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Benchmarking Country-by-Country Reports

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Abstract

Country-by-Country Reports (CbCRs) have emerged as a unique public source of information to track the country-by-country activities of multinational corporations. However, concerns about double counting and comparability have raised questions about the reliability of these reports for economic analyses. In this paper, we conduct a benchmark analysis focusing on publicly available CbCRs to assess the reliability of CbCR information compared to respective consolidated financial information. Our findings suggest only limited double counting issues. Most CbCR information matches well with the consolidated information, with only a few exceptions. Nonetheless, we document differences in the definition of variables and in the scope of the reports that may complicate comparisons across multinational corporations. We subsequently discuss the implications of our findings for the use of CbCRs as a source of information in economic analyses. In addition, we provide recommendations for improving the reliability and comparability of CbCR information.

Keywords: Country-by-Country Reporting, Tax Transparency, Double Counting, Geographic Reporting
JEL Codes: H25: Corporate Taxation, H32: Taxation, Subsidies, and Revenue, M48: Accounting and Auditing

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1 Introduction

In recent years, the issue of multinational corporations avoiding taxes has become a major concern for governments and citizens worldwide, resulting in a growing demand for corporate transparency. Country-by-Country Reports (CbCRs) respond to this demand by providing unique public information to track the country-level activities of multinationals. CbCRs comprise country-level information on various financial figures of a multinational such as revenues, pre-tax profits, accrued taxes, number of employees, tangible assets or stated capital. With the provision of such information, CbCRs may play a crucial role in evaluating the effectiveness of major international tax reforms and monitoring the tax avoidance behavior of multinationals. They may also be used for non-tax purposes such as all location-driven assessments of multinationals by stakeholders (e.g., Hope and Thomas (2008)). However, the reliability and comparability of CbCR data has been questioned (Bobeldijk and Klaassen (2019); OECD (2020); EBTF (2022)). But systematic evidence on these concerns remains limited. We contribute to filling this gap by investigating to what extent double counting occurs across all reported variables in CbCRs and identifying which dimensions in current reporting practices hamper the comparability of CbCRs across multinational corporations.

The main reliability concern relates to the way CbCRs are commonly prepared. It involves the aggregation of the financial figures of all group companies in a country. This process, however, often fails to account for intracompany transactions, potentially leading to double or multiple counting and hence artificially inflated figures. But the extent of double counting likely depends on the type of the financial figure. For instance, equity figures like stated capital might be particularly inflated as capital is often invested through a chain of group companies. External revenues figures, on the other hand, might be less affected as they generally only include third party transactions. Another concern is that the sensitive nature of CbCR data, combined with the potential for managerial discretion, may affect reporting behavior. Company-specific costs and benefits of public reporting may introduce heterogeneity in reporting and reduce comparability across companies. This may limit the usefulness of CbCRs for company outsiders. While some researchers argue that current reporting practices already provide robust country-level information (Geerts and De Baets (2022); Mansour (2022)), these concerns are difficult to evaluate by company outsiders as internal tax reporting processes of multinationals remain largely opaque (Brühne and Schanz, 2022).

To assess the extent of double counting across all reported variables in CbCRs and to identify the dimensions that introduce heterogeneity across the reporting of different companies, we rely on two main data sources: the CbCR information disclosed on a voluntary basis by multinationals and their respective consolidated financial statements. Similar to prior studies (Becker et al. (2021) for a review), we employ the benchmarking method to evaluate the extent of double counting and heterogeneity in reporting. We compare financial information in CbCRs and consolidated accounts to hold the underlying economic transactions constant and only vary the reporting source. Consolidated financial statements provide a suitable benchmark for evaluating the reliability and comparability of the CbCR data. First, all intracompany transactions are eliminated in such statements, ensuring that no double counting is present. Second, financial statements and the underlying internal reporting processes of the companies are regularly audited by a third party. Last, they are available for all multinationals.

We collect CbCRs voluntarily disclosed by multinational corporations that follow the respective reporting frameworks of the Organisation for Economic Co-operation and Development (OECD)[1] and the Global Reporting Initiative (GRI).[2] Our unbalanced sample includes data from 67 multinational corporations for the fiscal years 2017 to 2021, with a total of 94 CbCRs. We meticulously match the data in the CbCRs to the accounts of the respective consolidated financial statements, ensuring that all variables are consistently defined and that the varying scope of the reports (e.g., due to discontinued operations) is accounted for. After matching the CbCR and consolidated figures, we calculate a simple ratio between the aggregated figures. During this process, we also analyse the complementary information accompanying CbCR data and identify additional reporting dimensions that vary across companies.

Our benchmarking analysis reveals that voluntarily reported CbCRs of multinationals generally align well with their corresponding consolidated financial statements. Specifically, most variables (e.g., revenues, tax paid or the number of employees) display a high degree of alignment with virtually no discrepancy. Hence, double counting appears to be limited for most variables. Generally, the profit variable also indicates a good alignment. However, the reliability of this variable is compromised by a few large outliers when intracompany dividends are included. Of particular concern, the equity variables (i.e., accumulated earnings and stated capital) exhibit significant divergence between CbCRs and consolidated accounts, in line with substantial double counting. Moreover, our analysis reveals heterogeneity in reporting practices across companies, with varying definitions of variables (notably for tangible assets) and varying scopes of the reports (e.g., due to the inclusion of discontinued operations).

Our study contributes to the growing body of research on the reliability of data in country-by-country reporting. Current work primarily focuses on double counting in profit figures and only relies on aggregated data of US multinationals. In particular, Horst and Curatolo (2020) and Garcia-Bernardo et al. (2022) compare aggregate IRS CbCR profit figures with aggregate consolidated profit figures reported in Compustat. Similar analyses have also been carried out by some governments and tax authorities for the aggregate CbCR statistics of the OECD.[3] We extend this literature in two ways. First, we systematically evaluate potential double counting concerns across all variables, expanding prior literature's focus beyond profit figures. Second, while previous work mainly relies on aggregated data, we introduce a micro dimension by analysing firm-level CbCRs to complement the evidence on the aggregated studies. Firm-level CbCRs foster a more detailed understanding of the underlying data and allow to account for heterogeneity in reporting. Our results suggest valuable insights on double counting that are only visible in micro-level data. For example, for the profit figure, Horst and Curatolo (2020) estimate that 14% of aggregate US profit is double counted. But this estimate masks reporting heterogeneity across companies. We show that for a single multinational, double counting can be much more substantial. It can range from a doubling to a tenfold increase in total profit when including intracompany dividends.

We also add to the overall literature on country-by-country reporting as we re-emphasize the usefulness of CbCR information. Our work on data limitations complements other

[1] Under the Base Erosion and Profit Shifting (BEPS) Action 13, multinationals are required to report CbCRs to tax authorities. However, some companies voluntarily publish their CbCRs.

[2] We abstract from banks' CbCR reported under the Capital Requirements Directive (CRD) IV which was introduced before the BEPS Action 13 framework.

[3] Country-specific analyses are available for the Netherlands, Italy, Sweden and the United Kingdom.

papers highlighting the uniqueness of such country-level data. Dutt et al. (2019), for instance, evaluate the data coverage on banks' country-level activities in other data sources such as Orbis. They show that CbCRs provide substantial new information on banks' activities, particularly concerning their presence in tax havens. Overall, our work thus also relates to prior literature assessing the use of CbCRs. In particular, many studies assess whether greater corporate transparency due to CbCRs deters tax avoidance behavior of banks and multinational corporations. These studies use public bank CbCRs (Dutt et al. (2019); Joshi et al. (2020); Overesch and Wolff (2021); Baraké (2023)), private multinational CbCRs (Joshi (2020); De Simone and Olbert (2021)) and public multinational CbCRs (Müller et al. (2021); Gomez Cram and Olbert (2022)).

Finally, our work contributes to the literature on managerial discretion observed in corporate reporting such as geographic segment reporting. Investors, for instance, frequently call for such disaggregated information for valuation purposes (Véron, 2007). As part of their segment reporting (e.g., IFRS 8 or SFAS 131), multinationals are thus usually required to report some financial figures on a regional basis. Prior literature primarily examines changes in reporting behaviour and in the value relevance of reported information due to the adoption of these requirements (Prather-Kinsey and Meek (2004); Hope and Thomas (2008); Leung and Verriest (2015)). For example, both Prather-Kinsey and Meek (2004) and Leung and Verriest (2015) document variation across companies in the number of figures disclosed, frequency of reporting and the granularity of the information. We add to this literature by showing that similar heterogeneity in reporting exists for CbCRs. The collected CbCRs not only display variation in the number of figures disclosed, the frequency of reporting and the granularity of the information. We also document varying degrees of discretion in the definition of variables and the scope of the reports. This heterogeneity in reporting must be accounted for when comparing such information across multinationals.

Our study has important implications for tax authorities, policymakers and other users worldwide. The availability and the use of CbCR data in the aggregated form is on the rise and subject to increased public scrutiny. The data is not only used to evaluate policy and tax reforms (e.g. OECD (2020); Baraké et al. (2021)), but also used internally by tax authorities (e.g., to assess transfer pricing risk). Hence, it is essential to better understand the limitations of the data to interpret it properly. Our analysis highlights the potential for double counting for some CbCR figures and frequent heterogeneity in reporting practices of multinational corporations. Our findings can therefore contribute to the development of guidelines for the reporting of CbCR data, and inform policymakers, tax authorities, and other users on how to interpret the data.

The paper is structured as follows: Section 2 introduces CbCRs and highlights potential issues. Section 3 describes the methodology to benchmark CbCRs with consolidated accounts. Section 4 describes the data sample. Section 6 presents the main results including the key challenges of benchmarking. Section 7 provides suggestions to improve reporting and Section 8 concludes.

2 Background: Features and Potential Issues of Country-by-Country Reports

2.1 What is a Country-by-Country Report?

Country-by-country reporting is the reporting of financial, and tax-related information for each jurisdiction in which a multinational company operates. Figure 1 shows that a CbCR mainly consists of a table with different columns corresponding to the required variables and rows corresponding to jurisdictions where the multinational is active. For each jurisdiction, the financial and tax-related figures of all the resident entities are aggregated in one number, representing the total activities of the multinational.

Companies mainly follow two closely related frameworks when providing public CbCRs: OECD BEPS Action 13 and GRI 207-4.[4] OECD's Action 13 final report provides a template for multinationals to disclose information for each tax jurisdiction in which they operate. This includes country-level data on related party revenues, unrelated party revenues, total revenues, profits before income taxes, income tax paid, income tax accrued, stated capital, accumulated earnings, number of employees and tangible assets other than cash and cash equivalents. Reporting is mandatory for multinational companies with consolidated revenues of more than EUR 750 million in the previous year. Currently, however, reporting does not entail public disclosure. CbCRs are only submitted to the respective tax authority. Nevertheless, some companies voluntarily publish these reports.[5] In terms of the required information, GRI 207-4 is closely related to the OECD standard. It requires the same set of variables except for accumulated earnings and stated capital. In addition, GRI 207-4 allows for more flexibility in reporting (e.g., in measuring the number of employees). But these options appear to be rarely used. Overall, the crucial difference between the two is that the GRI tax transparency standard is set up for public disclosure in the first place.[6]

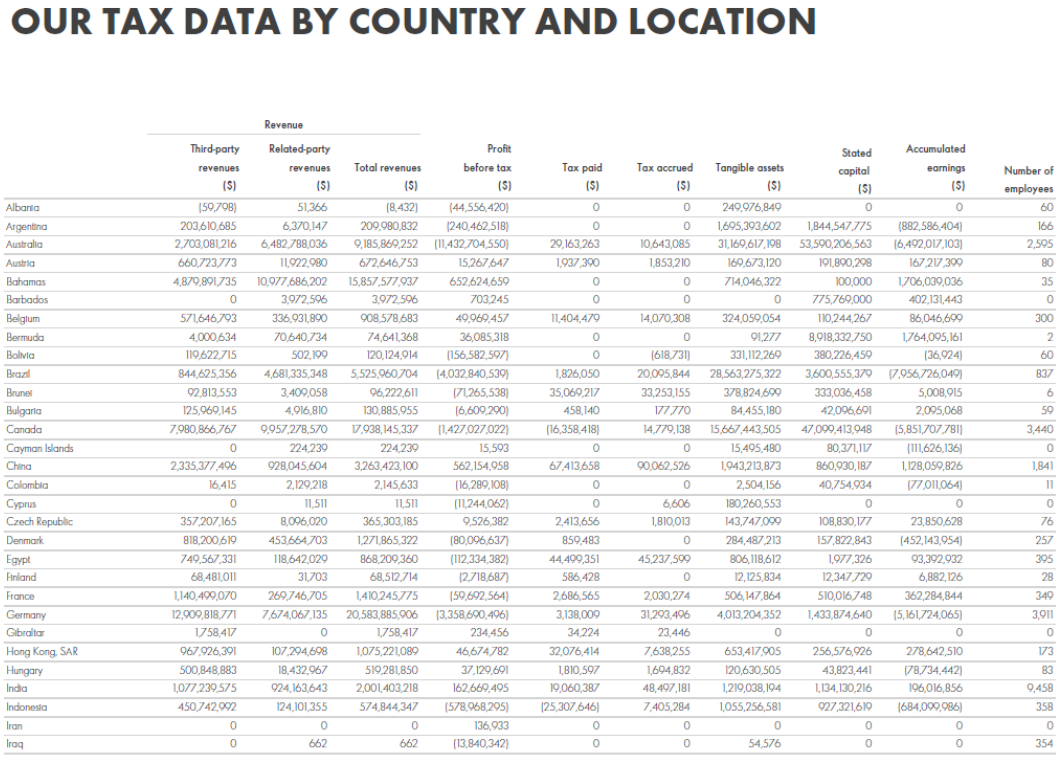
The reliability and comparability of public CbCRs are relevant for at least two purposes. First, granular country-level information allows the public to evaluate the effectiveness of international (tax) regimes. Second, public CbCRs enable company outsiders such as shareholders or consumers to assess and change the (tax avoidance) behaviour of multinationals. One strand of this literature focuses on the deterrence effect of increased tax transparency, mainly using existing mandatory country-by-country reporting regimes. The underlying rationale is that increased tax transparency should encourage multinational companies to change their behaviour to avoid (mainly reputational) damage by stakeholders. These studies use public bank CbCRs (Dutt et al. (2019); Joshi et al. (2020); Overesch and Wolff (2021); Baraké (2023)), private multinational CbCRs (Joshi (2020); De Simone and Olbert (2021)) and public multinational CbCRs (Müller et al. (2021); Gomez Cram and Olbert (2022)). A related strand of literature addresses shareholder monitoring to reduce managerial entrenchment. Hope and Thomas (2008), for instance, show that the reduction in geographic reporting requirements leads to lower profitability abroad and a lower company value. They conclude that shareholders lose

[4] A complete description of the GRI 207-4 tax transparency standard is available here.

[5] The landscape of reporting requirements appears to be changing rapidly. The European Union (EU), for example, is requiring large multinationals to provide a limited form of public country-by-country reporting starting in the summer of 2024.

[6] A detailed comparison between the GRI 207-4 and OECD BEPS Action 13 standard is available here. A short comparison is provided in Appendix B.

Figure 1: Country-by-Country Report Example



OUR TAX DATA BY COUNTRY AND LOCATION

	Revenue									
	Third-party revenues ($)	Related-party revenues ($)	Total revenues ($)	Profit before tax ($)	Tax paid ($)	Tax accrued ($)	Tangible assets ($)	Stated capital ($)	Accumulated earnings ($)	Number of employees
Albania	(59,798)	51,366	(8,432)	(44,556,420)	0	0	249,976,849	0	0	60
Argentina	203,610,685	6,370,147	209,980,832	(240,462,518)	0	0	1,695,393,602	1,844,547,775	(882,586,404)	166
Australia	2,703,081,216	6,482,788,036	9,185,869,252	(11,432,704,550)	29,163,263	10,643,085	31,169,617,198	53,590,206,563	(6,492,017,103)	2,595
Austria	660,723,773	11,922,980	672,646,753	15,267,647	1,937,390	1,853,210	169,673,120	191,890,298	167,217,399	80
Bahamas	4,879,891,735	10,977,686,202	15,857,577,937	652,624,659	0	0	714,046,322	100,000	1,706,039,036	35
Barbados	0	3,972,596	3,972,596	703,245	0	0	0	775,769,000	402,131,443	0
Belgium	571,646,793	336,931,890	908,578,683	49,969,457	11,404,479	14,070,308	324,059,054	110,244,267	86,046,699	300
Bermuda	4,000,634	70,640,734	74,641,368	36,085,318	0	0	91,277	8,918,332,750	1,764,095,161	2
Bolivia	119,622,715	502,199	120,124,914	(156,582,597)	0	(618,731)	331,112,269	380,226,459	(36,924)	60
Brazil	844,625,356	4,681,335,348	5,525,960,704	(4,032,840,539)	1,826,050	20,095,844	28,563,275,322	3,600,555,379	(7,956,726,049)	837
Brunei	92,813,553	3,409,058	96,222,611	(71,265,538)	35,069,217	33,253,155	378,824,699	333,036,458	5,008,915	6
Bulgaria	125,969,145	4,916,810	130,885,955	(6,609,290)	458,140	177,770	84,455,180	42,096,691	2,095,068	59
Canada	7,980,866,767	9,957,278,570	17,938,145,337	(1,427,027,022)	(16,358,418)	14,779,138	15,667,443,505	47,099,413,948	(5,851,707,781)	3,440
Cayman Islands	0	224,239	224,239	15,593	0	0	15,495,480	80,371,117	(111,626,136)	0
China	2,335,377,496	928,045,604	3,263,423,100	562,154,958	67,413,658	90,062,526	1,943,213,873	860,930,187	1,128,059,826	1,841
Colombia	16,415	2,129,218	2,145,633	(16,289,108)	0	0	2,504,156	40,754,934	(77,011,064)	11
Cyprus	0	11,511	11,511	(11,244,062)	0	6,606	180,260,553	0	0	0
Czech Republic	357,207,165	8,096,020	365,303,185	9,526,382	2,413,656	1,810,013	143,747,099	108,830,177	23,850,628	76
Denmark	818,200,619	453,664,703	1,271,865,322	(80,096,637)	859,483	0	284,487,213	157,822,843	(452,143,954)	257
Egypt	749,567,331	118,642,029	868,209,360	(112,334,382)	44,499,351	45,237,599	806,118,612	1,977,326	93,392,932	395
Finland	68,481,011	31,703	68,512,714	(2,718,687)	586,428	0	12,125,834	12,347,729	6,882,126	28
France	1,140,499,070	269,746,705	1,410,245,775	(59,692,564)	2,686,565	2,030,274	506,147,864	510,016,748	362,284,844	349
Germany	12,909,818,771	7,674,067,135	20,583,885,906	(3,358,690,496)	3,138,009	31,293,496	4,013,204,352	1,433,874,640	(5,161,724,065)	3,911
Gibraltar	1,758,417	0	1,758,417	234,456	34,224	23,446	0	0	0	0
Hong Kong, SAR	967,926,391	107,294,698	1,075,221,089	46,674,782	32,076,414	7,638,255	653,417,905	256,576,926	278,642,510	173
Hungary	500,848,883	18,432,967	519,281,850	37,129,691	1,810,597	1,694,832	120,630,505	43,823,441	(78,734,442)	83
India	1,077,239,575	924,163,643	2,001,403,218	162,669,495	19,060,387	48,497,181	1,219,038,194	1,134,130,216	196,016,856	9,458
Indonesia	450,742,992	124,101,355	574,844,347	(578,968,295)	(25,307,646)	7,405,284	1,055,256,581	927,321,619	(684,099,986)	358
Iran	0	0	0	136,933	0	0	0	0	0	0
Iraq	0	662	662	(13,840,342)	0	0	54,576	0	0	354

Source: Publicly available Shell Tax Contribution Report 2020 (Shell, 2020).
Note: Each row corresponds to a single tax jurisdiction where the multinational is active, aggregating the financial information of all the tax resident entities.

the ability to control managers who pursue their interests. A third strand of literature investigates whether granular geographic information is important to investors. It might enable them to account for the impact of local political and economic conditions on company performance. While earlier studies generally find evidence of changes in the information environment (Balakrishnan et al. (1990); Boatsman et al. (1993)), later studies do not (Hope et al. (2006); Leung and Verriest (2015)). But Leung and Verriest (2015) suggest that the quality of the information provided determines its relevance.

2.2 Potential Issues

Two characteristics of CbCR data preparation might lead to double counting, hampering their interpretation and use for economic and statistical analysis: data is generally aggregated at the jurisdiction level and profits potentially include intracompany dividends. These might lead to double counting and the computation of misleading ratios, in particular of effective tax rates (ETRs). In addition, the voluntary nature of public multinational CbCRs and the sensitivity of detailed tax information might create comparability issues.

2.2.1 Double Counting due to Data Aggregation

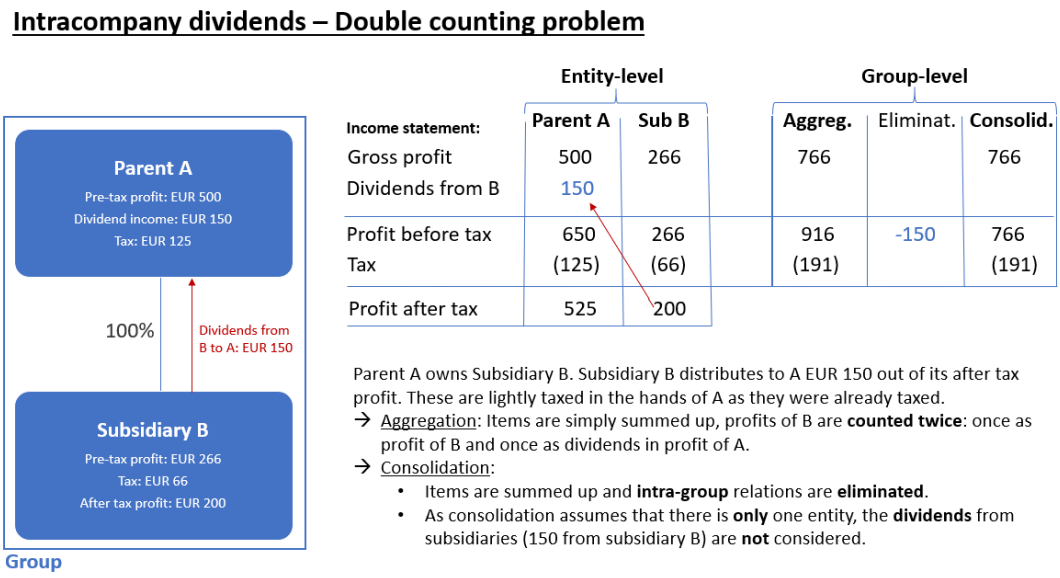
Multinationals are generally requested to report aggregate tax jurisdiction-wide information as opposed to reporting consolidated information. The principle of aggregation is to sum the financial accounts of each constituent entity in a jurisdiction, with no adjustment made for transactions between constituent entities in the same multinational group. This approach entails the risk of including intracompany transactions, which would lead to double counting and hence, an overestimation of the reported variables.

Providing consolidated figures would alleviate double counting concerns. This option is granted by the GRI 207-4 standard and by the BEPS Action 13 CbCR minimum standard, at least for jurisdictions allowing consolidation for tax purposes.[7]

2.2.2 Double Counting due to the Inclusion of Intracompany Dividends in the Profit Variable

The issue of intracompany dividends inclusion is a temporary one, stemming from unclear guidance from the OECD. The BEPS Action 13 instructions explicitly provided that "revenues should exclude payments received from other constituent entities that are treated as dividends in the payer's tax jurisdiction." (OECD, 2015) but no similar instructions were provided for profit before income tax, leaving it uncertain whether companies shall include or exclude intracompany dividends from profit. In 2019, the OECD/G20 Inclusive Framework on BEPS clarified that dividends from constituent entities must be excluded from profit before tax, ensuring a uniform approach for fiscal years commencing on or after 1 January 2020 (OECD, 2022).

Figure 2: Double Counting in the Profit Variable: The Intracompany Dividends Issue



Source: Authors' illustration.

[7] Further details are provided on page 8 of OECD (2022).

The potential lack of consistency in the calculation of profit across multinationals is thus mostly problematic for the fiscal years 2016 to 2019 and could result in double counting of profit at the multinational level and downward biased ETRs. Figure 2 provides an illustrative example. Suppose that parent A receives dividends from its fully owned subsidiary B. In the entity-level accounts of A, these dividends would be included in profit. When entity-level figures are aggregated and dividends are not eliminated, the profit would be counted twice: once as dividends for A and once as profit for B. Since dividends are generally taxed at a low rate (if they are taxed at all), the calculation of ETR with profit as the denominator would be biased downward in cases where dividends are included.

Within a multinational, this issue might be more pronounced for the ultimate parent entity or investment holding companies. Given that they are at the top of the ownership structure, they potentially receive large amounts of dividends from subsidiaries (EBTF, 2022).

2.2.3 Discretion in Voluntary Reporting

The manager´s decision to voluntarily disclose country-level information and its extent is endogenous. Christensen et al. (2021) summarize that a company may voluntarily disclose information other than traditional financial information out of several economic considerations. Müller et al. (2020) propose that this likely extends to tax-related reporting such as country-by-country reporting. First, information problems such as adverse selection generally lead to an undervaluation for companies with above-average performance (e.g., below-average tax evasion). With voluntary disclosure, a company may intend to differentiate itself from its competitors and voluntarily disclose (Grossman (1981); Milgrom (1981)). This may reduce costs due to information problems (Leuz and Wysocki (2016)). Second, a company may voluntarily disclose such information as it may reduce monitoring costs for shareholders due to moral hazard problems (Bushman and Smith (2001); Watson et al. (2002)). For instance, managerial empire building abroad may be more limited by enabling monitoring by shareholders (Hope and Thomas (2008)). Third, a company may disclose such information due to various self-interested motives of the manager. For example, managers may use tax transparency reporting strategically to manage impressions of stakeholders (Hopwood (2009); Merkl-Davies and Brennan (2007); Bilicka et al. (2020)). Closely related to these economic considerations are several socio-political theories. Institutional theory, for example, suggests that a company's disclosure decision is influenced by the environment of the company (Middleton and Muttonen (2020)). Voluntary tax reporting initiatives like the Extractive Industries Transparency Initiative that commit themselves to more disclosures may, for instance, pressure other companies.

In addition, a company may face direct and indirect costs from (the extent of) voluntary disclosure (Christensen et al. (2021); Müller et al. (2020)). Direct costs primarily stem from data preparation costs. Indirect costs may, for instance, include costs due to the disclosure of sensitive information (i.e., proprietary costs). Competitors, suppliers and others may use the granular information on the activities of the company to their advantage and harm the company (Adams et al. (2022)). Prior literature on geographic segment reporting suggests, at a minimum, that country-level financial information is such sensitive information and that companies are reluctant to disclose such granular

information (Prather-Kinsey and Meek (2004); Leung and Verriest (2015)). Similarly, the new information may increase the likelihood of reputational damage, future litigation and regulatory risk (Healy and Palepu (2001); Müller et al. (2020)). For example, the disclosed information may be used to prove the company's tax evasion behaviour. Overall, the manager´s decision to voluntarily disclose is a trade-off of the company-specific benefits and costs that are expected. As benefits and costs are likely different across companies, voluntary reporting likely differs across companies.

3 Methodology

To evaluate to which extent the outlined data limitations affect CbCR figures, we use benchmarking to hold the underlying economic transactions constant and just vary the reporting source, following prior literature (e.g., Becker et al. (2021)). For instance, to assess the impact of mandatory IFRS adoption, studies exploit the simultaneous reporting of disclosures based on old and new reporting requirements (Hung and Subramanyam (2007); Barth et al. (2014)). We, however, compare mandatory and (often) supplemental voluntary reporting of the same company in the same year holding the underlying economic transactions constant.

Mandatory reporting in the form of consolidated financial statements is widely publicly available and audited by a third party. In addition, the reported information is relatively well understood and standardised. On top of this, for this reporting purpose, the multinational is treated as one single entity and all intracompany transactions are eliminated, ensuring that no double counting is present. Hence, the use of consolidated statements as a benchmark can indicate the extent of double counting and other data limitations present in CbCR figures.

As we are interested in comparing accounts at the group level, the first step is to aggregate CbCR figures at the multinational-year level. Next, we identify the corresponding figure for each variable in the consolidated financial statements. Where a variable description is available in CbCRs we match it as precisely as possible with the financial accounts items. If, for instance, the tangible assets variable in the CbCR includes both the accounts property, plant and equipment and inventories, we search and sum the two items in the financial statements. Table 1 lists CbCR variables together with the main corresponding item in the financial statements.

Having gathered both aggregated and consolidated figures, we calculate a simple ratio between the two (i.e., CbCR sum divided by the consolidated figures). A ratio equal to one indicates that the correspondence between the two accounts is perfect while values larger than one indicate that CbCR figures are larger than the consolidated figures.

4 Data Sample

The analysis relies on two main data sources: publicly available CbCRs and consolidated financial statements.

4.1 Publicly Available Country-by-Country Reports

We hand-collect CbCRs disclosed by multinationals on a voluntary basis in various documents such as sustainability reports, annual reports (e.g., in the income tax note to the consolidated financial statements or the appendix), tax strategy reports or supplementary information within the company's website. Most CbCRs are reported outside of the traditional financial statements. In addition, most CbCRs are not explicitly audited.

The relevant CbCR tables are extracted and compiled in a single database to obtain an unbalanced sample covering 67 multinationals over the fiscal years 2017 to 2021 for a total of 94 CbCRs.[8] There is heterogeneity across reports in terms of variables and countries reported by multinationals. The majority of reports we analyse include at least one tax variable (either income tax accrued or paid), profit or revenues. A smaller number of companies report the country-level number of employees and tangible assets while only a minority include the equity variables of accumulated earnings and stated capital. For this analysis, the sample has been restricted to those reports that allow calculating the group total and thus exclude companies reporting financial information only on part of the jurisdictions they operate in.

The multinationals in our sample are often headquartered in Italy, the United Kingdom and Spain. Many issuers operate in the mining and extraction sector. Other frequent sectors are communications, chemicals and business services. Most CbCRs are from 2020. Compared to 2019, nearly three times as many CbCRs are reported in 2020. Since we collected CbCRs in January 2021, the number of available public CbCRs in 2021 is likely much larger than in our sample (Aliprandi and Borders, 2023). A complete list of the multinationals included in the sample is available in Appendix A.

4.2 Consolidated Financial Statements

For each of the public CbCRs, we identify the consolidated financial statement of the corresponding financial year and extract the variables of interest, listed in Table 1. As summarised in Table 2, the financial accounts are reported in various reports on the financial statements of the companies. Most financial accounts are, however, reported in the income statement and the balance sheet.

We pay close attention to including all items depending on the variables' definition (e.g., some companies might include or not discontinued operations, equity-accounted units), more details are available in Section 5. Frequently, companies provide explanations of the financial accounts and the elements they include. For other companies, we match by total CbCR amounts.

5 Heterogeneity in Reporting

In the process of identifying comparable figures in the financial statements, we encounter three main challenges: differences in variable definitions, differences in the treatment of discontinued operations and different treatments of equity-accounted units.

[8]The CbCRs are made publicly available by the EU Tax Observatory (Aliprandi et al., 2023).

Table 1: Corresponding CbCR and Financial Statements Variables

CbCR variable	Matched items in the financial statements
Unrelated party revenues	**Revenues**, other income
Profit	**Profit before tax**
Tax accrued	**Current tax**, deferred tax, prior year adjustments
Tax paid	**Tax paid**
Tangible assets	**Property, plant and equipment**, inventories, investment properties, industry-specific items
Accumulated earnings	**Retained earnings**, earnings reserves
Stated capital	**Share capital**, **share premium**
Number of employees	**Number of employees**, independent contractors

Note: The main item is printed in bold.

Table 2: Reports and Variables used from the Financial Statements

Reports	Financial statement variable
Income statement	Revenues, Profit before tax
Balance sheet	Tangible assets, Accumulated earnings, Stated capital
Cash flow statement	Tax paid
Changes in equity	Accumulated earnings, Stated capital
Notes	Number of employees, Tax accrued, Discontinued operations

Some companies include discontinued operations or subsidiaries accounted for using the equity method, while others exclude them.

First, the definition of CbCR variables appears to differ across companies. Table 1 depicts all matched items in the financial statements. It shows that companies frequently add other items (in addition to the main item) to the respective CbCR variable. For example, for CbCR purposes, the variable tangible assets is in some cases interpreted to correspond only to the financial account property plant and equipment while in other cases other items such as inventories or investment properties are also included. For tax accrued, some companies also include deferred taxes and prior year adjustments. To make the benchmarking as accurate as possible, we include all items explicitly indicated by the multinational in its CbCR. For example, when a multinational explicitly states that inventories are included in tangible assets for its CbCR figures, we make sure to also include them in the financial statement benchmarking.

Second, for financial reporting purposes, the distinction between continuing and discontinued operations is crucial, and the disclosure requirements are different. Continued operations describe the continuing business of a company while discontinued operations are a component of an entity that has been disposed of or is still part of the entity but is held for sale. Companies typically display items from continued operations in their financial statements and separately present discontinued operations in the notes to the financial statements. Depending on how these operations are considered in their CbCR, the differential accounting treatment in the financial statements may complicate the reconciliation. In most cases, discontinued operations seem to be excluded or not present. When included, the reconciliation requires summing up the main financial figures from both the financial statements and the notes. One example is Vodafone, which in 2017 announced the merger of the Indian telecommunications company Idea Cellular with the Vodafone subsidiary and reported the activities related to Vodafone India as discontinued operations in its 2017 financial statements. In their CbCR, discontinued operations were included in the Indian subgroup, so we added discontinued and continuing operations together for benchmarking purposes. A similar example is Repsol that also include discontinued operations in their CbCR.

Third, uncertainty around the inclusion of profits of equity-accounted units might complicate the reconciliation. Following accounting standards, the ultimate parent of a group typically consolidates all entities over which it exercises direct or indirect control.[9] These entities must be fully consolidated in the group financial statements, requiring the parent entity to aggregate assets and liabilities line by line and adjust the aggregated figures by intra-group transactions. In contrast, when a parent entity exercises significant influence but no control over an entity,[10] as it is typically the case with associates and joint ventures, the group's share of the entity's *after tax* profit or

[9] According to IFRS 10, a parent entity exercises control over a subsidiary if it has power over the investee, is exposed or has rights to variable returns from its involvement with the investee and can use its power over the investee to affect the amount of the investor's returns. This can be typically assumed to be the case when a parent entity has directly or indirectly more than 50% of the voting rights of the subsidiary. For example, even when the parent has only 65% of the voting rights, the subsidiary is still fully consolidated.

[10] According to IAS 28, significant influence is defined as "[...] the power to participate in the financial and operating policy decisions of the investee but is not control or joint control of those policies". This is typically the case when an entity directly or indirectly holds 20% or more but less than 50% of the voting rights. The same accounting treatment applies to joint ventures, where companies exercise joint control (e.g., two companies with only 50% of the voting rights each) over the investee.

loss may be included in a single line of the group's consolidated income statement. But no information on tangible assets or revenues would be presented in the other accounts.

For private mandatory reporting, the OECD guidance on CbCR implementation generally establishes that the treatment of an entity for country-by-country reporting purposes should follow the treatment prescribed in accounting standards. Hence, the share of the net profit or loss of a joint venture or associate should be included in the profit before tax variable of the relevant jurisdiction, aggregated with other profit before tax the group has in that jurisdiction. Importantly, the figure of the entity's revenues, income tax accrued, tax paid, stated capital, employees or tangible assets should be excluded and the entity should not be listed as a constituent entity. But this can be problematic as the exclusion has an impact on any ratios that compare a jurisdiction's profit before tax with any other data contained in the CbCR. In our sample, we observe a heterogeneous behaviour of companies concerning the treatment of equity-accounted units with some including and some excluding them. For example, Shell reports "Share of profit of joint ventures and associates" in its consolidated income statement. This item describes the portion of after-tax profits recorded by associates and joint ventures belonging to the group. In Shell's CbCR, these after-tax profits are included in the profit in the Netherlands, where the joint venture is owned.

6 Benchmarking of Country-by-Country Report Figures against Consolidated Figures

For each variable reported in the CbCRs, the distribution of ratios and an analysis of the main trends are presented below. The number of observations is not constant across all variables, as not all companies report the full set of variables.

6.1 Revenues

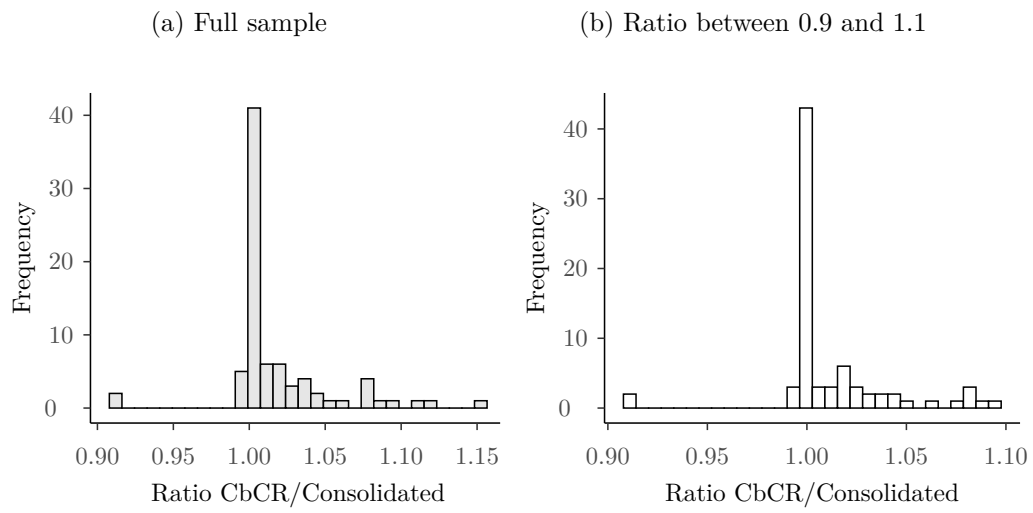
According to both the GRI and the OECD standard, CbCRs should include three different variables describing a multinational's revenues: related party revenues, unrelated party revenues and total revenues (i.e., the sum of related and unrelated party revenues). As figures from consolidated financial statements exclude all intracompany transactions, and as companies frequently do not report the intracompany eliminations made, it is only possible to benchmark unrelated party revenues against consolidated revenues reported in the income statement.

The financial account name for revenues in the financial statements can vary from company to company (e.g., "Sales", "Revenue", "Revenues", "Total Revenues" or "Group turnover to third parties"). Moreover, the account only includes revenues from continuing operations. Revenues from discontinued operations, if present, are generally reported in separate notes attached to the financial statements. For this analysis, we include both continued and discontinued operations in coherence with the treatment companies employed in CbCR.

The OECD CbCR implementation guidance adopts a broad definition of revenues, requiring companies to include "all revenue, gains, income, or other inflows shown in the financial statement prepared following the applicable accounting rules relating to

profit and loss [...]" (OECD, 2022). This broad definition includes not only sales revenue but also net capital gains from sales of assets, unrealized gains, interest received, and extraordinary income. Even revenues that are determined with market value accounting (e.g., gains from value changes of financial instruments) can be included without any further adjustments. The GRI standard appears to focus on sales revenues but grants the option that companies "[...] can also report other sources of revenue, for example, dividends, interest, and royalties, where this is standard practice in the sector of the organization" (GRI, 2019). For both standards, it remains unclear whether revenues should exclusively account for continuing operations or include discontinued ones.

Figure 3: Distribution of the Ratio between CbCR and Consolidated Unrelated Party Revenues



Note: The full sample comprises 81 observations. Subfigure *a* plots the full sample distribution while subfigure *b* zooms in on observations with a ratio between 0.9 and 1.1.
Data source: Publicly available CbCRs and consolidated financial statements.

6.1.1 Benchmarking

The majority of the companies include unrelated party revenues in their CbCRs. Overall, the variable is included in 81 of the 94 CbCRs analysed. As illustrated in Figure 3, plotting the distribution of the ratio between CbCR and consolidated revenues, the correspondence is remarkably precise in most cases. For 96 % of the observations, the ratio is between 0.9 and 1.1 with an average of 1.02 and a median of 1. We observe that companies take different approaches regarding the inclusion of discontinued operations. But in most cases, discontinued operations seem to be excluded or non-existent. Most companies also include other income than ordinary revenues such as income from financial investments. But some companies also explicitly exclude it.

This indicates that there is a good match between revenues reported in financial statements and CbCRs, with no signs of double counting.

6.1.2 Negative revenues

Sometimes, companies report in tax jurisdictions negative amounts for revenues from unrelated parties. We have identified at least two reasons for reporting such negative amounts.

First, negative revenues can be observed in jurisdictions mainly used for investment or financing purposes but where the company performs little or no operational activity. For instance, Repsol reports such negative revenues and explains that revenues from unrelated parties may also include other income like "Changes in the fair value of financial instruments", "Net exchange gains (losses)" and "Gains (losses) on disposal of financial instruments" (Repsol, 2020).

Second, a company may report negative revenues if revenues from unrelated parties of previous years need to be reversed. One example where revenue reversals may happen is the unitization agreements that are common in the oil and gas industry. In these agreements, company A which owns the off-shore oil field A and company B which owns the off-shore oil field B make a contract to jointly develop the two oil fields. Each company is then compensated with a pre-determined share of the oil extracted by the joint development. Typically in accounting, revenues resulting from such long-term projects are constantly recognized over time. However, this share may be adjusted in the course of the exploration once more is known about the oil reserves (e.g., their location). The change in the amount of oil extracted of the joint development may then also affect the revenue recognition in previous years. For instance, Shell reported negative revenues in 2018 for Brazil when it participated in a joint development of at least two Brazilian oil fields as required by the national oil agency. Following an adjustment in the share of the joint oil field outcome, Shell revised revenues from unrelated parties and thus recorded negative revenues.

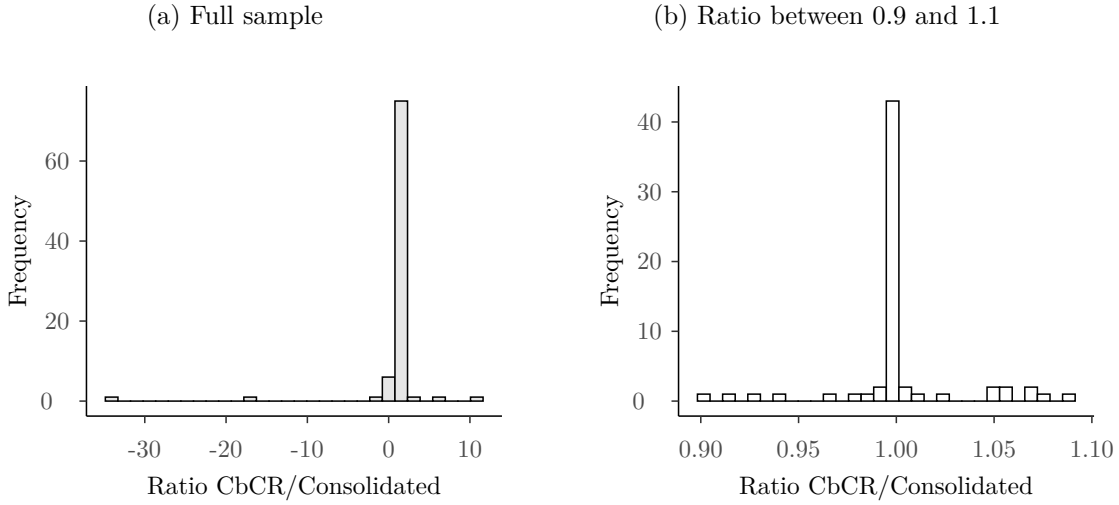
6.2 Profit and Loss before Tax

According to OECD BEPS Action 13, the variable "Profit (Loss) before Income Tax" is defined as "[. . .] the sum of the profit (loss) before income tax for all the Constituent Entities resident for tax purposes in the relevant tax jurisdiction" (OECD, 2022). It "[. . .] should include all extraordinary income and expense items" (OECD, 2022). The GRI standard grants companies the option to either aggregate or consolidate the profit variable (i.e., "Profit/loss before tax") for each tax jurisdiction.

Designations for the financial statement account are, for instance, "Profit before tax", "Income before tax" or "Pre-tax profit". Typically, extraordinary income and expenses – given that they are from continued operations – are included in the profit variable.

As explained in Section 2.2, the inclusion of intracompany dividends might be an issue and introduce double counting. The GRI standard does not specify the treatment of intracompany dividends. The OECD initially issued unclear guidance and only later recommended that companies exclude them.

Figure 4: Distribution of the Ratio between CbCR and Consolidated Profit Including Intracompany Dividends



Note: The full sample comprises88 observations. Subfigure *a* plots the full sample distribution while subfigure *b* zooms in on observations with a ratio between 0.9 and 1.1.
Data source: Publicly available CbCRs and consolidated financial statements.

6.2.1 Benchmarking

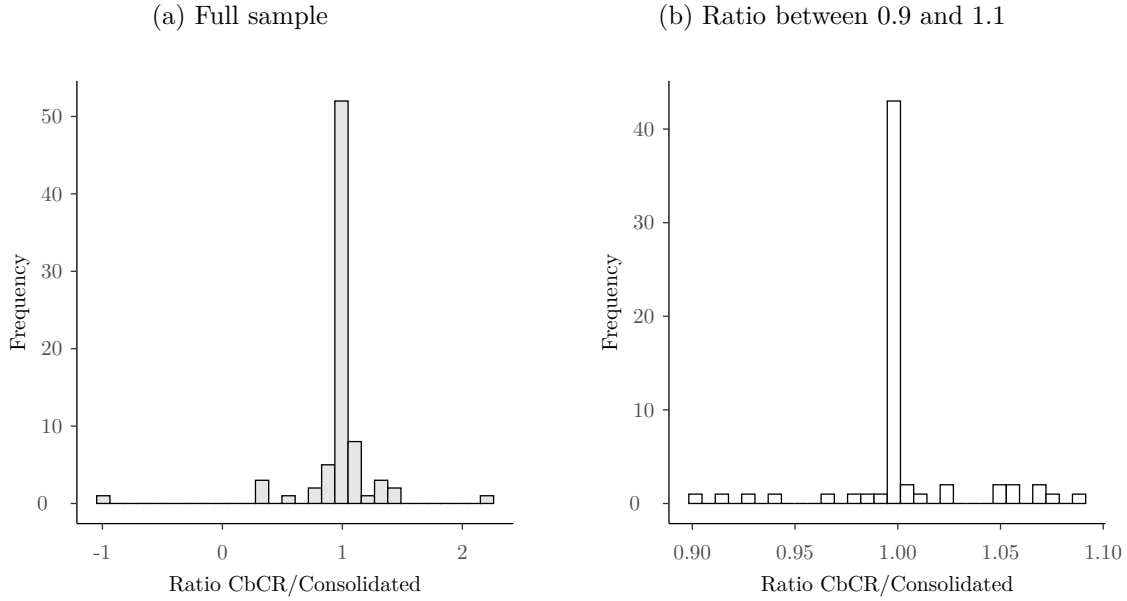
The majority of the companies in our sample report the profit variable in their CbCRs. Overall, the variable is included in 88 of the 94 CbCRs analysed. As plotted in Figure 4, plotting the distribution of the ratio between CbCR and consolidated profit, the correspondence is relatively precise in most cases. For 74 % of the observations, the ratio is between 0.9 and 1.1 with an average of 0.59 and a median of 1. The average is low, driven by a few large outliers on the left tail of the distribution. The two large negative values correspond to one single company claiming large goodwill-related tax impairments in two years. The few large positive values belong to four companies that explicitly state that profit figures include intracompany dividends. In addition, we observe that some companies include after-tax profits of equity-accounted units while others do not. Last, we observe that some companies exclude extraordinary items.

Figure 5 plots the distribution of the same ratio but based on sample companies not explicitly including intracompany dividends in their profit figures. The average is higher than before, reaching 0.98. We, however, still observe some large outliers, the highest being 2.1. The two largest outliers correspond to two companies reporting overall losses in both consolidated accounts and CbCR for the year 2020.

6.2.2 Potential Magnitude of Intracompany Dividends

There is limited information on the amount of intracompany dividends included in profit figures and which jurisdictions could be affected the most. In our sample, five out of 67 multinationals explicitly mention including intracompany dividends in their profit figures. In Table 3, we compare CbCR and consolidated profits for these five

Figure 5: Distribution of the Ratio between CbCR and Consolidated Profit Excluding Intracompany Dividends



Note: The full sample comprises 82 observations, excluding companies including intracompany dividends in their CbCR. Subfigure *a* plots the full sample distribution while subfigure *b* zooms in on observations with a ratio between 0.9 and 1.1.
Data source: Publicly available CbCRs and consolidated financial statements.

companies, together with the ratio between the two. As illustrated in Table 3, including intracompany dividends can significantly inflate profit figures, ranging from a doubling to a tenfold increase in total profit. When analysing aggregated US data Horst and Curatolo (2020) find that 14% of total profit are double counted. This points to the fact that the analysis of aggregated data can overlook significant heterogeneity across companies. Some companies may, for instance, simply not include intracompany dividends in their profits reducing the total bias in the aggregate figures.

Out of the companies analyzed in this paper, only ENI provides explicit information on the magnitude of intracompany dividends. In the footnotes of their 2017 CbCR, ENI specifies that CbCR profit figures do not include intracompany dividends. But ENI reports the figures in the notes attached. These figures are reported in Table 4, together with the amount of profit reported. Of the 72 jurisdictions in which ENI operated in 2017, intracompany dividends were mostly received by group companies in only three jurisdictions: the headquarter country Italy, the Netherlands and the United Kingdom. Including intracompany dividends would have substantially increased profit, inflating it from EUR 6.3 billion to EUR 11 billion.

The largest amount of intracompany dividends are reported for Italy, the headquarter country. Being at the top of the ownership structure, the Italian ultimate parent entity potentially receives dividends from all the subsidiaries further down in the ownership chain. The amount of intracompany dividends is particularly large, being more than double the profit reported for the same year. Dividends are also relatively large in the Netherlands and the UK, two countries that are often used for holding structures.

Table 3: Profit of Companies including Intracompany Dividends in their Profit Variable

Year	Company	CbCR profit	Consolidated profit	Ratio CbCR/Consolidated
2019	Atlantia	540	471	10.7
2020	Orica	997	171	5.8
2020	Evraz	3509	1671	2.1
2021	Evraz	3383	1091	3.1
2019	Piaggio	143	80	1.8

Note: Profit figures are reported in million euros. Vodafone includes intracompany dividends but is not included in this table due to high losses.
Source: Publicly available CbCRs and consolidated accounts.

Table 4: Intracompany Dividends of ENI in 2017

Tax jurisdiction	Profit before tax excluding intracompany dividends	Intracompany dividends
Italy	1.40	3.06
The Netherlands	0.25	1.82
The United Kingdom	0.19	0.94
Group total	6.33	5.82

Note: Profit figures are reported in billion euros. *Source:* Publicly available ENI CbCR 2017.

6.3 Tax Accrued

According to OECD BEPS Action 13, the variable "Income Tax Accrued (Current Year)" is defined as the "[...] sum of the accrued current tax expense recorded on taxable profits or losses of the year of reporting of all the Constituent Entities resident for tax purposes in the relevant tax jurisdiction. The current tax expense should reflect only operations in the current year and should not include deferred taxes or provisions for uncertain tax liabilities." (OECD, 2015). Following accrual accounting, it does not play a role whether the tax has already been paid or not. The decisive factor is when the income and expenses were earned or incurred.

Income tax expense can be differentiated between current tax expense, prior year adjustments and deferred tax expense. Current tax expense is the "[...] amount expected to be paid to [...] taxation authorities [for this period], using the rates/laws that have been enacted or substantively enacted by the balance sheet date" (IFRS, 2021). Thus, the company aims to adjust the tax base for the expected differences in financial accounting profit and taxable profits. This requires not only considering temporary differences (e.g., differences in accounting and tax depreciation) that arose this period but also of previous periods. It also aims to adjust for changes in the tax rate. The expected taxable profits are then multiplied by the tax rate to compute the current tax expense. Current tax expense is the relevant financial account for the variable income tax accrued. If tax obligations for the prior year are different than expected, the current tax expense may need to be adjusted for (i.e., prior year adjustments).

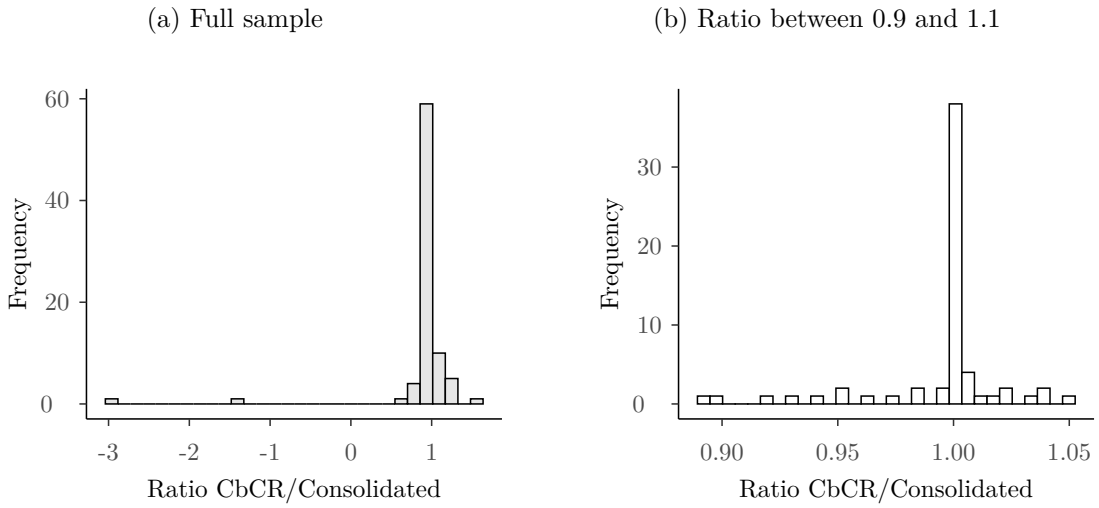
Deferred tax expenses are the "[...] amounts of income taxes payable in future periods in respect of taxable temporary differences" (IFRS, 2021). These amounts of deferred tax expenses are computed by multiplying the temporary difference with the tax rate. Such temporary differences in profits also imply that the accounting book values and the tax bases of assets and liabilities are temporarily different as well. To account for these differences on the statement of position, at the same time, a deferred tax asset or liability is recognized in the same amount (IFRS, 2021).

All three accounts are presented separately in the notes to the consolidated financial statement and as a summed position in the income statement. Following the definition by both GRI and OECD, only the amount of current tax expense reported in the notes is considered, while deferred taxes or prior year adjustments are disregarded.

6.3.1 Benchmarking

Most companies report the tax accrued variable in their CbCRs. The variable is included in 82 of the 94 CbCRs analysed. As shown in Figure 6, plotting the distribution of the ratio between CbCR and consolidated income tax accrued, suggests that the correspondence is relatively close in most cases. For 74 % of the observations, the ratio is between 0.9 and 1.1 with an average of 0.93 and a median of 1. There is one large outlier, where the ratio is equal to minus three. The different recording in CbCRs and financial accounts of tax gains at one company due to extraordinary losses registered in 2020 cause this discrepancy. The ratio is close to one in the other two fiscal years, indicating a good match between the two accounts in normal circumstances.

Figure 6: Distribution of the Ratio between CbCR and Consolidated Tax Accrued



Note: The full sample comprises 82 observations. Subfigure *a* plots the full sample distribution while subfigure *b* zooms in on observations with a ratio between 0.9 and 1.1.
Data source: Publicly available CbCRs and consolidated financial statements.

6.4 Tax Paid

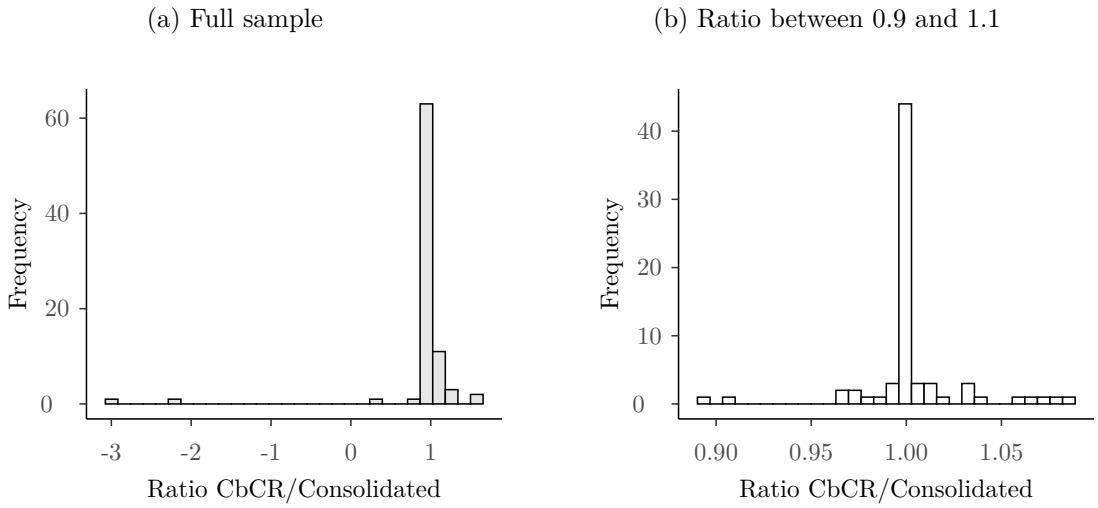
According to OECD BEPS Action 13, the variable "Income Tax Paid (on Cash Basis)" is defined as the "[. . .] the total amount of income tax actually paid during the relevant fiscal year by all the Constituent Entities resident for tax purposes in the relevant tax jurisdiction" (OECD, 2015). In addition, this variable shall include "[. . .] withholding taxes paid by other entities (associated enterprises and independent enterprises) with respect to payments to the Constituent Entity" (OECD, 2015). If, for instance, a company A headquartered in country A earns income in country B, the tax withheld in country B shall be reported by company A.

The corresponding GRI variable (i.e., "Corporate income tax paid on a cash basis") is defined similarly. According to the GRI guidance, "[. . .] the organization can calculate the total actual corporate income tax paid during the time period [. . .] resident entities in the jurisdiction" (GRI, 2019). The relevant financial statement account is the tax paid item on the statement of cash flows of companies.

6.4.1 Benchmarking

Most companies report the income tax paid variable in their CbCRs. Overall, the variable is included in 83 of the 94 CbCRs analysed. As illustrated in Figure 7, plotting the distribution of the ratio between CbCR and consolidated tax paid, the correspondence is relatively precise in most cases. For 84 % of the observations, the ratio is between 0.9 and 1.1 with an average of 0.93 and a median of 1. There are two negative outliers. The notes to the corresponding CbCRs explain that the discrepancy is due to different taxes being included in the financial statements, while for the purpose of the CbCR only income taxes are included. In addition, one company responds to one of

Figure 7: Distribution of the Ratio between CbCR and Consolidated Income Tax Paid



Note: The full sample comprises 83 observations. Subfigure *a* plots the full sample distribution while subfigure *b* zooms in on observations with a ratio between 0.9 and 1.1.
Data source: Publicly available CbCRs and consolidated financial statements.

our requests and indicates that the discrepancy is due to a discontinued business.

6.5 Tangible Assets

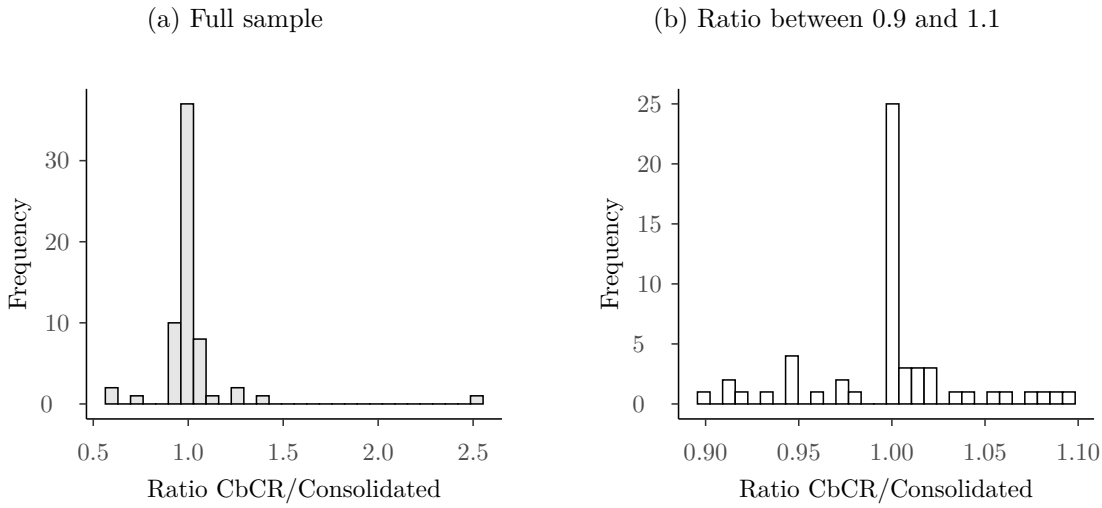
According to OECD BEPS Action 13, the variable "Tangible Assets other than Cash and Cash Equivalents" is defined as the "[. . .] sum of the net book values of tangible assets of all the Constituent Entities resident for tax purposes in the relevant tax jurisdiction" (OECD, 2015). The corresponding GRI variable (i.e., "Tangible assets other than cash and cash equivalents") is defined similarly.

6.5.1 Benchmarking

More than half of the companies in our sample report tangible assets in their CbCRs. Overall, the variable is included in 63 of the 94 CbCRs analysed. As illustrated in Figure 8, plotting the distribution of the ratio between CbCR and consolidated tangible assets, the correspondence is very precise in most cases. For 86 % of the observations, the ratio is between 0.9 and 1.1 with an average of 1.02 and a median of 1.

The outlying ratio of 2.5 corresponds to one company explaining in their notes that the discrepancy between their CbCR and the group financials is due to intracompany transactions. These must be recognized in accordance with GRI 207-4 but are eliminated when compiling consolidated financials according to IFRS. One example for such discrepancies might be the transfer of fixed assets within the group. From the consolidation perspective, when fixed assets are sold by one group member to another, adjustments must be made to recreate the situation that would have existed, if the sale had not occurred. This entails eliminating the profit or loss due to the sale and adjusting the depreciation schedule to correspond to the historical cost incurred.

Figure 8: Distribution of the Ratio between CbCR and Consolidated Tangible Assets



Note: The full sample comprises 63 observations. Each bar corresponds to the percentage of CbCR-consolidated-accounts-pairs having a ratio of that value.
Data source: Publicly available CbCRs and consolidated financial statements.

Frequently, companies seem to define the scope of tangible assets more broadly than others. At a minimum, all companies include the financial account properties, plants and equipment. Almost half of the companies also include inventories while a limited number of companies includes additional items like investment properties (e.g., land as an investment opportunity). The inclusion of other items seems to be driven by the specific sector. For instance, the insurance company SwissLife also includes long-term assets that are about to be sold while the conglomerate Wesfamers appears to include mineral rights as tangible assets.

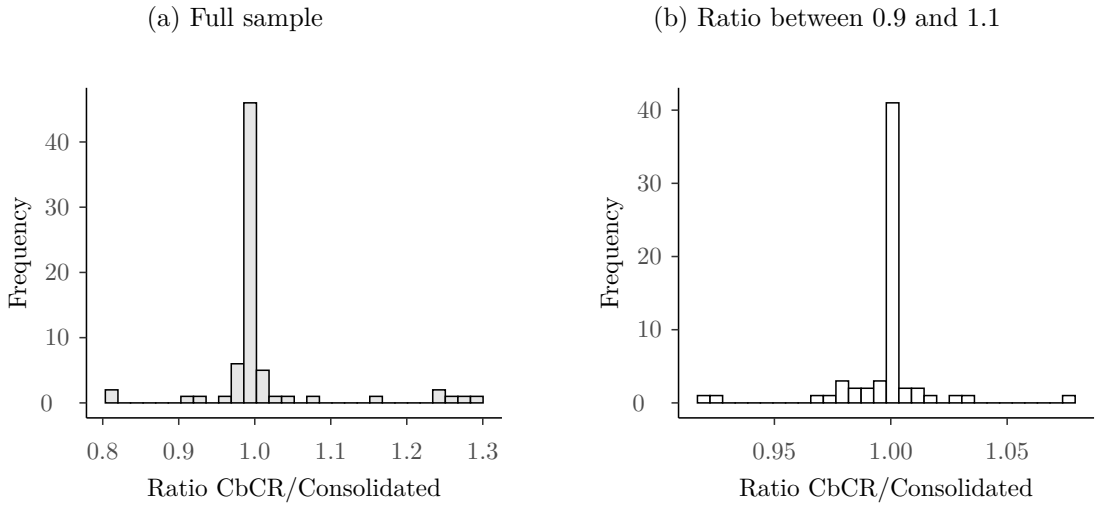
6.6 Number of Employees

According to OECD BEPS Action 13, the variable "Number of Employees" is defined as "[...] the total number of employees on a full-time equivalent (FTE) basis of all the Constituent Entities resident for tax purposes in the relevant tax jurisdiction" (OECD, 2015). Thus, the measurement parameter is only FTE. The measurement basis may be the average, the end-of-year number or any other measurement basis. The GRI standard provides more discretion for the reporting of the number of employees. Companies may not only use the FTE but also the headcount or any other appropriate measurement parameter. For both standards, it is important that the same measurement parameter and basis are used across tax jurisdictions and years. Moreover, the OECD guidelines grant companies the option to include independent contractors if they participate "[...] in the ordinary operating activities of the Constituent Entity [...]" (OECD, 2015). The inclusion of independent contractors may in some contexts be more appropriate to represent the complete activity of a company in a specific tax jurisdiction. The GRI standard does not provide specific instructions on the inclusion of independent contractors. Instead, it grants companies the option to report the number of workers if this is suitable to better explain the extent of the economic activity

of the company.

For consolidated financial statements, to our knowledge, there is no requirement to disclose the number of employees. Consequently, there are no financial statement accounts that display the number of employees. Nevertheless, companies regularly disclose the number of employees in the notes attached to the financial statements. This may be due to some jurisdictions requiring disclosure of the number of employees. For instance, the United States require listed companies to disclose the number of employees in their financial statements (e.g., Regulation S-K).

Figure 9: Distribution of the Ratio between CbCR and Consolidated Number of Employees



Note: The full sample comprises 71 observations. Subfigure *a* plots the full sample distribution while subfigure *b* zooms in on observations with a ratio between 0.9 and 1.1.
Data source: Publicly available CbCRs and consolidated financial statements.

6.6.1 Benchmarking

The majority of the companies reports the number of employees in their CbCRs. Overall, the variable is included in 71 of the 94 CbCRs analysed. As shown in Figure 9, plotting the distribution of the ratio between CbCR and consolidated number of employees, the correspondence is very precise in most cases. For 89 % of the observations, the ratio is between 0.9 and 1.1 with an average of 1.01 and a median of 1. On the right tail of the distribution, a small number of ratios between 1.2 and 1.3 can be observed. These values correspond to all observations of one company including independent contractors in their CbCR but excluding them in their financial statements. In general, the option to include workers or independent contractors is not used very often. We observe that companies frequently used different measurement bases and parameters. But overall, there is a good correspondence between CbCRs and financial statements.

6.7 Accumulated Earnings

The variable "Accumulated Earnings" is only required by the OECD framework. According to the OECD BEPS Action 13, the variable is defined as the "[...] sum of the total accumulated earnings of all the Constituent Entities resident for tax purposes in the relevant tax jurisdiction as of the end of the year" (OECD, 2015). Permanent establishments shall generally report accumulated earnings "[...] by the legal entity of which it is a permanent establishment" (OECD, 2015).

The relevant financial accounts are items on the balance sheet of companies, specifically items in the equity section. At the same time, the financial accounts are also presented in the statement of changes in equity. According to the conceptual framework of IFRS, equity is defined as "[...] the residual interest in the assets of the entity after deducting all its liabilities" (IFRS, 2018). The typical financial account for retained profits is retained earnings, one of the equity accounts on the balance sheet. The financial account retained earnings is increased by the profits of the current year and the profits of the previous years that remained in the company and were not distributed to shareholders. The account is reduced by the dividends that are declared.

Apart from retained earnings, there are at least three more reserves that can be set up by entities: the legal reserve, the (re-)valuation reserve and the foreign currency translation reserve. Typically, the legal reserve is a reserve required by some jurisdictions by law where the entity needs to withhold a minimum level of capital. This reserve is in some jurisdictions allocated to retained profits and may thus be automatically included. In the (re-)valuation reserve, changes in non-current assets like investment property (e.g., land for speculation purposes) may be recorded when they are measured at market value. Foreign currency translation gains or losses are recognized in the foreign currency translation reserve. This is the case, for example, when financial accounts from foreign operations are transferred to the group accounts and thus converted for presentation purposes. Companies have substantial flexibility in creating such reserves.

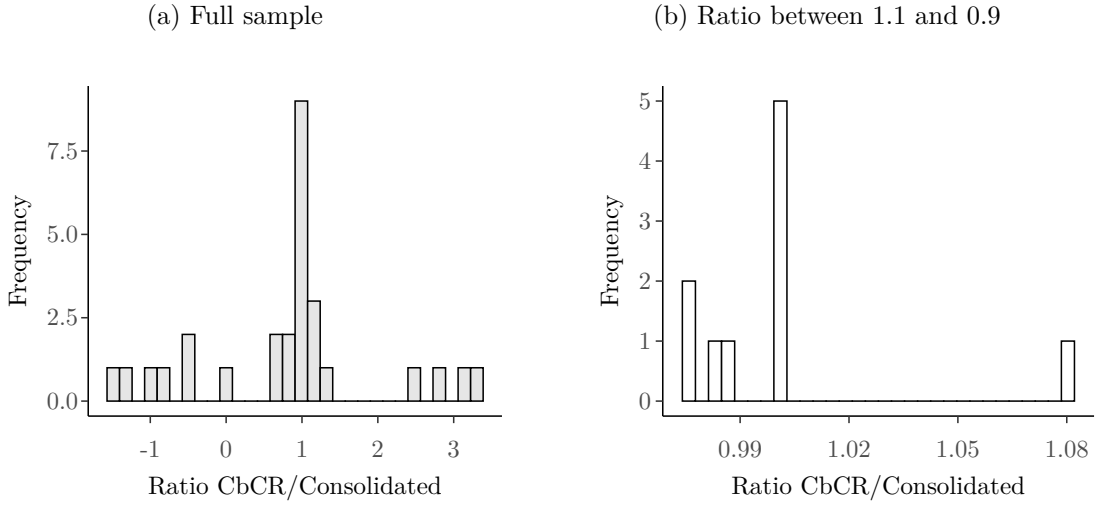
6.7.1 Benchmarking

Overall, only a few companies report accumulated earnings in their CbCR. The variable is included in only 28 of the 94 CbCRs analysed. One reason for this could be that this variable is only covered by the OECD standard, but not by the GRI standard. Another reason could be that the variable may not provide useful information, as it may be heavily skewed by double counting (EBTF, 2022).

As illustrated in Figure 10, plotting the distribution of the ratio between CbCR and consolidated accumulated earnings, the correspondence is not precise compared to previous variables. For only 36 % of the observations, the ratio is between 0.9 and 1.1. Although we observe an average of 0.82 and a median of 0.98, there are several outliers on both tails with large positive and negative ratios. The section below seeks to explain the particular features of this variable that might result in an imprecise match between the two reporting sources.

As already noted by the European Business Tax Forum (EBTF), it remains unclear how accumulated earnings are defined by the companies (EBTF, 2022). Some companies provide their definition of accumulated earnings in their CbCR. But provided definitions

Figure 10: Distribution of the Ratio between CbCR and Consolidated Accumulated Earnings



Note: The full sample comprises 28 observations. Subfigure *a* plots the full sample distribution while subfigure *b* zooms in on observations with a ratio between 0.9 and 1.1.
Data source: Publicly available CbCRs and consolidated financial statements.

largely differ. For instance, Shell defines accumulated earnings relatively narrowly as retained profits to pay dividends to shareholders while Repsol uses a broader definition including legal and other reserves on top of retained profits.

6.7.2 Reconciliation Issues

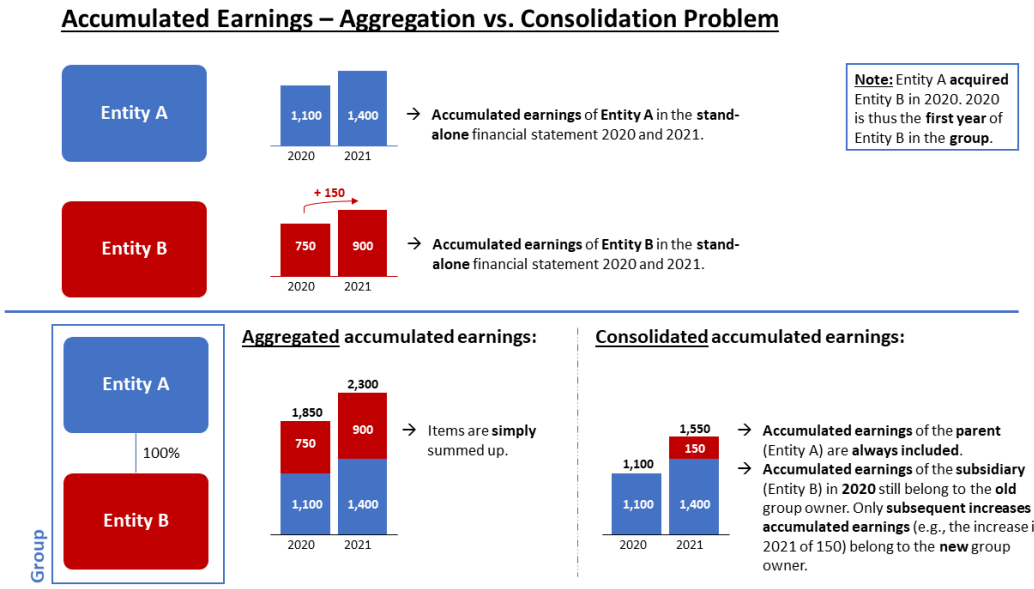
The main differences between consolidated and aggregated CbCR figures might be due to the different items included as the OECD requires companies to use aggregated, non-consolidated data when reporting accumulated earnings.

First, aggregated accumulated earnings may include unrealized gains and losses in transactions between related companies. These related-party transactions are eliminated for consolidation purposes as group accounting assumes that all group entities form only one economic entity. Thus, these gains and losses are not included in consolidated data. If there is only one economic entity, conceptually, there cannot be any transactions and thus also no gains and losses. Therefore, aggregated accumulated earnings may be overstated or understated as compared to consolidated accumulated earnings.

Second, aggregated accumulated earnings reported in CbCRs might include past earnings that belong to previous owners and that are excluded for consolidation purposes. As an example, Figure 11 illustrates how accumulated earnings differ when they are aggregated or consolidated. When parent entity A acquires entity B and consolidates accumulated earnings, it only takes into account the increase in accumulated earnings between 2020 and 2021 (i.e., 150), eliminating the balance from the previous period (i.e., 750) as it belongs to the previous owner. On the contrary, when the stand-alone accounts are simply aggregated, accumulated earnings include the results of subsidiaries

that existed before the acquisition and that belong to the owner of the old group.

Figure 11: Data Aggregation Issue: Accumulated Earnings



Source: Authors' illustration.

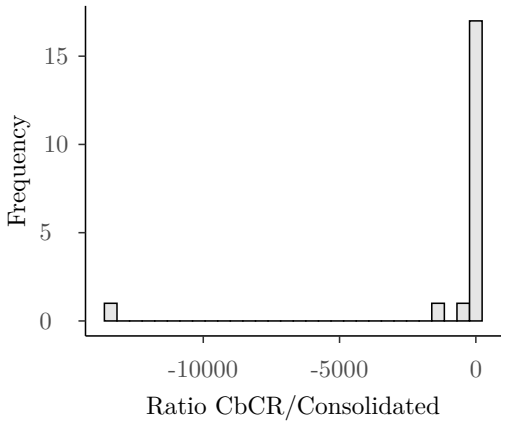
6.8 Stated Capital

According to OECD BEPS Action 13, the variable "Stated Capital" is defined as the "[...] sum of the stated capital of all the Constituent Entities resident for tax purposes in the relevant tax jurisdiction" (OECD, 2015). Permanent establishments shall generally report the stated capital "[...] by the legal entity of which it is a permanent establishment" (OECD, 2015). The variable is not required by the GRI standard.

The relevant financial accounts are items on the balance sheet of companies, specifically items in the equity section. Similar to accumulated earnings, the financial accounts are also presented in the statement of changes in equity. A share issue generally leads to booking entries both on the assets side (e.g., cash) and on the liabilities/equity side of the statement of financial position. The two financial accounts on the equity side where such share issues are usually recorded are share capital and share premium. While some companies, such as Vodafone, do not indicate which financial accounts they use, other companies such as Repsol or Cipla state that their calculation of stated capital is based on the financial accounts share capital and share premium. Typically, the financial account share capital records the product of the nominal value of the shares issued by a company and the number of shares issued. The financial account share premium, on the other hand, records the product of the amount in excess of the par value of shares issued by an entity and the number of shares issued. For example, if a company issues 10,000 shares with a par value of €1 for €3 per share, the company would report an amount of €10,000 (= €1 * 10,000) as share capital and an amount of €20,000 (= (€3 - €1) * 10,000) as share premium. The stated capital in the CbCR would then amount to 30,000€ (= 10,000€ + 20,000€).

Figure 12: Distribution of the Ratio between CbCR and Consolidated Stated Capital

(a) Full sample



Note: The full sample comprises 20 observations. Subfigure *a* plots the full sample distribution. As there is only one observation with a ratio between 0.9 and 1.1, no figure is presented on the subsample. *Data source:* Publicly available CbCRs and consolidated financial statements.

6.8.1 Benchmarking

Only a minority of the sample companies report stated capital in their CbCRs. Overall, the variable is included in 20 of the 94 CbCRs analysed. Similar to accumulated earnings, one reason for this could be that this variable is only covered by the OECD standard, but not by the GRI standard. Another reason could be that the variable may not provide useful information, as it may be heavily skewed by double counting (EBTF, 2022). For instance, Vodafone claims that the variable "[...] gives a false indication of the overall amount of money invested" (Vodafone, 2020). Therefore, the variable must be interpreted with caution but may still provide valuable insights into corporate tax planning and evasion strategies.

As shown in Figure 12, plotting the distribution of the ratio between CbCR and consolidated stated capital, the correspondence is not precise and entails large outliers. For only one observation, the ratio is between 0.9 and 1.1. The average ratio is of -756.11 and the median of 7.5. The section below seeks to provide some explanations of the particular features of this variable that might result in such an imprecise match.

6.8.2 Reconciliation Issues

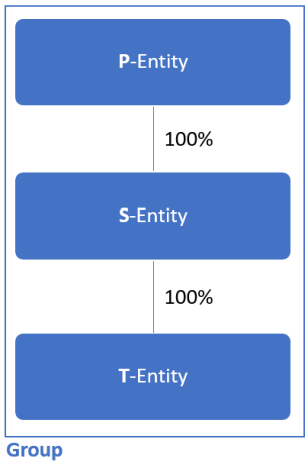
As already noted by the European Business Tax Forum (EBTF), it also remains unclear how companies define stated capital in their CbCRs (EBTF, 2022). Thus, the interpretation of the term seems to be left to the discretion of companies. But this lack of harmonization can result in a lack of clarity as to which financial statement accounts relate to stated capital and make it difficult to reconcile the amounts in the CbCR to the corresponding figure in the consolidated financial statements. Harmonization is further complicated by the lack of clear and concise financial statement requirements,

as no IFRS regulation provides clear guidance on the definition of equity accounts in financial statements. As a result, the names of the equity accounts, for example, differ.

However, in our sample, the definition of "Stated Capital" appears to be relatively uniform among the few companies that define the variable.

Consistent with anecdotal evidence, the main issue in the reconciliation process is likely double counting. Aggregated data is simply based on the sum of the corresponding amounts of stated capital in the stand-alone financial statements of subsidiaries, while consolidated data not only sums these amounts but excludes intracompany transactions.

Figure 13: Data Aggregation Issue: Stated Capital



	Entity-level			Group-level		
Assets:	**P-Entity**	**S-Entity**	**T-Entity**	**Aggreg.**	Eliminat.	**Consolid.**
S-Entity	10,000			10,000	-10,000	0
T-Entity		5,000		5,000	-5,000	0
Land	5,000	2,000	1,000	8,000	0	8,000
Machine	0	0	1,000	1,000	0	1,000
...	...	...	...	...	...	...
Equity + Liabilities:						
Stated Capital	50,000	10,000	5,000	65,000	-15,000	50,000
...	...	...	...	...	...	...

→ Aggregation: Items are simply summed up.
→ Consolidation:
- Items are summed up but **intra-group** relations are **eliminated**.
- As consolidation assumes that there is **only** one entity, the **investments** in subsidiaries (10,000 in S-Entity and 5,000 in T-Entity) and the corresponding **stated capital** (10,000 + 5,000 = 15,000) are **not** considered.

Source: Authors' illustration.

Figure 13 illustrates what might be driving different results when aggregating versus consolidating. In our example, if the parent company P-Entity company invests in a subsidiary S-Entity, which in turn invests in another subsidiary T-Entity, each of these equity investments is counted when aggregated. However, when consolidating the accounts, from a group accounting perspective, these investments into different subsidiaries do not exist as it is all one economic entity. Thus, the CbCRs amounts are likely to be overestimated. This feature is also explained by Vodafone which explains that the OECD definition can mean that money invested through a chain of companies is counted multiple times, with the result that the amounts reported do not bear any resemblance to the actual sum of money invested". In addition, the more complex a company structure is, the more likely it is that double counting occurs (EBTF, 2022). The double counting for this variable is similar to what is illustrated by Blouin and Robinson (2020) in the case of BEA data.

Another difficulty in the reconciliation process could be that the figures for stated capital are generally sourced from local stand-alone financial statements. These figures are not included in the consolidated financial statements as they are eliminated for consolidation purposes. As a result, companies need to access the local accounts in a timely manner or store the data elsewhere. In addition, companies must consider different local accounting and other regulations, which can complicate comparability.

For example, in some countries, the accounts' share capital and share premium are not classified as equity accounts. This is consistent with anecdotal evidence. Hence, their inclusion may blur the overall picture. As a consequence, local sourcing may result in an incomplete picture if local information is missing or a blurred picture if local information is based on different local regulations. The companies in our sample, however, claim several times that these differences are negligible. Anecdotal evidence, however, suggests that this may also drive the differences.

7 Discussion

Our benchmark analysis highlights the potential of micro CbCRs as a unique source of information to track the country-by-country activities of multinational corporations. The findings in this paper show that voluntary CbCR information generally matches well with respective consolidated financial information, with only a few exceptions. Hence, double counting appears to be limited for most variables. The variables that should be analysed with the most attention are stated capital and accumulated earnings, as CbCR and consolidated accounts figures substantially differ.

In addition, evidence from companies presented in Subsection 6.2 shows that double counting of profits due to intracompany dividends can be substantial, resulting in largely inflated profits. This should be carefully considered when analysing CbCR data. In particular, as intracompany dividends are usually lightly taxed, this might bias all ratios using profits in the denominator (e.g., effective tax rates). However, as the OECD provided guidance on this matter the issue should be less and less problematic as companies implement it.

To improve the comparability of CbCRs, further guidance could reduce the differences in reporting. As described in Subsection 5, these differences mainly relate to variable definitions (in particular for tangible assets) and the scope of the reports (e.g., the treatment of discontinued operations or equity-accounted units). Such differences may complicate comparisons across multinational corporations, highlighting the usefulness of clear guidance on the treatment of these items and their integration into the reports. As variables are loosely defined many options are opened for MNEs to report. For example, the OECD has not established specific guidelines to establish what should be included in the current income tax accrued. In the case of losses, some companies attribute the tax credit to the same year while others consider it as deferred tax excluding it from CbCR figures. This might be particularly problematic in extraordinary situations, such as the COVID pandemic. In addition, of particular concern is the potential bias introduced by equity-accounted units, which can significantly impact key indicators such as profitability and effective tax rates. Clarifying these reporting standards can enhance the comparability of CbCRs across multinationals and enable a more accurate analysis of their financial information.

Overall, based on our findings, we have identified at least three ways to improve the comparability and reliability of CbCRs. First, we recommend that, as prescribed by the GRI standard, multinational corporations provide a reconciliation with consolidated accounts or explain any large discrepancy in their CbCRs. Second, they should clearly indicate the financial accounts and the scope they use for the reports. Third, companies should explicitly outline whether their reports are verified by a third party. By adopting

these best practices, multinational corporations can enhance corporate transparency and accountability of their reporting practices, and enable a more effective use of CbCRs in economic analyses and policy making.

8 Conclusion

The number of multinational corporations voluntarily publishing CbCRs is steadily increasing. In addition, large multinationals operating in the European Union will be required to publish public CbCRs from the summer of 2024 onwards. The increasing availability of public CbCRs has thus the potential to facilitate policy analysis and stakeholder monitoring. However, the usefulness of the data for such purposes may be compromised by double counting issues and comparability concerns. As such, it is crucial to better understand the limitations of this new source of country-level data.

In order to address concerns related to double counting and comparability, we conducted a benchmark analysis using a sample of voluntarily reported CbCRs and respective consolidated financial statements. Our analysis revealed a high level of reliability for the reported financial figures. Specifically, we found that the aggregate figures in the CbCRs correspond well with the figures reported in the companies' consolidated financial statements. The good match for most variables indicates limited double counting issues arising from data aggregation. However, we also identified significant divergences for the equity variables (i.e., accumulated earnings and stated capital), suggesting substantial double counting. In addition, we examined the potential double counting bias that may arise from the inclusion of intracompany dividends, which has been a problem for OECD CbCRs at least up to 2019. Our analysis revealed that a subset of companies includes intracompany dividends in their profit variable, resulting in a doubling to a tenfold increase in CbCR profits.

Moreover, our analysis suggests that companies frequently exercise discretion in defining variables (in particular for tangible assets) and in the scope of their reports (e.g., the inclusion or exclusion of discontinued operations). Closely related to this and consistent with prior literature, CbCRs likely also provide managers with a new level playing field to strategically influence stakeholder impressions. It is therefore advisable for policymakers to establish and enforce guidelines for future mandatory public country-by-country reporting to enhance comparability across reports. This will improve the reliability and usefulness of CbCRs for policy analysis and stakeholder monitoring.

Our findings are subject to two main limitations. First, the voluntary nature of this kind of tax reporting likely results in a sample selection bias. Consistent with this, the majority of the companies in our sample are from the extractive sector. This may limit the external validity of our findings. Second, our benchmark is only a second-best option to evaluate the reliability of the data. It may also be biased and not represent the true and fair view of the financial situation of a company. Further research may thus be required to triangulate our results and extend them to other settings.

Overall, to ensure the reliable use of CbCR data, it is crucial to understand the potential limitations and biases that may arise, as well as to develop robust data cleaning processes. It is also important to recognize the impact of systematic biases on data interpretation. With a comprehensive understanding of these issues, CbCRs can provide a valuable source of information for policy analysis and stakeholder monitoring.

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Appendix A: Multinationals Included in the Sample

The table below lists the multinationals included in the sample, together with their sector, the number of reports (N.Obs.), headquarters country (HQ) and the average total profits, unrelated party revenues and number of employees reported in the CbCRs.

Multinational	Sector	HQ	N. Obs	Profit (M EUR)	Revenues (M EUR)	Employees
acciona	Construction	ESP	1	509	NA	38355
aegon	Banking, Insurance & Financial Services	NLD	1	-380	51367	18129
allianz	Banking, Insurance & Financial Services	DEU	1	9604	NA	137379
angloamerican	Mining & Extraction	GBR	3	4152	27825	63675
astm	Transport, Freight & Storage	ITA	1	169	2482	7288
atlantia	Transport, Freight & Storage	ITA	1	5040	14180	28972
axa	Banking, Insurance & Financial Services	FRA	1	4472	NA	NA
barloworld	Wholesale	ZAF	1	199	2378	10229
bhp	Mining & Extraction	AUS	1	12301	39158	78739
bp	Chemicals, Petroleum, Rubber & Plastic	GBR	1	-20213	164869	63555
cellnex	Communications	ESP	1	NA	1605	NA
cipla	Chemicals, Petroleum, Rubber & Plastic	IND	1	395	2208	36336
coloplast	Industrial, Electric & Electronic Machinery	DNK	1	1046	NA	12578
dno	Mining & Extraction	NOR	1	-78	NA	1257
dundee	Banking, Insurance & Financial Services	CAN	1	191	535	NA
ecopetrol	Mining & Extraction	COL	1	962	NA	13998
enagas	Transport, Freight & Storage	ESP	1	441	NA	1338
enav	Transport, Freight & Storage	ITA	3	140	864	4152
endesa	Utilities	ESP	2	1009	19532	9772
enel	Utilities	ITA	1	5414	78896	66716
eni	Mining & Extraction	ITA	4	558	62484	41007
equinor	Mining & Extraction	NOR	1	-1355	NA	21245
erg	Chemicals, Petroleum, Rubber & Plastic	ITA	1	107	975	784
essity	Wholesale	SWE	1	NA	NA	NA
evraz	Mining & Extraction	GBR	2	3446	8402	67339
ferrovial	Construction	ESP	2	-618	13296	77972
grupoacs	Construction	ESP	1	1368	NA	NA
heimstaden	Property Services	SWE	1	406	697	1372
hesscorp	Chemicals, Petroleum, Rubber & Plastic	USA	1	-2499	4095	1621
hydro	Metals & Metal Products	NOR	1	319	NA	34232
iberdrola	Utilities	ESP	2	5676	37436	38352

(continued)

Multinational	Sector	HQ	N. Obs	Profit (M EUR)	Revenues (M EUR)	Employees
inditex	Textiles & Clothing Manufacturing	ESP	1	959	NA	NA
indra	Business Services	ESP	2	76	NA	NA
l&g	Banking, Insurance & Financial Services	GBR	1	2011	NA	NA
leonardo	Transport Manufacturing	ITA	2	820	14072	48269
lush	Chemicals, Petroleum, Rubber & Plastic	GBR	1	-126	446	11687
nationalgrid	Utilities	GBR	1	4361	17186	NA
nn	Banking, Insurance & Financial Services	NLD	1	2349	NA	14592
nordgold	Mining & Extraction	GBR	1	567	1646	NA
orica	Chemicals, Petroleum, Rubber & Plastic	AUS	1	997	3485	15514
orsted	Utilities	DNK	1	2324	6727	6179
pearson	Printing & Publishing	GBR	2	202	3845	22010
philips	Industrial, Electric & Electronic Machinery	NLD	1	1675	19535	81589
piaggio	Transport Manufacturing	ITA	1	143	1645	6222
prisa	Printing & Publishing	ESP	1	-166	NA	NA
prudential	Banking, Insurance & Financial Services	GBR	1	1711	NA	17256
prysmian	Communications	ITA	1	430	11889	28759
randstad	Business Services	NLD	1	364	20717	34680
repsol	Mining & Extraction	ESP	3	-368	45983	24297
riotinto	Mining & Extraction	AUS	3	12657	39723	43875
royalunibrew	Food & Tobacco Manufacturing	DNK	1	221	1176	2890
shell	Mining & Extraction	GBR	3	7727	272537	81652
siltronic	Industrial, Electric & Electronic Machinery	DEU	2	254	1306	3944
snam	Transport, Freight & Storage	ITA	1	2163	2838	3015
sol	Chemicals, Petroleum, Rubber & Plastic	ITA	1	178	992	4613
south32	Mining & Extraction	AUS	2	-72	5552	11814
sse	Utilities	GBR	1	124	10723	11682
swisslife	Banking, Insurance & Financial Services	CHE	1	1262	20294	9823
swissre	Banking, Insurance & Financial Services	CHE	1	NA	NA	12886
teck	Mining & Extraction	CAN	1	-453	8052	10570
telefonica	Communications	ESP	2	2074	47344	114859
telenor	Communications	NOR	3	1934	NA	20122
usiminas	Metals & Metal Products	BRA	1	NA	3777	12109
vodafone	Communications	GBR	3	-59887	53042	106012
wesfarmers	Chemicals, Petroleum, Rubber & Plastic	AUS	1	1540	18648	87396
yara	Mining & Extraction	NOR	1	4826	NA	16210

Appendix B: Variables Required in GRI and OECD Action 13

Table 6: Correspondence between OECD CbCR and GRI Variables

OECD CbCR variables	**GRI 207-4 variables**
Revenues – Unrelated party	Revenues from third-party sales
Revenues – Related party	Revenues from intra-group transactions with other tax jurisdictions
Revenues – Total	*Not required*
Profit (loss) before income tax	Profit/loss before tax
Income tax accrued – current year	Corporate income tax accrued on profit/loss
Income tax paid (on cash basis)	Corporate income tax paid on a cash basis
Tangible assets other than cash and cash equivalents	Tangible assets other than cash and cash equivalents
Number of Employees	Number of employees
Accumulated Earnings	*Not required*
Stated Capital	*Not required*
Not required	Explanation of the difference between ETR and the statutory tax rate

Appendix C: Overview of the Benchmarking Results

Table 7: Overview of the Benchmarking Results

Variable	N. Obs	Mean	Median	Min	Max
Accumulated Earnings	28	0.82	0.98	-1.54	3.25
Income Tax Accrued	82	0.93	1.00	-3.03	1.49
Income Tax Paid	83	0.93	1.00	-2.95	1.62
N. of Employees	71	1.01	1.00	0.82	1.30
Profit (loss) before Income Tax	88	0.59	1.00	-34.22	10.70
Unrelated party Revenues	81	1.02	1.00	0.91	1.15
Stated Capital	20	-756.11	7.50	-13358.22	38.82
Tangible Assets	63	1.02	1.00	0.61	2.53

Note: The number of observations per variable may vary as not all companies report all variables.
Source: Publicly available CbCRs, consolidated financial statements, and own calculations.