data with alternative sources such as the OECD's Country-by-Country Reporting.

To construct the ORBIS-based dataset, we adopt a Global Ultimate Owner (GUO) framework to identify multinational enterprise group structures. This approach aligns with the aggregation logic of the OECD CbCR dataset, which reports financial information at the MNE group level based on consolidated ownership rather than control by voting rights. Unlike methodologies that trace ultimate controlling shareholders through pyramidal ownership chains or voting power aggregation (see, e.g., Aminadav and Papaioannou 2020; Fonseca, Nikalexi, and Papaioannou 2023), the GUO-based strategy offers a scalable and replicable mechanism for mapping parent–subsidiary relationships across jurisdictions. While shareholder-based control measures provide granular insights into corporate governance and ownership concentration, they are not directly comparable to CbCR data, which does

not distinguish control structures based on voting rights or family aggregation. The GUO framework thus ensures consistency in group-level identification and facilitates meaningful cross-dataset comparisons of profit allocation patterns.

We extract a targeted sample from the ORBIS database comprising active subsidiaries whose Global Ultimate Owners report annual operating revenues exceeding 750 million Euro. This revenue threshold aligns with OECD's country-by-country reporting requirements, and the focus was strictly on entities that are likely to qualify as multinational corporations[1]. Entities unlikely to meet the operational and structural criteria of MNCs were excluded from the sample[2]. The initial sample comprises 705 100 subsidiaries. To focus on cross-border structures, we exclude local subsidiaries—defined as entities located in the same jurisdiction as their GUO—yielding a refined sample of 352 143 firms. We further restrict the sample to subsidiaries with at least one non-missing observation for profit before tax over the 2016–2021 period, yielding a final dataset of 115 289 firms. To facilitate comparability with the aggregated CbCR data, firm-level observations are aggregated to the parent–partner country-pair–year level.

The composition of the ORBIS sample remains fixed over the study period, implying that temporal variation in aggregate profit measures is driven by changes in reported values and the incidence of missing data. In contrast, while the composition of the CbCR dataset—defined by the set of reporting MNCs and their subsidiaries—is expected to be relatively stable over the six-year period, minor changes may occur due to the expansion of reporting requirements or increased participation by jurisdictions. These factors may marginally affect the coverage and consistency of the CbCR data but are unlikely to generate substantial shifts in the underlying structure of multinational operations.

Importantly, methodological differences between the CbCR and ORBIS datasets may introduce discrepancies in measured outcomes. CbCR data are aggregated at the country level across all entities within an MNE group, whereas ORBIS provides unconsolidated subsidiary-level records. These records

[1] These included: (i) banks and financial companies; (ii) insurance companies; (iii) corporate companies; (iv) private equity firms; (v) hedge funds; and (vi) venture capital firms.

[2] The following entities were excluded: mutual and pension funds, trusts, and nominees, due to their lack of operational business structures; foundations and research institutes, which are typically non-commercial and nonprofit in nature; public authorities, states, and governments, as these are sovereign entities rather than corporate actors; and individuals, families, employees, and directors, as they do not constitute corporate entities.

are subject to variation in scope, definitional standards, and reporting practices across jurisdictions, which may affect the comparability and completeness of key variables such as profits, assets, and employment.

In Table 1, we present a comparison of the descriptive characteristics of the OECD CbCR data and the corresponding ORBIS sample.

Table 1: Comparison of OECD CbCR and ORBIS Data on MNCs and Subsidiaries' Geographic Distribution

	Number of subsidiaries	*Number of countries hosting subsidiaries*	*Number of MNCs /GUOs*	*Number of countries hosting MNCs*
OECD CbCR[a]	Not available	239	Over 8000[b]	56
ORBIS sample	115 289	159	4 876	80[c]

Note: [a]The OECD CbCR characteristics are provided for the entire period from 2016 to 2021 and may vary across years; [b]The figure is an approximation based on data available in the document "Corporate Tax Statistics: Country-by-Country Reporting FAQs" (p. 2)[3]; [c]The country hosting an MNC is determined based on the location of its Global Ultimate Owner (GUO) as identified in the ORBIS database.

The OECD Country-by-Country Reporting dataset offers broader geographic coverage at the subsidiary level, encompassing a wider array of host countries relative to ORBIS. Conversely, ORBIS provides more extensive geographical representation of multinational headquarters, capturing a larger set of jurisdictions in which Global Ultimate Owners are located. On the other hand, the CbCR dataset includes approximately twice as many multinational enterprises as ORBIS, reflecting fundamental differences in scope and reporting architecture between the two sources. These disparities stem from the regulatory design of the CbCR framework, which prioritizes large economies—primarily OECD member states—as reporting jurisdictions, thereby limiting the number of countries hosting MNE headquarters. At the same time, stringent reporting requirements under CbCR contribute to broader coverage of subsidiaries and a larger overall MNE sample. In contrast, ORBIS relies on commercially sourced data, which results in more limited coverage of subsidiaries and a smaller MNE sample, but a wider geographic distribution of headquarters due to its global reach. These structural differences have

[3] https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/corporate-taxation/corporate-tax-statistics-country-by-country-reporting-faqs.pdf, p.2.

important implications for the interpretation of cross-country patterns in multinational activity and for the empirical strategies employed in international economics research.

In this study we focus on the subset of multinational entities reporting positive profits. Within the OECD anonymized and aggregated Country-by-Country Reporting dataset, this subgroup comprises entities that report strictly positive profit before income tax in a given jurisdiction and fiscal year. Derived from financial accounting records, this measure excludes firms with zero or negative profits, thereby capturing economically active and tax-relevant entities. The OECD includes this breakdown to facilitate targeted analysis of profit allocation, tax liabilities, and potential base erosion and profit shifting (BEPS) behavior (OECD, 2024).

To ensure comparability across data sources, we harmonize the ORBIS sample by restricting it to firm/subsidiary-year observations with positive profits, aligning it with the corresponding subset in the CbCR data. Table 2 provides a comparative overview of key geographic and profit-related characteristics across the two final datasets for the period 2016–2021.

Table 2: Comparison of OECD CbCR and ORBIS Data for the Subgroups with Positive Profits: Geographic and Profit-Related Characteristics (2016–2021)

	Number of countries hosting subsidiaries	*Number of countries hosting MNCs*	*Number of country-pairs*	*Average pre-tax profit per country pair (USD millions)*	*Average pre-tax profit per country pair: CbCR/ORBIS*
CbCR/ORBIS 2016	152 / 147	19 / 79	795 / 2114	1471 / 612	2.4
CbCR/ORBIS 2017	201 / 147	26 / 78	1514 / 2197	1426 / 759	1.9
CbCR/ORBIS 2018	198 / 150	32 / 79	1883 / 2230	1482 / 969	1.5
CbCR/ORBIS 2019	187 / 149	35 / 79	1982 / 2228	1357 / 918	1.5
CbCR/ORBIS 2020	191 / 149	37 / 79	1967 / 2193	1140 / 812	1.4
CbCR/ORBIS 2021	194 / 151	39 / 79	2212 / 2244	1362 / 1030	1.3

Consistent with the patterns reported in Table 1 for the full sample, both datasets identify a broadly similar number of countries hosting subsidiaries, with the CbCR dataset recording a modestly higher count. In contrast, ORBIS consistently captures a wider set of jurisdictions serving as headquarters for multinational enterprises. This difference reflects the structural design of the ORBIS sample, which is constructed from a globally diverse and commercially sourced set of firms. Its fixed composition yields stable country coverage over time, at the headquarters and subsidiary levels.

By comparison, the number of headquarters countries in the CbCR dataset—though substantially smaller than in ORBIS—has increased markedly over the six-year period, approximately doubling between 2016 and 2021. This expansion likely reflects the progressive extension of reporting obligations and the growing participation of jurisdictions in the CbCR framework. As a result, the visibility of multinational structures has improved over time, enhancing the dataset's utility for cross-country analysis of profit-shifting behavior.

The broader scope of ORBIS enables the identification of a larger number of country-pair profit-flow relationships, offering a more granular view of inter-affiliate financial linkages. However, the CbCR dataset exhibits a marked rise in the number of country-pairs over time, suggesting progressive improvements in its coverage and reporting completeness.

Despite ORBIS's finer resolution, the average pre-tax profit per country-pair reported in CbCR consistently exceeds that observed in ORBIS. This discrepancy may reflect underreporting in ORBIS, particularly for large-scale profit flows, due to missing data or limited disclosure requirements. Nevertheless, both datasets show convergence over time in the number of country-pairs and in mean profit values, indicating a gradual alignment in the representation of multinational profit allocation patterns.

Table 3 examines the overlap between the OECD CbCR and ORBIS subgroups with positive profits by analyzing the profits of common country-pairs present in both databases.

Table 3: Comparison of Common Country-Pairs in OECD CbCR and ORBIS Data: Profit Values and Correlation Measures (2016–2021)

	2016	*2017*	*2018*	*2019*	*2020*	*2021*	*Pooled*
Number of country-pairs present in both databases	463	802	904	960	940	974	NA
Average pre-tax profit per country pair (USD millions), CbCR data	2117	2374	2639	2462	2136	2598	2413.5
Average pre-tax profit per country pair (USD millions), ORBIS data	1514	1422	1869	1661	1510	1838	1653
CbCR/ORBIS ratio: Average pre-tax profit per country pair	1.4	1.7	1.4	1.5	1.4	1.4	1.46
Pearson correlation coefficient	0.62	0.64	0.63	0.69	0.60	0.73	0.66
Spearman rank correlation coefficient	0.74	0.77	0.73	0.75	0.74	0.74	NA

Note: NA denotes cases where the indicator is not applicable due to the structure of the pooled dataset.

Table 3 documents a progressive convergence between the OECD CbCR and ORBIS datasets in terms of bilateral coverage. Over time, the number of overlapping country-pairs increases, driven primarily by expanded reporting in the CbCR data, as the ORBIS country-pair structure remains static by design. This pattern reflects an improving alignment in the representation of cross-border profit linkages, suggesting that the two sources increasingly capture similar underlying economic relationships. Despite this increasing overlap, the average pre-tax profit per country-pair reported in the CbCR dataset remains consistently higher than in ORBIS. This discrepancy reinforces the interpretation that ORBIS underreports certain large-scale profit flows, likely due to missing data or limited disclosure in specific jurisdictions.

Correlation analysis reveals a moderate to strong association between bilateral profit measures reported in the OECD Country-by-Country Reporting and ORBIS datasets. Pearson correlation coefficients range from 0.60 to 0.73, indicating a substantial linear relationship in profit levels across country pairs. Spearman rank correlation coefficients are consistently higher, between 0.73 and 0.77, suggesting that the relative ranking of country-pair profit levels is broadly preserved across the two sources. These findings point to a meaningful degree of consistency in cross-country profit reporting, despite notable differences in data collection mechanisms and aggregation methodologies.

We next examine the distributional properties of reported profits across the OECD CbCR and ORBIS datasets. Table 4 presents results from Kolmogorov–Smirnov (K–S) tests conducted over the 2016–2021 period, comparing the empirical distributions of profits in the two sources. The tests are implemented separately for the full sample of observations and for the subset of country pairs with overlapping coverage in both datasets. The K–S test evaluates the null hypothesis that the two samples are drawn from the same underlying distribution by comparing their empirical cumulative distribution functions (ECDFs). The D-statistic captures the maximum absolute deviation between the ECDFs, while the associated p-values assess the statistical significance of these differences.

Table 4: Kolmogorov-Smirnov Test Results Comparing ORBIS and CbCR Data (2016–2021)

Year	*Group*	*All observations*		*Common coverage*	
		D-statistics	*p-value*	*D-statistics*	*p-value*
2016	*ORBIS*	-0.2194	0.000	-0.2095	0.000
	CbCR	0.0080	0.929	0.0043	0.991
	Combined K-S	0.2194	0.000	0.2095	0.000
2017	*ORBIS*	-0.1615	0.000	-0.2182	0.000
	CbCR	0.0033	0.981	0.0012	0.999
	Combined K-S	0.1615	0.000	0.2182	0.000
2018	*ORBIS*	-0.1632	0.000	-0.2334	0.000
	CbCR	0.0018	0.993	0.0044	0.982
	Combined K-S	0.1632	0.000	0.2334	0.000
2019	*ORBIS*	-0.1264	0.000	-0.2073	0.000
	CbCR	0.0026	0.986	0.0010	0.999
	Combined K-S	0.1264	0.000	0.2073	0.000
2020	*ORBIS*	-0.1146	0.000	-0.1957	0.000
	CbCR	0.0060	0.929	0.0021	0.996
	Combined K-S	0.1146	0.000	0.1957	0.000
2021	*ORBIS*	-0.1208	0.000	-0.2320	0.000
	CbCR	0.0028	0.983	0.0021	0.996
	Combined K-S	0.1208	0.000	0.2320	0.000

Note: The D-statistic captures the maximum absolute difference between the cumulative distribution functions of the sample and the pooled benchmark. Larger values indicate greater divergence from the reference distribution. The associated p-value tests the null hypothesis that the sample distribution does not differ significantly from the pooled distribution. A p-value of zero implies strong statistical rejection of the null, while values well above conventional significance thresholds (e.g., 0.10, 0.05) suggest no meaningful deviation.

Across all years and specifications, the analysis reveals systematic and statistically significant differences in profit distributions between the two datasets. The ORBIS sample consistently yields large Kolmogorov–Smirnov (D) statistics alongside p-values equal to zero, indicating substantial divergence from the pooled distribution. In contrast, the CbCR data exhibit D-statistics close to zero and p-values well above conventional significance thresholds, suggesting close alignment with the joint distribution. These patterns are even more pronounced within the subset of country pairs with common coverage, reinforcing the robustness of the results and highlighting the differential properties of the two data sources.

Taken together, the results suggest that the CbCR dataset exhibits greater internal consistency in the measurement of profits across jurisdictions. By contrast, the ORBIS data appear to be affected by structural biases, which may arise from selective firm coverage, jurisdiction-specific reporting gaps, or measurement error inherent in unconsolidated subsidiary-level reporting. The magnitude and persistence of the discrepancies underscore the limitations of relying solely on ORBIS for cross-country

profit distribution analysis. Researchers employing ORBIS should account for these distortions through appropriate robustness checks, data harmonization procedures, or complementary use of regulatory datasets such as CbCR.

To assess the consistency between the ORBIS and OECD CbCR datasets in reported profit values, we employ a nonparametric test that does not rely on distributional assumptions. Table 5 presents the results of the Wilcoxon signed-rank test applied to matched country-pair–year observations with common coverage in both the ORBIS and OECD CbCR datasets over the period 2016–2021. This nonparametric test evaluates whether the median of the pairwise differences in reported profits—defined as ORBIS minus CbCR values—is statistically distinguishable from zero, without imposing parametric assumptions on the underlying distributions.

The table reports the number of country-pair observations in which ORBIS-reported profits exceed those in CbCR (Positive Observed) and vice versa (Negative Observed), alongside the expected counts under the null hypothesis of median equality. One-sided p-values test directional hypotheses: whether ORBIS profits are systematically greater than CbCR (Pos > Neg) or the reverse (Pos < Neg). The two-sided p-value assesses the null of symmetric distributional differences.

Table 5: Wilcoxon Signed-Rank Test Results: Comparison of Profits in CbCR and ORBIS Data, 2016–2021 (Common Coverage Sample)

Year	Positive (Observed)	Negative (Observed)	Expected (Pos/Neg)	Total Observations	One-Sided p-value (Pos > Neg)	One-Sided p-value (Pos < Neg)	Two-Sided p-value
2016	122	341	231.5	463	1	0	0
2017	180	622	401.0	802	1	0	0
2018	195	709	452.0	904	1	0	0
2019	212	748	480.0	960	1	0	0
2020	229	711	470.0	940	1	0	0
2021	206	768	487.0	974	1	0	0

Note: Positive (Observed) refers to the number of country-pair observations where ORBIS-reported profits exceed those in CbCR. Negative (Observed) indicates the opposite. Expected (Pos/Neg) shows the number of cases expected under the null hypothesis of equal medians. One-sided p-values test the null of median equality against the alternative that ORBIS profits are either greater than (Pos > Neg) or less than (Pos < Neg) CbCR profits. The two-sided p-value assesses whether the medians of the two distributions differ in either direction.

Across all years, the results reveal a consistent and statistically significant pattern: the number of negative observations substantially exceeds the number of positive ones, with one-sided p-values (Pos

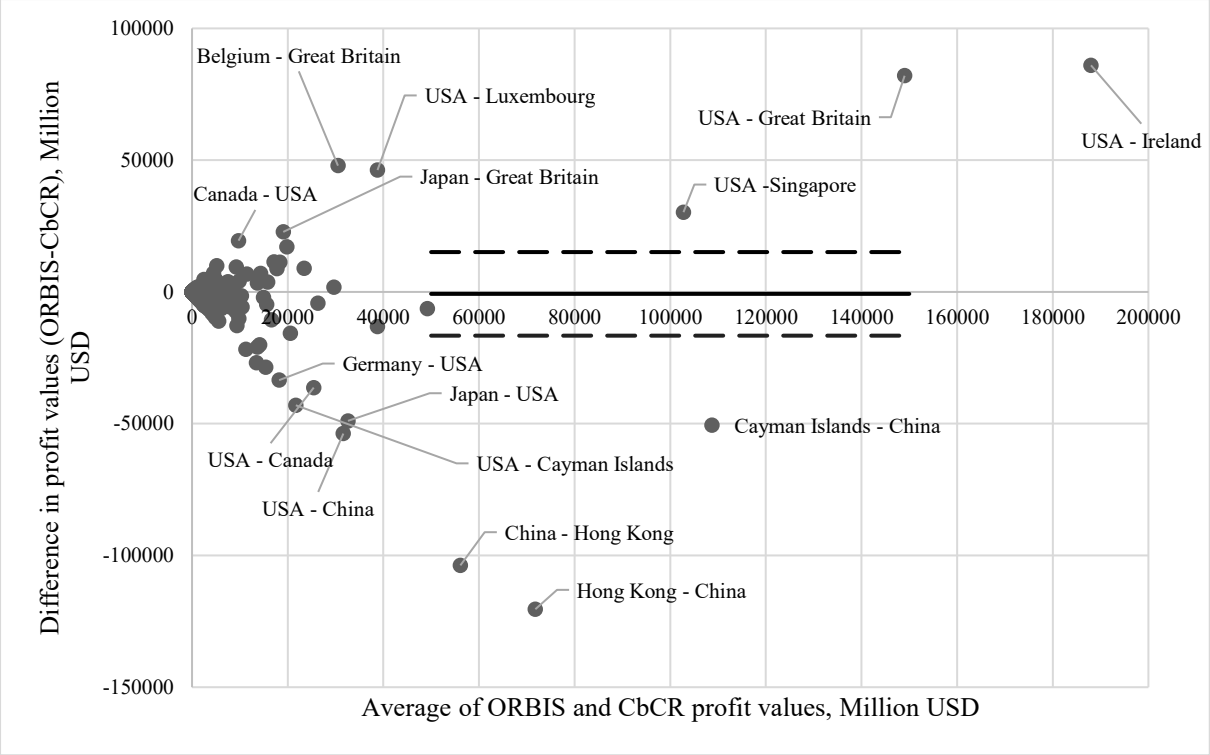
< Neg) uniformly equal to zero and the reverse direction yielding p-values of one. The two-sided p-values are also zero in all years, rejecting the null hypothesis of equal medians. These findings indicate that ORBIS systematically underreports bilateral profit flows relative to CbCR.

Taken together, the preceding analysis demonstrates that, despite increasing alignment in country-pair coverage and relatively strong correlation in reported profit levels, the absolute magnitude of profits recorded in ORBIS remains systematically lower than in the CbCR dataset. This persistent discrepancy likely reflects underlying differences in data coverage, firm-level reporting incentives, and the inclusion of tax-relevant financial flows in CbCR disclosures. The consistency and scale of the gap underscore the importance of accounting for structural and methodological divergences across data sources when analyzing multinational profit allocation. Failure to do so may result in biased estimates of the extent and distribution of profit shifting.

Statistical Diagnostics of Cross-Dataset Profit Reporting Discrepancies

To quantify the extent and nature of discrepancies in profit reporting between the CbCR and ORBIS datasets, we conduct a series of statistical comparisons restricted to country-pair observations jointly covered in both sources. As an initial step, we employ Bland–Altman plots (Limits of Agreement) to assess the degree of concordance between the two datasets. This approach plots the difference in reported pre-tax profits against the average of the two values for each country-pair observation, thereby facilitating the identification of systematic bias and heteroskedasticity in measurement differences.

Figure 1 displays the Bland–Altman plot for the year 2021, while analogous plots for the years 2016–2020 are provided in Online Appendix A. In these plots, the x-axis represents the average profit across ORBIS and CbCR for each country-pair, and the y-axis captures the difference in reported values (ORBIS value minus CbCR value). The solid horizontal line denotes the mean difference, while the dashed lines indicate the 95 percent limits of agreement, defined as the mean ± 1.96 times the standard deviation of the differences. Observations falling outside these bounds reflect substantial divergence in reported profits between the two sources.



Note: The x-axis displays the average profit across the ORBIS and CbCR datasets for each country-pair, while the y-axis plots the difference between ORBIS and CbCR profit values in millions of USD. The solid middle line represents the mean difference, indicating the average discrepancy between the two datasets. The dashed upper and lower lines denote the 95 percent limits of agreement, calculated as the mean difference ±1.96 times the standard deviation of the differences. Observations falling outside these bounds reflect substantial divergence in reported profits between the two sources.

Fig. 1: Bland–Altman Plot Comparing Reported Pre-Tax Profits in ORBIS and CbCR Datasets, 2021

The 2021 Bland–Altman plot indicates broad consistency between ORBIS and CbCR profit measures, with the majority of country-pair observations falling within the limits of agreement. Nonetheless, a non-negligible number of outliers—primarily situated below the lower bound—reinforce earlier findings that ORBIS tends to report lower profit values relative to CbCR for specific country-pair combinations. Comparable patterns are evident across earlier years, as documented in Online Appendix A.

To further explore these discrepancies, Heatmap 1 provides a visual summary of outlier country-pairs identified through the Bland–Altman analysis over the 2016–2021 period. The heatmap highlights parent–partner country pairs exhibiting the most pronounced differences in reported profits, with color gradients indicating both the magnitude and direction of the discrepancies.

Heatmap 1: Country-Pair Outliers in Reported Profits: Bland–Altman Analysis of ORBIS and CbCR Data, 2016–2021 (Profit Differences in Billion USD)

PARENT-PARTNER COUNTRY PAIRS/YEARS	2016	2017	2018	2019	2020	2021
Belgium* – Netherlands*	-48		-76			
Belgium* – United Kingdom	55.5	-854		-102.4	23	48
Bermuda* – China	-23.5					
Bermuda* – Peru	-13.6					
Canada – United States		-29		-57	-28.6	19.4
Cayman Islands* – China			-32	-39	-64	-50.5
Cayman Islands* – Hong Kong*			-24.5	-23	-27	
China – Hong Kong*	-24.6	-39.4	-43	-67	-51	-104
France – United States		-19			-17	-27
Germany – Netherlands*			-24			
Germany – United States		-36	-40.4	-26	-25	-33.5
Hong Kong* – China			-97	-103	-123	-120
Japan – Australia						17
Japan – China	-28					
Japan – United Kingdom					33	23
Japan – United States	-35	-64	-36	-36	-40.4	-49
Netherlands* – United States						-21782
Singapore* – Cayman Islands*		-78.5				
Switzerland* – United States				-21	-20	-21
United States – Australia				23		
United States – Bermuda*	-30	-33	-103	-39		
United States – Canada	-21	-33	-38	-29	-26	NA
United States – Cayman Islands*	-26.5	-58.4	-54	-66	-35	-43
United States – Hong Kong*					-20	-28.6
United States – Ireland*	-14	73	76	120	37	86
United States – Japan	-24	-22	-26	-26	-24.5	-20
United States – Luxembourg*		-15	13.6	25	60	46
United States – Netherlands*	-17	-31	-50	-39		
United States – Singapore*			128	39	77	30
United States – Switzerland*					-131	-54
United States – United Kingdom	59	60	94.5	107	71	82

Note: (1) The heatmap employs a gradient color scheme to represent the magnitude and direction of profit differentials between ORBIS and CbCR datasets. Positive differences are indicated using Light Rose (USD 17–50 billion), Medium Rose (USD 50–100 billion), and Dark Rose (USD 100–140 billion). Negative differences are represented by Light Blue (USD 0 to –30 billion), Medium Blue (USD –30 to –70 billion), and Dark Blue (≤ –70 billion). Jurisdictions classified as tax havens, following the methodology of Tørsløv, Wier and Zucman (2023)[4], are marked with an asterisk (*); (2) The entry for the United States–Canada country pair in 2021 is coded as "NA" due to the absence of corresponding CbCR data for that year.

[4] Tørsløv, Wier and Zucman (2023) tax haven classification: ***Non-OECD tax havens:*** Andorra, Anguilla, Antigua and Barbuda, Aruba, The Bahamas, Bahrain, Barbados, Belize, Bermuda, the British Virgin Islands, the Cayman Islands, Cyprus, Gibraltar, Grenada, Guernsey, Hong Kong, the Isle of Man, Jersey, Lebanon, Liechtenstein, Macao, Malta, Marshall Islands, Mauritius, Monaco, the Netherlands Antilles, Panama, Puerto Rico, Samoa, Seychelles, Singapore, St. Kitts and Nevis, St. Lucia, St. Vincent & Grenadines, Turks and Caicos, Vanuatu; ***OECD tax havens:*** Belgium, Ireland, Luxembourg, Netherlands, and Switzerland.

The heatmap reveals systematic patterns of divergence in profit reporting between the CbCR and ORBIS datasets. Among the 31 identified country-pair outliers, 20 (approximately 65 percent) involve at least one jurisdiction commonly classified as a tax haven. Persistent negative discrepancies—where ORBIS reports substantially lower profit values than CbCR—are observed in country pairs such as China–Hong Kong, Cayman Islands–China, Germany–United States, Japan–United States, and United States–Netherlands. These gaps likely reflect structural limitations in ORBIS coverage, particularly in jurisdictions characterized by limited public disclosure or high concentrations of offshore entities.

Conversely, consistent positive discrepancies—where ORBIS reports higher profit values than CbCR—are observed in bilateral pairs such as United States–United Kingdom, United States–Ireland, United States–Singapore, and United States–Luxembourg. Each of these cases involves the United States as the parent jurisdiction and partner countries commonly associated with favorable tax regimes. This pattern may reflect underreporting in CbCR or differences in profit measurement practices in ORBIS, particularly for U.S.-based multinationals. More broadly, the concentration of such discrepancies in tax-sensitive bilateral relationships suggests that profit overstatement in ORBIS—or understatement in CbCR—may be systematically linked to tax planning incentives.

The Belgium–United Kingdom pair exhibits temporal variation, alternating between positive and negative outliers across years, underscoring the dynamic nature of reporting discrepancies and the sensitivity of cross-dataset comparisons to jurisdiction-specific reporting practices.

While Bland–Altman analysis provides a useful diagnostic for bias and dispersion in paired data, it has limitations in contexts characterized by skewed distributions, extreme outliers, or large variation in profit magnitudes. In our setting, the wide dispersion in profit levels across countries reduces the interpretability of raw differences. Moreover, the method does not adjust for the relative scale of discrepancies, which may explain the disproportionate influence of U.S.-related pairs among the identified outliers.

To address the limitations of raw profit comparisons, we complement the Bland–Altman analysis with a measure of Absolute Percentage Error (APE), which expresses the discrepancy relative to the average reported profit level. This normalization facilitates more meaningful cross-country

comparisons and enhances the detection of systematic patterns of under- or over-reporting across datasets. APEs are computed for all matched parent–partner country-pair observations using the following formula:

$$APE_{ijt} = \frac{ProfitOrbis_{ijt} - ProfitCbCR_{ijt}}{Average(ProfitOrbis_{ijt}; ProfitCbCR_{ijt})} \times 100\% \qquad (1),$$

where *ij* denotes the country-pair and *t* the year. We calculate APEs for each country-pair and year, and then compute yearly averages, reported as Mean Absolute Percentage Error (MAPE) in Table 6.

Table 6: Yearly Mean Absolute Percentage Error (MAPE, %) in Profit Values Between ORBIS and OECD CbCR Data for Common Country-Pairs (2016–2021)

	2016	2017	2018	2019	2020	2021
MAPE, %	-63	-71	-75	-73	-67.3	-75.7

The consistently elevated MAPE values—ranging from –63 percent to –75.7 percent—indicate substantial discrepancies in absolute profit levels between the two datasets, with ORBIS systematically underreporting relative to CbCR. These differences likely reflect the broader scope of profit-shifting activities captured in CbCR, as well as differences in reporting incentives and coverage. In general, MAPE values exceeding 50 percent are considered indicative of significant measurement error, well above conventional thresholds for acceptable accuracy (typically 20–50 percent). In the context of the study, the magnitude of the observed discrepancies raises concerns about the reliability of ORBIS data for cross-country profit comparisons, particularly in analyses sensitive to absolute profit levels.

To examine the distributional characteristics of these discrepancies, Table 7 presents the frequency distribution of APEs across predefined error bins.

Table 7: Frequency Distribution of Absolute Percentage Errors in Profit Differences Between ORBIS and OECD CbCR Data (2016–2021)

Bin Range, %	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*
(-200, -150]	127	216	265	271	258	276
(-150, -100]	54	131	143	155	127	176
(-100, -50]	74	128	154	151	149	159
(-50, 0]	86	147	147	171	177	155
(0, 50]	57	88	87	104	106	106
(50, 100]	28	51	52	48	67	49
(100, 150]	12	21	30	35	31	30
(150, 200]	25	20	26	26	25	23
Total	463	802	906	961	940	974

The distribution of Absolute Percentage Errors (APEs) reveals a pronounced concentration of observations in the negative range, particularly within the (–200, –150] and (–150, –100] intervals. This pattern reinforces earlier findings that ORBIS tends to significantly underreport profits relative to CbCR across a substantial subset of country-pair observations. Instances of positive discrepancies are comparatively rare, suggesting that overreporting in ORBIS is limited and not systematic.

Online Appendix B (Table B1) lists all country pairs for which the Mean Absolute Percentage Error (MAPE) falls below –100 in at least three years during the 2016–2021 period. A total of 399 country pairs meet this criterion, representing 33 percent of the 1 203 country pairs with at least one profit observation over the same period. Of these 399 pairs, 123 (31 percent) involve parent countries classified as tax havens, 63 (16 percent) involve partner countries classified as tax havens, and 20 (5 percent) involve both parent and partner countries classified as tax havens. In total, 166 pairs (42 percent) involve either a parent or a partner country that is a tax haven. These patterns indicate that large underestimations in ORBIS data are more frequent when tax havens are involved—particularly on the parent side—though such cases do not dominate the sample.

Table 8 summarizes the parent and partner countries that most frequently appear in these high-discrepancy pairs.

Table 8: Most Frequent Parent and Partner Countries in Country Pairs with MAPE < –100% (≥3 Years)

Parent countries: Denmark (37; 9.27%), Germany (34; 8.52%), Luxembourg* (33; 8.27%), China (30; 7.52%), Hong Kong* (28; 7.02%), Switzerland* (27; 6.77%), United States (24; 6.02%), Italy (21; 5.26%), Japan, Spain (each 17; 4.26%), Mexico (14; 3.51%), Australia, India (each 13; 3.26%), Bermuda*, France, Norway (each 11; 2.76%), Brazil, Singapore* (each 10; 2.51%)
Partner countries: Mexico, United States (each 12; 3.01%); China, Netherlands* (each 11; 2.76%); Brazil, Japan, Russia (each 10; 2.51%); South Korea, Luxembourg*, Philippines, Singapore* (each 9; 2.26%); Turkey, Viet Nam (each 8; 2.01%); Canada, France, Germany, Indonesia, Italy, Malaysia, Portugal, Sweden, United Kingdom (each 7; 1.75%); Argentina, Australia, Belgium*, Colombia, India, New Zealand, Peru, Romania, Slovakia, Taiwan, Thailand, Ukraine, Uruguay (each 6; 1.50%); Austria, Bulgaria, Finland, Greece, Hong Kong*, Hungary, Ireland*, Mauritius*, Morocco (each 5; 1.25%)

Note: 1) Percentages are calculated based on the total number of country pairs with at least three years of MAPE below –100% (N = 399). 2) An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

The table reveals a pronounced concentration of high-MAPE country pairs among a relatively small set of parent jurisdictions. Denmark, Germany, Luxembourg, China, Hong Kong, Switzerland, and the United States account for the largest shares, with Denmark alone appearing in 9.27 percent of all flagged pairs. Notably, several of these jurisdictions—Luxembourg, Hong Kong, Switzerland, and Bermuda—are recognized tax havens, suggesting a potential link between aggressive tax planning and systematic underreporting in ORBIS. The presence of large economies such as China and the United States further underscores the role of multinational scale in shaping reporting discrepancies.

The distribution of partner countries is notably diffuse. Mexico and the U.S. each account for 3% of flagged pairs, followed by China and the Netherlands (2.8%), and Brazil, Japan, and Russia (2.5%). Several other jurisdictions—such as South Korea, Luxembourg, Singapore, and the Philippines—also appear relatively frequently. Many of these are not tax havens, suggesting that variation in disclosure norms and regulatory enforcement contributes to data gaps. Given ORBIS's reliance on public financials, large negative APEs likely reflect weak transparency or reporting standards for foreign affiliates. These results underscore the role of institutional quality in shaping the reliability of firm-level data for global profit allocation analysis.

We next examine country-pair–year observations in which reported profits in ORBIS and OECD CbCR data exhibit relatively close alignment. This exercise isolates cases characterized by low measurement discrepancies, thereby shedding light on the conditions under which the two datasets converge in their depiction of cross-border profit flows. Specifically, Online Appendix B (Table B2) enumerates all country pairs for which the Mean Absolute Percentage Error (MAPE) lies within the interval [–50%, 50%] in at least three years between 2016 and 2021. This threshold is selected to capture

instances where the absolute deviation between the two sources remains within a range commonly deemed acceptable in empirical analysis. A total of 241 country pairs satisfy this criterion, corresponding to approximately 20 percent of the 1 203 country pairs with at least one recorded profit observation over the same period.

Among these 241 pairs, 66 (27 percent) involve parent countries classified as tax havens, 27 (11 percent) involve partner countries classified as tax havens, and 6 (2.5 percent) involve both. In aggregate, 86 pairs (36 percent) include at least one tax haven jurisdiction. Notably, the prevalence of tax havens among these low-discrepancy cases is not substantially lower than among country pairs exhibiting the largest negative deviations. This suggests that tax haven status is not the primary determinant of divergence in profit reporting between ORBIS and CbCR data.

Table 9 summarizes the parent and partner countries that most frequently appear in these low-discrepancy pairs.

Table 9: Most Frequent Parent and Partner Countries in Country Pairs with MAPE Between –50% and +50% (≥3 Years)

Parent countries: United States (32; 13.28%), Japan (31; 12.86%), Switzerland* (27; 11.20%), Italy (14; 5.81%), France, Germany (each 13; 5.39%), India (11; 4.56%), Australia, Bermuda*, Spain (each 10; 4.15%), Belgium*, Norway (each 9; 3.73%), South Africa (7; 2.90%), Cayman Islands*, China, Mexico, Singapore* (each 6; 2.49%)
Partner countries: Spain (11; 4.56%); Germany, Poland (each 9; 3.73%); Belgium*, India, United Kingdom (each 8; 3.32%); Colombia, Malaysia, Thailand (each 7; 2.90%); Bulgaria, Czechia, Finland, France, Italy, Romania (each 6; 2.49%); Brazil, China, Serbia, Singapore*, Slovakia (each 5; 2.07%); Australia, Austria, Croatia, Hungary, Ireland*, Latvia, Netherlands*, New Zealand, Norway, Sweden (each 4; 1.66%)

Note: 1) Percentages are calculated based on the total number of country pairs with at least three years of MAPE Between –50% and +50% (N = 241). 2) An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

Low-discrepancy pairs show a concentrated distribution of parent countries, led by the U.S. (13.3%), Japan (12.9%), and Switzerland (11.2%). Several tax havens—Switzerland, Bermuda, Belgium, the Cayman Islands, and Singapore—also appear frequently, echoing patterns seen in high-discrepancy cases. In contrast, partner countries are more dispersed, with Spain, Germany, and Poland most common, followed by a diverse mix of EU and large Asian economies. The presence of both haven and non-haven jurisdictions suggests that ORBIS measurement accuracy is not systematically tied to regulatory environments. Instead, variation likely reflects differences in reporting standards, data

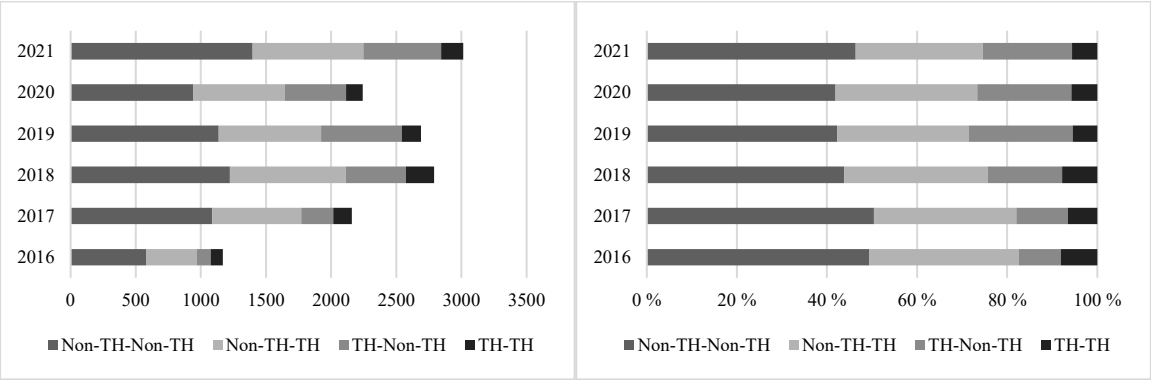
harmonization, and institutional transparency. Notably, EU partner countries are consistently associated with lower discrepancies, reinforcing their reputation for high financial reporting standards.

STYLIZED FACTS IN MULTINATIONAL PROFIT SHIFTING

We proceed by presenting stylized facts on cross-border profit allocation, drawing on data from the OECD CbCR and ORBIS datasets. The analysis focuses exclusively on country-pair observations where firms report positive pre-tax profits.

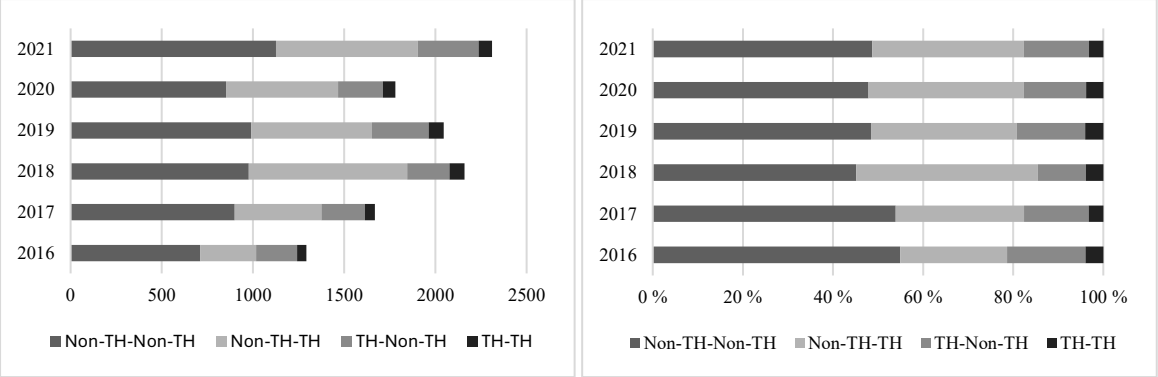
Stylized Fact 1: Profit flows involving tax havens have overtaken flows between non–tax haven jurisdictions since 2018.

Figures 2 and 3 present the volume and composition of cross-border profit flows, disaggregated by the tax haven status of parent and partner jurisdictions, following the taxonomy of Tørsløv, Wier, and Zucman (2023).



Note: *Non-TH* - Non-tax haven; *TH* – tax haven.

Fig. 2: Cross-Border Profit Flows by Parent–Partner Tax Haven Status (Billion USD, OECD CbCR Data, Positive-Profit Firms)



Note: *Non-TH* - Non-tax haven; *TH* – tax haven.

Fig. 3: Cross-Border Profit Flows by Parent–Partner Tax Haven Status (Billion USD, Aggregated ORBIS Data, Positive-Profit Firms)

In both datasets, a marked shift occurs in 2018: profit flows involving tax havens exceed those between non–tax haven jurisdictions and remain dominant through 2021. This trend suggests that profit shifting accounts for a substantial and growing share of global cross-border profit flows—potentially exceeding 50 percent. Moreover, the directionality of these flows is consistent with theoretical expectations. The majority of tax haven-related profit flows originate from non–tax haven parent countries and are allocated to tax haven partners. In contrast, intra–tax haven flows are quantitatively negligible, reinforcing the view that tax havens primarily serve as destinations rather than intermediaries in profit-shifting structures. The magnitude of reported profit flows is systematically larger in the CbCR dataset, reflecting its broader coverage and standardized reporting format. This pattern aligns with the statistical diagnostics presented earlier, which show that CbCR consistently captures higher profit values than ORBIS.

Stylized Fact 2: A small number of countries allocate disproportionately high shares of profits to tax havens.

Figure 4 presents cumulative pre-tax profits reported by parent countries in partner jurisdictions over the period 2016–2021, based on OECD CbCR data. Profit flows are disaggregated by the tax haven status of the partner country, following the classification scheme of Tørsløv, Wier, and Zucman (2023), enabling a comparative assessment of profit allocation patterns.

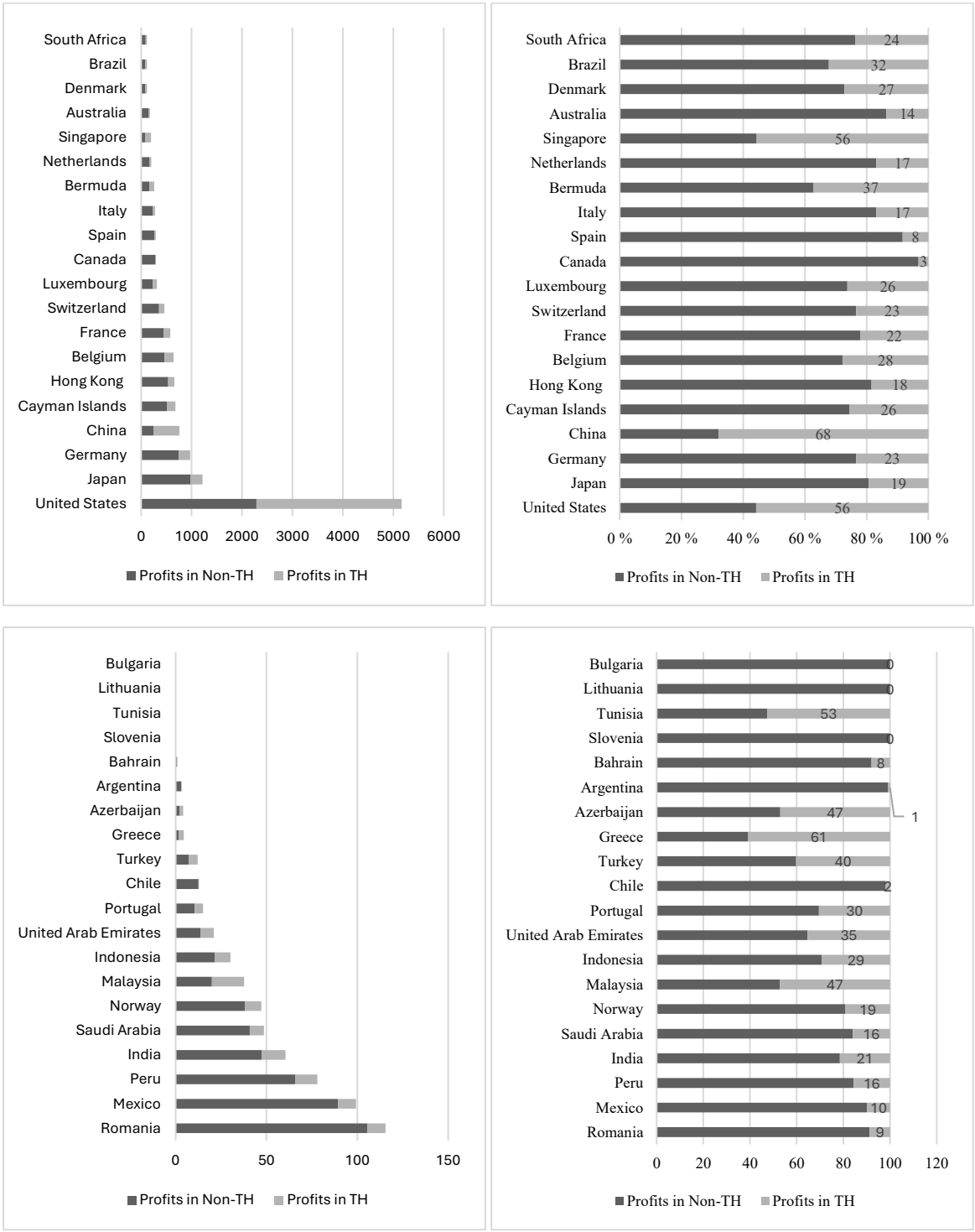


Fig. 4: Cumulative Pre-Tax Profits Reported in Partner Jurisdictions by Parent Country, 2016–2021 (OECD CbCR Data, Billion USD)

The data reveal a striking concentration of profit-shifting behavior among a limited set of parent countries. Specifically, eight jurisdictions—China (68%), Greece (61%), the United States (56%), Singapore (56%), Tunisia (53%), Azerbaijan (47%), Malaysia (47%), and Turkey (40%)—report

allocating more than 40 percent of their foreign profits to tax havens. This pattern suggests that profit shifting is not evenly distributed across the global economy but is instead driven by targeted tax planning strategies employed by multinational enterprises in specific jurisdictions.

The Cayman Islands offer a revealing example. Despite a domestic GDP of just $5.5 billion—less than 0.005 percent of global output and indicative of minimal real economic activity—the jurisdiction ranks fifth worldwide in cumulative outbound profit flows. Strikingly, 74 percent of these profits are directed toward non–tax haven destinations. This pattern deviates from the conventional role of conduit jurisdictions and suggests that the Cayman Islands may operate more as a financial platform for reallocating profits to economically substantive jurisdictions. The underlying mechanisms likely involve financial intermediation, investment holding, or treaty-based arbitrage, rather than simple pass-through structures.

Stylized Fact 3: Aggregated ORBIS and CbCR data exhibit a high degree of consistency at the parent country level.

Figure 5 presents cumulative pre-tax profits reported by parent countries in partner jurisdictions over the 2016–2021 period, based on ORBIS data. While ORBIS covers a broader set of parent countries (79) than the CbCR dataset (40), the comparison is restricted to the top 50 parent countries ranked by total profits reported in partner jurisdictions to ensure comparability in scale and presentation.

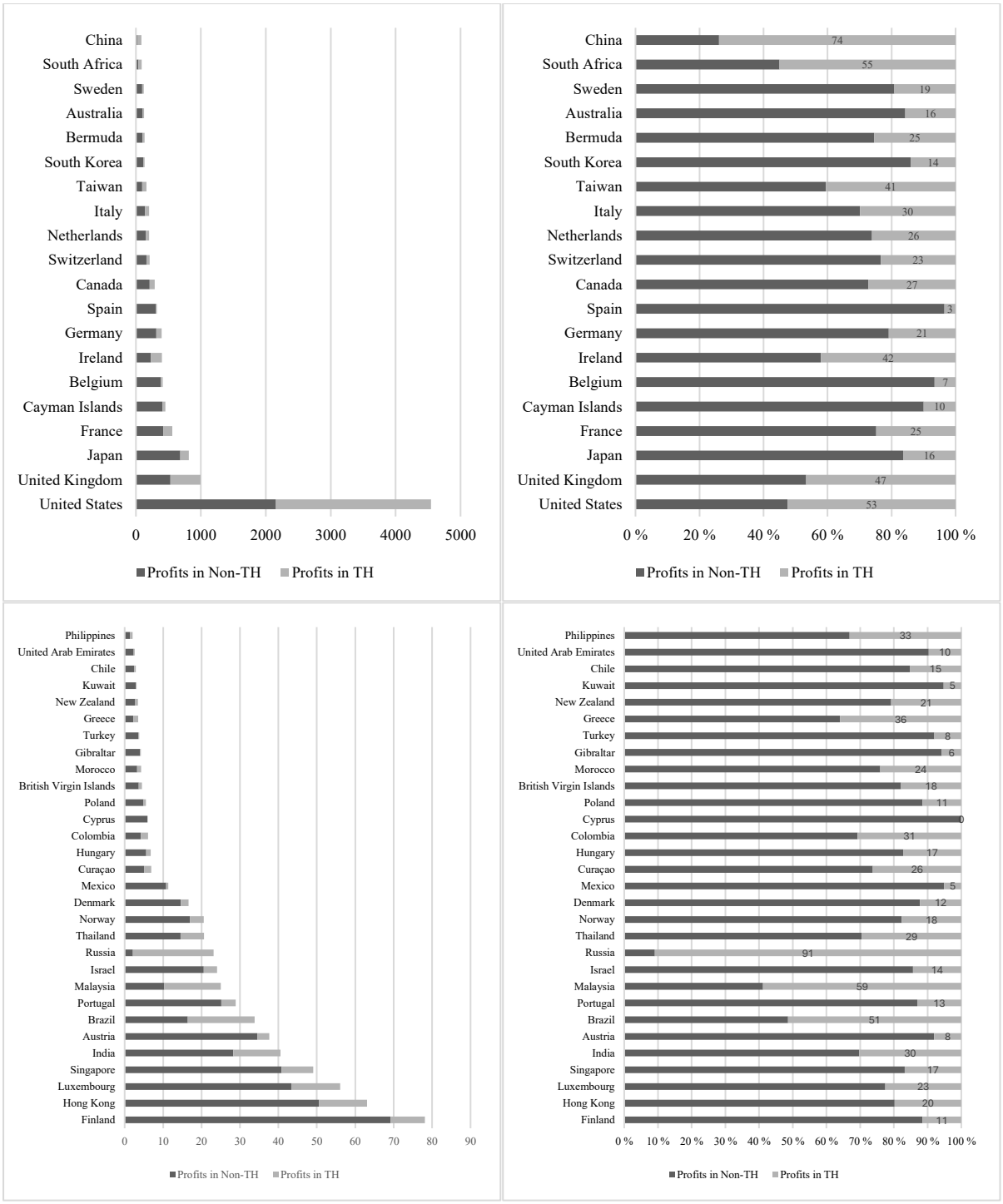


Fig. 5: Cumulative Pre-Tax Profits Reported in Partner Jurisdictions by Parent Country, 2016–2021 (ORBIS data, Billion USD)

Despite differences in coverage and data collection methodologies, the aggregate profit patterns across parent countries in ORBIS and CbCR datasets exhibit a high degree of consistency. Based on data aggregated over the 2016–2021 period, the correlation coefficient between total profits reported by parent countries in the two sources is 0.98. When disaggregated by the tax haven status of partner

jurisdictions, the correlation remains strong: 0.96 for profits allocated to non–tax haven countries and 0.98 for profits allocated to tax havens. These findings demonstrate that, when aggregated at the parent country level over the 2016–2021 period, ORBIS and CbCR data yield highly consistent estimates of multinational profit allocation. The strength of this alignment reinforces the credibility of ORBIS as a complementary data source for cross-country analysis of firm-level financial behavior, despite differences in coverage and reporting frameworks.

Stylized Fact 4: Aggregate alignment masks substantial country-level discrepancies in profit allocation across datasets.

Online Appendix C presents a comparative visualization of profit allocations to tax haven and non–tax haven partner jurisdictions by parent country, based on both CbCR and ORBIS datasets. At the aggregate level, the two datasets exhibit a high degree of consistency: over the 2016–2021 period, the average share of profits allocated to non–tax haven jurisdictions by individual parent countries is 75 percent in CbCR and 78 percent in ORBIS. This consistency suggests that, despite differences in coverage and reporting frameworks, both datasets broadly capture the global structure of profit flows in a comparable manner.

While aggregate patterns appear consistent across data sources, substantial discrepancies emerge at the country level. A notable case is Singapore, where Country-by-Country Reporting (CbCR) data attribute 56 percent of multinational enterprise (MNE) profits to tax havens, compared to only 17 percent in ORBIS. Detailed bilateral profit allocations for Singaporean MNEs are presented in Online Appendix D. The divergence is primarily driven by profit reporting in the Cayman Islands: CbCR records USD 80.5 billion in profits—accounting for 75 percent of Singapore's tax haven allocations—whereas ORBIS reports merely USD 0.4 billion. This discrepancy reflects fundamental differences in data construction. CbCR is based on standardized regulatory filings submitted by MNEs, ensuring comprehensive coverage, while ORBIS relies on firm-level financial statements, which are often incomplete or unavailable for entities domiciled in offshore jurisdictions.

A comparable discrepancy is observed in the case of Indonesia, for which detailed bilateral profit allocations are provided in Online Appendix D. According to CbCR data, 71 percent of foreign profits reported by Indonesian multinational enterprises (MNEs) are allocated to non–tax haven jurisdictions, while the remaining 29 percent are attributed to tax havens. In contrast, ORBIS data present a markedly different distribution, with only 5 percent of foreign profits located in non–tax havens and 95 percent in tax havens. This divergence reflects substantial differences in country coverage and reporting scope across the two datasets. Specifically, ORBIS captures USD 59 million in foreign profits across three non–tax haven jurisdictions—Australia, India, and Vietnam—and USD 1.24 billion in two tax havens, with Singapore alone accounting for 91 percent of the tax haven total. By comparison, CbCR data report USD 30 billion in foreign profits distributed across 86 jurisdictions. As illustrated in Figure 4, Indonesia ranks among the top ten parent countries globally in terms of foreign profit allocation in the CbCR dataset, yet does not appear among the top 50 in ORBIS, where total reported foreign profits amount to only USD 1.3 billion.

Further cross-dataset comparisons reveal systematic variation in tax haven shares across a number of countries. In CbCR, Turkey (40%), UAE (35%), Greece (61%), and Belgium (28%) report significantly higher tax haven shares than in ORBIS (8%, 10%, 36%, and 6.6%, respectively). Conversely, South Africa, Canada, and Brazil show higher tax haven shares in ORBIS—55%, 27%, and 51%—compared to 24%, 3%, and 32% in CbCR. In Online Appendix E we discuss all these cases in detail.

These discrepancies are not random but reflect structural differences in data coverage and reporting practices. For instance, Brazil's foreign profit allocation in ORBIS is concentrated in a few jurisdictions, with $17.4 billion (51%) attributed to tax havens, whereas CbCR reports $37.4 billion (32%) spread across a broader set of countries. Similarly, South Africa's ORBIS data show a pronounced bias toward tax havens, with 55% of foreign profits allocated to such jurisdictions, compared to only 24% in CbCR. In contrast, countries like Turkey and UAE exhibit the opposite pattern, with substantially higher tax haven shares in CbCR than in ORBIS, reflecting underreporting or missing data in ORBIS for offshore entities.

These patterns underscore the importance of dataset choice in empirical analyses of profit shifting. While ORBIS offers granular firm-level data, its coverage of offshore affiliates is uneven, particularly for emerging economies. CbCR, by contrast, provides standardized regulatory disclosures that capture a more complete picture of global profit allocation, albeit at a higher level of aggregation. The divergence between the two sources is thus not merely statistical noise but indicative of deeper limitations in cross-country financial reporting.

Stylized Fact 5: Profit shifting is concentrated in a small set of tax haven jurisdictions, with persistent bilateral channels across countries and datasets.

Online Appendix F documents the top five partner tax havens for each parent country, as identified in both the CbCR and ORBIS datasets. For OECD countries—including the United States, Japan, Germany, and France—European tax havens such as Ireland, Switzerland, the Netherlands, and Luxembourg consistently emerge as dominant destinations for profit allocation. This pattern is robust across both datasets and extends to several non-OECD countries, suggesting that these jurisdictions offer enduring tax advantages and financial secrecy that multinational enterprises systematically exploit.

In addition to European tax havens, several non-European, non-OECD jurisdictions—such as the Cayman Islands, Bermuda, and the British Virgin Islands—play a prominent role in global profit allocation. The Cayman Islands, for example, hosts large profit shares from the UAE (42% of its tax haven profits in CbCR), the U.S. (10% in CbCR), and China (4.7% in CbCR; 18.3% in ORBIS). Similarly, Hong Kong and Singapore serve as major profit-shifting hubs. Hong Kong channels profits from China (68% in CbCR; 35.6% in ORBIS), South Africa (41%), France (11.6%), Switzerland (10.4%), and Japan (10%). Singapore consistently appears as a core tax haven in both datasets, attracting profits from Malaysia (92% in ORBIS; 52.7% in CbCR), Japan (47.5% in ORBIS; 19% in CbCR), India (33.8% in ORBIS; 31% in CbCR), the U.S. (28.4% in ORBIS; 13.5% in CbCR), Norway (24.4% in ORBIS; 13.3% in CbCR), and China (12.6% in ORBIS; 5.7% in CbCR). Notably, while Singapore is

consistently prominent across both datasets, Hong Kong's role is more pronounced in CbCR, suggesting differences in data coverage and reporting depth.

A salient feature of profit allocation to tax havens is its pronounced concentration. Across most parent countries, at least one-third of total profits allocated to tax havens are directed to a single jurisdiction. According to CbCR data, the United States reports USD 2,882.1 billion in profits in tax havens, with over 56 percent concentrated in just five jurisdictions—most notably Ireland, Switzerland, and Singapore. In the ORBIS dataset, this concentration is even more pronounced: more than half of U.S. tax haven profits are allocated to EU jurisdictions such as Ireland, Luxembourg, and the Netherlands, while Singapore accounts for an additional 28 percent. These persistent bilateral channels reflect not only tax optimization strategies but also deeper cultural, political, and economic ties between parent and haven jurisdictions. The strategic positioning of specific tax havens within multinational tax planning architectures reinforces their central role in global profit shifting.

Stylized Fact 6: Dataset architecture shapes the visibility of secrecy jurisdictions in profit-shifting analysis.

A comparative analysis of CbCR and ORBIS data reveals systematic differences in tax haven representation. CbCR disproportionately allocates profits to secrecy jurisdictions such as Bermuda, the Cayman Islands, and the British Virgin Islands, reflecting standardized regulatory disclosures by multinational enterprises. In contrast, ORBIS emphasizes European tax havens—particularly Ireland, Luxembourg, and the Netherlands—due to its reliance on firm-level financial statements, which are more accessible in jurisdictions with robust public filing regimes. These divergences highlight the structural biases inherent in each dataset's construction and coverage.

Jurisdictions such as Switzerland and Hong Kong illustrate the limitations of ORBIS coverage. Both emerge as significant profit destinations in CbCR but are largely absent in ORBIS. In Hong Kong, simplified reporting requirements under the Companies Ordinance (Cap. 622, Sections 359–366 and Schedule 3) reduce the availability of detailed financial data. Similarly, in Switzerland, many holding and offshore entities are exempt from publishing comprehensive financial statements (Grant Thornton,

2022). Such regulatory environments constrain ORBIS's ability to capture the full extent of profit-shifting activity.

Cross-dataset consistency is notably higher for MNEs headquartered in OECD countries than for those based in non-OECD jurisdictions. This reflects stronger disclosure standards and broader participation in international tax transparency initiatives among OECD members. By contrast, limited data availability and weaker enforcement in non-OECD countries contribute to inconsistencies in firm-level reporting, reducing the reliability of profit-shifting estimates derived from ORBIS.

Overall, this stylized fact underscores the importance of understanding dataset architecture and regulatory context when interpreting empirical patterns in international tax avoidance.

Stylized Fact 7: The perceived geography of profit shifting across tax havens varies significantly across datasets.

Figures 6 and 7 present a comparative overview of accumulated pre-tax profits in tax haven jurisdictions over the period 2016–2021, based on CbCR and ORBIS data. Figure 6 reports absolute profit values (USD billions), while Figure 7 displays the proportional distribution across jurisdictions. These visualizations reinforce and summarize earlier findings on the scale and geographic concentration of profit-shifting activity, while also revealing systematic cross-dataset discrepancies.

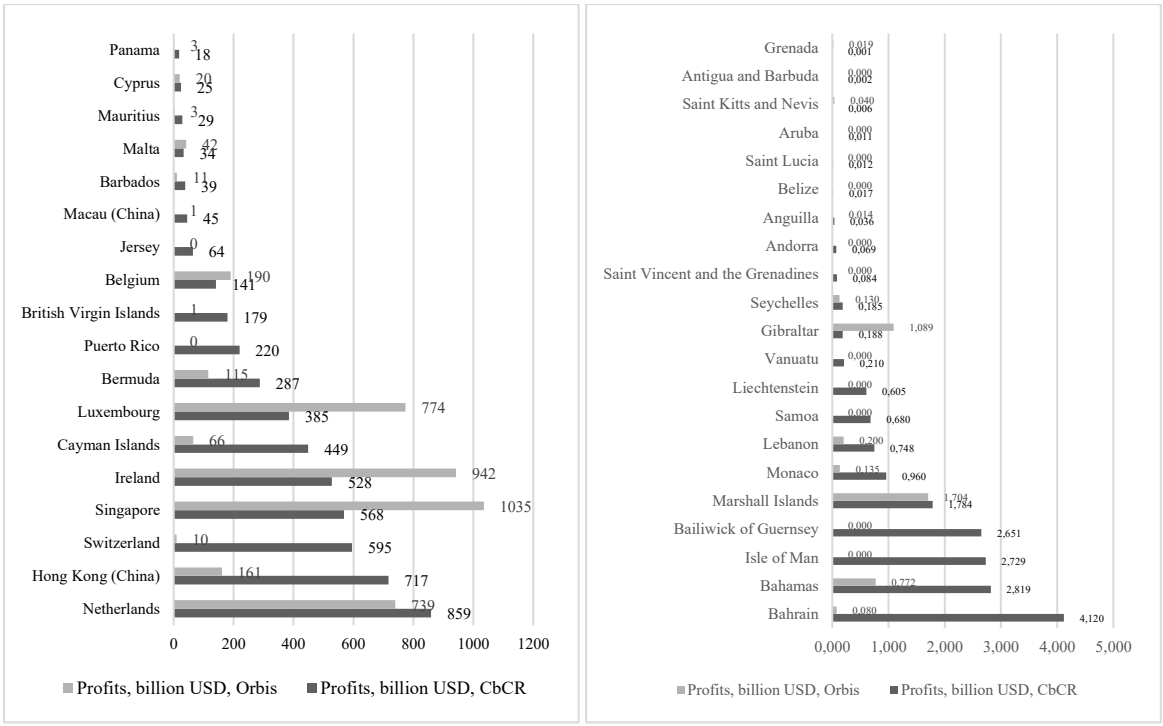


Fig. 6: Accumulated Profits (Before Tax) in Tax Havens (2016–2021): Billion USD

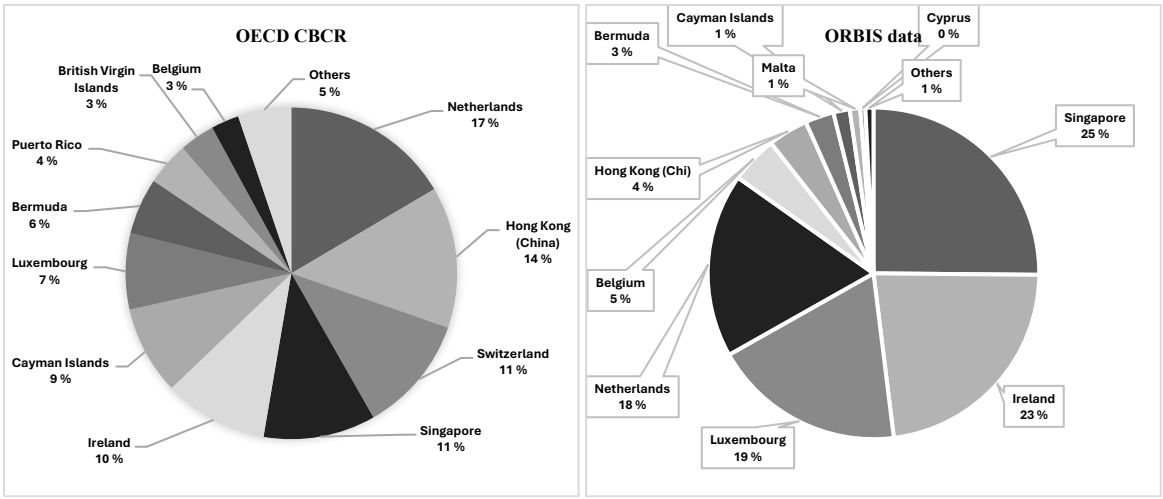


Fig. 7: Accumulated Profits (Before Tax) in Tax Havens (2016–2021): Structure, %

In the CbCR data, the top five tax haven destinations are the Netherlands, Hong Kong, Switzerland, Singapore, and Ireland. In contrast, ORBIS identifies Singapore, Ireland, Luxembourg, the Netherlands, and Belgium as leading jurisdictions. The divergence is particularly pronounced for Hong Kong and Switzerland: CbCR reports USD 716.6 billion and USD 594.9 billion in profits, respectively, while ORBIS records only USD 160.8 billion and USD 10 billion. These gaps reflect structural limitations in ORBIS coverage, especially in jurisdictions with high concentrations of offshore entities and minimal public disclosure requirements.

Further discrepancies arise in the treatment of traditional non-European tax havens. The Cayman Islands account for 9 percent of global tax haven profits in CbCR, but only 1 percent in ORBIS; Bermuda shows a similar gap (6 percent vs. 3 percent). These differences reflect structural variation in dataset architecture and regulatory context. Notably, the correlation between CbCR and ORBIS profit allocations to tax havens over 2016–2021 is 0.7—substantially lower than the 0.98 correlation observed for parent-country aggregates—highlighting the uneven visibility of offshore jurisdictions across sources.

Overall, our findings illustrate how the choice of data source shapes the observed geography of profit shifting. CbCR, based on standardized regulatory disclosures, consistently highlights both classical secrecy jurisdictions and European tax havens. ORBIS, relying on publicly available firm-level filings, offers broader coverage of European havens due to differences in national reporting practices. While CbCR provides a more accurate picture of profit shifting in participating countries, ORBIS reflects structural reporting biases. These differences can lead to contrasting interpretations and should be carefully considered in empirical analysis and policy design.

EMPIRICAL STRATEGY

To examine cross-country variation in MNCs` profit shifting and assess consistency across datasets, we estimate the following baseline specification:

$$Ln\_Profits_{ijt} = b_0 + b_1 Ln\_GDP_{jt} + b_2 Ln\_distance_{ij} + b_3 Comlang_{ij} + b_4 CTR_{jt} + b_5 TIEA_{ijt} + \\ + b_6 SS_{jt} + fe_{n(1-4)} + \varepsilon_{ij} \quad (2),$$

where: $fe_1 = \gamma_{it}; fe_2 = \gamma_{it} + \mu_j; fe_3 = \gamma_{it} + \mu_{jt}; fe_4 = \gamma_{it} + \mu_{jt} + \delta_{ij}$.

The unit of observation is the MNC parent–partner country pair (*i*,*j*) in year *t*. The dependent variable is the log of absolute pre-tax profits reported by MNCs headquartered in country *i* from operations in jurisdiction *j*, drawn from OECD CbCR or aggregated ORBIS data for 2016–2021.

The key explanatory variables are defined as follows. CTR_{jt} denotes the statutory corporate tax rate in the partner country *j* in year *t*, sourced from the OECD[5]. $TIEA_{ijt}$ is a binary variable equal to one if a Tax Information Exchange Agreement is in effect between countries *i* and *j* in year *t*, and zero otherwise. Information on TIEA implementation is based on OECD peer review reports on the standard of exchange of information upon request, covering evaluations published from 2017 to 2024 (see Appendix E for details).

Finally, SS_{jt} denotes the secrecy score for partner country *j*, capturing the degree of financial opacity. We proxy this using the secrecy score component of the Financial Secrecy Index (FSI), developed by the Tax Justice Network (Janský, Palanský, and Wójcik, 2023). The FSI is a widely used cross-country measure of financial transparency, combining a jurisdiction's secrecy score with a global scale weight. We focus on the secrecy score, which directly reflects institutional opacity and is constructed from 20 indicators across four dimensions: ownership registration, legal entity transparency, regulatory integrity, and international cooperation.

While widely used, the FSI exhibits key methodological limitations that constrain its applicability in panel data settings. In particular, its biennial publication, expanding jurisdictional coverage, and ongoing methodological revisions complicate temporal comparability and introduce structural breaks across editions (Janský, Palanská, and Palanský, 2022). To address these issues, we assign the 2018 secrecy score to 2016–2018 and the 2020 score to 2019–2021. The expansion in coverage—from 92 jurisdictions in 2015 to 133 in 2020—combined with relatively modest variation in scores between 2018 and 2020 (average standard deviation of 2.66, compared to 5.21 between 2015 and 2018), supports the validity of this interpolation strategy.

We also include a set of standard controls to account for economic and geographic factors that may also influence profit reporting. Ln_GDP_{jt} represents the natural logarithm of GDP (USD) of partner country *j* in year *t*, sourced from the World Bank. $Ln\_distance_{ij}$ denotes the natural logarithm of the distance between the capitals of countries *i* and *j*. $Comlang_{ij}$ indicates the presence of a common language between countries *i* and *j*. Both geographic variables are sourced from the CEPII database.

[5] https://github.com/TaxFoundation/worldwide-corporate-tax-rates/blob/master/final_data/final_data_long.csv

The specification incorporates a range of fixed effects to account for unobserved heterogeneity and time-varying shocks: parent country-year (γ_{it}), partner country (μ_j), partner country-year (μ_{jt}), and parent country–partner country (δ_{ij}) fixed effects. Descriptive statistics and correlation matrices of the variables are reported in Online Appendix H.

EMPIRICAL EVIDENCE WITH OECD CbCR DATA

We begin by presenting empirical estimates derived from the OECD's Country-by-Country Reporting dataset, which serves as the benchmark for our analysis. As previously discussed, the CbCR data offer superior coverage and precision in capturing profit shifting behavior among multinational enterprises, thereby enhancing the reliability of our identification strategy. Consistent with prior sections, we restrict the sample to entities reporting positive pre-tax profits.

Baseline Results

Tables 9 and 10 report baseline estimates examining how MNCs headquartered in non–tax havens allocate profits when operating with tax haven versus non–tax haven partner countries, respectively. Tax havens are defined following Tørsløv, Wier, and Zucman (2023). The dependent variable across all models is the natural logarithm of reported pre-tax profits (USD). No multicollinearity concerns arise, as all pairwise correlations remain below 0.4 (see Online Appendix H).

Table 9: Determinants of Profit Shifting by MNCs Located in Non-Tax Havens to Tax Havens (Dependent Variable: Log Profit)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	10.311 (1.276)***	14.221 (15.216)	7.516 (1.433)***	15.494 (15.092)	25.257 (0.696)***	19.466 (0.143)***
Natural Log GDP, Partner	0.568 (0.037)***	0.434 (0.600)	0.698 (0.042)***	0.408 (0.606)	Omitted	Omitted
Natural Log Distance	-0.691 (0.08)***	-0.762 (0.079)***	-0.812 (0.079)***	-0.786 (0.078)***	-0.740 (0.079)***	Omitted
Common Language Dummy	0.199 (0.195)	0.602 (0.195)***	-0.019 (0.191)	0.643 (0.191)***	0.692 (0.195)***	Omitted
Corporate Tax Rate (CTR), Partner			-0.059 (0.008)***	0.032 (0.031)	Omitted	Omitted
TIEA Dummy			-0.254 (0.236)	-1.090 (0.234)***	-1.023 (0.238)***	-1.601 (1.009)
Secrecy Score (SS), Partner			0.026 (0.008)***	-0.013 (0.033)	Omitted	Omitted
Parent Country by Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Partner Country Fixed Effects	No	Yes	No	Yes	Yes	Yes
Partner Country by Year Fixed Effects	No	No	No	No	Yes	Yes
Parent Country by Partner Country Fixed Effects	No	No	No	No	No	Yes
N.obs.	1 047	1 044	1 039	1 036	1 017	929
Adj. R-sq.	0.56	0.7	0.59	0.7	0.69	0.89

Note: 1) Standard errors in parentheses; 2) * p<0.1; ** p<0.05; *** p<0.01.

Table 10: Determinants of Profit Shifting by MNCs Located in Non-Tax Havens to Non-Tax Havens (Dependent Variable: Log Profit)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	4.25 (0.419)***	32.511 (8.387)***	2.965 (0.560)***	13.683 (12.052)	26.724 (0.323)***	18.494 (0.030)***
Natural Log GDP, Partner	0.769 (0.014)***	-0.213 (0.319)	0.821 (0.018)***	0.509 (0.448)	Omitted	Omitted
Natural Log Distance	-0.784 (0.031)***	-1.064 (0.034)***	-0.706 (0.034)***	-1.016 (0.037)***	-0.999 (0.037)***	Omitted
Common Language Dummy	1.445 (0.078)***	1.195 (0.085)***	1.598 (0.088)***	1.261 (0.092)***	1.289 (0.094)***	Omitted
Corporate Tax Rate (CTR), Partner			-0.014 (0.004)***	0.010 (0.016)	Omitted	Omitted
TIEA Dummy			0.156 (0.172)	-0.560 (0.175)***	-0.552 (0.179)***	0.941 (1.056)
Secrecy Score (SS), Partner			-0.008 (0.003)***	-0.012 (0.014)	Omitted	Omitted
Parent Country by Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Partner Country Fixed Effects	No	Yes	No	Yes	Yes	Yes
Partner Country by Year Fixed Effects	No	No	No	No	Yes	Yes
Parent Country by Partner Country Fixed Effects	No	No	No	No	No	Yes
N.obs.	5 491	5 484	4 254	4 254	4 244	3 992
Adj. R-sq.	0.6	0.67	0.63	0.69	0.69	0.89

Note: 1) Standard errors in parentheses; 2) * p<0.1; ** p<0.05; *** p<0.01.

First, it is important to note that the coefficients on GDP per capita, the statutory corporate tax rate, and the financial secrecy score lose statistical significance once partner-country fixed effects are introduced. This attenuation likely reflects the limited within-country temporal variation in these variables over the relatively short sample period, indicating that their explanatory power is primarily attributable to cross-sectional differences rather than to within-country time dynamics. By contrast, the coefficient on the bilateral Tax Information Exchange Agreement variable, which is statistically insignificant in specifications excluding partner fixed effects, becomes highly significant once these controls are included. This shift suggests that the estimated effect of TIEAs is more accurately identified when unobserved heterogeneity across partner countries is fully accounted for. However, the inclusion of parent-by-partner-country fixed effects in Model 6 renders the TIEA coefficient statistically insignificant once again, implying that the limited time-series variation in TIEA implementation constrains the identification of its effect within the short panel structure.

In the tax haven subsample (Table 9), the empirical results align closely with the theoretical expectations. Multinational corporations report significantly higher profits in jurisdictions characterized by lower statutory corporate tax rates (Model 3), higher levels of financial secrecy (Model 3), and the absence of bilateral Tax Information Exchange Agreements (Models 4 and 5). These findings suggest that tax minimization and opacity remain central to profit-shifting strategies in tax haven contexts.

In contrast, the estimates for the non–tax haven subsample (Table 10) reveal distinct allocation dynamics. While the coefficient on the statutory corporate tax rate remains negative (Model 3), its attenuated magnitude suggests that profit allocation to non–haven jurisdictions is less sensitive to tax rate differentials. The coefficient on financial secrecy is also negative and statistically significant, indicating a preference for more transparent jurisdictions when multinationals engage in substantive economic activity outside of tax havens. This stands in contrast to the secrecy-driven allocation observed in haven contexts. The estimated effect of bilateral Tax Information Exchange Agreements (TIEAs) further underscores this asymmetry: although the TIEA dummy retains a negative sign in Models 4 and 5, its magnitude is approximately half that observed in the haven sample. This implies that while TIEAs deter profit shifting in both settings, their influence is comparatively weaker in non–haven contexts. Moreover, given the existence of multiple tax haven classifications, some partner

countries included in the non–haven subsample may be considered havens under alternative definitions. Since TIEAs are predominantly signed with tax haven jurisdictions, this overlap may contribute to the persistence of a negative coefficient in the non–haven sample.

Across both subsamples, the control variables are generally statistically significant and display the expected signs, with the exception of GDP per capita in specifications that include partner fixed effects. The models demonstrate substantial explanatory power, with adjusted R-squared values ranging from 0.56 to 0.89 in the tax haven sample and from 0.6 to 0.89 in the non–tax haven sample. These results underscore the robustness of our empirical specification across different institutional contexts.

Analyzing the economic effect of tax rates on profit shifting, we find substantial differences between tax havens and non–tax havens subsamples. In tax havens subsample, a one percentage point increase in the partner country's corporate tax rate is associated with a 5.9 percent decrease in reported profits (Model 3, Table 9), while the same increase leads to only a 1.4 percent decrease in non–tax havens (Model 3, Table 10). These results are consistent with prior empirical findings, suggesting that multinational firms adjust reported profits more aggressively in response to tax rate differentials when operating through low-tax jurisdictions. For instance, Bratta, Santomartino, and Acciari (2024) report that MNCs are up to eight times more responsive to tax rate changes in low-tax countries, with a one-point increase reducing reported profits by nearly 6 percent. Similarly, Dowd, Landefeld, and Moore (2017) show that non-linear models better capture this relationship: a one-point tax cut from 5 to 4 percent boosts reported profits by 4.7 percent, compared to only a 0.7 percent increase from a 30 to 29 percent cut. Our results reveal similar patterns and further emphasize the pivotal role of tax rate differentials in driving profit shifting, reinforcing their importance for the formulation of effective international tax policy frameworks.

Models 4 and 5 in Table 9 provide evidence that the existence of a bilateral Tax Information Exchange Agreement between the parent and partner countries is associated with significantly lower reported profits in tax haven jurisdictions. In the most comprehensive specification (Model 5), the estimated coefficient implies a reduction in reported profits of approximately 64.1 percent, calculated as $[e^{-1.023} - 1] \times 100$). This finding suggests that TIEAs function as an effective institutional mechanism to curb profit shifting by enhancing transparency and increasing the expected costs of

detection and enforcement. The estimated magnitude of the effect is consistent with prior evidence. Beer, Coelho, and Leduc (2019), for instance, document that the introduction of automatic information exchange reduced foreign-owned deposits in offshore financial centers by 25 percent, indicating diminished reliance on secrecy jurisdictions. Similarly, Boas et al. (2024) report that comparable reforms in Denmark prompted significant asset repatriation and voluntary disclosures, accounting for an estimated 70 percent closure of the offshore tax gap. Collectively, these findings, along with our own, underscore the role of multilateral tax transparency initiatives in limiting the use of offshore tax havens and advancing international efforts to curb tax avoidance by multinational corporations.

The results further show a strong positive association between financial secrecy and profit shifting in tax havens. A one-point increase in the secrecy score corresponds to a 2.6 percent rise in reported profits (Model 3, Table 9), indicating that greater secrecy facilitates income concealment. In contrast, the non-haven sample reveals an opposite pattern: a one-point increase in secrecy is linked to a 0.8 percent decline in reported profits (Model 3, Table 10). This divergence underscores the distinct mechanisms driving profit allocation in tax havens versus non-haven jurisdictions. To our knowledge, this is the first large-scale empirical study to directly quantify the impact of financial secrecy on profit shifting, offering a novel contribution to the literature on international tax avoidance.

Placebo Analyses to Assess Robustness of Baseline Estimates

To evaluate the robustness of the baseline estimates and assess the likelihood that the observed relationships are driven by random variation, we conduct a series of placebo analyses for the three primary explanatory variables: the statutory corporate tax rate, the Tax Information Exchange Agreement status dummy, and the financial secrecy score. Each analysis is based on 500 Monte Carlo simulations in which the variable of interest is replaced with a randomly generated counterpart, while the model specification remains unchanged.

Figure 8 presents the distribution of placebo coefficients and associated p-values for the corporate tax rate variable (Model 3, Table 9).

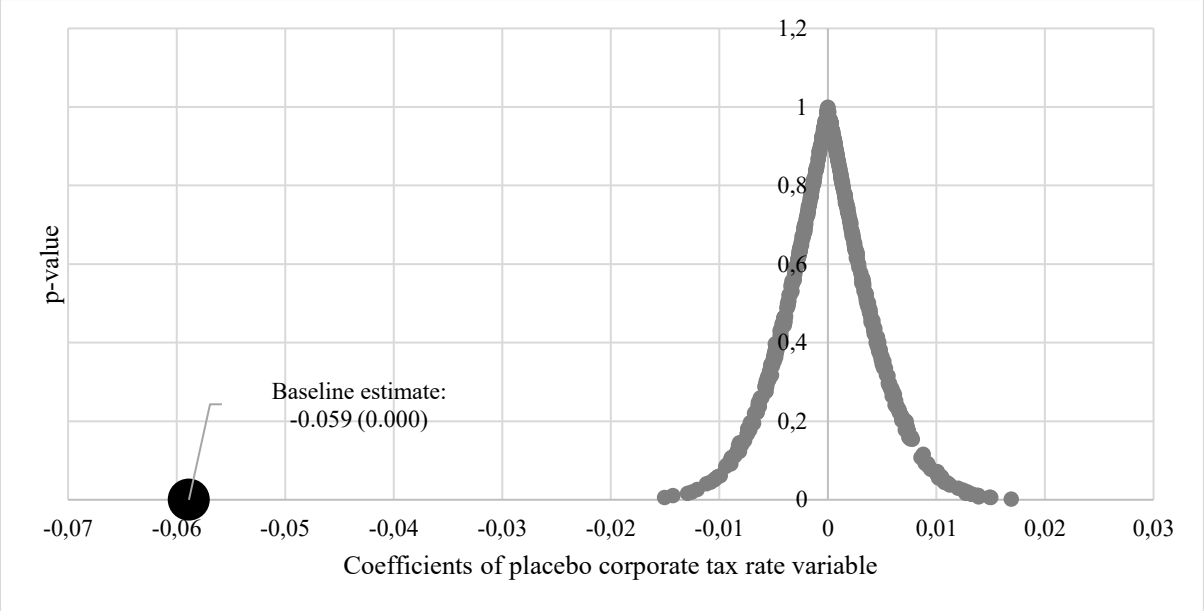


Fig. 8: Distribution of Placebo Coefficients and their P-values: Corporate Tax Rate Variable (Model 3, Table 9)

The empirical p-value—defined as the proportion of placebo coefficients with absolute values greater than or equal to the baseline estimate—is zero, indicating that none of the simulated coefficients approached the magnitude of the observed effect. Among the 500 placebo estimates, only 26 (5.2%) are statistically significant at the 5 percent level, and just 7 of them (1.4%) exhibit a negative sign consistent with the baseline estimate. These results suggest that the estimated link between corporate tax rates and reported profits is unlikely to be driven by random variation.

Figure 9 displays the corresponding placebo distribution for the TIEA status dummy variable (Model 5, Table 9).

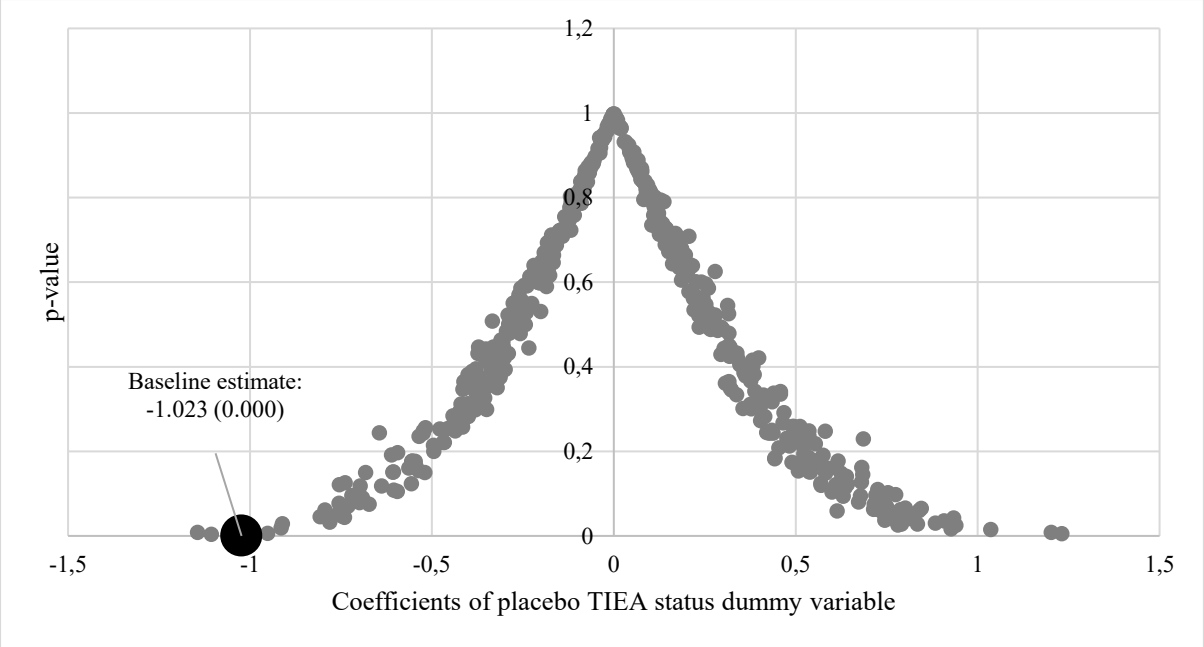


Fig. 9: Distribution of Placebo Coefficients and their P-values: TIEA Status Dummy Variable (Model 5, Table 9)

The empirical p-value in this case is 0.01, with only 5 out of 500 placebo estimates exceeding the absolute magnitude of the baseline coefficient. Furthermore, only 25 placebo estimates (5%) are statistically significant at the 5 percent level, and only 10 of them (2%) share the negative sign of the baseline estimate. These findings lend further credibility to the statistical validity of the observed negative association between TIEA participation and reported profits.

Figure 10 illustrates the resulting distribution of placebo coefficients for the financial secrecy score variable (Model 3, Table 9).

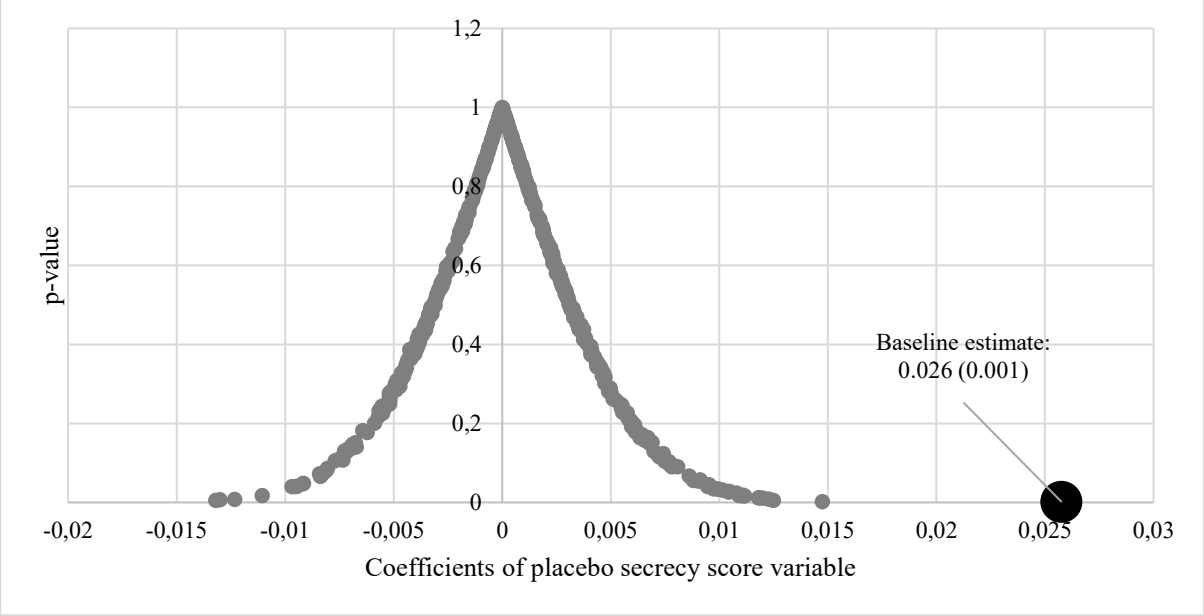


Fig. 10: Distribution of Placebo Coefficients and their P-values: Secrecy Score Variable (Model 3, Table 9)

The empirical p-value is zero, indicating that none of the simulated coefficients match the magnitude of the observed effect. Of the 500 placebo estimates, only 29 (5.8%) are statistically significant at the 5 percent level, and 20 of them (4%) are positive, consistent with the sign of the baseline estimate. Overall, these results reinforce the conclusion that the observed relationship between financial secrecy and reported profits is not a statistical artifact.

Taken together, the placebo analyses provide strong evidence that the estimated effects of corporate tax rates, TIEA status, and financial secrecy on reported profits are unlikely to be driven by spurious correlations or random variation in the data-generating process.

Sensitivity Analysis of Baseline Estimates: Sequential Exclusion of Parent and Partner Countries

To further assess the robustness of the baseline results, we implement a sequential exclusion procedure in which one parent or partner country is omitted at a time from the estimation sample. This approach evaluates the extent to which the estimated effects are sensitive to the presence of any single jurisdiction, particularly in light of the potential for outlier countries—either as MNC headquarters or as profit-attracting tax havens—to exert disproportionate influence on the results.

Figures 11 and 12 report the coefficient estimates and associated p-values for the statutory corporate tax rate from Model 3 of Table 9, which is estimated on the subsample of tax haven partner countries. The estimates are derived from a sequential exclusion procedure in which each of the 25 parent countries[6] (Figure 11) or each of the 28 tax haven partner jurisdictions[7] (Figure 12) is omitted from the sample one at a time. The black circles indicate the full-sample baseline estimates and serve as a benchmark for evaluating the stability and robustness of the results.

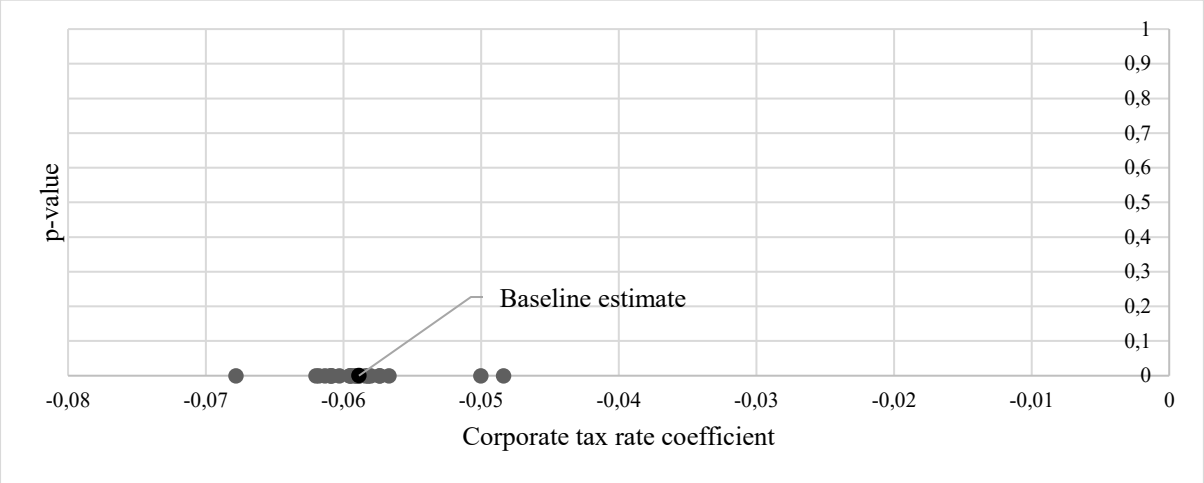


Fig. 11: Sensitivity of the Corporate Tax Rate Coefficient to Sequential Exclusion of Parent Countries — Tax Haven Subsample (Model 3, Table 9)

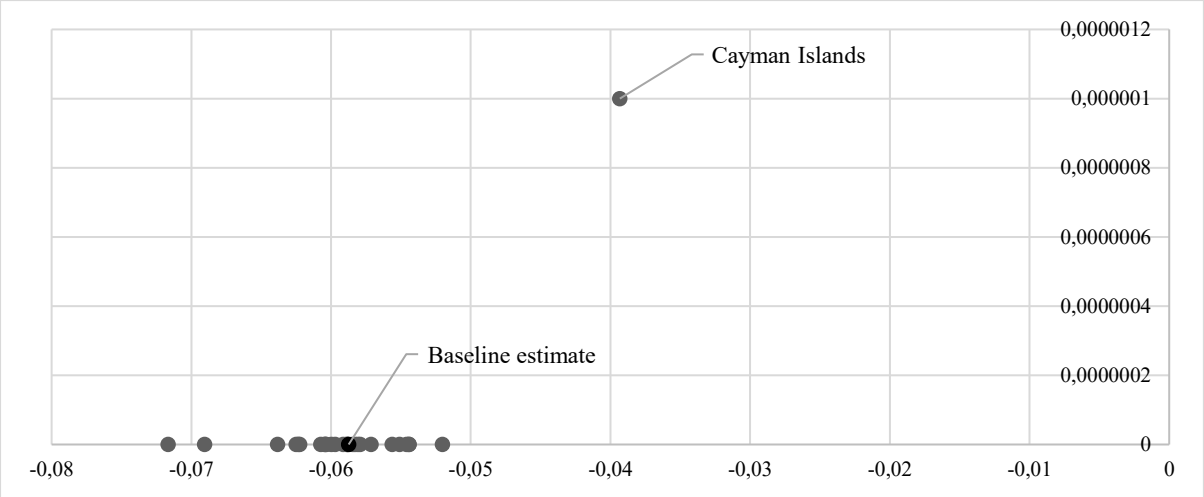


Fig. 12: Sensitivity of the Corporate Tax Rate Coefficient to Sequential Exclusion of Partner Countries — Tax Haven Subsample (Model 3, Table 9)

[6] Argentina, Australia, Azerbaijan, Brazil, Chile, China, Denmark, France, Germany, Greece, India, Indonesia, Italy, Japan, Malaysia, Mexico, Norway, Peru, Portugal, Saudi Arabia, South Africa, Spain, Turkey, United Arab Emirates, United States.

[7] Andorra, Aruba, Barbados, Belgium, Bahrain, Bermuda, Bahamas, Belize, Switzerland, Cyprus, Hong Kong, Ireland, Saint Kitts and Nevis, Cayman Islands, Lebanon, Saint Lucia, Luxembourg, Macao, Malta, Mauritius, Netherlands, Panama, Puerto Rico, Seychelles, Singapore, Saint Vincent and the Grenadines, Vanuatu, Samoa.

The results indicate that the estimated effect of the statutory corporate tax rate is highly robust to the exclusion of individual parent or partner countries. In all but one case, the coefficient remains statistically significant at the 0.0000001 percent level, underscoring the consistency of the estimated relationship. The sole exception arises with the exclusion of the Cayman Islands (Figure 12), which yields a visibly attenuated coefficient and a modest decline in statistical precision. Nevertheless, the estimate remains negative and statistically significant at the 0.00001 percent level. Overall, the results confirm that the baseline tax rate coefficient is not driven by any single observation and that its estimated effect is stable across alternative sample compositions.

Figures 13 and 14 display coefficient estimates and p-values for the TIEA indicator from Model 5 in Table 9, using the tax haven subsample. The figures assess the robustness of the estimates to the sequential exclusion of individual countries: Figure 13 excludes each parent country in turn, while Figure 14 does the same for partner countries.

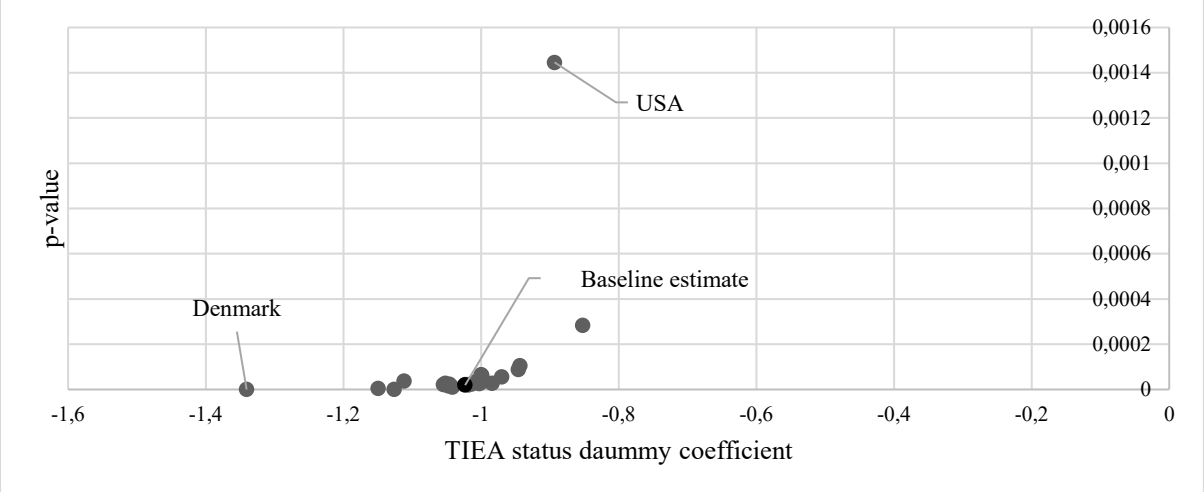


Fig. 13: Sensitivity of the TIEA Coefficient to Sequential Exclusion of Parent Countries — Tax Haven Subsample (Model 5, Table 9)

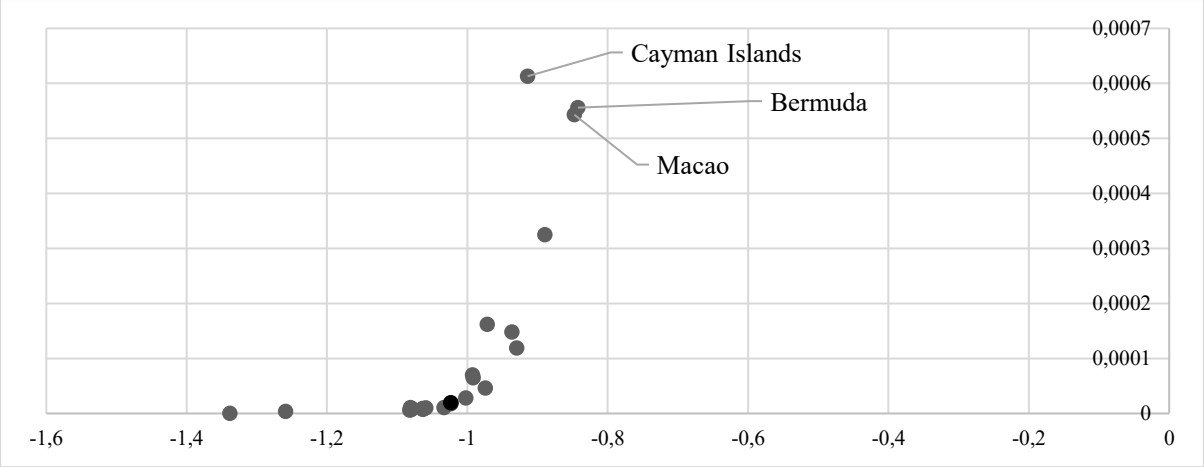


Fig. 14: Sensitivity of the TIEA Coefficient to Sequential Exclusion of Partner Countries — Tax Haven Subsample (Model 5, Table 9)

The results indicate that the estimated effect of the TIEA variable is highly stable. Across all iterations, the sign, magnitude, and statistical significance of the coefficient remain broadly unchanged. In particular, the exclusion of no single parent or partner country leads to a reversal of sign or a loss of statistical significance. Nonetheless, several influential observations are evident. Specifically, the exclusion of the United States as a parent country, or the Cayman Islands, Bermuda, or Macao as partner countries, results in a noticeable increase in the p-value. Even in these cases, however, the estimates remain statistically significant at the 0.001 percent level. These findings suggest that TIEAs with these jurisdictions may play a particularly important role in curbing profit shifting.

Finally, figures 15 and 16 provide analogous robustness checks for the financial secrecy variable, based on Model 3 in Table 9, again using the tax haven subsample. Figure 15 shows the variation in the coefficient and p-value when each parent country is excluded in turn, while Figure 16 reports the corresponding estimates for the exclusion of each partner country.

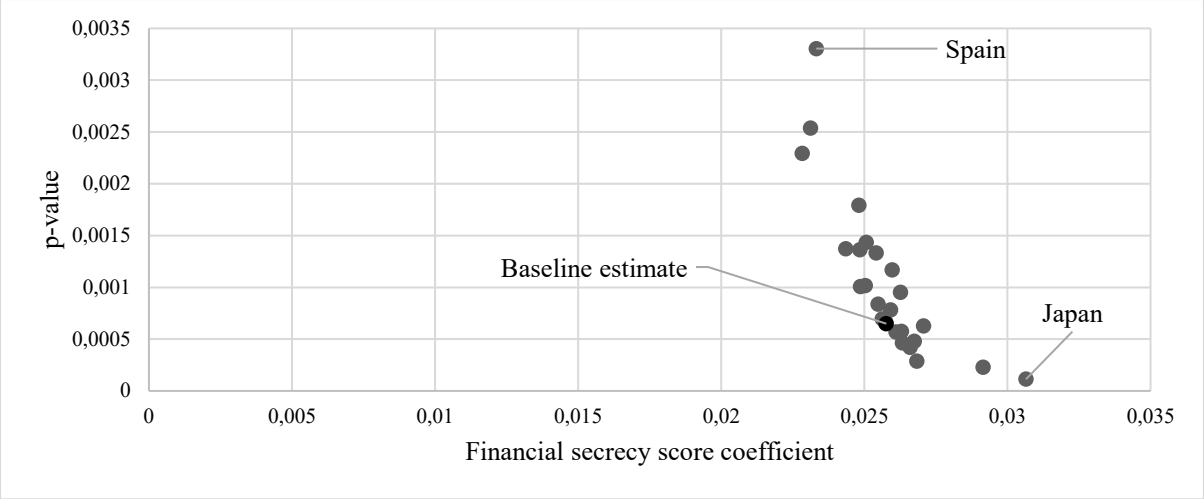


Fig. 15: Sensitivity of the Financial Secrecy Coefficient to Sequential Exclusion of Parent Countries — Tax Haven Subsample (Model 3, Table 9)

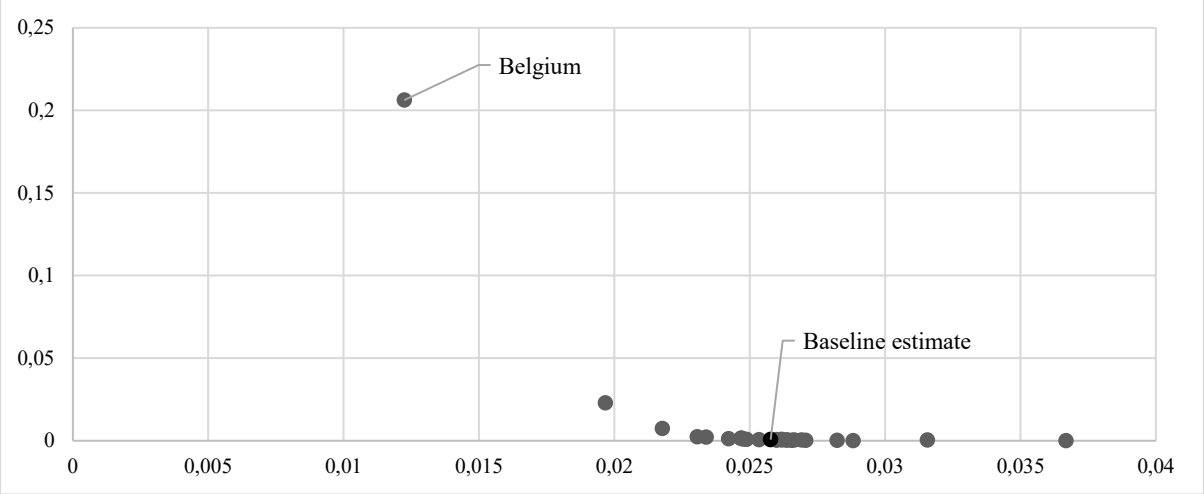


Fig. 16: Sensitivity of the Financial Secrecy Coefficient to Sequential Exclusion of Partner Countries — Tax Haven Subsample (Model 3, Table 9)

The results suggest that the estimated effect of financial secrecy is generally stable, with the coefficient retaining statistical significance at the 0.05 percent level in all but one specification. A notable exception arises when Belgium is excluded as a partner country, which leads to a loss of statistical significance and a visible reduction in the magnitude of the coefficient. This sensitivity indicates that the estimated effect of financial secrecy is less robust compared to the other variables examined. One possible explanation is the presence of measurement error or limited time-series variation in the financial secrecy index, which may affect the precision of the estimates.

EMPIRICAL ESTIMATES USING ORBIS DATA AND COMPARATIVE ANALYSIS WITH CbCR BASELINE RESULTS

Profit shifting to tax haven destinations

We compare baseline profit-shifting estimates from OECD CbCR data with those derived from ORBIS. Table 11 reports results using aggregated ORBIS data, while Table 12 presents estimates from the underlying firm-level sample. Both models are identically specified and restricted to subsidiaries with positive pre-tax profits. The dependent variable is log pre-tax profit. Firm-level results include controls for employment, revenue, and assets, along with fixed effects for industry and multinational group. The use of micro-level data improves identification and mitigates aggregation bias.

Table 11: Determinants of Profit Shifting by MNCs Located in Non-Tax Havens to Tax Havens (Dependent Variable: Log Profit): ORBIS Aggregated Data

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	10.48 (1.477)***	16.057 (30.647)	5.618 (1.776)***	14.139 (30.699)	22.605 (0.783)***	18.154 (0.028)***
Natural Log GDP, Partner	0.436 (0.046)***	0.241 (1.192)	0.523 (0.052)***	0.430 (1.198)	Omitted	Omitted
Natural Log Distance	-0.462 (0.086)***	-0.540 (0.091)***	-0.537 (0.087)***	-0.565 (0.089)***	-0.553 (0.092)***	Omitted
Common Language Dummy	0.538 (0.203)***	0.792 (0.222)***	0.394 (0.203)*	0.769 (0.219)***	0.742 (0.227)***	Omitted
Corporate Tax Rate (CTR), Partner			-0.003 (0.009)	-0.006 (0.040)	Omitted	Omitted
TIEA Dummy			-0.146 (0.386)	-2.621 (0.443)***	-2.690 (0.467)***	Omitted
Secrecy Score (SS), Partner			0.055 (0.008)***	-0.041 (0.056)	Omitted	Omitted
Parent Country by Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Partner Country Fixed Effects	No	Yes	No	Yes	Yes	Yes
Partner Country by Year Fixed Effects	No	No	No	No	Yes	Yes
Parent Country by Partner Country Fixed Effects	No	No	No	No	No	Yes
N.obs.	1 318	1 318	1 312	1 312	1 279	1 258
Adj. R-sq.	0.37	0.51	0.39	0.53	0.51	0.90

Note: 1) Standard errors in parentheses; 2) * p<0.1; ** p<0.05; *** p<0.01.

Table 12: Determinants of Profit Shifting by MNCs Located in Non-Tax Havens to Tax Havens (Dependent Variable: Log Profit): ORBIS Firm-level Data

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-3.311 (0.878)***	-7.006 (5.483)	-1.074 (1.052)	-6.966 (9.476)	-1.508 (0.542)***	-1.504 (0.077)***
Natural Log Number of Employees, Firm-level	0.059 (0.009)***	0.050 (0.009)***	0.051 (0.009)***	0.049 (0.009)***	0.050 (0.009)***	0.048 (0.010)***
Natural Log Revenues, Firm-level	0.268 (0.010)***	0.267 (0.010)***	0.266 (0.010)***	0.268 (0.010)***	0.267 (0.010)***	0.265 (0.010)***
Natural Log Total Assets, Firm-level	0.598 (0.009)***	0.593 (0.009)***	0.593 (0.009)***	0.593 (0.009)***	0.593 (0.009)***	0.595 (0.009)***
Natural Log GDP, Partner	0.025 (0.025)	0.195 (0.203)	-0.037 (0.032)	0.181 (0.335)	Omitted	Omitted
Natural Log Distance	0.134 (0.052)**	0.036 (0.066)	0.023 (0.060)	0.005 (0.067)	0.006 (0.067)	Omitted
Common Language Dummy	-0.056 (0.036)	-0.084 (0.051)*	-0.076 (0.046)*	-0.099 (0.051)*	-0.097 (0.051)*	Omitted
Corporate Tax Rate (CTR), Partner			-0.006 (0.003)**	0.005 (0.006)	Omitted	Omitted
TIEA Dummy			-0.466 (0.204)**	-1.030 (0.322)***	-1.079 (0.324)***	Omitted
Secrecy Score (SS), Partner			0.011 (0.002)***	0.009 (0.015)	Omitted	Omitted
Parent Country by Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Partner Country Fixed Effects	No	Yes	No	Yes	No	Yes
Partner Country by Year Fixed Effects	No	No	No	No	Yes	Yes
Parent Country by Partner Country Fixed Effects	No	No	No	No	No	Yes
4-digit Industry Fixed Effects, Firm-level	Yes	Yes	Yes	Yes	Yes	Yes
MNC/GUO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N.obs.	16 579	16 579	16 572	16 572	16 558	16 551
Adj. R-sq.	0.77	0.77	0.77	0.77	0.77	0.77

Note: 1) Standard errors in parentheses; 2) * p<0.1; ** p<0.05; *** p<0.01.

While CbCR (Table 9 above), the aggregated and firm-level ORBIS data yield broadly consistent patterns across specifications, differences emerge in coefficient magnitudes, significance levels, and model fit. Table 13 provides a comparative summary of profit shifting determinants across three data sources: OECD CbCR (Table 9), aggregated ORBIS (Table 11), and firm-level ORBIS (Table 12). The table synthesizes coefficient estimates and significance levels for key variables commonly associated with profit shifting behavior, allowing for a direct comparison of patterns across data granularities.

Table 13: Comparative Summary of CbCR and ORBIS Estimates on Profit Shifting Determinants: Tax Haven Subsample

Variable	*CbCR (Table 9)*	*Aggregated ORBIS (Table 11)*	*Firm-level ORBIS (Table 12)*	*Interpretation*
Corporate Tax Rate	Significant, negative (Model 3: –0.059***)	Insignificant (Model 3: –0.003)	Significant, negative (Model 3: –0.006**)	Profit shifting responds to tax differentials in CbCR and firm-level ORBIS data, with the strongest effect in CbCR. No statistically significant relationship is found in aggregated ORBIS data.
TIEA Dummy	Significant, negative (Model 5: –1.023***)	Significant, negative (Model 5: –2.69***)	Significant, negative (Model 5: –1.079***)	TIEAs reduce profit shifting across all data sources, with the strongest effect in aggregated ORBIS. Effects in CbCR and firm-level ORBIS are smaller but closely comparable in magnitude.
Secrecy Score	Significant, positive (Model 3: 0.026***)	Significant, positive (Model 3: 0.055***)	Significant, positive (Model 3: 0.011***)	Secrecy positively correlates with profit shifting in both datasets, with the largest effect observed in aggregated ORBIS. Effects in CbCR and firm-level ORBIS are smaller but more comparable in magnitude.
GDP (Partner)	Significant, positive (Model 3: 0.698***)	Significant, positive (Model 3: 0.523***)	Insignificant (Model 3: –0.037)	Partner country's economic size significantly predicts profit shifting in CbCR and aggregated ORBIS, but not in firm-level ORBIS.
Distance	Significant, negative (Model 5: -0.74***)	Significant, negative (Model 5: -0.553***)	Insignificant (Model 5: 0.006)	Geographic frictions significantly affect profit shifting in CbCR and aggregated ORBIS, but not firm-level ORBIS.
Common Language	Significant, positive (Model 5: 0.692***)	Significant, positive (Model 5: 0.742***)	Marginally significant, negative (Model 5: –0.097*)	Linguistic commonality is a significant determinant in CbCR and aggregated ORBIS; effect reverses in firm-level ORBIS.
Adjusted R^2	0.56 – 0.89	0.37 – 0.9	0.77 in all specifications	Model fit is broadly comparable across specifications.
Sample Size	~1,000	~1,300	~16,500	-

Note: 1)* p<0.1; ** p<0.05; *** p<0.01.

The corporate tax rate is negatively associated with reported profits in both the CbCR and firm-level ORBIS samples, consistent with profit-shifting incentives. The effect is strongest in the CbCR data (–

0.059), reflecting greater sensitivity to tax differentials. In contrast, the aggregated ORBIS sample shows no significant relationship, likely due to aggregation bias.

Tax Information Exchange Agreements are consistently associated with reduced profit shifting across all datasets. The largest effect is observed in the aggregated ORBIS sample (–2.69), followed by firm-level ORBIS (–1.08) and CbCR (–1.02). This pattern suggests that international transparency initiatives have a measurable deterrent effect, particularly in datasets with broader jurisdictional coverage.

The secrecy score, which proxies for financial opacity, is positively and significantly associated with profit shifting in all three datasets. The largest coefficient is found in aggregated ORBIS (0.055), followed by CbCR (0.026) and firm-level ORBIS (0.011). These results reinforce the role of secrecy jurisdictions in attracting profit allocations and highlight the consistency of this determinant across data sources.

Partner country GDP is a robust predictor of profit shifting in both CbCR and aggregated ORBIS samples, with positive and significant coefficients. However, the variable is statistically insignificant in the firm-level ORBIS data, suggesting that macroeconomic size may be more relevant in aggregate-level analyses than in firm-level decisions.

Geographic distance is negatively associated with profit shifting in CbCR and aggregated ORBIS, indicating that physical frictions reduce the likelihood of profit allocation. The effect is not significant in the firm-level ORBIS sample, possibly due to intra-group structuring that offsets geographic constraints.

Common language shows a positive and significant association with profit shifting in CbCR and aggregated ORBIS, consistent with the notion that linguistic proximity facilitates cross-border operations. Interestingly, the effect reverses in the firm-level ORBIS sample, where the coefficient is negative and marginally significant, suggesting that language may play a different role at the micro level, potentially reflecting reporting practices or internal firm dynamics.

Adjusted R^2 values range from 0.37 to 0.90 across specifications, with higher fit observed in models including more fixed effects, consistent with expectations.

Overall, our results highlight the importance of data structure in identifying profit shifting behavior. While aggregated data capture broad patterns, firm-level data offer sharper identification of tax responsiveness and institutional effects. The consistency of secrecy-related findings across all datasets underscores the persistent role of regulatory opacity in shaping multinational profit allocation strategies.

Profit allocation to non-tax haven destinations

To further assess the consistency of profit shifting estimates across datasets, we turn to the subset of multinational enterprises headquartered in non–tax haven jurisdictions and operating in partner countries likewise classified as non–havens. Tables 14 and 15 present results based on aggregated and firm-level ORBIS data, respectively.

Table 14: Determinants of Profit Shifting by MNCs Located in Non-Tax Havens to Non-Tax Havens (Dependent Variable: Log Profit): ORBIS Aggregated Data

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	5.935 (0.411)***	22.277 (9.218)**	5.434 (0.525)***	18.00 (11.128)*	26.424 (0.286)***	16.972 (0.014)***
Natural Log GDP, Partner	0.717 (0.015)***	0.156 (0.347)	0.752 (0.018)***	0.332 (0.413)	Omitted	Omitted
Natural Log Distance	-1.005 (0.030)***	-1.177 (0.032)***	-0.964 (0.032)***	-1.155 (0.033)***	-1.153 (0.034)***	
Common Language Dummy	1.431 (0.075)***	1.258 (0.086)***	1.296 (0.086)***	1.108 (0.094)***	1.108 (0.095)***	Omitted
Corporate Tax Rate (CTR), Partner			-0.011 (0.005)**	0.017 (0.017)	Omitted	Omitted
TIEA Dummy			-0.947 (0.271)***	-1.247 (0.278)***	-1.175 (0.285)***	4.904 (1.126)***
Secrecy Score (SS), Partner			-0.010 (0.003)***	-0.016 (0.013)	Omitted	Omitted
Parent Country by Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Partner Country Fixed Effects	No	Yes	No	Yes	Yes	Yes
Partner Country by Year Fixed Effects	No	No	No	No	Yes	Yes
Parent Country by Partner Country Fixed Effects	No	No	No	No	No	Yes
N.obs.	8 290	8 287	7 160	7 160	7 134	7 080
Adj. R-sq.	0.47	0.56	0.52	0.60	0.58	0.94

Note: 1) Standard errors in parentheses; 2) * p<0.1; ** p<0.05; *** p<0.01.

Table 15: Determinants of Profit Shifting by MNCs Located in Non-Tax Havens to Non-Tax Havens (Dependent Variable: Log Profit): ORBIS Firm-level Data

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	–2.140 (0.079)***	2.608 (1.794)	–3.428 (0.091)***	2.269 (1.893)	–1.745 (0.051)***	–2.053 (0.022)***
Natural Log Number of Employees, Firm-level	0.002 (0.003)	–0.018 (0.003)***	–0.012 (0.003)***	–0.018 (0.003)***	–0.018 (0.003)***	–0.019 (0.003)***
Natural Log Revenues, Firm-level	0.359 (0.004)***	0.366 (0.004)***	0.363 (0.004)***	0.363 (0.004)***	0.363 (0.004)***	0.363 (0.004)***
Natural Log Total Assets, Firm-level	0.577 (0.003)***	0.585 (0.003)***	0.584 (0.003)***	0.586 (0.003)***	0.586 (0.003)***	0.586 (0.003)***
Natural Log GDP, Partner	0.008 (0.003)***	–0.159 (0.065)**	0.040 (0.003)***	–0.140 (0.068)**	Omitted	Omitted
Natural Log Distance	–0.012 (0.005)**	–0.035 (0.005)***	–0.020 (0.005)***	–0.039 (0.006)***	–0.039 (0.006)***	Omitted
Common Language Dummy	0.038 (0.010)***	0.019 (0.012)	0.061 (0.010)***	0.019 (0.012)	0.019 (0.012)	Omitted
Corporate Tax Rate (CTR), Partner			–0.011 (0.001)***	–0.002 (0.003)	Omitted	Omitted
TIEA Dummy			0.163 (0.047)***	–0.111 (0.060)*	–0.118 (0.060)**	Omitted
Secrecy Score (SS), Partner			0.013 (0.001)***	–0.002 (0.002)	Omitted	Omitted
Parent Country by Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Partner Country Fixed Effects	No	Yes	No	Yes	No	Yes
Partner Country by Year Fixed Effects	No	No	No	No	Yes	Yes
Parent Country by Partner Country Fixed Effects	No	No	No	No	No	Yes
4-digit Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
MNC/GUO fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N.obs.	154 716	154 715	151 504	151 503	151 473	151 407
Adj. R-sq.	0.76	0.76	0.76	0.76	0.76	0.77

Note: 1) Standard errors in parentheses; 2) * p<0.1; ** p<0.05; *** p<0.01.

Table 16 presents a comparative summary of profit shifting determinants for non–tax haven allocations across three datasets: CbCR (Table 10), aggregated ORBIS (Table 14), and firm-level ORBIS (Table 15).

Table 16: Comparative Summary of CbCR and ORBIS Estimates on Profit Shifting Determinants: Non-Tax Haven Subsample

Variable	*CbCR (Table 10)*	*Aggregated ORBIS (Table 14)*	*Firm-level ORBIS (Table 15)*	*Interpretation*
Corporate Tax Rate	Significant, negative (Model 3: –0.014***)	Significant, negative (Model 3: –0.011**)	Significant, negative (Model 3: –0.011***)	Profit shifting exhibits consistent sensitivity to tax rate differentials across all datasets, with closely aligned magnitudes.
TIEA Dummy	Significant, negative (Model 5: –0.560***)	Significant, negative (Model 5: –1.247***)	Significant, negative (Model 5: –0.118**)	TIEAs reduce profit shifting across all datasets, with the largest effect in aggregated ORBIS.
Secrecy Score	Significant, negative (Model 3: –0.008***)	Significant, negative (Model 3: –0.010***)	Significant, positive (Model 3: 0.013***)	Secrecy is negatively associated with profit shifting in CbCR and aggregated ORBIS, but positively in firm-level ORBIS.
GDP (Partner)	Significant, positive (Model 3: 0.821***)	Significant, positive (Model 3: 0.752***)	Significant, positive (Model 3: 0.040***)	Partner country's economic size consistently predicts profit shifting, though the effect is notably weaker in firm-level ORBIS data.
Distance	Significant, negative (Model 5: –1.016***)	Significant, negative (Model 5: –1.155***)	Significant, negative (Model 5: –0.039***)	Geographic frictions consistently dampen profit shifting across datasets, though the attenuation is markedly less pronounced in firm-level ORBIS estimates.
Common Language	Significant, positive (Model 5: 1.261***)	Significant, positive (Model 5: 1.108***)	Insignificant, positive (Model 5: 0.019)	Linguistic proximity facilitates profit shifting in CbCR and aggregated ORBIS; effect is insignificant in firm-level ORBIS.
Adjusted R^2	0.60 – 0.89	0.47 – 0.94	0.76 – 0.77	Model performance remains robust and exhibits comparable explanatory power across the three datasets analyzed.
Sample Size	~5,000	~8,000	~150,000	-

Note: 1) * p<0.1; ** p<0.05; *** p<0.01.

The corporate tax rate exhibits a consistent negative association with reported profits, confirming tax sensitivity across all sources. TIEAs are associated with reduced profit shifting, with the strongest deterrent effect observed in aggregated ORBIS. Secrecy scores show divergent patterns: negative in CbCR and aggregated ORBIS, but positive in firm-level ORBIS, suggesting data granularity influences the direction of estimated effects. Partner country GDP and geographic distance are robust predictors across datasets, while common language effects are strongest in aggregated data. Model fit is high across specifications, with firm-level ORBIS offering the most precise identification. The non-haven

sample shows no greater consistency across data sources than the haven sample, with differences in coefficient magnitude and significance persisting in both cases.

CONCLUSIONS

This paper conducts a systematic comparison of multinational profit shifting using OECD Country-by-Country Reporting and ORBIS firm-level data. We document persistent discrepancies in profit values, country-pair coverage, and distributional patterns across sources. While ORBIS provides granular firm-level detail, it underreports profits relative to CbCR at the country-pair level, reflecting structural limitations in coverage, including jurisdiction-specific gaps and selective firm representation.

Empirical estimates derived from both the OECD CbCR and ORBIS datasets indicate that multinational enterprises systematically allocate profits in response to institutional and fiscal characteristics of host jurisdictions. Specifically, lower statutory corporate tax rates, higher levels of financial secrecy, and the absence of bilateral Tax Information Exchange Agreements (TIEAs) are consistently associated with increased reported profits. While these relationships are robust across data sources, notable differences in coefficient magnitudes and statistical significance underscore the importance of dataset choice. Estimates based on CbCR data exhibit greater internal consistency and stronger responsiveness to tax rate differentials, suggesting that regulatory data may offer a more reliable basis for identifying profit-shifting behavior.

From a policy perspective, our results underscore the importance of transparency and international cooperation in curbing base erosion and profit shifting. The strong negative association between TIEA implementation and reported profits in tax havens suggests that bilateral information exchange agreements are effective in deterring aggressive tax planning. Similarly, the positive relationship between financial secrecy and profit allocation highlights the need for enhanced regulatory oversight in jurisdictions with opaque financial systems. These findings support ongoing efforts by the OECD and other international bodies to strengthen tax transparency and harmonize reporting standards.

Our analysis also reveals that profit shifting is highly concentrated in a small number of jurisdictions, with European tax havens and classical offshore financial centers consistently attracting large volumes of profits. This concentration suggests that targeted policy interventions—such as

country-specific enforcement measures and treaty renegotiations—may yield substantial gains in revenue mobilization.

Finally, the paper highlights the critical role of data choice in empirical research on international taxation. While ORBIS remains a valuable resource for firm-level analysis, its limitations necessitate complementary use of regulatory datasets such as CbCR. Future research should continue to explore hybrid approaches that integrate multiple data sources, enabling more comprehensive and policy-relevant assessments of multinational tax behavior.

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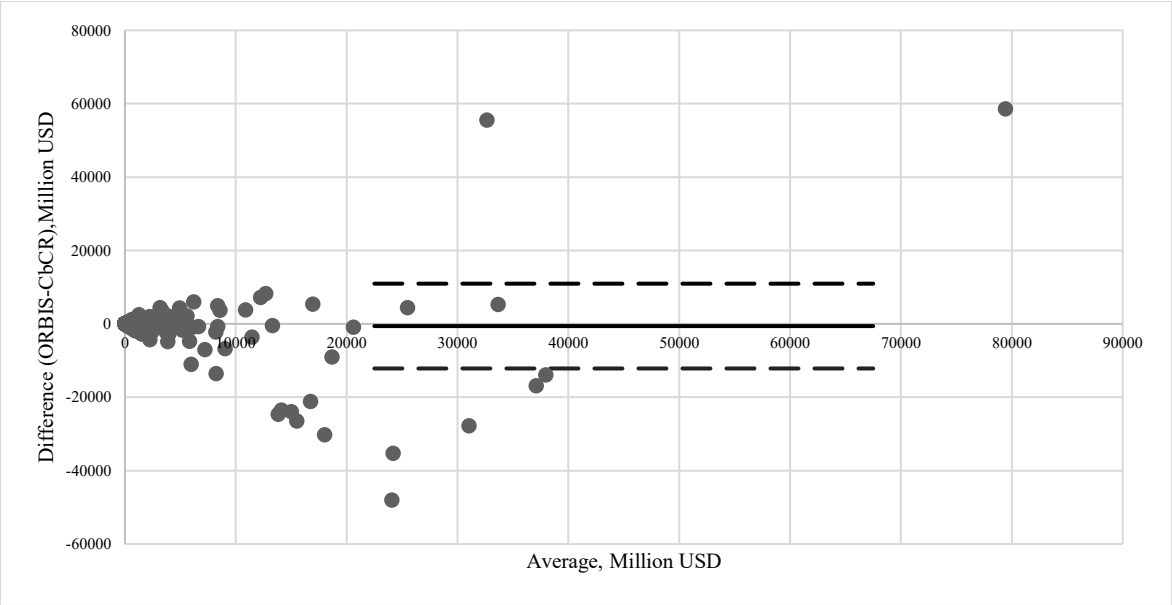
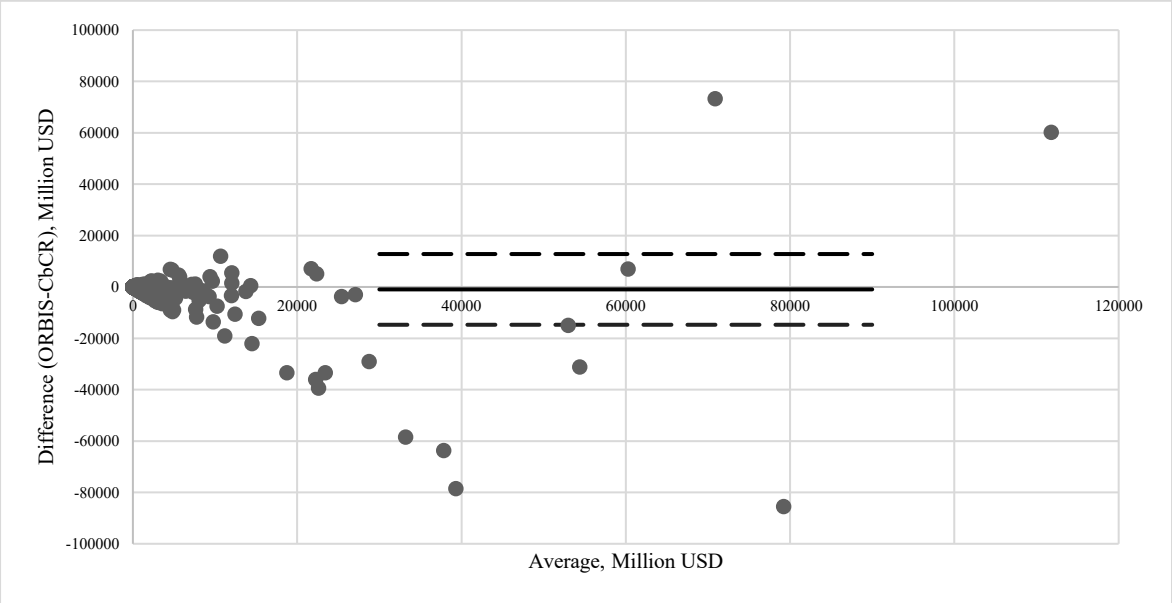
ONLINE APPENDIX

Appendix A: Bland–Altman Analysis of Profit Agreement Between ORBIS and CbCR (Positive-Profit Subsample)



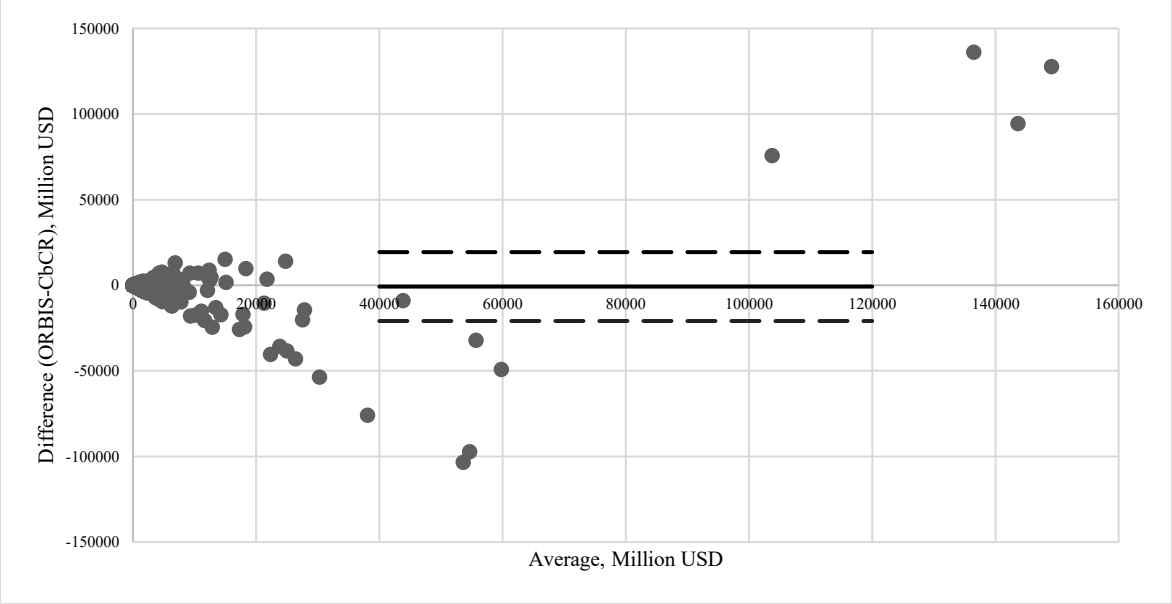
Note: The x-axis displays the average profit across the CbCR and ORBIS datasets for each country-pair, while the y-axis plots the difference between ORBIS and CbCR profit values in millions of USD. The solid middle line represents the mean difference, indicating the average discrepancy between the two datasets. The dashed upper and lower lines denote the 95% limits of agreement, calculated as the mean difference ±1.96 times the standard deviation of the differences. Observations falling outside these bounds reflect substantial divergence in reported profits between the two sources.

Fig. A1: Bland–Altman plot comparing reported pre-tax profits in ORBIS and CbCR datasets, 2016



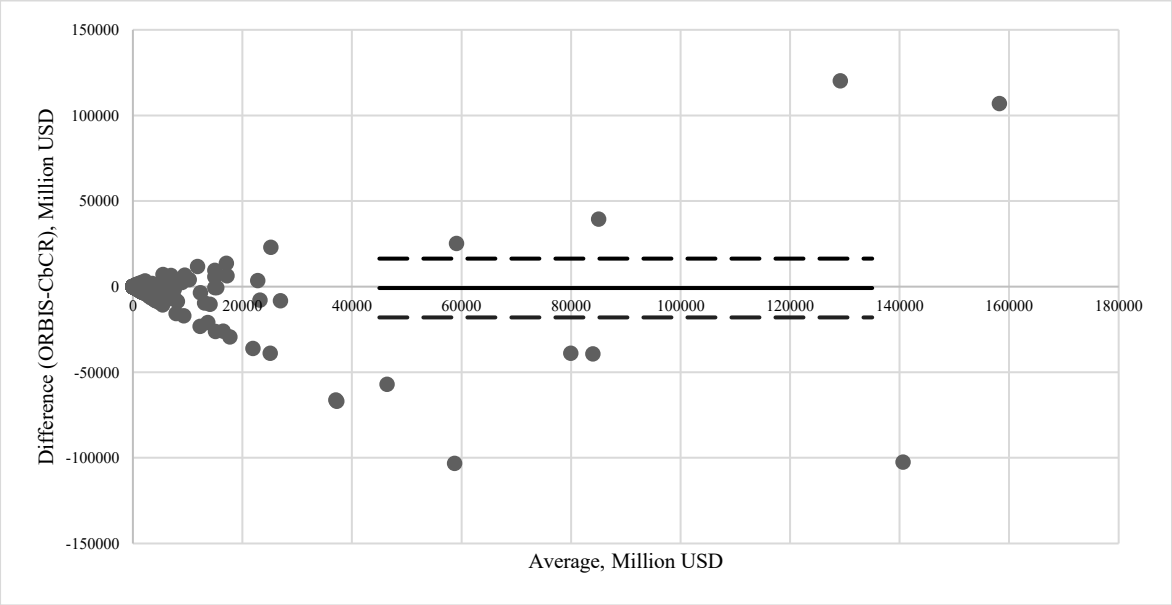
Note: See note of Figure A1.

Fig. A2: Bland–Altman plot comparing reported pre-tax profits in ORBIS and CbCR datasets, 2017



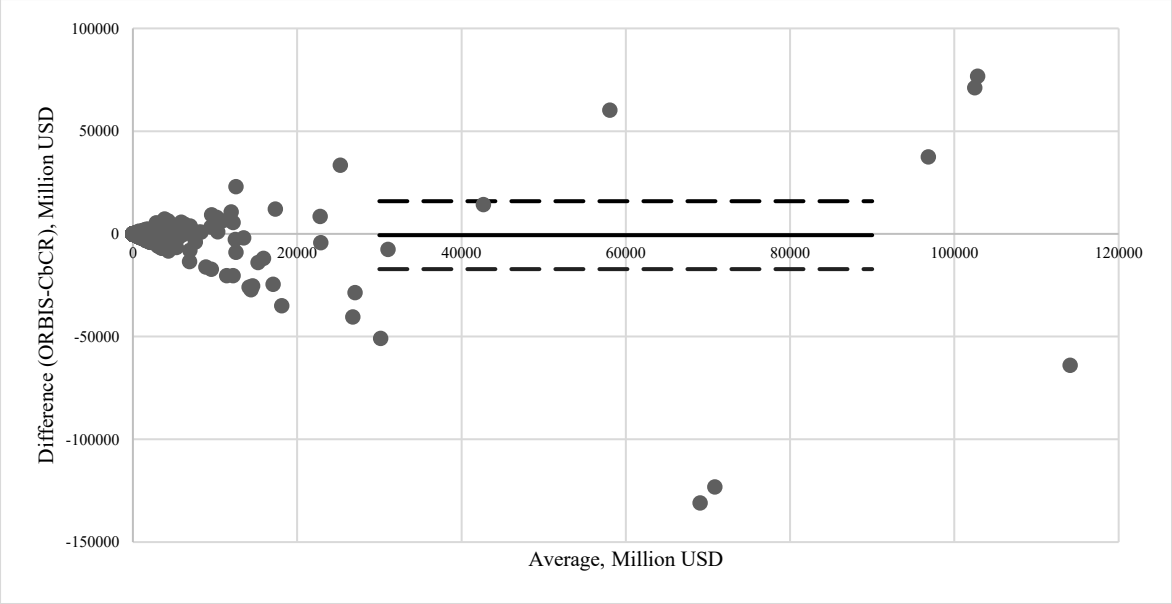
Note: See note of Figure A1.

Fig. A3: Bland–Altman plot comparing reported pre-tax profits in ORBIS and CbCR datasets, 2018



Note: See note of Figure A1.

Fig. A4: Bland–Altman plot comparing reported pre-tax profits in ORBIS and CbCR datasets, 2019



Note: See note of Figure A1.

Fig. A5: Bland–Altman plot comparing reported pre-tax profits in ORBIS and CbCR datasets, 2020

Appendix B: Summary of Mean Absolute Percentage Error (MAPE) Estimates Across Country Pairs

Table B1: Country Pairs with MAPE Below –100% in at Least Three Years in 2016–2021

Country pair	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Number of years with MAPE < -100%*	*Average MAPE*
Luxembourg*-Bulgaria	-199	-199	-200	-200	-200	-200	6	-200
Luxembourg*-Finland	-200	-200	-200	-199	-198	-200	6	-199
Denmark-Ukraine	-200	-200	-200	-200	-198	-199	6	-199
Bermuda*-Russian Federation	-198	-198	-199	-198	-199	-200	6	-199
Luxembourg*-Slovakia	-198	-189	-200	-199	-199	-195	6	-197
Singapore*-Japan	-192	-194	-198	-197	-199	-198	6	-196
Australia-Viet Nam	-197	-194	-197	-193	-194	-200	6	-196
Luxembourg*-Latvia	-175	-200	-200	-199	-199	-199	6	-195
Luxembourg*-Italy	-193	-196	-198	-198	-195	-191	6	-195
Luxembourg*-Austria	-198	-199	-199	-194	-193	-183	6	-194
China-Indonesia	-182	-190	-192	-195	-199	-199	6	-193
Luxembourg*-Portugal	-190	-195	-199	-191	-193	-189	6	-193
Belgium*-Netherlands*	-200	-187	-199	-199	-197	-174	6	-193
United States-Costa Rica	-194	-194	-196	-186	-192	-192	6	-192
Mexico-Slovakia	-195	-194	-195	-194	-186	-190	6	-192
Luxembourg*-Ireland	-199	-194	-163	-198	-199	-198	6	-192
United States-Egypt	-189	-189	-196	-194	-185	-194	6	-191
Luxembourg*-Romania	-189	-195	-197	-198	-196	-168	6	-190
Luxembourg*-Russian Federation	-172	-191	-197	-191	-197	-189	6	-189
China-Brazil	-190	-196	-193	-191	-185	-181	6	-189
Denmark-Ireland*	-191	-187	-187	-185	-196	-183	6	-188
Japan-Hong Kong*	-193	-191	-186	-188	-184	-182	6	-187
United States-Israel	-183	-187	-190	-183	-187	-189	6	-187
Luxembourg*-Estonia	-191	-167	-191	-187	-193	-187	6	-186
Italy-Ukraine	-192	-134	-198	-199	-198	-192	6	-186
United States-Kenya	-186	-171	-183	-190	-190	-189	6	-185
Australia-United States	-165	-171	-189	-184	-187	-198	6	-182
United States-Cayman Islands*	-171	-176	-177	-179	-193	-198	6	-182
France-Mexico	-192	-189	-194	-185	-180	-153	6	-182
Denmark-Slovenia	-172	-196	-170	-178	-177	-194	6	-181
Denmark-New Zealand	-176	-176	-177	-178	-184	-189	6	-180
United States-Ecuador	-170	-188	-181	-180	-175	-186	6	-180
Italy-United States	-190	-190	-182	-189	-190	-139	6	-180
Singapore-Philippines	-136	-184	-194	-193	-191	-172	6	-178
Italy-Belgium*	-188	-153	-179	-179	-194	-169	6	-177
Luxembourg*-Netherlands*	-150	-174	-189	-172	-194	-179	6	-177
United States-Argentina	-170	-180	-172	-169	-166	-194	6	-175
Italy-Turkey	-170	-188	-156	-180	-167	-189	6	-175
China-Hong Kong*	-178	-174	-163	-180	-169	-185	6	-175
Chile-Brazil	-143	-178	-181	-184	-189	-173	6	-174
Luxembourg*-Czechia	-187	-171	-182	-176	-150	-179	6	-174
Luxembourg*-Australia	-137	-159	-167	-181	-199	-199	6	-174
China-Norway	-114	-184	-156	-193	-197	-198	6	-174
Italy-Singapore*	-194	-195	-183	-157	-166	-144	6	-173
China-United Kingdom*	-176	-179	-184	-181	-164	-148	6	-172
Denmark-Colombia	-184	-161	-182	-173	-193	-132	6	-171
United States-Hong Kong*	-185	-150	-137	-184	-179	-185	6	-170
Luxembourg*-China	-155	-147	-168	-170	-194	-183	6	-170
Luxembourg*-Singapore*	-183	-106	-158	-184	-191	-190	6	-169
United States-Cyprus*	-198	-190	-121	-152	-151	-199	6	-168
Australia-Canada	-154	-159	-177	-168	-171	-178	6	-168
Denmark-Luxembourg*	-199	-165	-156	-155	-156	-171	6	-167
China-Japan	-150	-190	-184	-177	-142	-131	6	-162
China-Netherlands*	-191	-128	-162	-172	-164	-156	6	-162
United States-El Salvador	-171	-170	-166	-160	-161	-142	6	-162
France-South Africa	-163	-139	-144	-138	-197	-181	6	-161
China-Australia	-177	-154	-167	-182	-168	-116	6	-161
Japan-Canada	-165	-166	-165	-165	-147	-153	6	-160
Denmark-Viet Nam	-194	-175	-136	-149	-139	-154	6	-158
United States-Taiwan	-151	-150	-155	-155	-163	-172	6	-158
Japan-United States	-146	-168	-149	-165	-151	-150	6	-155
China-Belgium*	-157	-139	-181	-188	-118	-144	6	-155
Denmark-China	-113	-144	-189	-158	-143	-181	6	-155
Italy-Sweden	-155	-131	-140	-173	-145	-177	6	-154
United States-Canada	-126	-143	-153	-166	-183	-143	6	-152
Denmark-Slovakia	-156	-156	-161	-170	-114	-154	6	-152
United States-Japan	-160	-152	-149	-158	-144	-141	6	-151
Singapore*-Indonesia	-167	-176	-183	-107	-122	-147	6	-150
Australia-China	-126	-180	-178	-150	-130	-133	6	-150
Mexico-Australia	-147	-140	-135	-155	-137	-164	6	-146
United States-Uruguay	-123	-121	-131	-128	-180	-193	6	-146
Italy-France	-107	-107	-131	-157	-186	-149	6	-140
Singapore*-Taiwan	-166	-144	-122	-154	-120	-120	6	-138

United States-Kazakhstan	-136	-156	-138	-145	-105	-139	6	-136
Denmark-Norway	-109	-167	-148	-136	-110	-147	6	-136
Italy-Poland	-180	-126	-129	-126	-126	-121	6	-135
Italy-India	-135	-137	-125	-147	-125	-118	6	-131
Denmark-Sweden	-125	-153	-142	-116	-113	-131	6	-130
Luxembourg*-Croatia	-200	-200	NA	-200	-200	-200	5	-200
Germany-Canada	NA	-199	-200	-198	-199	-198	5	-199
Luxembourg*-Viet Nam	-199	-199	NA	-198	-197	-199	5	-199
Germany-Switzerland*	NA	-198	-199	-199	-196	-195	5	-197
Spain-Finland	NA	-196	-198	-197	-197	-196	5	-197
Luxembourg*-Greece	NA	-198	-194	-196	-195	-198	5	-197
Switzerland*-Japan	NA	-191	-197	-199	-197	-199	5	-196
Luxembourg*-Denmark	NA	-197	-197	-191	-191	-196	5	-195
Germany-Japan	NA	-195	-193	-192	-193	-195	5	-193
Germany-Mexico	NA	-198	-199	-175	-199	-194	5	-193
Switzerland*-Taiwan	NA	-199	-185	-193	-192	-195	5	-193
Switzerland*-Panama*	NA	-183	-197	-191	-192	-196	5	-192
Japan-Bangladesh	NA	-191	-191	-194	-192	-189	5	-191
India-Sri Lanka	NA	-195	-195	-189	-182	-195	5	-191
Switzerland*-Indonesia	NA	-178	-189	-193	-193	-195	5	-190
Germany-Bosnia and Herzegovina	NA	-158	-195	-196	-195	-193	5	-187
United States-Honduras	NA	-195	-197	-190	-169	-182	5	-187
Spain-Russian Federation	NA	-187	-182	-184	-181	-190	5	-185
Germany-Luxembourg*	NA	-180	-194	-185	-181	-183	5	-184
Mexico-Colombia	-181	NA	-170	-196	-187	-185	5	-184
China-Colombia	-187	-176	NA	-191	-158	-198	5	-182
France-Argentina	NA	-186	-191	-152	-180	-195	5	-181
Australia-Japan	NA	-145	-195	-188	-187	-183	5	-179
Germany-Lithuania	NA	-171	-187	-188	-167	-175	5	-177
Denmark-Serbia	-69	-198	-199	-197	-199	-199	5	-177
Germany-Latvia	NA	-165	-172	-180	-181	-185	5	-177
China-Morocco	NA	-123	-200	-198	-199	-157	5	-175
Germany-United States	NA	-162	-181	-174	-174	-184	5	-175
Germany-Slovakia	NA	-174	-181	-172	-171	-175	5	-175
Switzerland*-Brazil	NA	-138	-187	-190	-189	-165	5	-174
Spain-Peru	NA	-172	-188	-191	-181	-131	5	-173
Switzerland*-Ukraine	NA	-150	-118	-198	-197	-196	5	-172
Japan-Taiwan	NA	-182	-177	-175	-166	-159	5	-172
Switzerland*-Turkey	NA	-136	-178	-185	-185	-171	5	-171
Germany-Malta*	NA	-190	-163	-186	-158	-152	5	-170
China-Denmark	NA	-157	-188	-184	-181	-139	5	-170
Spain-New Zealand	NA	-160	-174	-192	-155	-165	5	-169
Germany-Peru	NA	-160	-174	-180	-144	-184	5	-169
Spain-Bulgaria	NA	-172	-177	-183	-160	-150	5	-168
Germany-Croatia	NA	-149	-170	-178	-164	-171	5	-166
India-Canada	NA	-169	-150	-154	-196	-156	5	-165
Germany-Philippines	NA	-170	-166	-155	-158	-173	5	-165
Spain-Ecuador	NA	-123	-190	-148	-176	-185	5	-164
Switzerland*-Canada	NA	-175	-172	-151	-160	-161	5	-164
China-Austria	NA	-149	-189	-156	-154	-161	5	-162
Switzerland*-Kenya	NA	-137	-190	-190	-147	-141	5	-161
Luxembourg*-India	-177	-167	-179	-182	-70	-187	5	-160
Germany-Greece	NA	-147	-159	-182	-152	-153	5	-158
Luxembourg*-Colombia	-66	-178	-176	-180	-168	-182	5	-158
United States-Nigeria	-166	-185	-183	-173	-65	-175	5	-158
Denmark-Lithuania	-50	-149	-185	-187	-185	-190	5	-158
Japan-Peru	NA	-189	-129	-154	-188	-120	5	-156
Singapore*-Germany	-175	-155	-173	-181	-157	-93	5	-156
Denmark-Bulgaria	-156	-161	-173	-173	-87	-180	5	-155
Switzerland*-Mexico	NA	-183	-124	-130	-158	-175	5	-154
Germany-Slovenia	NA	-147	-140	-160	-158	-164	5	-154
India-Russian Federation	NA	-173	-126	-127	-187	-155	5	-154
Italy-Peru	-166	-42	-185	-171	-181	-176	5	-153
Germany-Turkey	NA	-132	-150	-162	-144	-177	5	-153
Germany-Brazil	NA	-184	-151	-118	-145	-157	5	-151
Luxembourg*-Malaysia	-167	-103	-145	-166	NA	-166	5	-149
Spain-China	NA	-125	-172	-154	-147	-140	5	-148
Spain-Sweden	NA	-147	-171	-149	-116	-153	5	-147
Germany-Serbia	NA	-102	-173	-153	-143	-161	5	-146
South Africa-Tanzania	-129	-129	-126	-151	-189	NA	5	-145
India-Luxembourg*	NA	-101	-143	-179	-114	-187	5	-145
Germany-Czechia	NA	-152	-157	-155	-119	-139	5	-144
Brazil-United States	-44	-131	-127	-160	-190	-197	5	-141
Spain-Luxembourg*	NA	-162	-128	-104	-154	-159	5	-141
Spain-Belgium*	NA	-135	-169	-115	-131	-153	5	-141
Germany-Hungary	NA	-151	-145	-136	-131	-132	5	-139
Singapore*-Cayman Islands*	-166	-200	-152	-132	-155	-21	5	-138
Luxembourg*-Sweden	-149	-197	-141	-145	-130	-63	5	-137
Denmark-Germany	-57	-155	-171	-127	-181	-134	5	-137
China-South Korea	-37	-148	-162	-173	-146	-158	5	-137
Bermuda*-Thailand	-159	-165	-190	-106	-60	-143	5	-137
Japan-Mexico	NA	-152	-162	-131	-129	-104	5	-136

India-Japan	NA	-155	-108	-162	-120	-133	5	-136
Denmark-Netherlands*	-170	-160	-127	-57	-114	-183	5	-135
Bermuda*-Italy	-121	-114	-171	-73	-167	-158	5	-134
Japan-Indonesia	NA	-136	-134	-127	-165	-107	5	-134
Switzerland*-Pakistan	NA	-106	-121	-145	-156	-141	5	-134
Denmark-Romania	-29	-151	-131	-187	-151	-153	5	-134
Italy-Egypt	-115	-47	-167	-161	-149	-163	5	-134
Japan-Viet Nam	NA	-128	-128	-139	-140	-130	5	-133
Germany-Chile	NA	-178	-131	-111	-107	-136	5	-132
China-Turkey	-103	-93	-158	-182	-117	-140	5	-132
Brazil-United Kingdom	-127	-131	-104	-148	-95	-181	5	-131
Germany-Portugal	NA	-133	-140	-108	-132	-142	5	-131
Denmark-Russian Federation	-168	-98	-164	-128	-121	-106	5	-131
Switzerland*-South Korea	NA	-132	-112	-129	-158	-121	5	-130
Denmark-Croatia	-21	-148	-145	-140	-146	-177	5	-129
Brazil-Singapore*	-128	-144	-150	-72	-167	-114	5	-129
Germany-Bangladesh	NA	-103	-112	-136	-162	-131	5	-129
Denmark-India	-86	-157	-123	-136	-124	-128	5	-125
Australia-Philippines	-65	-138	-124	-149	-133	-139	5	-124
Denmark-Czechia	-75	-135	-119	-135	-136	-129	5	-122
Brazil-Germany	-177	-172	-151	-128	-102	12	5	-120
Denmark-Poland	-87	-112	-119	-134	-140	-117	5	-118
China-Singapore*	-106	-107	-143	-132	-126	-92	5	-118
China-Luxembourg*	-39	-105	-136	-159	-122	-141	5	-117
France-Greece	-133	-118	NA	-110	-111	-104	5	-115
Denmark-France	-99	-121	-108	-111	-100	-116	5	-109
China-France	0	-114	-104	-121	-144	-161	5	-107
China-New Zealand	150	-158	-171	-161	-146	-120	5	-101
Norway-Bulgaria	NA	NA	-200	-199	-199	-200	4	-199
Brazil-Uruguay	-200	-199	-198	-199	NA	NA	4	-199
Hong Kong*-Portugal	NA	NA	-200	-199	-199	-198	4	-199
Mexico-South Korea	NA	-196	NA	-200	-199	-198	4	-198
Hong Kong-Ireland	NA	NA	-197	-198	-198	-197	4	-198
Hong Kong-Malaysia	NA	NA	-197	-199	-197	-196	4	-197
United States-Mauritius*	NA	-200	-200	NA	-199	-191	4	-197
Hong Kong*-Macao	NA	NA	-198	-198	-195	-197	4	-197
Hong Kong*-Philippines	NA	NA	-200	-190	-199	-197	4	-197
Japan-Paraguay	NA	-195	-197	-197	-197	NA	4	-197
Switzerland*-Macao	NA	-197	-197	-198	-193	NA	4	-196
Denmark-Japan	-191	-196	NA	-200	-199	NA	4	-196
Hong Kong*-Viet Nam	NA	NA	-194	-198	-196	-197	4	-196
India-United States	NA	-184	NA	-200	-200	-200	4	-196
Spain-Morocco	NA	-197	-197	-197	NA	-193	4	-196
Hong Kong*-Finland	NA	NA	-184	-200	-200	-200	4	-196
Hong Kong*-South Korea	NA	NA	-197	-198	-189	-199	4	-196
Norway-Malaysia	NA	NA	-196	-197	-195	-194	4	-195
Japan-Argentina	NA	-192	-193	-195	-198	NA	4	-194
Cayman Islands-British Virgin Islands	NA	NA	-195	-191	-196	-191	4	-193
Hong Kong*-Thailand	NA	NA	-180	-199	-194	-199	4	-193
Cayman Islands*-France	NA	NA	-195	-194	-185	-193	4	-192
Switzerland*-Peru	NA	NA	-199	-190	-176	-198	4	-191
Hong Kong*-Poland	NA	NA	-200	-200	-164	-196	4	-190
Hong Kong*-Romania	NA	NA	-191	-190	-188	-190	4	-190
Bermuda*-Taiwan	NA	-197	-195	-174	-187	NA	4	-188
Spain-Venezuela	NA	NA	-186	-184	-198	-183	4	-188
Mexico-Austria	-154	-198	-197	NA	NA	-199	4	-187
Denmark-Brazil	-156	NA	-195	NA	-198	-198	4	-187
Switzerland*-Chile	NA	-199	-196	NA	-166	-179	4	-185
Italy-New Zealand	-190	-191	NA	NA	-170	-181	4	-183
Hong Kong*-Italy	NA	NA	-176	-176	-195	-182	4	-182
Hong Kon*g-Netherlands*	NA	NA	-196	-191	-143	-194	4	-181
France-United States	NA	-170	-170	NA	-181	-199	4	-180
China-Ukraine	NA	NA	-160	-189	-183	-185	4	-179
Hong Kong*-China	NA	NA	-178	-176	-174	-168	4	-174
Brazil-Mexico	-146	-174	-169	NA	-194	NA	4	-171
Norway-Russian Federation	NA	NA	-166	-149	-171	-192	4	-169
Netherlands*-Hungary	NA	NA	-165	-171	-169	-168	4	-168
Hong Kong*-Russian Federation	NA	NA	-194	-147	-176	-154	4	-168
United States-South Africa	-157	-152	-169	-192	NA	NA	4	-167
Luxembourg*-Hungary	-139	-175	-170	-180	NA	NA	4	-166
Luxembourg*-Philippines	-160	NA	-162	-153	-189	NA	4	-166
Hong Kong*-India	NA	NA	-180	-172	-157	-152	4	-165
Hong Kong*-Czechia	NA	NA	-167	-163	-175	-152	4	-164
Mexico-Ireland*	NA	NA	-194	-159	-123	-181	4	-164
Germany-Estonia	NA	-158	-98	-166	-192	-198	4	-163
India-United Arab Emirates	NA	-150	-172	-166	-151	NA	4	-160
Norway-Netherlands*	NA	NA	-185	-144	-132	-177	4	-160
Hong Kong*-Germany	NA	NA	-185	-122	-135	-186	4	-157
Japan-Cyprus*	NA	-198	-153	-144	-89	-198	4	-156
Bermuda*-Brazil	-199	NA	-133	-74	-191	-174	4	-154
United States-Bermuda*	-168	-178	-193	-156	NA	-61	4	-151
Netherlands*-Finland	NA	NA	-161	-162	-126	-149	4	-150

Cayman Islands*-South Korea	NA	NA	-140	-154	-148	-156	4	-149
Cayman Islands*-Japan	NA	NA	-168	-199	-111	-117	4	-149
Norway-Latvia	NA	NA	-153	-147	-135	-154	4	-147
China-Israel	NA	-68	-181	-125	-185	-164	4	-145
Malaysia-China	NA	-36	-187	-158	-171	-166	4	-144
Hong Kong*-Spain	NA	NA	-133	-137	-176	-122	4	-142
Switzerland*-Slovenia	NA	-153	-67	-162	-159	-167	4	-142
Mexico-Argentina	-156	-171	-106	-197	NA	-77	4	-142
China-Canada	-48	-118	-185	-198	-159	NA	4	-142
Denmark-Iceland	NA	-7	-155	-170	-185	-185	4	-140
India-South Korea	NA	-143	-188	4	-186	-184	4	-140
Singapore*-Luxembourg*	NA	NA	-101	-139	-159	-159	4	-139
Mexico-Netherlands*	-196	NA	-181	-151	13	-174	4	-138
Hong Kong-Belgium*	NA	NA	-106	-123	-147	-173	4	-137
Denmark-Turkey	-88	-97	-144	-180	-142	-170	4	-137
Spain-Malaysia	NA	-158	-144	-179	-23	-169	4	-135
Switzerland*-United States	NA	-72	-120	-153	-167	-153	4	-133
Denmark-Philippines	NA	NA	-158	-146	-126	-102	4	-133
Germany-Russian Federation	NA	-154	-164	-131	-97	-109	4	-131
Netherlands*-Romania	NA	NA	-120	-115	-134	-151	4	-130
Denmark-Singapore*	-23	-95	-170	-153	-142	-179	4	-127
Malaysia-Viet Nam	NA	NA	-104	-117	-160	-126	4	-127
Bermuda*-Viet Nam	-175	-94	-155	-133	-129	-74	4	-126
Singapore*-Australia	-83	-165	-155	-128	-78	-147	4	-126
India-Mexico	NA	-156	-121	-122	-81	-142	4	-124
Luxembourg*-France	-123	-128	-96	-183	-162	-49	4	-124
Germany-New Zealand	NA	-152	-130	-109	-94	-131	4	-123
Netherlands*-Brazil	NA	NA	-110	-116	-127	-139	4	-123
United States-Indonesia	-94	-127	-135	-90	-124	-161	4	-122
India-China	NA	-175	-172	-124	-25	-110	4	-121
Norway-China	NA	NA	-103	-135	-118	-126	4	-120
France-Thailand	-99	-124	-127	NA	-136	-114	4	-120
Australia-Thailand	-140	-124	-128	-99	-91	-126	4	-118
China-Romania	NA	-25	-136	-158	-139	-130	4	-118
Switzerland*-Luxembourg*	NA	-134	-53	-148	-118	-129	4	-117
Switzerland*-Argentina	NA	-94	-127	-111	-144	-105	4	-116
Chile-Peru	-76	-110	-108	-142	-185	-72	4	-116
China-Thailand	-85	-118	-98	-146	-117	-118	4	-114
United States-Brazil	-82	-114	-125	-97	-116	-136	4	-112
Bermuda*-India	-27	-135	-118	-127	-161	-99	4	-111
India-Mauritius*	NA	-125	-164	-125	-41	-101	4	-111
Mexico-Portugal	-187	-163	-189	177	NA	-192	4	-111
United States-Turkey	-112	-106	-112	-97	-97	-128	4	-109
Italy-Luxembourg*	-86	-134	-119	-102	-120	-87	4	-108
South Africa-Zimbabwe	-102	-96	-125	-124	-70	-129	4	-108
Luxembourg*-Germany	-142	-108	-101	-72	-121	-83	4	-104
Brazil-Netherlands*	-174	-180	163	-180	-147	-84	4	-100
Mexico-Hungary	-158	5	-123	-128	-45	-153	4	-100
China-Sweden	39	-161	-167	-189	69	-192	4	-100
Bermuda*-Belgium*	143	-105	-147	-87	-195	-106	4	-83
Italy-Portugal	-172	86	88	-142	-154	-166	4	-77
Canada-Netherlands*	-183	139	-146	-131	-112	154	4	-47
Germany-Taiwan	NA	-200	NA	NA	-199	-199	3	-200
Luxembourg*-Mexico	NA	-199	NA	-199	-199	NA	3	-199
Chile-Argentina	-200	-199	-199	NA	NA	NA	3	-199
Netherlands*-Bulgaria	NA	NA	NA	-199	-198	-198	3	-198
Spain-Philippines	NA	-200	NA	-197	NA	-198	3	-198
Hong Kong*-United States	NA	NA	-198	-198	NA	-199	3	-198
Norway-Turkey	NA	NA	-197	NA	-198	-199	3	-198
Mexico-Brazil	-195	NA	-198	-200	NA	NA	3	-198
Hong Kong*-Japan	NA	NA	-199	-195	-195	NA	3	-196
Australia-Indonesia	NA	-195	-195	-196	NA	NA	3	-195
Hong Kong*-Norway	NA	NA	-191	-198	-197	NA	3	-195
Luxembourg*-Uruguay	NA	-200	-185	-197	NA	NA	3	-194
Spain-South Korea	NA	NA	-197	NA	-193	-190	3	-193
China-Mexico	NA	NA	NA	-194	-191	-192	3	-193
Italy-Mexico	NA	NA	-184	NA	-199	-193	3	-192
United States-Barbados	NA	NA	-192	-190	-192	NA	3	-191
Brazil-China	NA	NA	-200	-178	NA	-196	3	-191
Netherlands*-United States	NA	NA	-191	NA	-189	-193	3	-191
Cayman Islands*-Hong Kong*	NA	NA	-190	-190	-189	NA	3	-190
Germany-Saudi Arabia	NA	NA	NA	-190	-189	-188	3	-189
India-Brazil	NA	-190	-180	NA	-189	NA	3	-186
France-Mauritius*	NA	-163	NA	-198	-196	NA	3	-186
Norway-Viet Nam	NA	NA	-179	-181	NA	-192	3	-184
Australia-Russian Federation	NA	-199	-191	NA	-159	NA	3	-183
Australia-Mexico	-181	NA	-199	-167	NA	NA	3	-182
Germany-Mauritius*	NA	-196	-136	NA	-199	NA	3	-177
Norway-Thailand	NA	NA	-196	NA	-129	-196	3	-174
Saudi Arabia-Singapore*	NA	NA	-192	-129	NA	-200	3	-173
Chile-Mexico	-169	NA	NA	NA	-198	-152	3	-173
Turkey-Netherlands*	NA	NA	NA	-161	-183	-174	3	-173

Saudi Arabia-United Kingdom	NA	NA	NA	-126	-188	-200	3	-171
Switzerland*-Mauritius*	NA	-199	-181	-132	NA	NA	3	-170
Argentina-Uruguay	NA	NA	-165	-148	NA	-189	3	-167
France-Indonesia	NA	-188	NA	-161	-150	NA	3	-166
Hong Kong*-Sweden	NA	NA	-69	-191	-195	-198	3	-163
Bermuda*-Philippines	NA	NA	-182	-186	NA	-103	3	-157
Japan-Kazakhstan	NA	-190	-159	-122	NA	NA	3	-157
Hong Kong*-Singapore*	NA	NA	-88	-178	-170	-190	3	-157
South Africa-Singapore*	NA	-193	-137	NA	-129	NA	3	-153
France-Luxembourg*	NA	-146	-152	-157	NA	NA	3	-151
Turkey-Russian Federation	NA	NA	NA	-178	-128	-146	3	-151
France-Philippines	-192	NA	NA	NA	-140	-108	3	-146
Switzerland*-Georgia	NA	NA	NA	-135	-151	-146	3	-144
Turkey-United Kingdom	NA	NA	NA	-169	-156	-101	3	-142
Cayman Islands*-Norway	NA	NA	-184	-87	-176	-107	3	-139
Portugal-Poland	NA	NA	NA	-112	-148	-143	3	-134
Hong Kong*-Denmark	NA	NA	-160	-164	-155	-55	3	-133
Denmark-Mexico	-91	-163	-193	-99	-68	-187	3	-133
Japan-Uruguay	NA	-180	-124	-164	-66	NA	3	-133
Malaysia-Australia	NA	NA	-145	-161	-97	-127	3	-133
Peru-Colombia	NA	NA	-185	23	-200	-169	3	-132
France-Côte d'Ivoire	-181	-174	NA	NA	-183	13	3	-131
Malaysia-India	NA	NA	-178	-189	-48	-109	3	-131
Canada-China	NA	-127	-140	NA	NA	-124	3	-130
Japan-Cambodia	NA	-190	-190	-68	-138	-57	3	-129
Australia-Colombia	NA	-55	-171	-109	-178	NA	3	-128
Cayman Islands*-Germany	NA	NA	-43	-133	-165	-173	3	-128
Germany-Pakistan	NA	-109	-95	-135	NA	-166	3	-126
Luxembourg*-South Korea	-158	-77	-121	-98	NA	-160	3	-123
Denmark-Morocco	NA	-167	-153	-143	NA	-22	3	-121
Singapore*-Italy	NA	-183	-81	-121	-126	-81	3	-118
Germany-Uruguay	NA	-127	-114	-110	NA	NA	3	-117
Italy-Finland	-80	-81	-166	-157	-94	-119	3	-116
Switzerland*-Morocco	NA	-127	-45	-189	-35	-183	3	-116
Spain-Slovakia	NA	-73	-129	-143	-79	-155	3	-116
China-Portugal	NA	-38	-139	-175	-137	-87	3	-115
Hong Kong*-Bermuda*	NA	NA	4	-128	-183	-150	3	-114
Portugal-Belgium*	NA	NA	NA	-101	-112	-129	3	-114
Denmark-Estonia	-93	-95	-134	-132	-87	-126	3	-111
Hong Kong*-United Kingdom	NA	NA	-52	-125	-112	-153	3	-110
China-Malaysia	-29	-160	-96	-144	-90	-142	3	-110
Germany-Italy	NA	-126	-84	-94	-127	-105	3	-107
Norway-Sweden	NA	NA	-123	-101	-62	-135	3	-105
Germany-France	NA	-99	-117	-91	-111	-107	3	-105
Denmark-Portugal	-45	-147	-72	-101	-183	-82	3	-105
Mexico-Serbia	179	NA	-197	-198	NA	-199	3	-104
Switzerland*-Australia	NA	-67	-136	-144	-37	-132	3	-103
Australia-Ireland*	-160	-187	-181	-97	-59	73	3	-102
Japan-Lithuania	NA	-114	-116	-147	-98	-33	3	-101
Italy-Monaco	-106	-90	-142	-111	-78	-80	3	-101
Mexico-Turkey	-200	-149	-139	-12	-42	-63	3	-101
Switzerland*-Slovakia	NA	-56	-80	-114	-119	-127	3	-99
Luxembourg*-Ukraine	-117	-80	-14	-199	-152	-29	3	-99
Norway-France	NA	NA	-115	-47	-121	-107	3	-98
Singapore*-Netherlands*	-141	-140	-68	-52	-125	-57	3	-97
Italy-Germany	-141	-51	-124	-117	-65	-85	3	-97
Denmark-United Kingdom	-73	-63	-110	-105	-95	-131	3	-96
Italy-China	-91	-88	-111	-62	-103	-114	3	-95
Brazil-Spain	-121	-14	-40	-85	-174	-130	3	-94
Switzerland*-Singapore*	NA	-101	-96	-46	-104	-111	3	-91
Japan-Morocco	NA	-149	-84	-197	98	-123	3	-91
Canada-United States	-49	-101	-73	-123	-106	NA	3	-90
Denmark-Malaysia	-72	-101	-112	-106	-63	-85	3	-90
India-Ukraine	NA	-151	74	-19	-150	-194	3	-88
Switzerland*-Austria	NA	-47	-60	-115	-104	-115	3	-88
Spain-Romania	NA	-107	-110	-119	-31	-73	3	-88
Switzerland*-New Zealand	NA	-102	-80	-112	-21	-109	3	-85
China-Italy	26	-93	-62	-133	-127	-115	3	-84
Australia-South Korea	-99	-156	-115	-130	-70	73	3	-83
Bermuda*-United States	6	-90	-86	-110	-111	-105	3	-82
Italy-Malaysia	-67	-52	-108	-133	-22	-108	3	-81
Bermuda*-Spain	-102	-92	-121	-57	-8	-107	3	-81
Malaysia-Hong Kong*	NA	NA	-109	-103	27	-129	3	-78
Denmark-Italy	-21	-104	-101	-76	-105	-60	3	-78
Italy-Greece	-192	-111	-176	8	37	-11	3	-74
Mexico-Spain	-18	-20	-127	-103	-163	-14	3	-74
Denmark-Hungary	71	-111	-89	-100	-85	-108	3	-71
Brazil-Austria	-123	-122	-54	-17	-200	107	3	-68
Luxembourg*-United Kingdom	54	-29	-43	-118	-161	-106	3	-67
China-Greece	NA	-67	84	-103	-111	-108	3	-61

Note: An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

Table B2: Country Pairs with MAPE Between –50% and +50% in at Least Three Years in 2016–2021

Country pair	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*Number of years with MAPE between -50% and +50%*	*Average absolute MAPE, computed from annual absolute values*
Australia-New Zealand	43	-24	-35	-39	-48	-23	6	35
United States-Slovakia	20	34	-42	-28	-34	-18	6	29
Bermuda*-Indonesia	32	30	42	32	20	16	6	29
United States-India	-32	-28	-25	-29	-22	-30	6	28
United States-Croatia	26	24	-8	33	47	20	6	26
Singapore*-Thailand	22	10	-34	-28	-39	-13	6	24
United States-Italy	38	-16	25	48	12	-6	6	24
Italy-Croatia	11	49	15	2	50	-8	6	23
United States-Germany	32	23	16	15	37	6	6	22
France-Germany	-28	-28	-12	-14	10	-29	6	20
United States-Poland	-14	-11	-32	-11	-12	-30	6	18
Singapore*-Malaysia	-32	1	-15	-6	-22	-33	6	18
Japan-Malaysia	34	9	13	-5	6	29	6	16
United States-Belgium	-12	-10	-9	40	9	-14	6	16
United States-Portugal	29	5	19	13	14	14	6	16
United States-Chile	-29	-6	-26	19	-3	2	6	14
Bermuda*-France	13	23	11	-17	3	19	6	14
Denmark-Thailand	-24	-35	9	-13	-2	1	6	14
South Africa-Namibia	6	4	-20	24	-26	-3	6	14
United States-Bulgaria	8	8	-3	0	-13	41	6	12
Japan-Thailand	-4	4	11	-4	-15	25	6	10
United States-Spain	-2	6	9	-11	-4	10	6	7
United States-Czechia	16	2	-18	0	2	-3	6	7
United States-Lithuania	5	-9	-1	4	10	-6	6	6
Bermuda*-Germany	86	-13	19	38	44	24	5	37
Japan-China	-90	-14	-49	-34	-19	-16	5	37
Germany-Denmark	NA	-46	-34	-15	-37	-45	5	35
Italy-Ireland*	-49	13	6	63	41	39	5	35
Japan-Belgium*	-26	15	37	-52	-49	12	5	32
Italy-Spain	-16	-5	-24	50	83	-14	5	32
Germany-Finland	NA	-24	-29	37	-20	-48	5	32
Japan-Croatia	NA	18	-39	-35	-22	-36	5	30
Denmark-Australia	9	-47	-96	2	-1	-26	5	30
Japan-Romania	NA	-33	-38	-21	-11	-34	5	27
India-Italy	NA	-42	-14	26	-17	-39	5	27
France-India	-20	-3	-29	-44	-51	-16	5	27
Australia-Singapore*	-67	-18	-2	21	34	-18	5	27
United States-Austria	-9	-59	-10	-27	-20	-31	5	26
United States-China	-5	-11	-52	-31	-24	-34	5	26
Japan-Bulgaria	NA	-32	-10	-14	-38	-35	5	26
Switzerland*-Colombia	NA	-28	-50	-21	-7	-18	5	25
France-Spain	-33	-23	-24	55	-1	-9	5	24
United States-Malaysia	14	-6	13	19	20	-72	5	24
Spain-Brazil	NA	17	41	15	5	42	5	24
Singapore-Viet Nam	-29	-25	-13	4	-53	-21	5	24
Spain-Mexico	NA	14	25	26	25	29	5	24
Spain-India	NA	17	30	-35	7	-24	5	23
Switzerland*-Bulgaria	NA	18	-7	-25	-40	-20	5	22
Switzerland*-Netherlands*	NA	28	29	-1	-40	-14	5	22
Japan-Hungary	NA	-7	-28	-22	-42	8	5	21
Japan-India	NA	-9	-10	-49	-16	21	5	21
Spain-Portugal	NA	19	-33	9	38	-4	5	21
Malaysia-Singapore*	NA	27	31	26	1	18	5	20
France-Romania	NA	-14	-21	-21	-16	-27	5	20
Spain-Czechia	NA	-2	24	23	8	-41	5	19
Japan-New Zealand	NA	-17	-8	-39	10	23	5	19
Mexico-Lithuania	28	-21	NA	-31	-1	-16	5	19
India-Spain	NA	6	-8	48	26	9	5	19
Japan-Slovakia	NA	-8	7	-15	-35	25	5	18
Japan-France	-10	-18	-4	-13	-1	59	5	17
United States-Finland	-7	14	1	51	22	2	5	16
Japan-Czechia	NA	15	18	8	-28	7	5	15
Japan-Poland	NA	-19	19	-13	0	20	5	14
Japan-Serbia	NA	4	-14	-21	26	3	5	14
Spain-Poland	NA	20	12	-1	-5	-25	5	13
Switzerland*-Malaysia	NA	-6	-7	25	16	11	5	13
Japan-Germany	NA	-7	-8	1	28	13	5	11
Japan-South Korea	NA	2	17	7	1	28	5	11
Japan-Austria	NA	8	-3	-16	-8	10	5	9
Belgium*-India	-3	NA	10	0	14	12	5	8

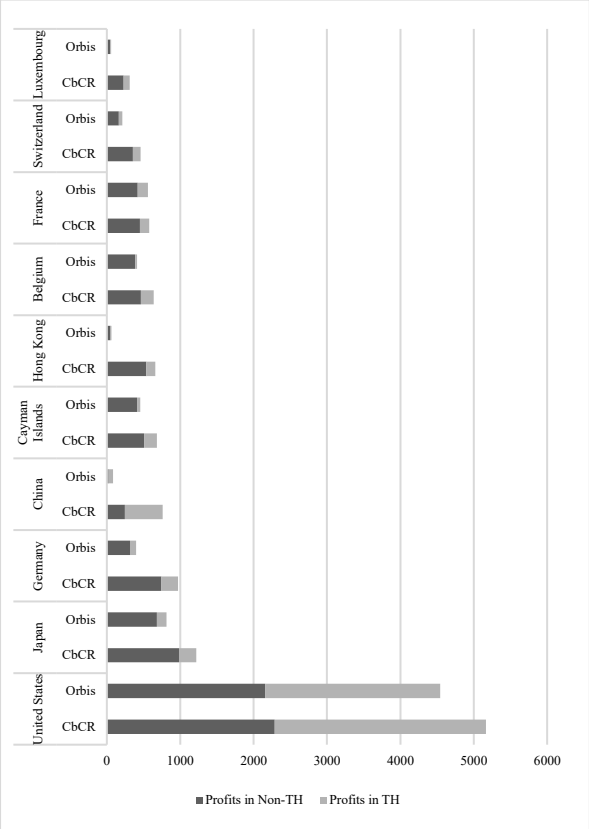
South Africa-Kenya	172	18	44	129	39	16	4	70
Italy-Slovenia	-37	106	-42	-18	-38	-103	4	57
Japan-Netherlands*	NA	-40	-44	-107	-42	41	4	55
Mexico-Italy	-32	NA	0	-25	-25	-179	4	52
Malaysia-United Kingdom	NA	178	19	36	-10	-16	4	52
United States-France	34	46	37	80	45	61	4	50
Italy-Serbia	-29	20	-132	-28	-38	-53	4	50
Bermuda*-Peru	-165	11	8	11	94	-9	4	50
Australia-India	20	-48	-54	-40	-79	-48	4	48
United States-Netherlands*	-46	-57	-82	-49	33	-13	4	47
Switzerland*-France	NA	30	47	21	120	15	4	47
Belgium*-Spain	-16	-129	17	-9	36	72	4	47
Romania-Moldova	NA	188	-25	7	6	6	4	47
Belgium*-Australia	18	36	-50	-133	1	-38	4	46
Italy-Romania	-82	25	-46	-19	-72	-32	4	46
Germany-Malaysia	NA	-50	-46	-53	-34	-47	4	46
India-Romania	NA	4	21	12	176	15	4	46
United States-Slovenia	-45	-79	-43	-54	3	-45	4	45
Singapore*-China	-19	-55	-78	-42	-36	-35	4	44
Switzerland*-Norway	NA	164	-4	-11	-5	-36	4	44
Germany-Belgium	NA	-45	-26	-48	-54	-47	4	44
United States-Singapore*	16	12	86	46	75	29	4	44
Switzerland*-Spain	NA	33	-48	-92	-22	-21	4	43
China-India	-18	-35	-30	-69	-48	-58	4	43
Italy-Slovakia	-70	3	-26	-32	-44	-78	4	42
Switzerland*-Bermuda*	NA	-139	-43	-3	-2	23	4	42
India-Turkey	NA	-40	59	-49	-17	-44	4	42
Belgium*-Poland	-32	-42	4	-59	-63	-50	4	42
Australia-Malaysia	-100	-50	-45	17	32	3	4	41
Mexico-Norway	-13	-4	NA	5	-162	-21	4	41
South Africa-Uganda	49	-5	59	78	28	25	4	41
India-Germany	NA	-81	-22	-40	27	32	4	40
Brazil-Colombia	-14	-23	-33	-30	55	-80	4	39
Belgium*-France	17	22	74	-49	-71	-1	4	39
Bermuda*-Japan	5	-5	-39	-75	-3	-105	4	39
Switzerland*-Philippines	NA	-9	-12	-8	-4	-158	4	38
Italy-United Kingdom	-27	61	91	16	-21	-13	4	38
Italy-Hungary	-20	66	-28	-27	-53	-34	4	38
Italy-Albania	-18	52	36	-5	-40	-74	4	37
France-Brazil	9	-55	-47	-35	-40	NA	4	37
India-Sweden	NA	-90	4	-44	-7	-41	4	37
United States-Romania	-12	-34	-46	-51	-24	-51	4	36
Netherlands*-Belgium*	NA	NA	-39	-47	-36	-23	4	36
Germany-Bulgaria	NA	-13	-67	-32	-33	-33	4	36
Germany-Singapore*	NA	-20	76	3	35	-43	4	36
Switzerland*-Italy	NA	18	-27	-32	-72	-27	4	35
Bermuda*-South Korea	83	33	19	-64	-9	1	4	35
Japan-Latvia	NA	74	49	8	15	24	4	34
Norway-South Korea	NA	NA	36	-41	44	14	4	34
United States-Serbia	53	-6	-34	-63	-11	-27	4	32
Italy-Bosnia and Herzegovina	NA	141	-3	0	8	-6	4	32
United States-Greece	-56	-17	-64	-8	-11	-33	4	31
Switzerland*-Finland	NA	-15	21	25	80	16	4	31
Japan-Colombia	NA	-87	15	12	-36	-7	4	31
Switzerland*-United Kingdom	NA	26	43	-56	-9	22	4	31
Japan-Italy	NA	-14	-6	-87	12	35	4	31
Norway-Lithuania	NA	NA	-2	-35	-43	-41	4	31
Japan-Singapore*	NA	-21	-14	14	34	67	4	30
United States-Denmark	NA	9	-19	68	42	6	4	29
Switzerland*-Bosnia and	NA	51	30	23	35	4	4	29
Switzerland*-Sweden	NA	58	15	24	31	12	4	28
Australia-Luxembourg*	NA	11	-28	-35	-12	53	4	28
Australia-Germany	-3	27	10	12	56	54	4	27
Switzerland*-Greece	NA	76	-15	-24	-9	1	4	25
Belgium*-Brazil	NA	67	3	8	6	-31	4	23
Japan-Russian Federation	NA	-6	3	-13	-79	3	4	21
Netherlands*-Germany	NA	NA	-33	10	-9	31	4	21
Japan-Finland	NA	11	9	-18	5	54	4	19
Cayman Islands*-Malaysia	NA	NA	-12	-38	-2	-3	4	14
France-Slovakia	NA	-31	-12	NA	7	-1	4	13
Switzerland*-Sri Lanka	NA	-3	-18	-8	-12	NA	4	10
Mexico-Finland	NA	3	NA	0	15	-8	4	6
Bermuda*-Luxembourg*	36	36	-3	164	-169	-152	3	93
Italy-Greece	-192	-111	-176	8	37	-11	3	89
Bermuda*-Austria	-191	-124	-11	-72	-41	-18	3	76
Mexico-Spain	-18	-20	-127	-103	-163	-14	3	74
Germany-Tanzania	NA	-4	13	159	162	-18	3	71
United States-Luxembourg*	17	-28	100	43	104	119	3	68
Italy-Estonia	-48	37	-91	-141	-40	-54	3	68
Bermuda*-Canada	18	52	59	-47	-49	-185	3	68
Luxembourg*-Panama*	32	-52	-180	-93	-30	-21	3	68
Switzerland*-Malta*	NA	-24	31	-48	-80	154	3	67

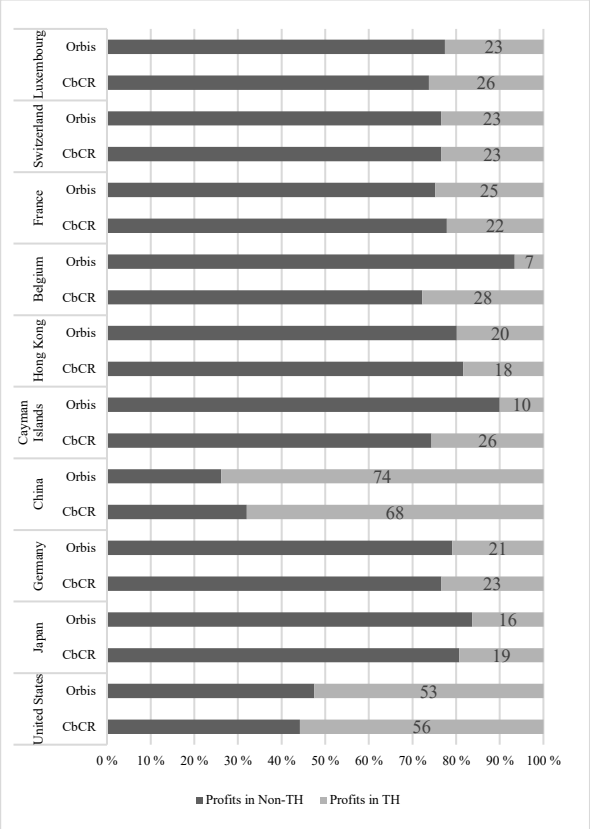
India-Thailand	NA	-9	146	28	123	27	3	66
United States-Ireland*	-37	103	73	93	39	46	3	65
Luxembourg*-Poland	-37	-110	-71	-105	-45	-17	3	64
Italy-Chile	23	16	43	55	131	117	3	64
Japan-United Kingdom	43	24	53	-4	132	119	3	63
United States-Tanzania	-20	-35	-43	-152	NA	NA	3	62
Spain-Ireland*	NA	-37	-45	-60	-116	-43	3	60
Malaysia-Thailand	NA	32	0	3	-163	-101	3	60
Singapore*-United Kingdom	40	-14	-23	-58	-123	-97	3	59
United States-Viet Nam	-95	-62	-44	-46	-40	-61	3	58
Bermuda*-China	-167	31	-59	-54	13	-21	3	57
Mexico-Czechia	-85	16	-40	-116	-56	-31	3	57
Germany-Iceland	NA	NA	-31	25	134	35	3	56
India-Australia	NA	3	-7	27	123	-120	3	56
Luxembourg*-Bosnia and Herzegovina	-25	68	-40	-113	-77	-10	3	55
China-Viet Nam	8	-43	-74	-94	-48	-65	3	55
Denmark-Latvia	-56	-42	-61	23	-35	-113	3	55
Japan-Spain	NA	-41	-77	-49	-70	36	3	55
Luxembourg*-Brazil	-87	-100	-55	-26	-35	-25	3	55
Switzerland*-Costa Rica	NA	93	-54	-46	-34	-43	3	54
South Africa-Germany	5	-36	-64	112	49	NA	3	53
China-Slovakia	NA	-8	NA	-27	-28	-150	3	53
Norway-Australia	NA	NA	180	-14	-8	11	3	53
Germany-Austria	NA	-38	-35	-106	-28	-56	3	53
Germany-Ireland*	NA	-49	-42	-82	-60	-29	3	52
India-Finland	NA	-16	119	-39	3	85	3	52
Spain-Colombia	NA	-76	-27	-30	-43	-80	3	51
Switzerland*-Thailand	NA	-26	-41	-44	-67	-75	3	51
Denmark-Belgium*	-44	-41	-57	68	8	-83	3	50
Malaysia-Indonesia	NA	-35	-61	-36	-35	-83	3	50
Germany-Indonesia	NA	-46	-74	-27	-49	-52	3	50
Luxembourg*-Spain	11	-46	-67	-25	-92	-57	3	50
United States-Russian Federation	-27	-70	-54	-49	-40	-57	3	49
Japan-Portugal	NA	59	37	59	46	44	3	49
Germany-Thailand	NA	-37	-46	-45	-52	-60	3	48
Switzerland*-Ecuador	NA	65	-59	-45	-37	-34	3	48
South Africa-Lesotho	-11	-35	-52	86	-36	-68	3	48
Norway-Belgium*	NA	NA	143	-31	13	-3	3	48
Switzerland*-Czechia	NA	-17	-39	-69	-46	-66	3	47
Australia-United Kingdom	-10	-17	21	61	79	96	3	47
United States-New Zealand	-47	-50	-55	-35	-63	-32	3	47
Belgium*-Germany	6	82	61	47	63	21	3	47
Spain-Norway	NA	51	33	39	82	27	3	46
Singapore*-New Zealand	NA	43	59	69	39	21	3	46
South Africa-Malawi	-19	-31	-99	7	-70	NA	3	45
India-Belgium*	NA	-57	30	-7	25	-107	3	45
Switzerland*-Poland	NA	-41	-32	-55	-43	-54	3	45
United States-Colombia	-14	-52	-81	-56	-23	-42	3	45
Germany-United Kingdom	NA	12	24	63	97	24	3	44
China-Bulgaria	NA	NA	38	-31	-46	-61	3	44
Cayman Islands*-Croatia	NA	NA	-160	-1	7	-7	3	44
Belgium*-China	15	NA	NA	-70	-47	-42	3	44
France-Colombia	-24	NA	NA	-44	-38	-66	3	43
Norway-Poland	NA	NA	55	42	38	35	3	42
China-Hungary	NA	-6	92	-63	-29	-20	3	42
Norway-United Kingdom	NA	NA	-92	39	-22	-15	3	42
France-Poland	-32	-15	NA	NA	-41	-78	3	42
Norway-India	NA	NA	-78	-43	-16	-28	3	41
Spain-Hungary	NA	-37	-55	-43	7	-61	3	40
Australia-Papua New Guinea	-8	-72	-36	-43	NA	NA	3	40
France-Netherlands*	-98	-18	-52	-24	-7	NA	3	40
Japan-Slovenia	NA	36	52	27	57	23	3	39
China-Serbia	NA	113	NA	7	32	0	3	38
Switzerland*-Latvia	NA	61	-3	-31	-27	-59	3	36
Australia-Italy	-20	-22	-66	NA	8	-62	3	36
France-Chile	-25	NA	NA	15	70	-32	3	35
France-Belgium*	NA	16	76	NA	11	37	3	35
Cayman Islands*-Spain	NA	NA	12	42	64	18	3	34
Belgium*-Romania	-46	8	NA	NA	NA	-46	3	33
Switzerland*-Nigeria	NA	-61	-84	2	5	-11	3	33
India-France	NA	11	3	58	62	25	3	32
Japan-Sweden	NA	59	19	-15	-6	60	3	32
Cayman Islands*-Colombia	NA	NA	-33	-15	-3	73	3	31
France-Sweden	-10	59	27	20	NA	NA	3	29
Japan-Norway	NA	12	-7	-53	-9	59	3	28
Switzerland*-Uruguay	NA	-15	-36	-30	NA	NA	3	27
Switzerland*-Serbia	NA	59	1	0	-21	-51	3	26
South Africa-Nigeria	NA	12	NA	80	9	0	3	25
Norway-Brazil	NA	NA	-2	16	72	9	3	25
Australia-Poland	NA	-15	NA	NA	13	-45	3	24

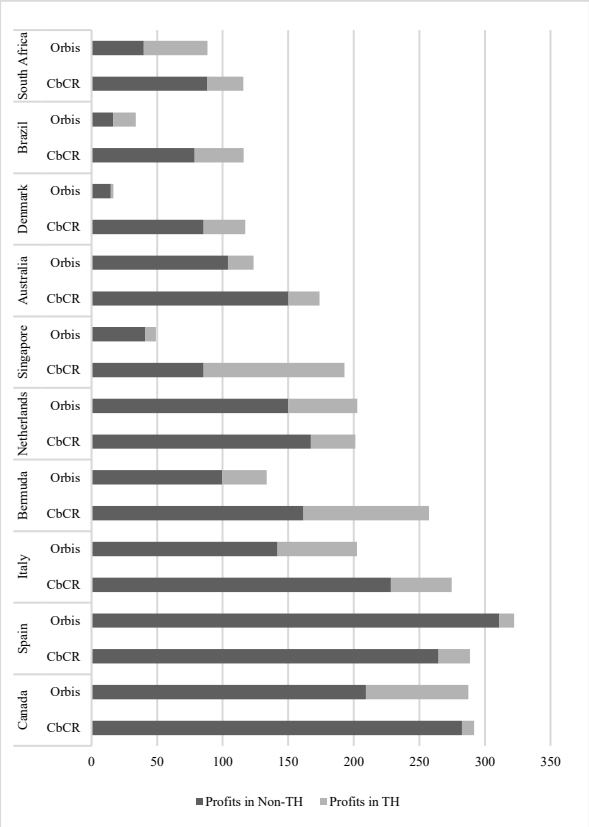
Norway-Estonia	NA	NA	-24	-15	0	-57	3	24
Greece-Bulgaria	NA	NA	NA	-32	-23	4	3	20
Switzerland*-Moldova	NA	NA	NA	10	-37	11	3	19
Greece-Spain	NA	NA	NA	-36	0	7	3	15
Greece-North Macedonia	NA	NA	NA	-17	-9	-4	3	10
Greece-Montenegro	NA	NA	NA	-16	-9	-4	3	10
France-Czechia	NA	NA	NA	-5	-9	-9	3	8
Cayman Islands*-Latvia	NA	NA	11	NA	7	-4	3	8
Cayman Islands*-Moldova	NA	NA	-2	2	0	NA	3	2

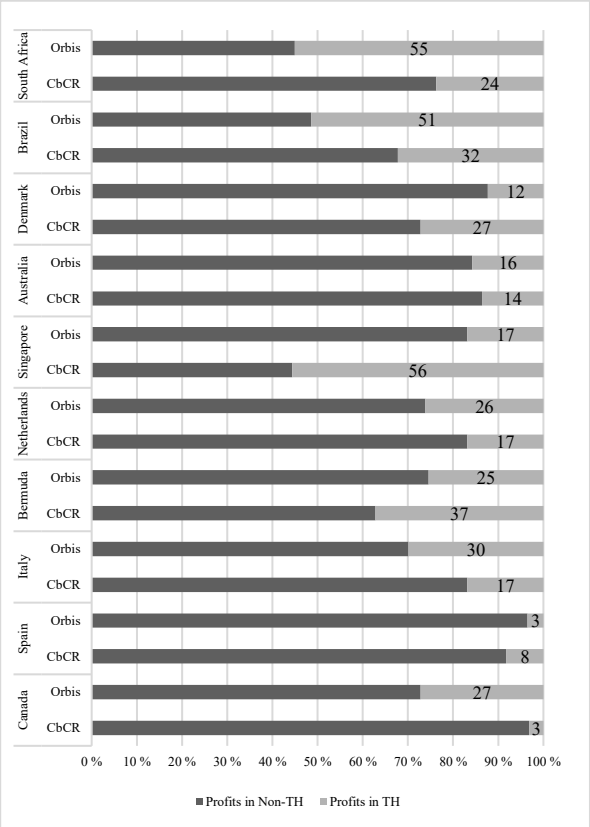
Note: An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

Appendix C: Comparison of Profits Across Parent Countries in Non-Tax Haven and Tax Haven Partner Countries between the CbCR and ORBIS Databases









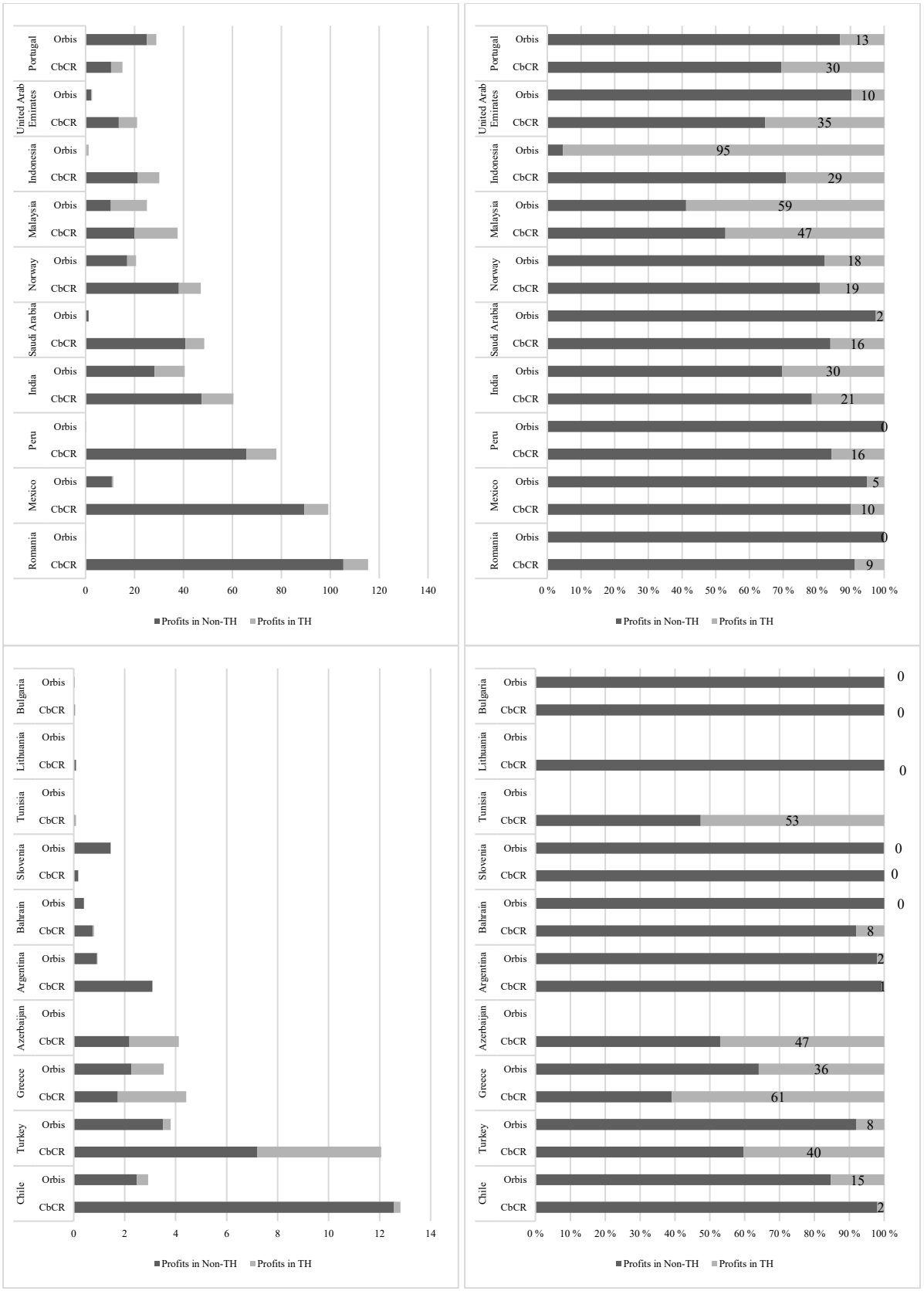


Fig. C1: Pre-Tax Profits by Parent Country in Non-Tax Haven and Tax Haven Partner Jurisdictions According to CbCR and ORBIS Data**,** Billion USD

Appendix D: The Analysis of Profit Allocation Gaps Between CbCR and ORBIS for Singapore and Indonesia

Table D1: Partner Jurisdiction-Level Profit Allocations by Singaporean MNEs in OECD CbCR and ORBIS Datasets (2016–2021)

Partner Country	*Profit in CbCR (million USD)*	*Percent in CbCR*	*Profit in ORBIS (million USD)*	*Percent in ORBIS*
Cayman Islands*	80457	41.71	398	0.81
China	30138	15.62	19118	38.95
Hong Kong*	14558	7.55	6158	12.55
Malaysia	10386	5.38	8611	17.55
Australia	9819	5.09	1802	3.67
Indonesia	8837	4.58	1272	2.59
United Kingdom	4319	2.24	2520	5.13
Japan	4045	2.10	24	0.05
Switzerland*	3418	1.77	NA	NA
United States	2828	1.47	NA	NA
Mauritius*	2771	1.44	NA	NA
India	2704	1.40	1091	2.22
Netherlands*	2341	1.21	766	1.56
Thailand	2189	1.13	1835	3.74
British Virgin Islands*	2057	1.07	NA	NA
Russia	1412	0.73	NA	NA
Vietnam	1229	0.64	987	2.01
Kazakhstan	1153	0.60	NA	NA
Philippines	900	0.47	32	0.07
South Korea	828	0.43	NA	NA
Taiwan	789	0.41	152	0.31
Luxembourg*	657	0.34	165	0.34
New Zealand	508	0.26	969	1.97
Italy	492	0.25	123	0.25
Canada	433	0.22	NA	NA
Belgium*	417	0.22	70	0.14
France	395	0.20	1039	2.12
United Arab Emirates	352	0.18	111	0.23
Spain	340	0.18	123	0.25
Germany	337	0.17	41	0.08
Brazil	315	0.16	NA	NA
Jersey*	294	0.15	NA	NA
Ireland	193	0.10	377	0.77
Mexico	161	0.08	50	0.10
Poland	146	0.08	143	0.29
Panama*	134	0.07	NA	NA
Ghana	125	0.06	32	0.06
Myanmar	121	0.06	NA	NA
Turkey	110	0.06	NA	NA
South Africa	51	0.03	NA	NA
Egypt	51	0.03	NA	NA
Sri Lanka	30	0.02	NA	NA
Papua New Guinea	27	0.01	NA	NA
Bangladesh	22	0.01	NA	NA
Pakistan	7	0.004	NA	NA
Saudi Arabia	6	0.003	NA	NA
Brunei	4	0.002	NA	NA
Kenya	1	0.001	NA	NA
Sweden	NA	NA	337	0.69
Macau	NA	NA	315	0.64
Hungary	NA	NA	122	0.25
Ukraine	NA	NA	99	0.20
Portugal	NA	NA	56	0.11
Denmark	NA	NA	53	0.11
Finland	NA	NA	38	0.08
Romania	NA	NA	33	0.07
Czech Republic	NA	NA	12	0.02
Slovakia	NA	NA	5	0.01
Norway	NA	NA	2	0.005

Note: An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

Table D2: Partner Jurisdiction-Level Profit Allocations by Indonesian MNEs in OECD CbCR and ORBIS Datasets (2016–2021)

Partner Country	*Profit in CbCR (million USD)*	*Percent in CbCR*	*Profit in ORBIS (million USD)*	*Percent in ORBIS*
Taiwan	12653.0	41.96	NA	NA
China	2867.0	9.51	NA	NA
Switzerland*	2664.0	8.83	NA	NA
Philippines	2296.0	7.61	NA	NA
Hong Kong*	1751.0	5.81	NA	NA
British Virgin Islands*	1606.0	5.32	NA	NA
Singapore*	978.0	3.24	1121.0	86.55
Malaysia	874.0	2.9	NA	NA
Macao	838.0	2.78	NA	NA
France	725.0	2.41	NA	NA
United States	513.0	1.7	NA	NA
Netherlands*	363.0	1.2	NA	NA
Cayman Islands*	271.0	0.9	NA	NA
Thailand	171.0	0.57	NA	NA
Japan	168.0	0.56	NA	NA
Mauritius*	163.0	0.54	115.0	8.87
Viet Nam	161.0	0.53	0.004	0.0003
United Kingdom	156.0	0.52	NA	NA
American Samoa	113.0	0.37	NA	NA
Germany	87.0	0.29	NA	NA
Timor-Leste	83.0	0.28	NA	NA
Barbados*	62.0	0.2	NA	NA
Australia	60.0	0.2	59.0	4.58
Oman	55.0	0.18	NA	NA
Seychelles*	45.0	0.15	NA	NA
Canada	38.0	0.13	NA	NA
Yemen	32.0	0.11	NA	NA
Algeria	29.0	0.1	NA	NA
India	25.0	0.08	0.004	0.0003
Bahamas*	24.0	0.08	NA	NA
Bangladesh	22.0	0.07	NA	NA
Mexico	21.0	0.07	NA	NA
Iraq	20.0	0.07	NA	NA
Niger	19.0	0.06	NA	NA
South Korea	17.0	0.06	NA	NA
Russia	16.0	0.05	NA	NA
Myanmar	12.0	0.04	NA	NA
Brazil	12.0	0.04	NA	NA
Bermuda*	11.0	0.04	NA	NA
Belgium*	10.0	0.03	NA	NA
Italy	10.0	0.03	NA	NA
Cambodia	10.0	0.03	NA	NA
Saudi Arabia	10.0	0.03	NA	NA
Virgin Islands (the USA)	9.0	0.03	NA	NA
Austria	9.0	0.03	NA	NA
Tunisia	8.0	0.03	NA	NA
Poland	7.0	0.02	NA	NA
Norway	7.0	0.02	NA	NA
Spain	6.0	0.02	NA	NA
Samoa*	6.0	0.02	NA	NA
Denmark	4.0	0.01	NA	NA
Marshall Islands*	3.0	0.01	NA	NA
Hungary	3.0	0.01	NA	NA
Sweden	3.0	0.01	NA	NA
Cyprus*	3.0	0.01	NA	NA
Jersey*	2.0	0.01	NA	NA
Senegal	2.0	0.01	NA	NA
Turkey	2.0	0.01	NA	NA
South Africa	2.0	0.01	NA	NA
Papua New Guinea	2.0	0.01	NA	NA
Monaco*	2.0	0.01	NA	NA
United Arab Emirates	1.0	0.005	NA	NA
Czechia	1.0	0.005	NA	NA
Nigeria	1.0	0.004	NA	NA
Slovakia	1.0	0.004	NA	NA
Slovenia	1.0	0.003	NA	NA
New Zealand	1.0	0.003	NA	NA
Panama*	1.0	0.003	NA	NA
Israel	1.0	0.002	NA	NA
Kazakhstan	1.0	0.002	NA	NA
Lao People's Democratic	1.0	0.002	NA	NA
Solomon Islands	1.0	0.002	NA	NA
Croatia	0.4	0.001	NA	NA
Ukraine	0.3	0.001	NA	NA
Sri Lanka	0.1	0.0004	NA	NA
Ecuador	0.03	0.0001	NA	NA
Chad	0.002	0.00001	NA	NA
Gabon	0.001	0.000002	NA	NA
Malta*	0.00003	0.0000001	NA	NA

Note: An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

Appendix E: Comparative Analysis of Profit Allocation Gaps Between CbCR and ORBIS for Selected Parent Countries

Turkey

Table E1 presents a jurisdiction-level comparison of profit allocations by Turkish multinational enterprises as reported in the CbCR and ORBIS datasets.

Table E1: Partner Jurisdiction-Level Profit Allocations by Turkish MNEs in OECD CbCR and ORBIS Datasets (2016–2021)

Partner Country	*Profit in CbCR (million USD)*	*Percent in CbCR*	*Profit in ORBIS (million USD)*	*Percent in ORBIS*
Russia	1768	14.66	279	7.34
Netherlands*	1528	12.67	219	5.74
Belgium*	1223	10.14	NA	NA
Bahrain*	979	8.12	NA	NA
Malta*	785	6.51	NA	NA
Kazakhstan	702	5.82	NA	NA
United Arab Emirates	667	5.53	NA	NA
Saudi Arabia	522	4.33	NA	NA
Germany	503	4.17	485	12.76
United States	287	2.38	456	11.97
United Kingdom	273	2.26	75	1.98
Switzerland*	263	2.18	NA	NA
Iraq	223	1.85	NA	NA
Ghana	210	1.74	NA	NA
Egypt	206	1.71	NA	NA
China	185	1.53	1	0.03
Romania	166	1.37	156	4.09
Pakistan	145	1.2	NA	NA
Uzbekistan	137	1.14	NA	NA
Azerbaijan	119	0.99	16	0.43
Qatar	105	0.87	NA	NA
Jordan	93	0.77	NA	NA
Ukraine	87	0.72	5	0.13
Algeria	62	0.51	NA	NA
Georgia	61	0.5	20	0.53
Albania	58	0.48	NA	NA
Greece	55	0.46	53	1.4
Turkmenistan	54	0.45	NA	NA
Bulgaria	50	0.41	643	16.89
Kosovo	49	0.41	NA	NA
North Macedonia	48	0.4	NA	NA
Morocco	47	0.39	0.1	0.0
Singapore*	42	0.35	21	0.56
Indonesia	41	0.34	149	3.9
Bosnia and Herzegovina	40	0.33	109	2.86
Poland	40	0.33	1	0.03
Finland	32	0.26	NA	NA
South Africa	29	0.24	NA	NA
Austria	28	0.24	493	12.95
Italy	25	0.21	65	1.72
Spain	22	0.18	0.42	0.01
France	22	0.18	4	0.12
Hong Kong*	14	0.12	NA	NA
Cyprus*	13	0.11	NA	NA
Croatia	13	0.11	NA	NA
Serbia	12	0.1	43	1.13
Luxembourg*	8	0.07	NA	NA
Hungary	6	0.05	1	0.03
Belarus	3	0.03	3	0.08
India	3	0.03	53	1.4
Libya	3	0.03	NA	NA
Israel	1	0.01	NA	NA
Ireland	1	0.005	67	1.75
Ivory Coast	0.46	0.004	NA	NA
Thailand	NA	NA	232	6.09
Bangladesh	NA	NA	78	2.05
Brazil	NA	NA	39	1.03
Slovakia	NA	NA	20	0.54
Sweden	NA	NA	11	0.28
Norway	NA	NA	5	0.14
Malaysia	NA	NA	2	0.04
Australia	NA	NA	1	0.02

Note: An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

According to the tax haven classification by Tørsløv, Wier, and Zucman (2023), Turkey allocates 40.3% of its foreign profits to tax havens in the CbCR dataset, compared to just 8.1% in ORBIS. This stark contrast highlights substantial differences in data coverage and reporting standards. CbCR identifies jurisdictions such as the Netherlands (12.67%), Belgium (10.14%), Bahrain (8.12%), Malta (6.51%), and Switzerland (2.18%) as key destinations for Turkish outbound profits, while ORBIS reports minimal or no allocations to these same jurisdictions. The discrepancy likely reflects ORBIS's structural limitations, including underreporting and incomplete coverage in low-transparency jurisdictions. The Turkish case illustrates the value of regulatory datasets like CbCR in capturing the geography of profit shifting and cautions against relying solely on commercial data sources for cross-country analysis.

United Arab Emirates

Table E2 presents a jurisdiction-level comparison of profit allocations by UAE multinational enterprises as reported in the CbCR and ORBIS datasets. Notably, the CbCR data for the UAE is available only for the year 2021, indicating that the country began reporting to the OECD relatively recently. In contrast, ORBIS provides data for the full period from 2016 to 2021.

Table E2: Partner Jurisdiction-Level Profit Allocations by UAE MNEs in OECD CbCR** and ORBIS Datasets (2016–2021)

Partner Country	*Profit in CbCR (million USD)*	*Percent in CbCR*	*Profit in ORBIS (million USD)*	*Percent in ORBIS*
Cayman Islands*	3126	14.86	4	0.17
Egypt	2693	12.81	1668	63.88
Canada	2458	11.69	NA	NA
Morocco	1293	6.15	4	0.17
Singapore*	1160	5.52	245	9.39
Bermuda*	888	4.22	NA	NA
United Kingdom	878	4.18	336	12.89
Ireland*	876	4.17	3	0.13
USA	647	3.08	NA	NA
Hungary	581	2.76	NA	NA
Turkey	512	2.43	5	0.17
Spain	473	2.25	NA	NA
British Virgin Islands*	344	1.63	NA	NA
South Korea	328	1.56	NA	NA
Bahrain*	311	1.48	NA	NA
Senegal	284	1.35	NA	NA
Thailand	273	1.30	0.01	0.001
Saudi Arabia	271	1.29	NA	NA
Australia	265	1.26	11	0.43
India	254	1.21	60	2.30
Netherlands*	229	1.09	NA	NA
Pakistan	185	0.88	161	6.18
Iraq	178	0.85	NA	NA
Peru	157	0.75	NA	NA
Denmark	149	0.71	NA	NA
Kuwait	144	0.69	NA	NA
Turkmenistan	136	0.65	NA	NA
Luxembourg*	132	0.63	NA	NA
Qatar	130	0.62	NA	NA

Mali	92	0.44	NA	NA
Saint Vincent and the Grenadines*	83	0.40	NA	NA
Burkina Faso	83	0.40	NA	NA
Hong Kong*	78	0.37	NA	NA
Dominican Republic	72	0.34	NA	NA
Switzerland	63	0.30	NA	NA
Gabon	60	0.29	NA	NA
Indonesia	57	0.27	NA	NA
Austria	53	0.25	6	0.22
Iran	51	0.24	NA	NA
Italy	49	0.23	NA	NA
Philippines	47	0.22	NA	NA
Romania	46	0.22	1	0.03
Ukraine	44	0.21	NA	NA
Ghana	43	0.21	NA	NA
Malta*	42	0.20	NA	NA
Argentina	39	0.19	NA	NA
Russia	38	0.18	NA	NA
Oman	37	0.18	NA	NA
Jordan	31	0.15	NA	NA
France	31	0.15	NA	NA
Chad	31	0.15	NA	NA
Belgium*	31	0.15	NA	NA
Rwanda	29	0.14	NA	NA
Chile	27	0.13	NA	NA
Togo	25	0.12	NA	NA
Angola	25	0.12	NA	NA
Mexico	24	0.11	NA	NA
Lebanon	24	0.11	NA	NA
Kenya	23	0.11	NA	NA
Kazakhstan	21	0.10	NA	NA
Mozambique	18	0.08	NA	NA
Afghanistan	17	0.08	NA	NA
Norway	15	0.07	NA	NA
Papua New Guinea	11	0.05	NA	NA
Nigeria	11	0.05	NA	NA
Libya	11	0.05	NA	NA
Maldives	11	0.05	NA	NA
Cyprus*	11	0.05	NA	NA
Poland	10	0.05	NA	NA
Malaysia	10	0.05	7	0.27
Jersey*	10	0.05	NA	NA
Azerbaijan	9	0.04	NA	NA
Ethiopia	9	0.04	NA	NA
China	9	0.04	0.41	0.02
Germany	9	0.04	NA	NA
Japan	8	0.04	NA	NA
Sudan	8	0.04	NA	NA
Tanzania	8	0.04	NA	NA
Equatorial Guinea	7	0.03	NA	NA
New Zealand	6	0.03	19	0.73
Mauritania	6	0.03	NA	NA
Barbados*	6	0.03	NA	NA
Ivory Coast	5	0.03	NA	NA
South Africa	5	0.02	NA	NA
Marshall Islands*	4	0.02	NA	NA
Cambodia	4	0.02	NA	NA
Benin	3	0.01	NA	NA
Uganda	3	0.01	NA	NA
Taiwan	3	0.01	NA	NA
Sri Lanka	2	0.01	NA	NA
Guinea	2	0.01	NA	NA
Guernsey*	2	0.01	NA	NA
Algeria	2	0.01	NA	NA
Georgia	2	0.01	NA	NA
Saint Lucia*	2	0.01	NA	NA
Finland	2	0.01	NA	NA
Greece	1	0.01	NA	NA
Bulgaria	1	0.004	NA	NA
Sierra Leone	1	0.004	NA	NA
Syria	1	0.004	NA	NA
Zimbabwe	1	0.003	NA	NA
Slovakia	1	0.003	NA	NA
Vietnam	1	0.003	NA	NA
Czech Republic	0.4	0.002	NA	NA
Sweden	0.4	0.002	NA	NA
Israel	0.3	0.002	NA	NA
Tunisia	0.3	0.001	NA	NA
Nepal	0.3	0.001	NA	NA
Democratic Republic of the Congo	0.3	0.001	NA	NA
Serbia	0.3	0.001	NA	NA
Brazil	0.2	0.001	NA	NA

Portugal	0.1	0.001	NA	NA
Suriname	0.1	0.001	NA	NA
Uzbekistan	0.1	0.001	NA	NA
Bangladesh	0.1	0.001	79	3.02
Seychelles*	0.1	0.0005	NA	NA
Republic of the Congo	0.1	0.0004	NA	NA
Trinidad and Tobago	0.1	0.0002	NA	NA
Paraguay	0.04	0.0002	NA	NA
Yemen	0.03	0.0001	NA	NA

Note: 1) An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023); 2) ** Data from the OECD CbCR pertains exclusively to fiscal year 2021.

In comparing multinational enterprise profit allocations across datasets, we find that UAE-headquartered MNEs allocate approximately 35% of their foreign profits to tax havens in the CbCR dataset, whereas the corresponding figure in ORBIS is only 10%. The CbCR data reveal substantial profit reporting in jurisdictions commonly classified as tax havens, including the Cayman Islands (14.86%), Singapore (5.52%), Bermuda (4.22%), Ireland (4.17%), and the British Virgin Islands (1.63%). These jurisdictions are either absent or minimally represented in ORBIS, suggesting potential underreporting or limited coverage in the latter. In contrast, countries such as Egypt (63.88%) and Pakistan (6.18%) appear prominently in ORBIS but are less significant in CbCR. This discrepancy likely reflects fundamental differences in data construction: CbCR is based on confidential tax filings submitted by large MNEs to tax authorities, while ORBIS relies on publicly available financial statements, which may exclude entities operating in low-transparency jurisdictions.

Greece

Table E3 presents a jurisdiction-level comparison of profit allocations by Greek multinational enterprises (MNEs) as reported in the OECD CbCR and ORBIS datasets. Notably, the CbCR data for Greece is available for the years 2019–2021, indicating that the country began reporting to the OECD relatively recently. In contrast, ORBIS provides data for the full period from 2016 to 2021.

Table E3: Partner Jurisdiction-Level Profit Allocations by Greek MNEs in OECD CbCR** and ORBIS Datasets (2016–2021)

Partner Country	*Profit in CbCR (million USD)*	*Percent in CbCR*	*Profit in ORBIS (million USD)*	*Percent in ORBIS*
Ireland*	1934	43.79	NA	NA
Cyprus*	619	14.01	1258	35.62
Bulgaria	437	9.89	691	19.56
United Kingdom	284	6.42	194	5.48
Romania	240	5.43	762	21.56
Serbia	166	3.76	38	1.06
North Macedonia	163	3.69	313	8.86
Turkey	92	2.08	NA	NA
Luxembourg*	65	1.47	NA	NA
Austria	43	0.98	154	4.37
Libya	40	0.90	NA	NA
Qatar	34	0.77	NA	NA
Germany	30	0.68	NA	NA
Poland	29	0.65	2	0.07
Netherlands*	29	0.65	13	0.36
Spain	25	0.56	19	0.54
Malta*	22	0.50	NA	NA
Colombia	21	0.47	NA	NA
British Virgin Islands*	20	0.46	NA	NA
Albania	18	0.40	NA	NA
Montenegro	17	0.39	40	1.14
United Arab Emirates	16	0.37	NA	NA
Ukraine	14	0.32	22	0.63
United States of America	11	0.25	NA	NA
Argentina	7	0.17	NA	NA
Australia	7	0.15	NA	NA
Ghana	7	0.15	NA	NA
Croatia	6	0.14	12	0.35
Chile	4	0.09	NA	NA
Italy	3	0.06	0.21	0.01
New Zealand	2	0.05	NA	NA
Tunisia	2	0.05	NA	NA
Algeria	2	0.04	NA	NA
Guatemala	2	0.04	NA	NA
Slovenia	1	0.03	NA	NA
Uzbekistan	1	0.03	NA	NA
Saudi Arabia	1	0.03	NA	NA
Egypt	1	0.02	NA	NA
Iran	1	0.02	NA	NA
Iraq	1	0.01	NA	NA
Bahrain*	0.33	0.01	NA	NA
Marshall Islands*	0.23	0.01	NA	NA
Morocco	0.23	0.01	NA	NA
Jersey'	0.14	0.00	NA	NA
Cayman Islands*	0.13	0.00	NA	NA
Kuwait	0.11	0.00	NA	NA
France	0.06	0.00	0.16	0.00
Guernsey*	0.03	0.00	NA	NA
Slovakia	0.03	0.00	NA	NA
Singapore*	0.02	0.00	0.01	0.00
Jordan	0.02	0.00	NA	NA
Panama*	0.003	0.00	NA	NA
South Korea	NA	NA	13	0.38

Note: 1) An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023); 2) ** Data from the OECD CbCR pertains exclusively to the years 2019- 2021.

Greek multinational enterprises (MNEs) allocate 61% of their foreign profits to tax havens in the OECD Country-by-Country Reporting (CbCR) dataset, compared to 36% in ORBIS. Ireland and Cyprus dominate profit allocations in CbCR, accounting for 43.79% and 14.01%, respectively. Notably, Ireland—the top destination—is entirely absent from ORBIS, highlighting limitations in its coverage of low-tax jurisdictions. Cyprus appears in both datasets but with divergent patterns: it accounts for 35.62% of foreign profits in ORBIS, more than twice its share in CbCR, with the absolute profit amount

similarly inflated. These discrepancies underscore how data construction and disclosure practices shape the visibility of profit shifting.

Further differences emerge in the representation of non-haven jurisdictions. Romania (21.56%), North Macedonia (8.86%), and Austria (4.37%) are prominently featured in ORBIS but play a minor role in CbCR. These patterns suggest that ORBIS may overrepresent countries with more transparent reporting regimes while underrepresenting tax havens. Overall, the CbCR data reveal a significantly higher concentration of profits in low-tax jurisdictions, reinforcing the importance of using multiple data sources to obtain a more accurate picture of MNE profit allocation and tax avoidance behavior.

Belgium

Table E4 presents a jurisdiction-level comparison of profit allocations by Belgian multinational enterprises as reported in the CbCR and ORBIS datasets.

Table E4: Partner Jurisdiction-Level Profit Allocations by Belgian MNEs in OECD CbCR and ORBIS Datasets (2016–2021)

Partner Country	*Profit in CbCR (million USD)*	*Percent in CbCR*	*Profit in ORBIS (million USD)*	*Percent in ORBIS*
United Kingdom	374603	58,52	304193	73,89
Netherlands*	149171	23,30	450	0,11
United States	30381	4,75	59	0,01
Luxembourg*	24165	3,77	19006	4,62
Brazil	15842	2,47	22758	5,53
France	7576	1,18	7382	1,79
Mexico	6739	1,05	13	0,00
Germany	6071	0,95	9884	2,40
China	5314	0,83	4929	1,20
Spain	3497	0,55	2964	0,72
Canada	3484	0,54	NA	NA
Australia	2739	0,43	1764	0,43
Switzerland*	2634	0,41	NA	NA
Italy	1242	0,19	1261	0,31
Czech Republic	1060	0,17	6782	1,65
Poland	767	0,12	482	0,12
Ireland*	706	0,11	968	0,24
India	562	0,09	715	0,17
Croatia	507	0,08	14	0,00
Portugal	463	0,07	80	0,02
Singapore*	401	0,06	242	0,06
Colombia	355	0,06	7181	1,74
Russia	271	0,04	115	0,03
Ecuador	255	0,04	1045	0,25
Hungary	208	0,03	1507	0,37
Sweden	186	0,03	920	0,22
Romania	167	0,03	186	0,05
Chile	140	0,02	NA	NA
Malaysia	128	0,02	549	0,13
Japan	122	0,02	NA	NA
Austria	91	0,01	262	0,06
Zambia	71	0,01	219	0,05
Greece	57	0,01	1117	0,27
Morocco	39	0,01	5	0,00
Norway	36	0,01	133	0,03
New Zealand	31	0,00	123	0,03
Denmark	24	0,00	197	0,05
Indonesia	20	0,00	NA	NA
Taiwan	18	0,00	NA	NA
Serbia	2	0,00	8	0,00
Cayman Islands*	NA	NA	5822	1,41
Peru	NA	NA	4118	1,00
Slovakia	NA	NA	941	0,23
Bulgaria	NA	NA	699	0,17
Tanzania	NA	NA	493	0,12
Turkey	NA	NA	409	0,10
Cyprus*	NA	NA	388	0,09
Uruguay	NA	NA	300	0,07
South Korea	NA	NA	197	0,05
Finland	NA	NA	192	0,05
Mozambique	NA	NA	186	0,05
Ukraine	NA	NA	94	0,02
Thailand	NA	NA	93	0,02
Marshall Islands*	NA	NA	67	0,02
Vietnam	NA	NA	56	0,01
Slovenia	NA	NA	44	0,01
Lithuania	NA	NA	35	0,01
Iceland	NA	NA	14	0,00
Nigeria	NA	NA	9	0,00
Algeria	NA	NA	9	0,00
Philippines	NA	NA	8	0,00
Pakistan	NA	NA	4	0,00
Latvia	NA	NA	1	0,00
Bosnia and Herzegovina	NA	NA	1	0,00
Estonia	NA	NA	1	0,00

Note: An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

Belgian multinational enterprises allocate 28% of their foreign profits to tax havens in the OECD CbCR dataset, compared to just 6.6% in ORBIS. The discrepancy is primarily driven by profit allocations to

the Netherlands. In CbCR, the Netherlands accounts for approximately USD 150 billion, or 23% of Belgian MNEs' foreign profits, making it the second-largest destination after the United Kingdom. In contrast, ORBIS reports only USD 0.45 billion allocated to the Netherlands, representing a mere 0.11% of foreign profits. This stark difference largely explains the gap in the share of profits allocated to tax havens between the two datasets.

South Africa

Table E5 compares jurisdiction-level profit allocations of South African multinational enterprises using CbCR and ORBIS data for the period 2016–2021.

Table E5: Partner Jurisdiction-Level Profit Allocations by South African MNEs in OECD CbCR and ORBIS Datasets (2016–2021)

Partner Country	*Profit in CbCR (million USD)*	*Percent in CbCR*	*Profit in ORBIS (million USD)*	*Percent in ORBIS*
United Kingdom	31330	27,04	8916	10,09
United Arab Emirates	12500	10,79	2	0,002
Hong Kong*	11252	9,71	NA	NA
Australia	10189	8,79	8286	9,38
Netherlands*	9737	8,40	46060	52,14
Ghana	3971	3,43	2908	3,29
Nigeria	3641	3,14	6018	6,81
Zimbabwe	3448	2,98	867	0,98
Chile	2295	1,98	NA	NA
Switzerland*	2006	1,73	NA	NA
Namibia	1814	1,57	1774	2,01
Mauritius*	1568	1,35	1522	1,72
United States	1543	1,33	NA	NA
Botswana	1537	1,33	939	1,06
Peru	1487	1,28	NA	NA
Germany	1395	1,20	1506	1,70
Austria	1362	1,18	633	0,72
Mozambique	1310	1,13	604	0,68
Tanzania	1209	1,04	160	0,18
Uganda	1022	0,88	1489	1,69
Poland	1008	0,87	494	0,56
Bermuda*	948	0,82	NA	NA
Kazakhstan	831	0,72	NA	NA
Kenya	821	0,71	1486	1,68
Zambia	727	0,63	361	0,41
Isle of Man*	609	0,53	NA	NA
Russia	502	0,43	283	0,32
Singapore*	479	0,41	462	0,52
Angola	436	0,38	567	0,64
Guernsey*	394	0,34	NA	NA
Eswatini	382	0,33	177	0,20
Lesotho	351	0,30	275	0,31
Brazil	311	0,27	113	0,13
Canada	277	0,24	100	0,11
Malawi	269	0,23	211	0,24
Argentina	263	0,23	NA	NA
France	255	0,22	108	0,12
Guinea	236	0,20	NA	NA
Italy	221	0,19	270	0,31
Sweden	161	0,14	NA	NA
British Virgin Islands*	160	0,14	NA	NA
Colombia	158	0,14	6	0,01
Czech Republic	140	0,12	232	0,26
Spain	126	0,11	22	0,02
Ireland*	118	0,10	293	0,33
Slovakia	112	0,10	34	0,04
China	94	0,08	82	0,09

Côte d'Ivoire*	70	0,06	NA	NA
Democratic Republic of the Congo	66	0,06	NA	NA
Belgium*	61	0,05	210	0,24
New Zealand	44	0,04	294	0,33
Papua New Guinea	42	0,04	NA	NA
Bulgaria	40	0,03	4	0,004
Romania	38	0,03	190	0,21
Cyprus*	37	0,03	NA	NA
Gabon	33	0,03	NA	NA
Republic of the Congo	31	0,03	NA	NA
Jersey*	30	0,03	NA	NA
Serbia	30	0,03	NA	NA
Luxembourg*	26	0,02	1	0,002
Philippines	26	0,02	3	0,003
Egypt	25	0,02	NA	NA
Mali	23	0,02	NA	NA
Mexico	21	0,02	56	0,06
Indonesia	20	0,02	NA	NA
Bolivia	18	0,02	NA	NA
Cameroon	17	0,01	NA	NA
Seychelles*	15	0,01	55	0,06
Portugal	13	0,01	22	0,02
Turkey	12	0,01	3	0,004
Malaysia	12	0,01	18	0,02
Burkina Faso	11	0,01	NA	NA
Ecuador	10	0,01	NA	NA
Ukraine	9	0,01	NA	NA
South Korea	7	0,01	NA	NA
Hungary	7	0,01	NA	NA
Morocco	7	0,01	0,07	0,0001
Taiwan	6	0,01	NA	NA
Iraq	6	0,01	NA	NA
Japan	6	0,005	0,09	0,0001
Finland	6	0,005	3	0,004
Sierra Leone	4	0,004	NA	NA
Yemen	4	0,003	NA	NA
Gibraltar	4	0,003	NA	NA
Rwanda	4	0,003	80	0,09
Benin	4	0,003	NA	NA
South Sudan	3	0,003	NA	NA
Oman	3	0,002	NA	NA
Madagascar	2	0,002	NA	NA
Macau	2	0,002	NA	NA
Venezuela	2	0,002	NA	NA
Saudi Arabia	2	0,002	2	0,002
Panama*	2	0,001	NA	NA
Thailand	2	0,001	40	0,05
Timor-Leste	1	0,001	NA	NA
Paraguay	1	0,001	NA	NA
Croatia	1	0,001	NA	NA
Mauritania	1	0,001	NA	NA
Lebanon	1	0,001	NA	NA
Guatemala	1	0,001	NA	NA
Greece	1	0,001	NA	NA
Jordan	1	0,001	NA	NA
Iran	0,22	0,0002	NA	NA
Mongolia	0,17	0,0001	NA	NA
India	0,16	0,0001	31	0,03
Malta*	0,08	0,0001	NA	NA
Bahrain	0,06	0,0001	NA	NA
Norway	0,06	0,0001	1	0,001
Uruguay	0,06	0,0001	NA	NA
Slovenia	0,06	0,0001	NA	NA
New Caledonia	0,06	0,0001	NA	NA
Bosnia and Herzegovina	0,05	0,00004	NA	NA
Senegal	0,04	0,00004	NA	NA
Myanmar	0,04	0,00003	NA	NA
Denmark	0,03	0,00002	0,45	0,001
Syria	0,02	0,00001	57	0,06
Burundi	0,01	0,00001	NA	NA
Guinea-Bissau	0,001	0,0000005	NA	NA
Ethiopia	0,00004	0,00000003	NA	NA
Curaçao	0,000001	0,000000001	NA	NA
Estonia	NA	NA	4	0,004
Vietnam	NA	NA	0,12	0,0001

Note: An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

South African MNEs allocate 24% of foreign profits to tax havens in the CbCR dataset, compared to 55% in ORBIS. A salient discrepancy emerges in the treatment of the Netherlands, mirroring the case of Belgium but in the opposite direction. In ORBIS, South African MNEs report $46 billion in profits in the Netherlands, representing 52% of total foreign profits. In contrast, the CbCR data records only $9.7 billion (8.4%) for the same jurisdiction. For Belgium, the pattern is reversed: CbCR captures a larger profit amount and share than ORBIS. These divergent reporting outcomes highlight that cross-dataset inconsistencies are jurisdiction-specific and may reflect differences in regulatory environments, data coverage, and firm-level reporting practices across both host and parent countries.

Canada

Table E6 presents a jurisdiction-level comparison of foreign profit allocations by Canadian multinational enterprises, based on OECD CbCR and ORBIS data over the 2016–2021 period.

Table E6: Partner Jurisdiction-Level Profit Allocations by Canadian MNEs in OECD CbCR and ORBIS Datasets (2016–2021)

Partner Country	*Profit in CbCR (million USD)*	*Percent in CbCR*	*Profit in ORBIS (million USD)*	*Percent in ORBIS*
United States	220526	75,58	95825	33,34
United Kingdom	35083	12,02	41768	14,53
Australia	6721	2,30	21831	7,60
Bermuda*	NA	NA	21726	7,56
Luxembourg*	NA	NA	17344	6,03
Netherlands*	9199	3,15	14223	4,95
Ireland*	NA	NA	11409	3,97
Barbados*	NA	NA	10139	3,53
Germany	NA	NA	9441	3,28
Mexico	11068	3,79	6341	2,21
Spain	650	0,22	3559	1,24
Brazil	NA	NA	3544	1,23
Peru	NA	NA	3266	1,14
Chile	NA	NA	2578	0,90
Sweden	NA	NA	2464	0,86
China	5873	2,01	2295	0,80
France	2347	0,80	2069	0,72
Colombia	NA	NA	1967	0,68
Austria	NA	NA	1933	0,67
Hungary	NA	NA	1659	0,58
Singapore*	NA	NA	1158	0,40
Malta*	NA	NA	1091	0,38
Turkey	NA	NA	935	0,33
Trinidad and Tobago	NA	NA	798	0,28
Cambodia	NA	NA	783	0,27
Jamaica	NA	NA	767	0,27
Bahamas*	NA	NA	739	0,26
Poland	NA	NA	601	0,21
Portugal	NA	NA	550	0,19
India	NA	NA	488	0,17
Italy	320	0,11	457	0,16
New Zealand	NA	NA	414	0,14
Norway	NA	NA	404	0,14
Finland	NA	NA	400	0,14
Czech Republic	NA	NA	378	0,13
Belgium*	NA	NA	278	0,10
Denmark	NA	NA	229	0,08
Uruguay	NA	NA	194	0,07
Costa Rica	NA	NA	187	0,06
Thailand	NA	NA	164	0,06
Slovakia	NA	NA	105	0,04
Bulgaria	NA	NA	101	0,04
Russia	NA	NA	90	0,03
South Korea	NA	NA	78	0,03
Vietnam	NA	NA	74	0,03
Serbia	NA	NA	71	0,02
Philippines	NA	NA	68	0,02
Dominican Republic	NA	NA	57	0,02
South Africa	NA	NA	55	0,02
Marshall Islands*	NA	NA	53	0,02
Japan	NA	NA	53	0,02
Romania	NA	NA	53	0,02
Malaysia	NA	NA	40	0,01
Croatia	NA	NA	34	0,01
Cyprus*	NA	NA	24	0,01
Slovenia	NA	NA	21	0,01
Anguilla	NA	NA	14	0,00
Guatemala	NA	NA	10	0,00
Iceland	NA	NA	6	0,00
Greece	NA	NA	6	0,00
Latvia	NA	NA	6	0,00
Switzerland*	NA	NA	5	0,00
Bosnia and Herzegovina	NA	NA	5	0,00
Panama*	NA	NA	1	0,00
Lithuania	NA	NA	1	0,00
Morocco	NA	NA	1	0,00
Cayman Islands*	NA	NA	0	0,00
Albania	NA	NA	0	0,00
Algeria	NA	NA	0	0,00

Note: An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

Canadian multinational enterprises allocate only 3% of foreign profits to tax havens in the OECD CbCR dataset, compared to 27% in ORBIS. Jurisdictions such as Bermuda, Luxembourg, Ireland, and Barbados appear as major profit destinations in ORBIS but are not reported in CbCR. This discrepancy reflects the limited jurisdictional coverage of CbCR for Canadian MNEs. More broadly, the CbCR data for Canadian MNEs are limited to a narrow set of jurisdictions, illustrating that its coverage can be constrained for certain countries. However, based on our overall analysis, such instances are significantly less frequent in CbCR than in ORBIS.

Brazil

Table E7 reports jurisdiction-level foreign profit allocations of Brazilian multinational enterprises, drawing on OECD CbCR and ORBIS data for the 2016–2021 period.

Table E7: Partner Jurisdiction-Level Profit Allocations by Brazilian MNEs in OECD CbCR and ORBIS Datasets (2016–2021)

Partner Country	*Profit in CbCR (million USD)*	*Percent in CbCR*	*Profit in ORBIS (million USD)*	*Percent in ORBIS*
United States	32695	28,17	3308	9,79
Luxembourg*	13643	11,75	7615	22,53
Netherlands*	10630	9,16	9539	28,22
United Kingdom	10602	9,13	1704	5,04
Austria	9855	8,49	4770	14,11
Cayman Islands*	6448	5,55	1	0,00
Argentina	5619	4,84	2	0,01
Switzerland*	4533	3,90	NA	NA
Mexico	2827	2,44	117	0,35
Spain	2390	2,06	973	2,88
Peru	2032	1,75	NA	NA
Chile	1920	1,65	NA	NA
Uruguay	1891	1,63	2	0,01
Germany	1740	1,50	293	0,87
Australia	1520	1,31	3229	9,55
Portugal	1469	1,27	228	0,67
Paraguay	1383	1,19	NA	NA
British Virgin Islands*	796	0,69	NA	NA
Singapore*	740	0,64	141	0,42
Bahamas*	572	0,49	NA	NA
China	487	0,42	7	0,02
Colombia	481	0,41	353	1,04
United Arab Emirates	475	0,41	NA	NA
Canada	383	0,33	NA	NA
Japan	262	0,23	NA	NA
France	168	0,14	193	0,57
Bolivia	162	0,14	NA	NA
South Africa	146	0,13	NA	NA
Italy	143	0,12	122	0,36
Hong Kong*	31	0,03	NA	NA
Belgium*	30	0,03	68	0,20
India	10	0,01	11	0,03
Poland	NA	NA	333	0,99
Malaysia	NA	NA	301	0,89
Russia	NA	NA	173	0,51
New Zealand	NA	NA	91	0,27
Romania	NA	NA	57	0,17
Hungary	NA	NA	47	0,14
Czech Republic	NA	NA	46	0,14
Slovakia	NA	NA	14	0,04
Ireland*	NA	NA	12	0,04
South Korea	NA	NA	8	0,02
Bulgaria	NA	NA	8	0,02
Thailand	NA	NA	6	0,02
North Macedonia	NA	NA	3	0,01
Bosnia and Herzegovina	NA	NA	3	0,01
Morocco	NA	NA	3	0,01
The Philippines	NA	NA	3	0,01
Moldova	NA	NA	3	0,01
Lithuania	NA	NA	3	0,01
Croatia	NA	NA	3	0,01
Republic of Serbia	NA	NA	2	0,01
Greece	NA	NA	2	0,00
Latvia	NA	NA	1	0,00
Denmark	NA	NA	1	0,00
Estonia	NA	NA	0	0,00
Slovenia	NA	NA	0	0,00
Sweden	NA	NA	0	0,00

Note: An asterisk (*) denotes a tax haven, as classified by Tørsløv, Wier, and Zucman (2023).

Brazilian multinational enterprises allocate 32% of foreign profits to tax havens in the CbCR dataset, compared to 51% in ORBIS. This discrepancy is primarily driven by reporting asymmetries: ORBIS provides relatively better coverage of tax havens than of non-haven jurisdictions, while overall reporting quality remains limited. In absolute terms, profit allocations to tax havens are more than twice as large

in CbCR (USD 37.4 billion) as in ORBIS (USD 17.4 billion), underscoring the importance of data source selection in measuring profit shifting.

Appendix F: Top Partner Tax Havens

Table F1: Five Top Partner Tax Havens in 2016-2021, Profits Before Tax, Billion USD

Source/Partner Country	*Database*	*Total in partner tax havens*	*1*	*2*	*3*	*4*	*5*
OECD countries							
United States	CbCR	2882,1B / 56%	**Ireland, 437.3B/15.2%**	Switzerland, 421.3B/14.6%	**Singapore, 390.3B/13.5%**	**Netherlands, 387.3B/13.4%**	Cayman Islands, 297.3B/10.3%
	Orbis	2386,4B / 53%	**Ireland, 815.9B/34.2%**	**Singapore, 677B/28.4%**	Luxembourg, 499.6B/21%	**Netherlands, 259B/11%**	Belgium, 50.8B/2%
Japan	CbCR	234,8B / 19%	**Netherlands, 47.2B/20.1%**	**Singapore, 44.2B/18.8%**	Jersey, 42.2B/18.1%	**Ireland, 26.2B/11.1%**	Hong Kong, 23.2B/10.1%
	Orbis	133.3B / 16%	**Singapore, 63.3B/47.5%**	**Netherlands, 38.7B/29%**	**Ireland, 11B/8.3%**	Belgium, 10.1B/7.6%	Bermuda, 6.6B/4.9%
Germany	CbCR	226,7B / 23%	**Netherlands, 78.1B/34.4%**	**Switzerland, 45.1B/20.2%**	**Luxembourg, 28.1B/12.4%**	**Ireland, 21.1B/9.3%**	**Belgium, 19.1B/8.7%**
	Orbis	82.8B / 21%	**Netherlands, 40.6B/49%**	**Belgium, 15B/18.3%**	**Ireland, 13.7B/16.5%**	Singapore, 11B/13.3%	**Luxembourg, 1.25B/1.5%**
Belgium*	CbCR	177,6B / 28%	**Netherlands 149.2B/84.0%**	**Luxembourg 24.2B/13.6%**	Switzerland 2.2B/1.5%	**Ireland, 0.7B/0.4%**	Hong Kong, 0.4B/0.3%
	Orbis	26.9B / 7%	**Luxembourg, 19B/70.5%**	Cayman Islands, 5.8B/21.6%	**Ireland, 0.97B/3.6%**	**Netherlands, 0.45B/1.7%**	Cyprus, 0.39B/1.44%
France	CbCR	127,9B / 22%	**Netherlands, 37.7B/29.5%**	**Belgium, 27.7B/21.1%**	**Luxembourg, 16.7B/12.9%**	Hong Kong, 14.7B/11.6%	Switzerland, 14.7B/11.6%
	Orbis	138.5B / 25%	**Belgium, 61.6B/44.5%**	**Netherlands, 34.2B/24.7%**	Singapore, 29B/21%	Ireland, 7.3B/5.3%	**Luxembourg, 4.3B/3.1%**
Switzerland*	CbCR	107,5B / 23%	**Bermuda, 35.6B/33.1%**	**Singapore, 16.6B/15.5%**	**Luxembourg, 13.5B/12.6%**	Hong Kong, 11.1B/10.4%	Cyprus, 9.8B/9.1%
	Orbis	49.2B / 23%	**Bermuda, 25.3B/51.5%**	**Singapore, 7.6B/15.4%**	Netherlands, 6.9B/14%	**Luxembourg, 3.6B/7.3%**	Belgium, 2.8B/5.7%
Luxembourg*	CbCR	81,8B / 26%	**Netherlands, 32.2B/39.3%**	Switzerland, 18.8B/22.9%	**Belgium, 7.8B/9.3%**	**Singapore, 4.8B/6.0%**	Ireland, 4.8B/5.9%
	Orbis	12.7B / 23%	Cyprus, 5.8B/45.8%	**Belgium, 4.2B/33.1%**	**Netherlands, 1.7B/13.1%**	**Singapore, 0.4B/3.3%**	Panama, 0.35B/2.7%
Italy	CbCR	46,2B / 17%	**Netherlands, 14.8B/32%**	**Luxembourg, 14.6B/31.5%**	**Ireland, 5.9B/12.7%**	Switzerland, 3.8B/8.3%	**Belgium, 3B/6.6%**
	Orbis	60.5B / 30%	**Netherlands, 48.8B/80.7%**	**Ireland, 7B/11.6%**	**Luxembourg, 4.3B/7.1%**	**Belgium, 0.14B/0.23%**	Monaco, 0.14B/0.23%
Netherlands*	CbCR	33,9B / 17%	Switzerland, 18.8B/55.5%	**Beligum, 11.5B/33.8%**	**Ireland, 1.5B/4.5%**	**Singapore, 1.5B/4.4%**	Hong Kong, 0.6B/1.8%
	Orbis	60.5BB / 30%	**Ireland, 32.5B/61.4%**	**Belgium, 12B/22.7%**	Luxembourg, 5.4B/10%	**Singapore, 2.8B/5.3%**	Malta, 0.3B/0.57%
Denmark	CbCR	31,9B / 27%	Switzerland, 13.7B/43%	**Netherlands, 5.7B/18.5%**	**Singapore, 5.7B/15.6%**	**Ireland, 3.7B/10.9%**	Hong Kong, 2.7B/7%
	Orbis	2.05B/ 12%	**Netherlands, 0.74B/36.2%**	Belgium, 0.7B/34.1%	**Singapore, 0.49B/23.8%**	**Ireland, 0.09B/4.2%**	Luxembourg, 0.03B/1.4%
Canada	CbCR	9,2B / 3%	**Netherlands, 9.2B/100%**	-	-	-	-
	Orbis	78.2B / 27%	Bermuda, 21.7B/27.8%	Luxembourg, 17.3B/22.2%	**Netherlands, 14.2B/18.2%**	Ireland, 11.4B/14.6%	Barbados, 10.1B/13%
Spain	CbCR	23,9B / 8%	**Netherlands, 6.3B/26.2%**	Switzerland, 5.3B/22.2%	**Ireland, 4.3B/18.1%**	**Luxembourg, 1.3B/8.8%**	**Singapore, 1.3B/5.5%**
	Orbis	11.2B / 3%	**Netherlands, 6.5B/58.2%**	**Ireland, 2.9B/26.2%**	**Singapore, 1.1B/9.6%**	**Luxembourg, 0.45B/4.05%**	Belgium, 0.2B/1.8%
Australia	CbCR	23,6B / 14%	**Singapore, 10B/42.3%**	Switzerland, 6B/25.3%	Hong Kong, 3B/14.6%	Bermuda, 1B/5.2%	**Luxembourg, 1B/4.7%**
	Orbis	19.5B / 16%	**Singapore, 9.5B/48.7%**	Netherlands, 7.2B/36.8%	**Luxembourg, 1.4B/7.2%**	Belgium, 0.9B/4.7%	Malta, 0.26B/1.4%
Mexico	CbCR	9,8B / 10%	**Netherlands, 5.8B/59.7%**	Luxembourg, 1.8B/16.8%	Switzerland, 1.8B/12.8%	Panama, 4.8B/4.4%	**Ireland, 2.8B/2.7%**
	Orbis	0.57B / 5%	**Netherlands, 0.56B/97.5%**	**Ireland, 0.01B/1.9%**	Singapore, 0,003B/0.5%	Belgium 0.001B, 0.1%	-
Norway	CbCR	9,0B / 19%	**Netherlands, 5.6B/62.7%**	**Singapore, 1.6B/13.3%**	**Ireland, 0.6B/10.2%**	Switzerland, 0.6B/8.8%	**Belgium, 0.6B/2.3%**
	Orbis	3.65B / 18%	**Netherlands, 1B/27.3%**	**Singapore, 0.9B/24.4%**	**Belgium, 0.58B/16%**	Malta, 0.6B/15.8%	**Ireland, 0.4B/11.1%**
Turkey	CbCR	4,9B / 40%	Bahrain, 1.0B/20.2%	Belgium, 1.2B/25.2%	Cyprus, 0.01B/0.3%	Hong Kong, 0.01B/0.3%	**Ireland, 0.001B/0.01%**
	Orbis	0.31B / 8%	Netherlands, 0.22B/71.4%	**Ireland, 0.07B/21.7%**	Singapore, 0.02B/6.9%	-	-
Portugal	CbCR	4,6B / 30%	**Luxembourg, 2.2B/47.6%**	**Netherlands, 2.1B/44.8%**	Switzerland, 0.2B/3.3%	Macau, 0.1B/2.7%	Hong Kong, 0.1B/1.1%
	Orbis	3.8B / 13%	**Netherlands, 3.5B/91.1%**	**Luxembourg, 0.26B/6.76%**	Singapore, 0.05B/1.26%	Cayman Islands, 0.03B/0.75%	Belgium, 0.006B/0.16%
Greece	CbCR	2,7B / 61%	Ireland, 1.9B/71.9%	**Cyprus, 0.6B/23%**	Luxembourg, 0.1B/2.4%	Netherlands, 0.03B/1.1%	Malta, 0.02B/0.82%
	Orbis	1.27B / 36%	**Cyprus, 1.26B/99%**	**Netherlands, 0.01B/1%**	Singapore, 0.00001B/0.001%	-	-
Chile	CbCR	0,3B / 2%	**Panama, 0.2B/96%**	**Singapore, 0.01B/4%**	-	-	-
	Orbis	0.45B / 15%	Belgium, 0.4B/87.8%	**Panama, 0.05B/10.6%**	**Singapore, 0.005B/1%**	Luxembourg, 0.003B/0.58%	
Non-OECD countries							
China	CbCR	517,6B / 68%	**Hong Kong, 350.7B/67.8%**	British Virgin Islands, 59.4B/11.5%	**Singapore, 29.3B/5.7%**	**Cayman Islands, 24.1B/4.7%**	**Netherlands, 20.6B/4.0%**
	Orbis	61.9B / 74%	**Honk Kong, 22.03B/35.6%**	Bermuda, 15.6B/25.2%	**Cayman Islands, 11.3B/18.3%**	**Singapore, 7.8B/12.6%**	**Netherlands, 2.1B/3.3%**
Cayman Islands*	CbCR	174,3B / 26%	**Hong Kong, 106.8B/61.3%**	British Virgin Islands, 36.1B/20.7%	**Singapore, 8.3B/4.7%**	**Netherlands, 5B/2.9%**	**Luxembourg, 3.8B/2.2%**
	Orbis	45.6B / 10%	**Singapore, 19.4B/42.5%**	Bermuda, 9B/19.8%	**Netherlands, 7B/15.3%**	**Hong Kong, 3.4B/7.5%**	**Luxembourg, 3B/6.6%**
Hong Kong *	CbCR	121,0B / 18%	British Virgin Islands 54.3B/44.9%	Macau, 18.5B/15.3%	**Cayman Islands 13.3B/11.0%**	**Singapore, 9.5B/7.9%**	Malta, 7.1B/5.8%
	Orbis	12.5B / 20%	**Cayman Islands, 9.6B/76.8%**	**Singapore, 1.3B/10.6%**	Bermuda, 0.97B/7.7%	Netherlands, 0.3B/2.3%	Monaco, 0.2B/1.5%
Singapore*	CbCR	107,3B / 56%	**Cayman Islands, 80.5B/75%**	**Hong Kong, 14.6B/13.6%**	Switzerland, 3.4B/3.2%	Mauritius, 2.8B/2.6%	**Netherlands, 2.3B/2.2%**
	Orbis	8.25B / 17%	**Hong Kong, 6.2B/74.7%**	**Netherlands, 0.8B/9.3%**	**Cayman Islands, 0.4B/4.8%**	Ireland, 0.4B/4.6%	Monaco, 0.3B/3.8%

Bermuda*	CbCR Orbis	95,6B / 37% 34B / 25%	Hong Kong, 4 2.2B/44.1% **Singapore,** **18B/53%**	British Virgin Islands, 19.0B/19.8% Netherlands, 6.3B/18.5%	**Luxembourg,** **5.8B/6.1%** **Luxembourg,** **5.9B/17.3%**	Cayman Islands, 5.5B/5.8% Ireland, 1.3B/3.8%	**Singapore,** **5.0B/5.2%** Malta, 1.1B/3.2%
Brazil	CbCR Orbis	37,4B / 32% 17.4B / 51%	**Luxembourg,** **13.6B/36.5%** **Netherlands,** **9.5B/54.9%**	**Netherlands,** **10.6B/28.4%** **Luxembourg,** **7.6B/43.8%**	Cayman Islands, 6.4B/17.2% Singapore, 0.14B/0.8%	Switzerland, 4.5B/12.1% Belgium, 0.07B/0.4%	British Virgin Islands, 0.8B/2.1% Ireland, 0.01B/0.07%
South Africa	CbCR Orbis	27,5B /24% 0.03B / 55%	Hong Kong, 11.3B/41.0% **Netherlands,** **0.02B/73.8%**	**Netherlands,** **9.7B/35.5%** Singapore, 0.004B/13.4%	Switzerland, 2.0B/7.3% Luxembourg, 0.003B/8.2%	Mauritius, 1.6B/5.7% Ireland, 0.002B/4.7%	Bermuda, 0.9B/3.5% -
Malaysia	CbCR Orbis	17,7B / 47% 14.7B / 59%	**Singapore,** **9.3B/52.7%** **Singapore,** **13.5B/92%**	Cayman Islands, 4.6B/26.1% **Hong Kong,** **0.64B/4.35%**	**Hong Kong,** **1.3B/7.4%** Bermuda, 0.43B/2.9%	British Virgin Islands, 1.0B/5.5% Netherlands, 0.07B/0.46%	Mauritius, 0.5B/2.8% Belgium, 0.03B/0.2%
India	CbCR Orbis	13,0B / 21% 12.3B / 30%	**Singapore,** **4.0B/31.0%** **Netherlands,** **6.5B/52.7%**	**Mauritius,** **2.2B/16.6%** **Singapore,** **4.2B/33.8%**	**Netherlands,** **2.1B/16.4%** **Belgium,** **0.7B/5.4%**	**Belgium,** **0.8B/6.5%** **Mauritius,** **0.6B/5%**	**Switzerland,** **0.8B/6.4%** **Switzerland,** **0.14B/1.15%**
Peru	CbCR Orbis	12,2B / 16% NA	Panama, 2.7B/22.3% NA	Cayman Islands, 1.9B/15.9% NA	Netherlands, 1.9B/15.9% NA	Ireland, 1.4B/11.5% NA	Singapore, 1.4B/11.2% NA
Romania	CbCR Orbis	10,1B / 9% NA	Netherlands, 5.7B/56.9% NA	Hong Kong, 3.6B/36.2% NA	Singapore, 0.4B/4.3% NA	Switzerland, 0.1B/0.7% NA	Belgium, 0.04B/0.4% NA
Indonesia	CbCR Orbis	8,8B / 29% 1.2B / 95%	Switzerland, 2.7B/30.3% **Singapore,** **1.1 B/90.7%**	Hong Kong, 1.8B/20% Mauritius, 0.1B/9.3%	British Virgin Islands, 1.6B/18.2% -	**Singapore,** **1.0B/11.1%** -	Macau, 0.8B/9.5% -
Saudi Arabia	CbCR Orbis	7,8B / 16% 0.03B / 2%	**Netherlands,** **1.8B/23.4%** **Netherlands,** **0.02B/74%**	Bermuda, 1.1B/14.7% **Singapore,** **0.004B/13.4%**	Bahrain, 1.0B/12.5% Luxembourg, 0.003B/8%	Hong Kong, 0.8B/10.3% Ireland, 0.002B/4.7%	**Singapore,** **0.8B/10.2%** -
United Arab Emirates	CbCR Orbis	7,4B / 35% 0.25B / 10%	**Cayman Islands,** **3.1B/42.1%** **Singapore,** **0.245B/97%**	**Singapore,** **1.2B/15.6%** **Cayman Islands,** **0.004B/1.7%**	Bermuda, 0.9B/12.0% **Ireland,** **0.003B/1.3%**	**Ireland,** **0.9B/11.8%**	British Virgin Islands, 0.3B/4.6%
Azerbaijan	CbCR Orbis	1,9B / 47% NA	British Virgin Islands, 0.7B/34.6% NA	Jersey, 0.6B/32.0% NA	Luxembourg, 0.5B/24.1% NA	Switzerland, 0.1B/6.2% NA	Singapore, 0.1B/2.8% NA
Bahrain*	CbCR Orbis	0,1B / 8% NA	Cayman Islands, 0.04B/60.8% NA	Guernsey, 0.02B/27.4% NA	Jersey, 0.01B/10.4% NA	Bermuda, 0.0002B/0.4% NA	Isle of Man, 0.0002B/0.3% NA
Tunisia	CbCR Orbis	0,05B / 53% NA	Malta, 0.05B/100% NA	NA	NA	NA	NA
Argentina	CbCR Orbis	0,022B / 1% 0.02B /2%	Netherlands, 0.019B/78% Bahamas, 0.02B/100%	Cayman Islands, 0.005B/22%			

Note: *Indicates a source/parent tax haven; red bold denotes countries that appear in the top 5 in both databases.

Appendix G: Tax Information Exchange Agreements Used in the Study

Table G1: List of TIEAs used in the Study

Country	EOI Partner	Date Signed	Date Entered Into Force
Australia	Dominica	2010-03-31	2011-12-08
Australia	Gibraltar	2009-08-25	2010-07-26
Australia	Grenada	2010-03-30	2012-01-09
Australia	Guatemala	2013-09-26	Not yet in force
Australia	Guernsey	2009-10-09	2010-07-27
Australia	Isle of Man	2009-01-29	2010-01-05
Australia	Jersey	2009-06-10	2010-01-05
Australia	Liberia	2011-08-11	2012-05-23
Australia	Liechtenstein	2011-06-21	2012-06-21
Australia	Macao (China)	2011-07-17	2012-05-18
Australia	Marshall Islands	2010-05-12	2011-11-25
Australia	Mauritius	2010-12-08	2011-11-25
Australia	Monaco	2010-04-01	2011-01-13
Australia	Montserrat	2010-11-23	2011-11-25
Australia	Samoa	2009-12-16	2012-02-24
Australia	San Marino	2010-03-05	2011-01-11
Australia	Saint Vincent and the Grenadines	2010-03-20	2011-01-11
Australia	Sint Maarten	2007-03-01	2008-04-04
Australia	Saint Kitts and Nevis	2010-03-05	2011-01-11
Australia	Saint Lucia	2010-03-30	2011-02-10
Australia	Turks and Caicos Islands	2010-03-30	2011-01-25
Australia	Uruguay	2010-03-30	2014-07-01
Australia	Vanuatu	2010-04-21	2011-09-01
Argentina	Andorra	2009-10-26	2012-06-15
Argentina	Armenia	2014-07-07	2017-04-28
Argentina	Aruba	2013-09-30	2014-05-31
Argentina	Azerbaijan	2012-12-17	2013-04-22
Argentina	Bahamas	2009-12-03	2012-07-27
Argentina	Bermuda	2011-08-22	2011-10-14
Argentina	Brazil	2005-04-21	2005-04-22
Argentina	Cayman Islands	2011-10-18	2012-08-31
Argentina	China (People's Republic of)	2010-12-13	2011-09-16
Argentina	Costa Rica	2009-11-23	2012-07-12
Argentina	Curaçao	2014-05-14	2016-01-08
Argentina	Ecuador	2011-05-23	2011-05-24
Argentina	Guernsey	2011-07-28	2012-01-04
Argentina	India	2011-11-29	2013-01-28
Argentina	Ireland	2014-10-29	2016-01-21
Argentina	Isle of Man	2012-12-14	2013-05-04
Argentina	Jersey	2011-07-28	2011-12-09
Argentina	Macau (China)	2014-09-05	2015-11-06
Argentina	Monaco	2009-10-13	2010-08-07
Argentina	North Macedonia	2013-04-26	2013-12-17
Argentina	Peru	2004-10-07	2004-10-08
Argentina	San Marino	2009-12-07	2012-06-16
Argentina	South Africa	2013-08-02	2014-11-28
Argentina	Turkmenistan	2017-04-27	2017-08-15
Argentina	United Arab Emirates	2016-02-05	2017-01-17
Argentina	United States	2016-12-23	2017-11-13
Argentina	Uruguay	2012-04-23	2013-02-07
Argentina	Venezuela	2014-02-18	2014-02-18
Azerbaijan	Argentina	2012-12-17	2013-04-22
Bahrain	Australia	2011-12-15	2012-12-15
Bahrain	Canada	2013-06-04	2014-04-03
Bahrain	Denmark	2011-10-14	2012-09-05
Bahrain	Faroe Islands	2011-10-14	2013-07-23
Bahrain	Finland	2011-10-14	2012-07-11
Bahrain	Greenland	2011-10-14	2012-07-04
Bahrain	Iceland	2011-10-14	2012-08-15
Bahrain	India	2012-05-31	2013-04-11
Bahrain	Norway	2011-10-14	2012-07-12
Bahrain	Sweden	14-10-2011	15-03-2014
Belgium	Andorra	23-10-2009	13-01-2015
Belgium	Anguilla	24-09-2010	Not yet in force
Belgium	Antigua and Barbuda	07-12-2009	09-11-2017
Belgium	Aruba	24-04-2014	Not yet in force
Belgium	The Bahamas	07-12-2009	11-02-2014
Belgium	Belize	29-12-2009	04-03-2014
Belgium	Bermuda	23-03-2013	Not yet in force
Belgium	Cayman Islands	24-04-2014	Not yet in force
Belgium	Cook Islands	08-09-2015	Not yet in force
Belgium	Dominica	26-02-2010	24-11-2015
Belgium	Gibraltar	16-12-2009	17-06-2014
Belgium	Grenada	18-03-2010	13-01-2015
Belgium	Guernsey	07-05-2014	Not yet in force
Belgium	Jersey	13-03-2014	26-07-2017
Belgium	Liechtenstein	10-11-2009	12-06-2014
Belgium	Monaco	15-07-2009	Not yet in force
Belgium	Montserrat	16-02-2010	18-11-2015
Belgium	Saint Kitts and Nevis	18-12-2009	20-02-2014
Belgium	Saint Lucia	07-12-2009	20-02-2014
Belgium	Saint Vincent and the Grenadines	07-12-2009	24-03-2014
Bermuda	Argentina	22-08-2011	14-10-2011
Bermuda	Aruba	20-10-2009	01-12-2011
Bermuda	Australia	10-11-2005	20-09-2007
Bermuda	Belgium	11-04-2013	Not yet in force
Bermuda	Brazil	29-10-2012	Not yet in force
Bermuda	Canada	14-06-2010	01-07-2011
Bermuda	Chile	24-06-2016	Not yet in force
Bermuda	China	02-12-2010	03-11-2011
Bermuda	Curaçao	28-09-2009	24-03-2015
Bermuda	Czech Republic	15-08-2011	Not yet in force

Bermuda	Denmark	16-04-2009	25-12-2009
Bermuda	Faroe Islands	16-04-2009	09-09-2010
Bermuda	Finland	16-04-2009	31-12-2009
Bermuda	France	08-10-2009	28-10-2010
Bermuda	Germany	03-07-2009	06-12-2012
Bermuda	Greenland	16-04-2009	22-03-2012
Bermuda	Guernsey	23-08-2013	05-04-2014
Bermuda	Iceland	16-04-2009	02-04-2011
Bermuda	India	07-10-2010	03-11-2010
Bermuda	Indonesia	22-06-2011	Not yet in force
Bermuda	Ireland	28-07-2009	11-05-2010
Bermuda	Italy	23-04-2012	03-04-2017
Bermuda	Japan	01-02-2010	01-08-2010
Bermuda	Korea	23-01-2012	13-02-2015
Bermuda	Malaysia	23-04-2012	28-12-2012
Bermuda	Malta	02-11-2011	05-11-2012
Bermuda	Mexico	15-09-2009	09-09-2010
Bermuda	Netherlands	08-06-2009	01-02-2010
Bermuda	New Zealand	16-04-2009	23-12-2009
Bermuda	Norway	16-04-2009	22-01-2010
Bermuda	Poland	25-11-2013	15-03-2015
Bermuda	Portugal	10-05-2010	16-03-2011
Bermuda	Singapore	29-10-2012	06-12-2012
Bermuda	Sint Maarten	28-09-2009	24-03-2015
Bermuda	South Africa	06-09-2011	08-02-2012
Bermuda	Sweden	16-04-2009	25-12-2009
Bermuda	Turkey	23-01-2012	18-09-2013
Bermuda	United Kingdom	05-12-2007	10-11-2008
Bermuda	United States	02-12-1988	02-12-1988
Brazil	Bermuda	29-10-2012	Not yet in force
Brazil	Cayman Islands	19-03-2013	Not yet in force
Brazil	Guernsey	06-02-2013	Not yet in force
Brazil	Jamaica	13-02-2014	Not yet in force
Brazil	Jersey	28-01-2013	Not yet in force
Brazil	San Marino	31-03-2016	Not yet in force
Brazil	Switzerland	23-11-2015	Not yet in force
Brazil	United Kingdom	28-09-2012	Not yet in force
Brazil	United States	20-03-2007	19-03-2013
Canada	Anguilla	28-10-2010	12-10-2011
Canada	Aruba	20-10-2011	01-06-2012
Canada	Bahamas	17-06-2010	17-11-2011
Canada	Bahrain	05-06-2013	03-04-2014
Canada	Bermuda	14-06-2010	01-07-2011
Canada	British Virgin Islands	21-05-2013	11-03-2014
Canada	Brunei	09-05-2013	26-12-2014
Canada	Cayman Islands	24-06-2010	01-06-2011
Canada	Cook Islands	15-06-2015	Not yet in force
Canada	Costa Rica	11-08-2011	14-08-2012
Canada	Curacao	29-08-2009	01-01-2011
Canada	Dominica	29-06-2010	10-01-2012
Canada	Guernsey	19-01-2011	18-12-2011
Canada	Isle of Man	17-01-2011	19-12-2011
Canada	Jersey	12-01-2011	19-12-2011
Canada	Liechtenstein	13-01-2013	26-01-2014
Canada	Panama	17-03-2013	06-12-2013
Canada	Saint Lucia	18-06-2010	08-08-2012
Canada	San Marino	27-10-2010	20-10-2011
Canada	Sint Maarten	29-08-2009	01-01-2011
Canada	St. Kitts and Nevis	14-06-2010	21-11-2011
Canada	St. Vincent and the Grenadines	22-06-2010	06-10-2011
Canada	Turks and Caicos	22-06-2010	06-10-2011
Canada	Uruguay	05-02-2013	27-06-2014
China	Argentina	13-12-2010	16-09-2011
China	Bahamas	01-12-2009	28-08-2010
China	Bermuda	02-12-2010	31-12-2011
China	British Virgin Islands	07-12-2009	30-12-2010
China	Cayman Islands	26-09-2011	15-11-2012
China	Guernsey	27-10-2010	17-08-2011
China	Isle of Man	26-10-2010	14-08-2011
China	Jersey	29-10-2010	10-11-2011
China	Liechtenstein	27-01-2014	02-08-2014
China	San Marino	09-07-2012	30-04-2013
Cayman Islands	Argentina	13-10-2011	31-08-2012
Cayman Islands	Aruba	20-04-2010	01-12-2011
Cayman Islands	Australia	30-03-2010	14-02-2011
Cayman Islands	Belgium	24-04-2014	Not yet in force
Cayman Islands	Brazil	19-03-2013	Not yet in force
Cayman Islands	Canada	24-06-2010	01-06-2011
Cayman Islands	China	26-09-2011	15-11-2012
Cayman Islands	Curaçao	29-10-2009	Not yet in force
Cayman Islands	Czech Republic	26-10-2012	20-09-2013
Cayman Islands	Denmark	01-04-2009	06-02-2010
Cayman Islands	Faroe Islands	01-04-2009	08-09-2010
Cayman Islands	Finland	01-04-2009	31-03-2010
Cayman Islands	France	05-10-2009	13-10-2010
Cayman Islands	Germany	27-05-2010	20-08-2011
Cayman Islands	Greenland	01-04-2009	24-03-2012
Cayman Islands	Guernsey	29-07-2011	05-04-2012
Cayman Islands	Iceland	01-04-2009	30-05-2010
Cayman Islands	India	21-03-2011	08-11-2011
Cayman Islands	Ireland	23-06-2009	09-06-2010
Cayman Islands	Isle of Man	22-09-2015	13-08-2016
Cayman Islands	Italy	03-12-2012	13-08-2015
Cayman Islands	Japan	07-02-2011	13-11-2011
Cayman Islands	Malta	25-11-2013	01-04-2014
Cayman Islands	Mexico	28-08-2010	09-03-2012
Cayman Islands	Netherlands	08-07-2009	29-12-2009
Cayman Islands	New Zealand	13-08-2009	30-09-2011

Cayman Islands	Norway	01-04-2009	04-03-2010
Cayman Islands	Poland	29-11-2013	11-12-2014
Cayman Islands	Portugal	13-05-2010	18-05-2011
Cayman Islands	Qatar	26-10-2012	Not yet in force
Cayman Islands	Seychelles	12-02-2014	22-09-2016
Cayman Islands	Sint Maarten	29-10-2009	Not yet in force
Cayman Islands	South Africa	10-05-2011	23-02-2012
Cayman Islands	Sweden	01-04-2009	27-12-2009
Cayman Islands	United States (renegotiated)	29-11-2013	14-04-2014
Denmark	Andorra	24-02-2010	13-02-2011
Denmark	Anguilla	02-09-2009	11-03-2011
Denmark	Antigua and Barbuda	02-09-2009	23-02-2011
Denmark	Aruba	10-09-2009	01-06-2011
Denmark	Bahamas	10-03-2010	09-09-2010
Denmark	Bahrain	14-10-2011	05-09-2012
Denmark	Barbados	03-11-2011	14-06-2012
Denmark	Belize	15-09-2010	09-03-2011
Denmark	Bermuda	16-04-2009	01-01-2010
Denmark	Botswana	20-02-2013	14-05-2015
Denmark	British Virgin Islands	18-05-2009	15-04-2010
Denmark	Brunei Darussalam	21-06-2012	17-04-2015
France	Andorra	22-09-2009	22-12-2010
France	Anguilla	30-12-2010	15-12-2011
France	Antigua and Barbuda	26-03-2010	28-12-2010
France	Aruba	14-11-2011	01-04-2013
France	Bahamas	07-12-2009	13-09-2010
France	Belize	22-11-2010	19-12-2011
France	Bermuda	12-10-2009	28-10-2010
France	British Virgin Islands	17-06-2009	18-11-2010
France	Brunei Darussalam	30-12-2010	Not yet in force
France	Cayman Islands	05-10-2009	13-10-2010
France	Cook Islands	15-09-2010	16-11-2011
France	Costa Rica	16-12-2010	14-12-2011
France	Curaçaoa	10-09-2010	01-08-2012
France	Dominica	24-12-2010	14-12-2011
France	Gibraltar	24-09-2009	09-12-2010
France	Grenada	31-03-2010	09-01-2012
France	Guernsey	24-03-2009	04-10-2010
France	Isle of Man	26-03-2009	04-10-2010
France	Jersey	23-03-2009	11-10-2010
France	Liberia	06-01-2011	30-12-2011
France	Liechtenstein	22-09-2009	19-08-2010
France	Saint Kitts and Nevis	01-04-2010	16-12-2010
France	Saint Lucia	01-04-2010	20-01-2011
France	Sint Maarten	10-09-2010	01-08-2012
France	Saint Vincent and the Grenadines	13-04-2010	21-03-2011
France	San Marino	22-09-2009	02-09-2010
France	Turks and Caicos Islands	12-10-2009	14-07-2011
France	Uruguay	28-01-2010	31-12-2010
France	Vanuatu	31-12-2009	07-01-2011
Germany	Andorra	25-11-2010	20-01-2012
Germany	Anguilla	19-03-2010	11-04-2011
Germany	Antigua and Barbuda	09-04-2010	12-12-2011
Germany	Bahamas	09-04-2010	12-12-2011
Germany	Bermuda	03-07-2009	06-06-2012
Germany	British Virgin Islands	05-10-2010	04-12-2011
Germany	Cayman Islands	27-05-2010	20-08-2011
Germany	Cook Islands	03-04-2012	11-12-2013
Germany	Dominica	21-09-2010	Not yet in force
Germany	Gibraltar	13-08-2009	04-11-2010
Germany	Guernsey	26-03-2009	22-12-2010
Germany	Isle of Man	02-03-2009	05-11-2010
Germany	Jersey	04-07-2008	28-08-2009
Germany	Liechtenstein	02-09-2009	28-10-2010
Germany	Monaco	27-07-2010	09-12-2011
Germany	Saint Kitts and Nevis	19-10-2010	19-09-2016
Germany	Saint Lucia	07-06-2010	28-02-2013
Germany	Saint Vincent and the Grenadines	29-03-2010	07-06-2011
Germany	San Marino	21-06-2010	23-12-2011
Germany	Turks and Caicos Islands	04-06-2010	25-11-2011
Greece	Guernsey	08-10-2010	07-03-2014
Hong Kong	Denmark	22-08-2014	04-12-2015
Hong Kong	Faroe Islands	22-08-2014	04-12-2015
Hong Kong	Greenland	22-08-2014	17-02-2016
Hong Kong	Iceland	22-08-2014	04-12-2015
Hong Kong	Norway	22-08-2014	04-12-2015
Hong Kong	Sweden	22-08-2014	16-01-2016
Hong Kong	United States	25-03-2014	20-06-2014
India	Argentina	21-11-2011	28-01-2013
India	Bahamas	11-02-2011	01-03-2011
India	Bahrain	31-05-2012	11-04-2013
India	Belize	18-09-2013	25-11-2013
India	Bermuda	07-10-2010	03-11-2010
India	British Virgin Islands	09-02-2011	22-08-2011
India	Cayman Islands	21-03-2011	08-11-2011
India	Gibraltar	01-02-2013	11-03-2013
India	Guernsey	20-12-2011	11-06-2012
India	Isle of Man	04-02-2011	17-03-2011
India	Jersey	03-11-2011	08-05-2012
India	Liberia	03-10-2011	30-03-2012
India	Liechtenstein	28-03-2013	20-01-2014
India	Macau (China)	03-01-2012	16-04-2012
India	Maldives	11-04-2016	02-08-2016
India	Marshall Islands	18-03-2016	Not yet in force
India	Monaco	31-07-2012	27-03-2013
India	Saint Kitts and Nevis	11-11-2014	02-02-2016
India	San Marino	19-12-2013	29-08-2014
India	Seychelles	26-08-2015	28-06-2016

Indonesia	Bahamas	25-06-2015	Not yet in force
Indonesia	Bermuda	22-06-2011	23-11-2017
Indonesia	Guernsey	27-04-2011	22-09-2014
Indonesia	Isle of Man	22-06-2011	19-09-2014
Indonesia	Jersey	27-04-2011	22-09-2014
Indonesia	San Marino	25-09-2013	Not yet in force
Italy	Andorra	22-09-2015	08-06-2017
Italy	Bermuda	23-04-2012	03-04-2017
Italy	Cayman Islands	03-12-2012	13-08-2015
Italy	Cook Islands	17-05-2011	17-02-2015
Italy	Costa Rica	27-05-2016	Not yet in force
Italy	Gibraltar	04-10-2012	12-06-2015
Italy	Guernsey	05-09-2012	10-06-2015
Italy	Isle of Man	16-09-2013	10-06-2015
Italy	Jersey	13-03-2012	26-01-2015
Italy	Liechtenstein	26-02-2015	20-12-2016
Italy	Monaco	02-03-2015	04-02-2017
Italy	Turkmenistan	04-05-2012	18-01-2017
Japan	Bahamas	27-01-2011	25-08-2011
Japan	Bermuda	01-02-2010	01-08-2010
Japan	British Virgin Islands	18-06-2014	11-10-2014
Japan	Cayman Islands	07-02-2011	13-11-2011
Japan	Guernsey	06-12-2011	23-08-2013
Japan	Isle of Man	21-06-2011	01-09-2011
Japan	Jersey	02-12-2011	30-08-2013
Japan	Liechtenstein	05-07-2012	29-12-2012
Japan	Macao	13-03-2014	22-05-2014
Japan	Panama	25-08-2016	12-03-2017
Japan	Samoa	04-06-2013	06-07-2013
Lithuania	Guernsey	20-06-2013	08-03-2014
Malaysia	Bermuda	23-04-2012	28-12-2012
Mexico	Aruba	18-07-2013	01-09-2014
Mexico	Bahamas	23-02-2010	30-12-2010
Mexico	Belize	17-11-2011	09-08-2012
Mexico	Bermuda	15-10-2009	09-09-2010
Mexico	Cayman Islands	17-08-2010	09-03-2012
Mexico	Cook Islands	08-11-2010	03-03-2012
Mexico	Costa Rica	25-04-2011	26-06-2012
Mexico	Curaçao	01-09-2009	04-02-2011
Mexico	Gibraltar	09-11-2012	27-08-2014
Mexico	Guernsey	10-06-2011	24-03-2012
Mexico	Isle of Man	18-03-2011	04-03-2012
Mexico	Jersey	08-11-2010	22-03-2012
Mexico	Liechtenstein	20-04-2013	24-07-2014
Mexico	Saint Lucia	05-07-2013	18-12-2015
Mexico	Samoa	17-11-2011	18-07-2012
Netherlands	Andorra	06-11-2009	01-01-2011
Netherlands	Anguilla	22-07-2009	01-05-2011
Netherlands	Antigua and Barbuda	02-09-2009	01-03-2010
Netherlands	Bahamas	04-12-2009	01-12-2010
Netherlands	Belize	04-02-2010	01-01-2011
Netherlands	Bermuda	08-06-2009	01-02-2010
Netherlands	British Virgin Islands	11-09-2009	01-07-2013
Netherlands	Cayman Islands	08-07-2009	29-12-2009
Netherlands	Cook Islands	23-10-2009	07-09-2011
Netherlands	Costa Rica	29-03-2011	01-07-2012
Netherlands	Dominica	11-05-2010	01-03-2012
Netherlands	Gibraltar	23-04-2010	01-12-2011
Netherlands	Grenada	18-02-2010	20-01-2012
Netherlands	Guernsey	25-04-2008	11-04-2009
Netherlands	Isle of Man	12-10-2005	24-07-2006
Netherlands	Jersey	20-06-2007	01-03-2008
Netherlands	Liberia	27-05-2010	01-06-2012
Netherlands	Liechtenstein	10-11-2009	01-12-2010
Netherlands	Marshall Islands	14-05-2010	08-11-2011
Netherlands	Monaco	11-01-2010	01-12-2010
Netherlands	Montserrat	10-12-2009	01-12-2011
Netherlands	Saint Kitts and Nevis	02-09-2009	29-11-2010
Netherlands	Saint Lucia	02-12-2009	31-03-2011
Netherlands	Saint Vincent and the Grenadines	01-09-2009	21-03-2011
Netherlands	Samoa	14-09-2009	02-03-2012
Netherlands	San Marino	27-01-2010	01-01-2011
Netherlands	Seychelles	04-08-2010	01-09-2012
Netherlands	Turks and Caicos Islands	22-07-2009	01-05-2011
Netherlands	Uruguay	24-10-2012	01-06-2016
Norway	Andorra	24-02-2010	18-06-2011
Norway	Anguilla	14-12-2009	10-04-2011
Norway	Antigua and Barbuda	19-05-2010	15-01-2011
Norway	Aruba	10-09-2009	01-08-2011
Norway	Bahamas	10-03-2010	09-09-2010
Norway	Bahrain	14-10-2011	12-07-2012
Norway	Belize	15-09-2010	26-02-2011
Norway	Bermuda	16-04-2009	22-01-2010
Norway	Botswana	20-02-2013	10-01-2016
Norway	British Virgin Islands	18-05-2009	03-12-2010
Norway	Brunei	27-06-2012	27-04-2015
Norway	Cayman Islands	01-04-2009	04-03-2010
Norway	Cook Islands	16-12-2009	06-10-2011
Norway	Costa Rica	29-06-2011	13-04-2014
Norway	Dominica	19-05-2010	22-01-2012
Norway	Gibraltar	16-12-2009	08-09-2010
Norway	Grenada	19-05-2010	09-02-2012
Norway	Guatemala	15-05-2012	Not yet in force
Norway	Guernsey	28-10-2008	07-10-2009
Norway	Hong Kong, China	22-08-2014	04-12-2015
Norway	Isle of Man	30-10-2007	06-09-2008
Norway	Jersey	28-10-2008	07-10-2009
Norway	Liberia	10-11-2010	17-05-2012

Norway	Liechtenstein	17-12-2010	31-03-2012
Norway	Macao, China	29-04-2011	18-12-2011
Norway	Marshall Islands	28-09-2010	19-06-2011
Norway	Mauritius	01-12-2011	26-05-2012
Norway	Monaco	23-06-2010	31-01-2011
Norway	Montserrat	22-11-2010	19-12-2011
Norway	Niue	19-09-2013	28-05-2014
Norway	Panama	12-11-2012	20-12-2013
Norway	Samoa	16-12-2009	19-10-2012
Norway	San Marino	12-01-2010	22-07-2010
Norway	Seychelles	30-03-2011	11-08-2012
Norway	St. Kitts and Nevis	24-03-2010	12-01-2011
Norway	St. Lucia	19-05-2010	01-12-2011
Norway	St. Vincent and the Grenadines	24-03-2010	20-04-2011
Norway	Turks and Caicos Islands	16-12-2009	09-04-2011
Norway	United Arab Emirates	03-11-2015	15-02-2017
Norway	Uruguay	14-12-2011	30-01-2014
Norway	Vanuatu	13-10-2010	Not yet in force
Peru	Argentina	07-10-2004	08-10-2004
Peru	Ecuador	09-03-2002	07-01-2003
Peru	United States	15-02-1990	31-03-1993
Portugal	Andorra	30-11-2009	31-03-2011
Portugal	Anguilla	28-02-2011	Not ratified in Portugal
Portugal	Antigua and Barbuda	13-09-2010	Not ratified in Portugal
Portugal	Belize	22-10-2010	Not ratified in Belize
Portugal	Bermuda	10-05-2010	05-04-2011
Portugal	British Virgin Islands	05-10-2010	Not ratified in BVI
Portugal	Cayman Islands	13-05-2010	18-05-2011
Portugal	Dominica	05-10-2010	Not ratified in Portugal
Portugal	Gibraltar	14-10-2009	24-04-2011
Portugal	Guernsey	09-07-2010	17-02-2017
Portugal	Isle of Man	09-07-2010	18-01-2012
Portugal	Jersey	09-07-2010	09-11-2011
Portugal	Liberia	14-01-2011	Not ratified in Portugal
Portugal	Saint Kitts and Nevis	29-07-2010	24-05-2017
Portugal	Saint Lucia	14-07-2010	28-10-2011
Portugal	Turks and Caicos Islands	21-12-2010	Not ratified in Turks and Caicos Islands
Romania	Guernsey	12-01-2011	22-01-2012
Romania	Isle of Man	04-11-2015	08-09-2016
Romania	Jersey	01-12-2014	05-02-2016
Singapore	Bermuda	29-10-2012	06-12-2012
South Africa	Argentina	02-08-2013	28-11-2014
South Africa	Bahamas	14-09-2011	25-05-2012
South Africa	Barbados	17-09-2013	19-01-2015
South Africa	Belize	06-05-2014	23-05-2015
South Africa	Bermuda	06-09-2011	08-02-2012
South Africa	Cayman Islands	10-05-2011	23-02-2012
South Africa	Cook Islands	25-10-2013	08-01-2015
South Africa	Costa Rica	27-10-2012	08-02-2017
South Africa	Dominica	07-02-2012	17-09-2015
South Africa	Gibraltar	02-02-2012	21-07-2013
South Africa	Grenada	10-12-2014	10-03-2017
South Africa	Guernsey	21-02-2011	26-02-2012
South Africa	Jersey	12-07-2011	29-02-2012
South Africa	Liberia	07-02-2012	07-07-2013
South Africa	Liechtenstein	29-11-2013	23-05-2015
South Africa	Monaco	23-09-2013	06-12-2014
South Africa	Samoa	26-07-2012	28-05-2017
South Africa	San Marino	10-03-2011	28-01-2012
South Africa	St. Kitts and Nevis	07-04-2015	18-02-2017
South Africa	Turks and Caicos Islands	27-05-2015	21-09-2018
South Africa	Uruguay	07-08-2015	06-10-2017
Spain	Andorra	14-01-2010	10-02-2011
Spain	Aruba	24-11-2008	27-01-2010
Spain	Bahamas	11-03-2010	17-08-2011
Spain	Curaçao	10-06-2008	27-01-2010
Spain	Guernsey	10-11-2015	Not yet in force
Spain	Isle of Man	03-12-2015	Not yet in force
Spain	Jersey	17-11-2015	Not yet in force
Spain	San Marino	06-09-2010	02-08-2011
Spain	Sint Maarten	10-06-2008	27-01-2010
Switzerland	Andorra	17-03-2014	27-07-2015
Switzerland	[Country missing]	10-08-2015	13-10-2016
Switzerland	Brazil	23-11-2015	04-01-2019
Switzerland	Greenland	07-03-2014	22-07-2015
Switzerland	[Country missing]	19-05-2015	21-12-2016
Switzerland	Guernsey	11-09-2013	03-11-2014
Switzerland	Isle of Man	28-08-2013	14-10-2014
Switzerland	Jersey	16-09-2013	14-10-2014
Switzerland	San Marino	16-05-2014	20-07-2015
Switzerland	Seychelles	26-05-2014	10-08-2015
Turkey	Bermuda	23-01-2012	18-09-2013
Turkey	Gibraltar	04-12-2012	15-02-2018
Turkey	Guernsey	13-03-2012	06-10-2017
Turkey	Isle of Man	21-09-2012	07-10-2017
Turkey	Jersey	24-11-2010	11-09-2013
United Arab Emirates	Argentina	05-02-2016	17-01-2017
United Arab Emirates	Colombia	09-02-2016	Not yet in force
United Arab Emirates	Denmark	04-11-2015	15-02-2017
United Arab Emirates	Faroe Islands	02-05-2016	Not yet in force
United Arab Emirates	Finland	27-03-2016	10-02-2017
United Arab Emirates	Iceland	12-04-2016	Not yet in force
United Arab Emirates	Norway	03-11-2015	15-02-2017
United Arab Emirates	Sweden	05-11-2015	08-02-2017
USA	Antigua and Barbuda	06-12-2001	10-02-2003
USA	Argentina	23-12-2016	13-11-2017
USA	Aruba	21-11-2003	13-09-2004
USA	Bahamas	25-01-2002	31-12-2003

USA	Barbados	03-11-1984	03-11-1984
USA	Bermuda	02-12-1988	02-12-1988
USA	Brazil	20-03-2007	19-03-2013
USA	British Virgin Islands	03-04-2002	10-03-2006
USA	Cayman Islands	29-11-2013	14-04-2014
USA	Colombia	30-03-2001	30-04-2014
USA	Costa Rica	15-03-1989	12-02-1991
USA	Costa Rica	01-04-2018	Not yet in force
USA	Curaçao	17-04-2002	22-03-2007
USA	Dominica	01-10-1987	09-05-1988
USA	Dominican Republic	07-08-1989	12-10-1989
USA	Gibraltar	31-03-2009	22-12-2009
USA	Grenada	18-12-1986	13-07-1987
USA	Guernsey	19-09-2002	30-03-2006
USA	Guyana	22-07-1992	27-08-1992
USA	Honduras	27-09-1990	11-10-1991
USA	Hong Kong (China)	25-03-2014	20-06-2014
USA	Isle of Man	03-10-2002	26-06-2006
USA	Jamaica	18-12-1986	18-12-1986
USA	Jersey	04-11-2002	26-06-2006
USA	Liechtenstein	08-12-2008	04-12-2009
USA	Marshall Islands	14-03-1991	14-03-1991
USA	Mauritius	27-12-2013	29-08-2014
USA	Mexico	09-11-1989	18-01-1990
USA	Monaco	08-09-2009	11-03-2010
USA	Panama	30-11-2010	18-04-2011
USA	Peru	15-02-1990	31-03-1993
USA	Saint Lucia	30-01-1987	05-05-2014
USA	Sint Maarten	17-04-2002	22-03-2007
USA	Trinidad and Tobago	11-01-1989	09-02-1990

Source: OECD country-specific peer review reports on the exchange of information upon request, published between 2017 and 2024.

Appendix H: Descriptive Statistics and Correlation Structure of Baseline Variables: OECD CbCR Data

Table H1: Descriptive Statistics for Dependent, Explanatory, and Control Variables – Full Sample

Variable	**Obs**	**Mean**	**Std. dev.**	**Min**	**Max**
Ln_profit, in tax havens	1 232	18.55	3.31	2.20	25.70
Ln_profit, in non-tax havens	6 304	17.76	2.84	0.00	25.41
Ln_GDP_partner	10 121	26.02	1.95	19.18	30.80
Ln_distcap	9 516	8.51	0.96	4.11	9.89
Comlang	9 516	0.19	0.39	0.00	1.00
Corporate tax rate	10 459	22.60	8.27	0.00	44.00
TIEA	10 497	0.06	0.25	0.00	1.00
Secrecy score	8 532	60.89	10.11	37.55	88.58

Table H2: Correlation Matrix of Explanatory and Control Variables

	Ln_GDP_pc_partner	Ln_distcap	Comlang	CTR	TIEA	Secrecy score
Ln_GDP_partner	1.00					
Ln_distcap	0.04	1.00				
Comlang	-0.09	-0.05	1.00			
Corporate tax rate	0.40	0.09	0.03	1.00		
TIEA	-0.04	0.07	0.17	-0.07	1.00	
Secrecy score	-0.38	0.12	0.12	-0.28	0.02	1.00