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Abstract:

This study investigates the effect of mandatory public Country-by-Country Reporting (CbCR) for European banks on their presence in tax and regulatory havens. We find that the number of subsidiaries of European banks in tax havens declines significantly after the introduction of mandatory public CbCR in contrast to insurance firms that need not disclose. We document that this decline is mainly driven by a reduction of subsidiaries in small countries with little economic substance ("dot havens") and in tax havens that are regulatory havens at the same time, i.e., with high financial secrecy. Further, we find that high exposure to reputational risk is a major amplifier of reorganizational activities. Our results explain prior mixed evidence and document that CbCR effectively curbs tax haven presence only under specific circumstances, i.e., in countries offering both tax shelter and financial secrecy, and more strongly for banks with high reputational risk. These findings suggest that increased tax disclosure on banks does not effectively attenuate tax haven presence per se, but only for a subset of havens and banks. Policymakers need to be aware of these limitations, especially in light of the current decision of extending public CbCR to all large multinationals.

Keywords: financial secrecy, real effects, reputational risk, tax haven, tax disclosure

1   Introduction

Our main research question is whether and to what extent the mandatory disclosure of incremental information, which can be costly, influences firms' organizational choices. More precisely, we investigate whether multinational banks reduce their tax and regulatory haven presence, i.e., their number of subsidiaries, after the introduction of public Country-by-Country Reporting (CbCR). We identify subsidiaries in low-tax countries (tax havens) and countries with high financial secrecy (regulatory havens) to explore haven heterogeneity. We thus identify settings where public CbCR increases tax, regulatory, and reputational costs and where disclosing banks are likely to adjust their organizational structure regarding subsidiaries in tax and regulatory havens.

Public CbCR represents a per-country breakdown of tax-relevant key financial information about multinational enterprises' (MNE) global activities, disclosed in financial reports.[4] CbCR has been implemented by the European Union (EU) in response to the ongoing public debate about aggressive tax planning. In 2013 a non-profit organization's petition led to the inclusion of public CbCR as an additional disclosure requirement of the Credit Requirement Directive IV (CRD IV) for financial institutions with activities in the EU for financial years 2014 onward (Treanor, 2013; Dutt et al., 2019b). The disclosure includes turnover, the number of employees, profit or loss before tax, tax on profit or loss, and public subsidies received. Presently, the EU Commission and member states seem committed to extending CbCR requirements to all large multinationals active in the EU (Boffey, 2021).

Bank disclosures connect to bank business models and their tax avoidance channels. Financial assets and liabilities can be relocated at very low cost. Therefore, for instance, banks relocate assets held for proprietary trading to shift profits to low-tax countries (Langenmayr and Reiter, 2020). This business model offers opportunities for banks to keep the tax burden low on highly profitable low-cost parts of their business. In addition, some banks' business models may attract customers who seek low tax rates and high secrecy, as disclosed, for instance, in the Panama Papers (European Parliament, 2016).

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[4] As opposed to private CbCR, where such per-country information is disclosed privately vis-à-vis tax authorities only.

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In the absence of a comprehensive theory on the need for mandatory disclosure regimes (Verrecchia, 2001; Beyer et al., 2010) and in the face of mixed evidence on CbCR's implications for firms' tax behavior (for an overview, see Müller et al., 2020), it is not immediately clear whether mandatory public CbCR really is an effective tool to induce behavioral adjustments in general (Evers et al., 2016; Hanlon, 2018; Oats and Tuck, 2019; Lagarden et al., 2020) and in multinational banks specifically (Joshi et al., 2020; Overesch and Wolff, 2021).

We address this open empirical question about the conditions for CbCR effectively changing bank behavior and focus on their organizational structure. Prior literature often abstracts from banks (Dyreng et al., 2016), but since banks and insurance companies are subject to industry-specific regulatory costs, earlier results on other industries may not apply to our setting. Other research abstracts from the public character of mandated public CbCR (De Simone and Olbert, 2021; Joshi, 2020) or focuses on changes in tax expense or effective tax rates (Brown, 2020; Joshi et al., 2020; Overesch and Wolff, 2021) and stock price (Johannesen and Larsen, 2016; Hoopes et al., 2018; Dutt et al., 2019a) rather than on the number of subsidiaries, and therefore does not investigate possible organizational changes in the group. We highlight our contribution as compared to prior literature in Appendix C.

Two countervailing mechanisms determine the overall effect of CbCR on tax haven presence. On the one hand, financial institutions might reduce their tax haven presence to avoid costs connected to disclosure. In particular, we expect banks to protect their reputation because they are exposed to an increasingly negative perception after the financial crisis, Panama Papers, and FinCEN files (ICIJ, 2020). Public CbCR provides novel information and raises the salience of tax haven exposure. Users of the reports (consumers, broader public, investors, regulators, etc.) might be very sensitive to CbCR disclosure of the location of subsidiaries and their aggregated key data, especially if located in tax havens. Consequently, CbCR might trigger subsidiary shut-downs in tax havens for reputational reasons. Moreover, CbCR might trigger more intensive tax authority scrutiny if low tax and high secrecy locations are salient and could thereby motivate financial institutions to reduce tax haven presence and attenuate the risk of double taxation or sanctions.

On the other hand, financial institutions might not reduce their tax haven presence. The availability of tax disclosures via CbCR does not necessarily imply that these disclosures add relevant

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information over previously existing information, and in turn, neutralize CbCR's potential to stimulate behavioral changes. While CbCR adds new and disaggregated information about key tax variables at the intensive margin, information on the extensive margin about the location of banks' subsidiaries was already publicly available from segment reporting and, more specifically, from the disclosed list of IFRS[5] consolidated entities. Additionally, recent studies highlight the importance of tax haven usage for banks (Aliprandi et al., 2021). Banks strongly shift profits to low tax countries and thereby reduce their own tax burden (Langenmayer and Reiter, 2020) but also provide services to wealthy individuals in jurisdictions with low taxation and high financial secrecy (Alstadsæter et al., 2017). Given the important role of tax havens for the business model of multinational banks, it is questionable whether additional costs from tax transparency likely reduce banks' subsidiary presence in these countries.

To empirically identify settings with behavioral responses of disclosing banks, we consider three different types of costs connected to CbCR and which are possibly relevant to the decision to reduce tax haven presence. First, *tax costs* from tax administration scrutiny (expected higher tax payments) may arise from more frequent or more focused tax audits prompted by information from CbCR. In a U.S. setting, Hoopes et al. (2012) provide evidence that firms have higher effective tax rates (ETRs) when the Internal Revenue Service imposes higher monitoring. De Simone et al. (2013) show that firms´ compliance behavior may depend on the tax authority´s effectiveness in detecting uncertain tax positions, in which CbCR may be helpful.

Second, given that tax havens are often also regulatory havens and frequently provide strong bank secrecy and other laws that reinforce a "vow of silence" for employees of financial institutions in regulatory havens (Leikvang, 2012), CbCR may incur additional *regulatory costs*. According to Zimmerman (1983), firms under greater governmental scrutiny face higher political costs imposed by tighter regulation or higher taxes. The supervising authority (European Central Bank, assisted by domestic bank supervision) may increase their scrutiny of haven activity through enforcing know-your-customer and anti-money-laundering requirements in bank-secrecy-countries, as is shown by authorities' reactions to the Panama Papers or the recent FinCEN Files (European Parliament, 2016;

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[5] A small number of firms of our control sample prepare their financial statements according to German GAAP. However, the preparation of the consolidation scope under German GAAP is similar to IFRS.

Holmes, 2020). Accordingly, a significant tax haven exposure revealed by public CbC-reports could attract costly political attention. For example, many EU governments recently announced that firms with subsidiaries in tax havens might be excluded from Covid 19-specific tax subsidies.[6]

Third, *reputational costs* from public scrutiny relating to taxation or regulation include negative market reactions to the news on using tax havens (Hanlon and Slemrod, 2009; Dyreng et al., 2016) or a lower engagement in (profitable) tax planning strategies (Graham et al., 2014; Austin and Wilson, 2017). Recent literature provides evidence that public pressure can indeed affect MNE tax behavior. While respective evidence on banks is missing, Dyreng et al. (2016) show that NGO-campaigning of ActionAid pressured non-compliant U.K. firms to become compliant with specific transparency requirements. These previously non-compliant firms subsequently decrease the proportion of their subsidiaries located in low-tax countries relative to compliant firms. According to the survey in Graham et al. (2014), corporate tax executives rank reputational concerns as the second most important reason to refrain from engaging in tax planning activities. Moreover, two recent studies provide experimental evidence about adverse consumer reactions after they were exposed to news about tax aggressive firms (Asay et al., 2018; Hardeck et al., 2019). In the context of public CbCR, Joshi et al. (2020) discuss but do not find evidence of reputational costs for EU banks. These anticipated tax, regulatory, and reputational costs may thus offset the benefits of lower overall tax liability with a higher risk of money laundering on profits from the business in tax havens.

To investigate under what conditions banks change their organizational behavior in response to mandated disclosure, we test four predictions. We first test whether EU banks, after the introduction of public CbCR, reduce their tax haven presence. We use a cross-country panel of the largest financial institutions headquartered in the EU.[7] Banks in our sample have not been suspected of non-compliance regarding transparency regulation. However, we expect that in the face of the overall costs of CbCR, banks adjust their tax haven presence. We hand-collect the number and location of banks' global subsidiaries from the list of shareholdings in their consolidated group statements before and after public

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[6] Cf. Obermaier and Ott (2020); Hecking (2020); Financial Times Online (2020).
[7] All banks in our study are under regulatory supervision from the European Central Bank and defined as Global Systemically Important Institutions (G-SIIs).

CbCR implementation. In line with prior literature, we choose large European insurance companies[8] and their global subsidiaries as the control group for our difference-in-difference design. We follow Hines (2010) to identify tax havens and find that, on average, multinational banks reduce their total share of tax haven entities by -2.72 percentage points relative to our control group. Additional model specifications indicate an economically meaningful reduction of about a quarter of banks' subsidiaries in tax havens relative to insurance firms after the introduction of public CbCR. This effect, however, is driven by small tax havens only. When splitting the tax haven countries into small tax havens, or so-called "*dot havens*" (e.g., mostly island countries with a small population, such as the Cayman Islands), and other tax havens with a larger population, or so-called "*Big 7 havens*" (e.g., Singapore), we can observe a significantly negative effect of tax transparency on tax haven presence in dot havens only.

Second, we investigate the role of exposure to financial secrecy as a potential condition for behavioral responses and test whether banks reduce their regulatory haven presence relative to insurance companies. We use the Financial Secrecy Index (Tax Justice Network, 2015) to identify regulatory havens. If public CbCR increases regulatory concerns, affected banks may reduce their presence in countries with high financial secrecy. However, we do not find support for banks reducing their share of subsidiaries in regulatory havens.

Third, we therefore test whether EU banks decrease their presence in countries that are tax and regulatory havens at the same time. Public CbCR may particularly increase the costs of subsidiary presence in low tax countries with high financial secrecy. Our results indicate that subsidiary presence particularly decreases in tax havens, which are at the same time characterized by a high degree of financial secrecy.

Fourth, we focus on the role of exposure to reputational cost and investigate whether firm-specific reputational risk affects EU banks' response to the increase of mandatory tax transparency. We split the sample between banks with high or low reputational risk at the firm level. We use the RepRisk database and find that, in most instances, the reduction of the share of subsidiaries in dot havens (tax havens) and those dot havens (tax havens) that are also regulatory havens is prevalent only for banks

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[8] All insurance companies in our study are under regulatory supervision from the European Insurance and Occupational Pension Authoriy.

with high reputational risk. A battery of robustness tests that examine the sensitivity of our results supports our findings.[9]

Overall, these findings suggest that mandated tax disclosure seems to effectively curb bank use of subsidiaries in tax havens only under specific circumstances, emphasizing the crucial role of haven heterogeneity for the observed effects. We can attribute the identified reduction in tax haven presence to subsidiaries in countries with a small economy, low taxes, and high financial secrecy, concentrated in banks exposed to high reputational risk. This finding suggests that tax disclosure is a promising tool to curb presence in tax and regulatory havens, but only in so far as the bank identifies potential damage to their reputation.

Our study contributes to four strands of research. First, we build on and contribute to the literature on the *real effects of financial disclosure* (Leuz and Wysocki, 2016), and especially on the global firm structure of MNEs (Kanodia and Sapra, 2016). More specifically, we contribute to the recent decision to require CbCR tax disclosure in all industries (European Parliament, 2021). Thereby, we also respond to Dyreng and Maydew (2018), who call for more research on the effect of disclosure of tax information on real behavior. While Dyreng et al. (2016) document a decrease in tax haven subsidiaries focussing on non-compliant UK companies and studying the effect of a public shaming campaign, we investigate whether compliant European banks that become subject to mandatory public CbCR respond correspondingly. Against the inconclusive findings on firm responses to CbCR (Brown et al., 2019; Brown, 2020; Joshi et al., 2020; De Simone and Olbert, 2021; Overesch and Wolff, 2021) and in contrast to Dyreng et al. (2016), we identify conditions under which banks decrease their subsidiary presence after the introduction of CbCR. To the best of our knowledge, the banks in our sample were neither accused of being non-compliant nor targeted explicitly by a public shaming campaign. They thus did not suffer from prior firm-specific reputational costs due to public pressure.[10] In particular, and in line with other studies using financial reporting data, we rely on the correctness of audited IFRS disclosure.

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[9] See Section 5 for details.

[10] French banks in our sample were scutinized for their tax haven presence by an NGO report in 2014 based on public CbCR information (Plateforme Paradis fiscaux et judiciaires (2014)). However, this report neither accused banks of non-compliant behaviour, nor attracted significant media attention.

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We, therefore, attribute any disclosure or non-disclosure of tax-haven subsidiaries to their respective presence or non-presence, and not to misreporting.

We document that banks that have not been suspected of noncompliance before are affected by reputational spillover effects from public tax information on their tax haven activities. However, these spillover effects materialize in a behavioral response from banks only if financial secrecy and bank-specific reputational concerns are crucial. While De Simone and Olbert (2021) find firms decrease their tax haven presence under private CbCR, we contribute to understanding which types of tax havens are affected and how reputational spillovers under public CbCR ultimately lead to a change in behavior.

Second, we highlight the role of *reputational* costs in the financial sector as banks are exposed to a particularly high risk of public shaming and face stricter reporting regulations than other industries. We also draw on a study by Christensen et al. (2017), who provide evidence that incremental disclosure can have real effects. In their case, disclosure of safety issues increased observable safety in the disclosing firms. However, we go beyond analyzing the direct impact of mandatory disclosure of tax-related information on tax planning behavior, as intended by the regulator, but examine conditions under which tax information disclosure is associated with spillovers to fundamental real decisions such as organization.

Third, we add to the under-researched area of the *taxation of financial firms* (Hanlon and Heitzman, 2010) by investigating the effect of transparency on the firm structure of multinational banks. While previous studies on bank responses to public CbCR focus on tax avoidance behavior and provide mixed evidence (Brown, 2020; Joshi et al., 2020; Overesch and Wolff, 2021), our findings help to identify under what conditions bank behavioral responses emerge and which tax havens are likely being shut down. In the face of the enormous regulatory requirements for banks, CbCR in this industry might provide only limited or even no additional information that is perceived by stakeholders. Thus, it is ex-ante unclear whether the incremental information provided by public CbCR[11] is actually relevant. Clausing (2020) argues strongly in favor of the information value of, preferably public, CbCR. Lagarden

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[11] For instance, according to its 2014 CbCR, Barclays Plc generated an after-tax profit of € 590 million with only 30 full-time employees (FTE) in Luxembourg, a tax haven country. This corresponds to an after-tax profit of almost € 20 million per FTE in Luxembourg.

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et al. (2020), in contrast, discuss the limited information value of CbCR for the evaluation of a firm's tax avoidance behavior. Dutt et al. (2019b) mitigate some of these concerns. They comprehensively analyze public CbCR from EU banks and suggest that, indeed, incremental transparency increased for banks' worldwide profits and real activities and that disclosure is also indicative to better understand the existence and scale of tax haven usage (Brown et al., 2019). However, their study does not provide a specific indication for CbCR increasing transparency about tax haven subsidiaries since public knowledge on the group structure of EU banks was available already before CbCR. To summarize, none of these studies specifically examine the effect of public CbCR for European banks and their group structure by using a difference-in-difference research design. We document that both the deemed incremental transparency and the indirect and spillover effects from increased awareness for tax and regulatory havens are crucial.

Fourth, as we extend our analysis to *regulatory havens,* our study connects with a literature strand on the economic consequences of regional variation in bank regulation (Houston et al., 2012; Ongena et al., 2013; Agarwal et al., 2014; Bischof et al., 2021). Our results indicate that public CbCR is not only about tax disclosure but specifically spills over to other regulatory layers. Our findings suggest that CbCR leads to an increase in regulatory costs in countries with strong financial secrecy. Banks, therefore, reduce their number of subsidiaries in opaque tax havens in particular.

Understanding the conditions that make banks change their tax behavior, for instance, their tax haven presence, is particularly important for policymakers and other interest groups that advocate enhanced tax disclosure requirements, especially to name and shame tax avoiders, and thus effectuate a change in behavior OECD (2020). Our results are relevant for policymakers who want to understand the implications of corporate tax transparency, especially because public CbCR will extend to all large multinational firms in the EU[12] and likely beyond. Our findings suggest that tax disclosure regulations interact with other layers of disclosure and regulation. While our study indicates efficacy in terms of reducing tax and regulatory haven presence if both CbCR and financial secrecy regulation coincide, and if the reputational risk is high, our study does not account for the increased compliance costs due to

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[12] Directive (EU) 2021/2101 of the European Parliament and of the Council of 24 November 2021 amending Directive 2013/34/EU as regards disclosure of income tax information by certain undertakings and branches.

extended and multiple-layer reporting and disclosure obligations. Ever-increasing layers of disclosure, therefore, may not be beneficial.

2   Institutional background and prior literature

2.1   TRANSPARENCY UNDER CRD IV

In response to the financial crisis and the Basel III requirements, and with the general aim of restoring public trust in and resilience of the financial sector (European Commission, 2013), the EU implemented the Capital Requirement Directive IV. This regulatory package includes an enhanced transparency initiative regarding the international activities of banks and other financial firms via mandatory public CbCR. Financial institutions have been required to publish key financial information about the geographical distribution of their business activities, tax payments, and other details since the reporting year of 2014. The largest banks were urged to confidentially report parts of this information already for the reporting year of 2013 to the European Commission. Public CbCR represents an additional disclosure requirement, which is seen as an unanticipated shock for multinational financial institutions with operations in the EU (Joshi et al., 2020) because the disclosure of formerly private and potentially delicate financial and tax information became mandatory as a surprise event at the end of the EU legislation process on CRD IV (Dutt et al., 2019a). According to Article 89 of CRD IV, banks have to "disclose annually, specifying by Member State and by the third country in which it has an *establishment*, the following information on a consolidated basis for the financial year: name(s), nature of activities and geographical location; turnover; number of employees on a full-time equivalent basis; profit or loss before tax; tax on profit or loss; public subsidies received."

In Article 89 of CRD IV, "establishment" includes subsidiaries, branches, and other relevant entities through which a bank has a subsidiary presence in a particular country (European Banking Authority, 2014). "Consolidated basis" refers either to the prudential scope of consolidation as defined by the CRR representing a less comprehensive consolidation or to the consolidation scope under accounting rules. However, the competent authorities of countries where the majority of the banks in our sample are headquartered (France, Germany, and the United Kingdom) refer to the accounting scope of consolidation (Dutt et al., 2019b).

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Public CbCR generally applies to banks as defined in the regulation, which includes banks headquartered in the EU with their entities located in and outside of the EU and EU entities of institutions headquartered outside of the EU. Consequently, banks operating in the EU, but not headquartered in any member state, typically have lower publication requirements than their peers with headquarters in the EU. From a banking perspective, Article 89 of CRD IV, therefore, required additional transparency from 2014 onwards, as compared to merely disclosing consolidated entities regarding 1) detail (as listed above), 2) the entities included (subsidiaries and also branches and "other relevant entities"), and 3) aggregation, on a per-country-level.

2.2 THE IFRS CONSOLIDATION SCOPE

As of 2005, listed corporations with their registered office in the EU are required to prepare their consolidated financial statements according to IFRS.[13] Disclosure of consolidated entities on a firm-by-firm basis (i.e., not country-by-country) is required. The IASB has revised its rules regarding the scope of consolidation in 2011. IFRS 10 determines the consolidation requirement[14], IFRS 11 contains provisions on joint arrangements[15], and IFRS 12 provides for disclosure in the notes[16]. Under IFRS, normally, an entity is fully consolidated if the parent entity controls it. This is usually the case if the parent directly or indirectly owns more than half of the entity's voting rights. Associated entities represent parts of a corporate group over which the parent has significant influence and which are consolidated by using the equity method. Significant influence normally means that the parent owns between 20% and 50%. Hence, also jointly controlled entities are included in this group.

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[13] Article 4 Regulation (EC) 606/2002.

[14] IFRS 10 "Consolidated Financial Statements" replaces the relevant rules in IAS 27 and SIC 12 and applies in the EU for financial years beginning on or after 1 January 2014; Article 2 Regulation (EU) 1254/2012. IFRS 10 introduces a single consolidation model and also establishes a uniform criterion of control applicable to all entities, *including* structured entities. Regardless, several studies in the literature find that IFRS 10 does not lead to significant changes in the scope of consolidation (e.g. EFRAG (2012), Jungius, Knappstein, and Schmidt (2015)). We follow these prior findings and therefore assume comparability of the information contained in all consolidation scopes as well as their comprehensiveness over the whole observation period.

[15] IFRS 11 replaces IAS 31 and its interpretation SIC 13.

[16] IFRS 12 addresses the disclosure requirements for entities that have an interest in a subsidiary, a joint arrangement, an associate or an unconsolidated structured entity and replaces former disclosure rules required by IAS 27 "Consolidated Financial Statements", IAS 31 "Interest in Joint Ventures" and IAS 28 "Investment in Associates" (Deloitte (2012)).

2.3 PRIOR LITERATURE

Several studies in prior literature investigate the consequences of tax transparency on firm behavior, and their findings are inconclusive. Brown (2020), Joshi et al. (2020), Overesch and Wolff (2021) all analyze the effect of CRD IV on the tax avoidance behavior of multinational EU banks, operationalized by ETR measures. While Joshi et al. (2020) do not find a robust increase of ETRs using, among other things, insurance firms as a control group, Overesch and Wolff (2021) report significantly higher ETRs in the post-CbCR periods only for banks with tax haven operations. Contrary to the findings in these studies, Brown (2020) shows decreasing ETRs for EU banks relative to EU insurers. ETR changes may be due to many different effects[17], but we focus on tax haven presence as one specific channel of aggressive tax strategies. In this respect, our main research question differs from prior studies and teases out whether higher levels of tax transparency cause spillover effects to fundamental organizational decisions, i.e., banks' global firm structure (real effects).

We emphasize that a reduction of tax haven presence and a reduction of ETRs are not necessarily connected. A multinational bank may decide to close tax haven entities and still use (different) tax planning strategies. Conversely, they may also decide to maintain their tax haven presence but not use it for tax planning purposes, i.e., not shift profits to the tax haven entity. However, Langenmayr and Reiter (2020) study profit-shifting in the financial sector and identify the relocation of proprietary trading units to low-tax countries as an important profit-shifting channel. Proprietary trading is a highly mobile and profitable business activity that is particularly sensitive to a change in the corporate income tax rate. They find a tax semi-elasticity of -4.0 for fixed-income trading assets, which largely exceeds other estimates in prior literature. In contrast to our analysis, Langenmayr and Reiter (2020) abstract from specific disclosure regulations but cater to the importance of tax avoidance in the financial industry. Building on this evidence and studies on reputational risk, we expect multinational banks to be very sensitive to the disclosure of tax haven activities in the face of public CbCR.

Bouvatier et al. (2021) analyze public CbC-reports for the 36 largest European banks and apply a standard gravity model identifying abnormal amounts of financial transactions in tax havens. By

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[17] Including the introduction of additional bank levies in the aftermath of the financial crisis.

contrast, we use the number of multinational banks' subsidiaries as a proxy for the commercial presence in tax havens. This information is available before and after public CbCR was introduced and allows us to observe adaptive behavior.

Studies on investor reactions to the introduction of public CbCR show mixed results for different industries. Johannesen and Larsen (2016) conduct an event study around the days when public CbCR rules for European firms from the extractive industry were adopted and report significant negative abnormal returns for affected firms. The authors explain these findings by two possible channels, the disclosed information (1) may help authorities to detect tax evasion and (2) may increase public pressure for firms that report low effective tax rates. Surprisingly, the event study in Dutt et al. (2019a) does not find a significant stock market reaction around the announcement dates of public CbCR in the financial sector. Given that bribery is often perceived as relevant among extractive firms (Robinson et al., 2006; Chazan, 2012; Christensen et al., 2020), markets may have viewed increased transparency as a particular threat to the business model of firms in the extractive industries.

Dyreng et al. (2016) analyze the effect of a public shaming NGO campaign against FTSE 100 firms that used to be non-compliant with a specific transparency law requiring U.K. firms to disclose a complete list of their subsidiaries, including the geographical location. The authors report that the NGO campaign not only urged non-compliant companies to comply with the law but further made them decrease the proportion of their subsidiaries located in low-tax countries relative to compliant firms. Their analysis of non-compliant firms differs from our study as we are concerned about the effects of incremental mandatory tax transparency on *compliant* firms in the financial sector. Furthermore, our theoretical channel relies on anticipated future reputational costs, increased scrutiny by the tax administration, and regulatory supervision instead of actual reputational costs resulting from an NGO campaign.

Our study also ties in with a strand of literature dealing with the economic consequences of bank regulation arbitrage. For example, Houston et al. (2012) find evidence that banks exploit global differences in bank regulation by transferring funds from countries with restrictive regulations to countries where bank regulation is more relaxed. Relatedly, Ongena et al. (2013) suggest that stricter regulation in banks' home countries can lead to more risk-taking abroad. Using differences in regulatory

enforcement in the U.S., Agarwal et al. (2014) provide evidence that more lenient regulators are associated with higher bank failure rates. These findings are related to our study, as such regulatory arbitrage could be mitigated by introducing more country-specific transparency induced by public CbCR.

3   *Hypotheses*

Stakeholders such as activist groups (e.g., Oxfam, 2017) or the public press (e.g., Austin, 2015), ICIJ (2020) blame banks for shifting profits to low-tax jurisdictions and laundering money via high-secrecy jurisdictions. Also, the literature provides some evidence about tax avoidance behavior of the financial sector, e.g., Langenmayr and Reiter (2020) and Merz and Overesch (2016). However, little is known about the bank subsidiaries in tax havens in general and the effects of attempts to curb banks' profit shifting by increasing tax transparency.

Public CbCR may or may not affect the number of haven subsidiaries. On the one hand, it is likely that public CbCR negatively influences haven presence. Before the introduction of public CbCR, stakeholders could inform themselves on tax haven presence from the IFRS list of consolidated entities. This information is, of course, still available to them, but public CbCR adds to the salience of such information but also includes more details. Stakeholders may be better able to distinguish between activities that fulfill core business functions and activities with the possible purpose of tax avoidance or activities that benefit from high financial secrecy. Such information enables customers, media, and policymakers to more easily identify multinational banks as "poor corporate citizens", resulting in reputational costs (Hanlon and Slemrod, 2009). The financial crisis of 2008 and the subsequent use of taxpayer money for bailouts increased reputational concerns for financial institutions. In the face of this increased sensitivity towards reputational issues and to avoid further reputational damage, banks may withdraw from tax and regulatory havens. Such a response to reputational concerns is consistent with the institutional theory, assuming that firms will adopt institutional norms to conform to institutional expectations ("reduce profit shifting") formed by policymakers or the media (Gramlich and Whiteaker-Poe, 2013). It is possible that mandatory tax-related disclosures reinforce such adoption and may, in turn, lead to a reduction of banks' haven exposure. Moreover, public CbCR may reduce tax

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aggressiveness as it gives tax authorities roadmaps for tax audits, such as orientation on which financial institution and tax issue to challenge in their auditing processes. Related research on the effectiveness of mandatory CSR disclosures indicates higher corporate fiscal contributions (Rauter, 2020) or increasing CSR activities (Fiechter et al., 2020) and thus behavioral changes of affected firms. These results corroborate the expectation that mandated public disclosure (e.g., public CbCR) is likely to induce real effects in affected firms.

Other costs may result from increased regulatory scrutiny, which is in line with prior literature showing increased regulatory attention on a firm's tax disclosure deterring tax aggressiveness. Kubick et al. (2016) document that firms receiving a tax-related comment letter from the United States Securities and Exchange Commission (SEC) have higher ETRs in the years after receiving a comment letter. Furthermore, many tax havens also offer strict banking secrecy, facilitating economic activity's obfuscation (regulatory havens). Hence, banks may worry about increased know-your-customer inquiries or anti-money-laundering laws resulting from public CbCR (Dutt et al., 2019b). Expected regulatory costs may be particularly relevant for banks with presence in regulatory havens.

On the other hand, public CbCR may not reduce tax haven presence of multinational banks if benefits from tax savings or business models outweigh tax, regulatory, and reputational costs. Investors may appreciate compliant tax planning strategies and be unlikely to change their attitude under public CbCR. Furthermore, Evers et al. (2016) question the additional insights and benefits from public CbCR for tax authorities. The authors argue that tax authorities and regulatory bodies already have access to information about banks' common tax haven activities, which alleviates the relevance of the CbC-information and makes organizational adjustment unlikely.

Therefore, it is an empirical question whether the introduction of public CbCR affects the group structure of multinational banks and their presence in tax havens. We predict that CbCR decreases banks' tax haven presence under specific conditions and use insurance firms as a control group. We state the following hypotheses:

H1: Following the introduction of public CbCR, EU banks decrease their tax haven presence relative to EU insurance firms.

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In addition, public CbCR could attract the attention of regulators and supervisors and impose regulatory costs on banks present in financially opaque countries (regulatory havens). Consequently, we also expect a subsidiary reduction in opaque countries characterized by high financial secrecy (regulatory havens).

> *H2: Following the introduction of public CbCR, EU banks decrease their regulatory haven presence relative to EU insurance firms.*

Given anticipated tax and regulatory costs in expectation to public CbCR, it is likely that banks particularly reduce their presence in countries with low or zero taxation and high financial secrecy (tax and regulatory havens).

> *H3: Following the introduction of public CbCR, EU banks decrease their presence in tax and regulatory havens more strongly, relative to EU insurance firms.*

However, if the reputational risk exposure of a disclosing bank is not very high, CbCR might not lead to an organizational adjustment. High reputational risk exposure might be important for behavioral adjustments and partially explain mixed evidence in prior related literature. Hence we conjecture and predict:

> *H4: Following the introduction of public CbCR, EU banks with high reputational risk decrease their presence in tax and regulatory havens more strongly, relative to EU insurance firms with high reputational risk.*

Reputational costs related to tax haven presence are likely to increase under public CbCR. Hence, we expect the reduction of subsidiary presence in tax and regulatory havens to be centered on banks with high reputational risk, e.g., the vulnerability to suffering from reputational costs due to negative stakeholder scrutiny.

4   *Empirical Analysis*

4.1   SAMPLE SELECTION

We hand-collect information on subsidiaries from disclosure in the notes of annual financial statements of the Global Systemically Important Institutions (G-SIIs) headquartered in the EU, as defined by the European Banking Authority (2015) for the years 2011-2015. Of the 37 G-SIIs, we have to drop six

banks due to lack of data and therefore include 31 banks in our analysis. Table 1.1 presents the sample selection process for EU banks.[18]

<div align="center">"Table 1.1 around here"</div>

We follow a standard approach of prior literature and use multinational insurance firms headquartered in the EU as our control group. EU insurance firms are not subject to tax transparency requirements via public CbCR. We acknowledge that insurance firms are different from banks in many regards. However, in line with prior literature (Beatty et al., 1996; Bischof and Daske, 2013; Chircop and Novotny-Farkas, 2016; Overesch and Wolff, 2021), we still find that they form an adequate control group for our purposes. First, both types of firms serve as financial intermediaries that do business internationally and may be active in tax havens. Second, similar to banks whose profits largely depend on interest spread, insurers also depend strongly on the interest rate environment. Third, they both compete in markets for similar investment and protection products, i.e., government bonds or credit default swaps. Finally, EU banks and EU insurers are both subject to supervision and similar regulatory and prudential rules that pursue a risk-based approach to minimum capital requirements and promote the integrated use of models by institutions in risk management and solvency assessment (Al-Darwish et al., 2011).[19] We hand-collect data on subsidiaries as shown in the notes of IFRS statements of multinational insurers, which are insurance groups for supervision by the European Insurance and Occupational Pension Authority (European Insurance and Occupational Pensions Authority, 2015). The total control sample consists of 29 EU insurers. Table 1.2 presents the sample selection process.

<div align="center">"Table 1.2 around here"</div>

Tables 2.1 and 2.2 give an overview of headquarter locations of our banks and insurers. Our sample consists of firms headquartered in ten EU countries, with Germany and the United Kingdom hosting most banks and insurers.

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[18] In general, our data panel is balanced, however 5 firm-year observations are missing due to unavailability of the data. The consolidation scopes of HSBC Holdings (2011, 2013, and 2014), Standard Chartered (2012) and British United Provident Association (2011) could not be obtained. Requests for data to investor relations teams of the relevant firms remained unsuccessful.

[19] Other controls groups are not adequate: Large banks headquartered in non-EU countries offer no clear setting, because (*only*) their EU-subsidiaries *are* subject to public CbCR; small EU banks are not, or not sufficiently, active internationally.

"Tables 2.1 and 2.2 around here"

We build on previous literature to define a list of tax haven countries. Companies invest in tax havens not only because local income is taxed at low or zero rates but also because subsidiaries in tax havens can facilitate the avoidance of taxes that might otherwise be payable in high-tax countries (Dharmapala and Hines, 2009). Although tax haven countries share similar characteristics, a universally accepted list of tax havens does not exist. For our study, we choose the list of tax havens from Hines (2010), which includes 52 countries. Additionally, we include the U.S. state of Delaware as our approach to hand collect data on subsidiary location enables us also to identify domestic tax havens; moreover, managerial decisions to venture into Delaware are partially driven by corporate state income tax considerations (Dyreng et al., 2013). We follow Hines and Rice (1994) and Desai et al. (2006) and distinguish between the "Big 7 Havens" and all other tax haven countries, the so-called dot-havens. While the first is a group of countries with a relatively large economy and population, the latter are usually small island countries with little economic substance. Appendix B shows our tax haven list.

Furthermore, we use the Financial Secrecy Index (FSI) of the Tax Justice Network (2015) to proxy for financial secrecy at the country level. This index ranks countries according to their level of secrecy, with higher ranks indicating less financial transparency, less engagement in information sharing with other national authorities, and less compliance with international anti-money-laundering norms.

4.2 ESTIMATION AND VARIABLES

To assess our main research question and to isolate the effect of incremental tax transparency on banks' group structures and their presence in tax havens relative to insurance companies, which are not affected by public CbCR, we apply a difference-in-difference (DiD) research design.

$$\textbf{(I)} \qquad y_{i,t} = \beta_0 + \beta_1 Bank_i * PostCbCR_t + \sum \beta_k\, controls_{i,t} + \mu_i + \theta_t + \varepsilon_{i,t}$$

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We estimate tax haven presence as our dependent variable ($y_{i,t}$) by the share of tax haven entities on the number of total entities of multinational financial firms located in the EU, thereby measuring the relative presence in tax havens for each firm ($\frac{tax\ haven\ entities}{total\ entities}$). We prefer the relative number of tax haven entities to the absolute number; consequently, we also capture the general trend of reducing the number of entities seen since the financial crisis. As an alternative specification, we also use the absolute number of tax haven entities as a dependent variable. This information on subsidiaries is usually disclosed in the notes of financial statements prepared according to IFRS. For our main sample, we hand-collect data from the list of shareholdings according to IFRS disclosure of 31 G-SSIs for the years 2011-2015. Given that we carefully hand-collected data and that the sample size is small, we refrain from any outlier treatment of the dependent variable in the form of winsorizing or truncating.

For independent variables, we include the time dummy "*postCbCR*" that equals 1 for financial years 2014 and 2015 or 0 otherwise. Moreover, our model contains the dummy variable "*Bank*" that equals 1 for EU headquartered banks or 0 for EU headquartered insurance groups. Thus, the coefficient of interest in our model is β_1 capturing the average effect of public CbCR on banks relative to insurers. We also include control variables to account for time-varying firm characteristics that may influence tax haven presence. We control for the logarithm of a firm's total assets and employees to control for size, the return on average assets (ROAA) to control for profitability, and the GAAP effective tax rate to keep tax planning opportunities constant. In addition, we include firm fixed effects (μ_i) to absorb unobservable time-invariant firm characteristics and year fixed effects (θ_t) to keep common time effects constant. We obtain financial data for our control variables from S&P Global Market Intelligence. The control variables of equation (I) are winsorized at the 1% and 99% levels.[20] Appendix A displays our variable definitions.

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[20] Our results are robust to not winsorizing.

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5   Empirical Results

In this subsection, we present our results based on descriptive statistics and DiD-specifications using a treatment and control sample for the years 2011 to 2015. As public CbCR became mandatory in 2014, the pre-treatment years are 2011, 2012, and 2013. Accordingly, 2014 and 2015 serve as the period when mandatory tax transparency for banks was in effect.

We start our empirical analysis by illustrating the tax haven presence for banks and insurers graphically over time. Figure 1, Graphs (a) and (b) show that banks increase their relative presence (i.e., the share of haven subsidiaries) in tax havens and dot havens in the pre-CbCR period. However, for financial years after 2013, when public CbCR is applied, banks reduce their share of tax haven and dot haven subsidiaries. In contrast, insurance firms show a general upward sloping trend of their share of tax haven and dot haven subsidiaries in the pre- and post-period. Figure 1, Graphs (c) and (d) plot the development of the absolute number of tax haven and dot haven entities over time. Consistent with Graphs (a) and (b), banks decrease their absolute number of tax haven and dot haven subsidiaries after 2013, while insurance firms show a relatively constant positive slope over time. Taken together, the two lines for banks and insurers are similar in the pre-period, supporting the parallel trend assumption.[21]

Table 3 shows the summary statistics separately for the treatment and control group. On average, and not surprisingly, banks are bigger in total assets and less profitable. Their mean number of total entities and entities located in tax havens is greater than the equivalent figures for insurers over the whole sample period, on average. The mean ratio of banks' tax haven entities and banks' total entities ("Share Haven") is 13% compared to 10% for insurers. Banks have, on average, more employees and show lower GAAP effective tax rates. Panel C compares the differences between banks and insurers and indicates the differences in means between the two groups. Panels D and E show the summary statistics for the treatment and control group separately for the pre and post-CbCR years (2011-2013 vs. 2014-2015). In contrast to insurers who increased both the total numbers of entities as well as the tax haven entities, banks show a decline in both figures in the post-CbCR period. While banks show a constant share of tax haven entities, insurers increased this ratio from 10% to 11%. Consistent with observations

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[21] We also support the parallel trend assumption in a multivariate analysis.

since the financial crisis, banks reduced their size over time measured by total assets and employees compared to insurers with constant total assets and more employees in the post-CbCR period. Banks in the treatment group experienced an increase in ROAA after the introduction of public CbCR, with the mean increasing from 0.14% to 0.29%. In comparison, insurers in the control group have a similar pattern and increased their ROAA from 0.67% to 0.88%. Lastly, both groups show higher ETRs in the years after the introduction of public CbCR for banks.

"Table 3 around here"

Table 4 illustrates our regression results. We begin the multivariate analysis with an ordinary least squares (OLS) regression in columns (1) to (3), with the share of tax haven entities ($\frac{tax\ haven\ entities}{total\ entities}$) as the dependent variable. Our coefficient of interest is the interaction term of *Bank*PostCbCR,* measuring the average treatment effect of public CbCR in the years when public CbCR was in place. Column 1 shows the results with no control variables and fixed effects; Column 2 includes control variables; Column 3 includes controls and fixed effects. Consistent with our expectation, all model specifications show a negative and statistically significant coefficient of the variable of interest.

The result in our strictest specification (Column 3) suggests that, on average, banks decrease their overall share of tax haven entities by 2.72 percentage points relative to insurance firms, which are not affected by public CbCR[22], supporting our H1. This reduction represents a 23.17% decrease relative to the unconditional sample mean.

"Table 4 around here"

To check for robustness, we alter our model of equation (I) and use the absolute number of tax haven subsidiaries as a dependent variable. Since our dependent variable now counts data that takes non-negative integer values, an estimation using OLS likely leads to biased coefficients. Hence, we follow Baltagi, Cameron, and Trivedi (2015) and use a Negative Binominal regression including firm-fixed effects in Column 4. The Negative Binominal result is generally consistent with the previous OLS specification. The results are also economically meaningful as the coefficient of the interaction term in

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[22] We include Delaware (U.S) in our list of tax havens because our data collection approach allows the collection of information on domestic tax havens as well. However, as Delaware (U.S.) is not part of the original lists in Hines (2010), we run our regressions again excluding Delaware (U.S.) from the list of tax havens. The non-tabulated results are qualitatively similar to the results shown in Table 3.

Column 4 indicates a reduction of banks' tax haven subsidiaries of -24.9%[23] after the introduction of public CbCR relative to the control group. This result is within the corridor of other studies related to an increase of tax transparency that report a reduction of tax haven subsidiaries of 17-24% (De Simone and Olbert (2021) and 46% (Braun and Weichenrieder (2015). In our data, Intesa Sanpaolo serves as a case study on the magnitude of the negative association between public CbCR and tax haven presence. In the pre-CbCR period, Italy's second-biggest bank increased its number of tax haven subsidiaries from 97 in 2011 to 102 in 2013. After the obligation to present public CbCR, the bank significantly reduced its tax haven exposure to only 29 subsidiaries in 2015 (28 in 2014). We do not, however, find a significant relative reduction of banks' total subsidiaries (Column 5), suggesting a targeted reduction of tax haven presence rather than a more general organizational restructuring in the post-CbCR period.

We further check whether the reduction of tax haven entities depends on the type of tax haven country. Appendix A shows our lists of tax havens. We differentiate between dot havens and Big 7 Havens following Hines and Rice (1994) and Desai et al. (2006). Big 7 havens are Hong Kong, Ireland, Lebanon, Liberia, Panama, Singapore, and Switzerland, i.e., low-tax countries with economic substance and a relatively large population. It is likely that in these countries, economic substance rather than tax or bank secrecy drive firms' presence. By contrast, all other countries in our tax haven list (Appendix A) are defined as dot havens and represent primarily small island countries without much economic substance. We expect that one reason why banks reduce their tax haven presence in response to public CbCR is reputational concerns. Consequently, we expect that banks subject to increased tax transparency reduce their number of dot haven entities to a greater extent than entities located elsewhere because an engagement in dot haven countries may attract particular negative publicity.

Table 5 reports a negative and significant reduction of the share of entities that are located in dot havens (Column 1). Applying the same method for Big 7 havens only shows a contrary result. Table 5 Column 2 reports a negative but statistically insignificant effect on the share of entities located in Big 7 havens. Additionally, we check whether public CbCR is also associated with a reduction of entities in

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[23] $100 \cdot (e^{-0,2863}-1)$%. We receive a qualitatively similar result when using a Poisson model instead.

EU tax havens.[24] Table 5 Column 3 shows a negative and statistically significant coefficient of the interactions term, indicating that tax haven presence in the EU is negatively associated with the introduction of public CbCR. The results displayed in Columns 1 and 3 are consistent since all EU tax havens are considered dot havens except Ireland.

"Table 5 around here"

Additional tests in Table 6 reveal that the reduction is predominantly centered on fully consolidated subsidiaries located in dot havens. This result is consistent with the regulatory details of the transparency requirements under public CbCR since the disclosures are required on a "consolidated basis" (Art. 89, CRD IV). Moreover, "non-consolidated entities" in columns 4-7 also include non-controlling interest, e.g., at-equity investments, which further explains the insignificant result as banks cannot respond autonomously with respect to these types of shareholdings.

"Table 6 around here"

5.1   THE ROLE OF REGULATORY COSTS

As mentioned earlier, regulatory concerns could play a role for managers when deciding on their global organizational structure. Prior literature shows that firms invest in tax havens not only for tax reasons but also for the secrecy these countries offer (Braun and Weichenrieder, 2015). Opaque country structures may facilitate harmful activities, for instance, direct shareholder expropriation (Bennedsen and Zeume (2018) or obscuring beneficial ownership of assets (Schjelderup, 2016). We use the Financial Secrecy Index (FSI) of the Tax Justice Network (2015) to proxy for financial secrecy at the country level. Hence, we split all countries where subsidiaries are located at the median according to their FSI index in countries with high and low financial secrecy. In contrast to our prediction in H2, we do not find a significant negative association between the introduction of public CbCR and banks' presence in financially opaque countries (Table 7, Column 1). However, when testing subsidiary presence for banks in countries with low financial secrecy, we report a positive sign of the coefficient of interest that is weakly significant at the 10%-level, suggesting that banks increased their subsidiary presence in countries with low financial secrecy in the post-CbCR period. We view this as evidence that regulatory

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[24] Based on the tax haven list of Hines (2010), EU tax havens are Cyprus, Gibraltar, Ireland, Luxembourg and Malta.

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concerns about the presence of subsidiaries in financially opaque countries alone did not change the global subsidiary structure of banks. However, after the introduction of CbCR, banks instead sought to enter new markets in countries with low secrecy or high transparency.

<center>"Table 7 around here"</center>

In the next step, we create a list of "tax & regulatory havens" defined as tax havens by Hines (2010) with an above-median rank in the FSI. Accordingly, "tax & non-regulatory havens" are tax havens with a below-median rank in the FSI. As public CbCR increased financial transparency significantly at the country level (Dutt et al., 2019b), we expect, according to H3, a stronger reduction in subsidiaries located in opaque tax havens ("tax & regulatory havens") than in transparent tax havens ("tax & non-regulatory havens"). The results in Table 8 confirm our expectations. We only find a significant negative effect of public CbCR on banks' presence in "tax and regulatory havens" in Column 1. In contrast, Column 2 shows no significant result for the same test based on a list of tax havens with low financial secrecy ("tax & non-regulatory havens"). Accordingly, we expect this negative effect also for dot havens characterized by high financial secrecy but not for dot havens with low financial secrecy. We, therefore, define "dot & non-regulatory havens" as dot havens with an above-median rank in the FSI. Column 3 confirms our expectation and reports a negative and statistically significant coefficient of the interaction term. However, when running the same test for dot havens with a below-median rank in the FSI (Column 4), the coefficient does not load. Taken together, the tests performed in Table 8 find empirical support for H3, with EU banks decreasing their presence in tax and regulatory havens more strongly, relative to insurance firms, after the introduction of public CbCR.

<center>"Table 8 around here"</center>

Collectively, these results suggest that regulatory concerns indeed play a role for banks when deciding about their corporate group structure in light of increased financial transparency; however, this dynamic only applies with tax haven countries characterized by high financial secrecy. Our results also further explain insignificant stock market reactions to the introduction of public CbCR (Dutt et al., 2019a). On the one hand, increased tax transparency may have increased costs to tax avoidance activities, thereby lowering firm value. On the other hand, stock prices may have benefited from

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increased transparency because expropriation activities by the managers in the form of tunneling or hiding firm resources may be impeded (Bennedsen and Zeume, 2018). As a result, these two offsetting effects may have canceled out each other from an investor perspective.

5.2   THE ROLE OF REPUTATIONAL COSTS

In the next step, we test the association between reputational risk and tax haven presence after the introduction of public CbCR. We measure reputational risk at the firm level, using the reputational risk rating from the RepRisk database. RepRisk is a commercial database provider tracking firms across the globe according to their exposure to reputational risks over time. One of RepRisk's metrics is the RepRisk rating. This rating builds on negative stakeholder sentiment, measured through an automatized daily screening of various sources (including news agencies and stakeholder communication) in 20 different languages. The RepRisk rating captures firms' exposure to reputational risk rather than their absolute reputation levels (Hombach and Sellhorn, 2021). This measure comprises a scale from AAA to D, where AAA stands for no or very low risk and D for high risk. The average RepRisk rating in our sample is between A and BBB and ranges from AAA (e.g. Norddeutsche Landesbank) to CC (e.g. HSBC Holdings Plc).

Accordingly, we expect banks with a higher reputational risk (e.g., banks exposed to more negative public scrutiny before the introduction of public CbCR) to be more sensitive to increased tax transparency with respect to tax haven presence because banks with higher reputational risk may anticipate higher reputational costs from public CbCR. We, therefore, follow a similar approach as Hombach and Sellhorn, 2021) and split our sample of banks in those with a RepRisk rating above (below) the median rating as of 31.12.2013 and run the DiD specification with insurance firms as the control group separately for high risk and low-risk banks. Table 9, Column 1 reports insignificant results for a test based on low-risk banks with RepRisk ratings below the median for their presence in tax havens after public CbCR was introduced. However, Column 1 shows a significantly negative and larger coefficient of the interaction term for high-risk banks. When we run the same test based on dot haven presence, we find that high-risk banks decrease their dot haven presence more strongly than low-risk banks (Table 9, Columns 3 and 4). Our results indicate that banks with a high reputational risk reduced

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their tax haven and their dot haven presence relative to insurance firms after 2013, while banks with a low reputational only adjust their presence in dot havens.

<div align="center">"Table 9 around here"</div>

We find similar results in a test based on tax and regulatory haven presence. Table 10 shows that only high-risk banks are associated with a reduced subsidiary presence in the post-CbCR period in tax havens and dot havens with high financial secrecy. In contrast, we do not report significant results for the same test based on a list of tax havens characterized by low financial secrecy ("tax and non-regulatory havens") regardless of whether a bank faces high or low reputational risk (Table 11).

<div align="center">"Table 10 & 11 around here"</div>

Collectively, these tests find empirical evidence for H4 and emphasize that reputational concerns in the context of public CbCR are not only tax-related but also related to financial opaqueness at the country level.

5.3   ROBUSTNESS AND ADDITIONAL ANALYSIS

To strengthen the parallel trend assumption of our DiD model, we perform a placebo test in which we replace the *Post* dummy in Equation (I) with year dummies. If the introduction of public CbCR is responsible for a reduction of tax haven presence, the coefficient of the interaction term should only load for financial years starting 2014. Table 12 presents multivariate results for the graphical evidence of Figure 1. We use 2013, the year immediately before the reform, as a reference year to evaluate the timing of the effect of public CbCR and the parallel trends assumption. Thus, we constrain the coefficient to be zero in the year before the reform and test the annual coefficients for 2011, 2012, 2014, and 2015 relative to the year 2013. Independent of the model specification, the coefficient of interest shows insignificant results in the pre-treatment years 2011 and 2012, while the coefficients only load for the period after the transparency regime was in place in all four columns. This result increases confidence that treatment and control firms showed similar patterns of tax haven usage prior to the reform.

<div align="center">"Table 12 around here"</div>

<div align="right">25</div>

Additionally, we plot coefficients of the difference-in-difference estimation for the year indicators, which are all insignificant in the pre-period (Figure 2). These results collectively suggest that the introduction of public CbCR, rather than pre-reform differences in tax haven presence between banks and insurers, explain our findings.

"Figure 2 around here"

A possible concern regarding the validity of our results could be that the reduction in tax haven subsidiaries that we observe might rather be due to an overall organizational "clean-up" of large banks induced by increased tax transparency than a targeted reduction of tax havens. De Simone and Olbert (2021) indicate that firms under private CbCR reduce their organizational complexity, i.e., reduce their overall number of subsidiaries and increase capital and labor expenditures in Europe. However, in contrast to De Simone and Olbert (2021), our results do not indicate an overall organizational complexity decline. To mitigate such concerns, first, we choose the share of tax haven entities related to the total number of entities as our dependent variable in our main regression (Table 4, Columns 1-3). Second, we use the absolute number of overall entities as the dependent variable in our test in Table 4 (Column 5) and do not find a significant result.

To further mitigate the concern that increasing tax transparency leads to more efficient organizational structures than to a targeted reduction of country presence in tax havens, we examine whether the number of tax haven countries in which the banks operate changes between the periods before and after the introduction of public CbCR. A decline in the number of subsidiaries, but not in the number of countries, points to an organizational clean-up rather than targeted structural changes in the use of tax havens. Table 13, Column 3 presents weak evidence of a significant ($p<0.1$) reduction in the average number of tax haven countries, including firm and year fixed effects. However, we do not find a significant reduction when controlling for firm characteristics. Taken together, these tests point to a targeted reduction in firm presence in tax havens in response to public CbCR rather than a general reduction in organizational complexity.

"Table 13 around here"

The small sample size of our study could raise concerns that the effect of public CbCR on banks' haven presence is driven by a few outliers of very large banks reducing their haven exposure overproportionally. We repeat our main test several times to mitigate such concerns and exclude one bank for each run. The untabulated results increase confidence that our results are not caused by statistical outliers. We also validate our findings further and use different tax haven lists from the literature for our analysis. The untabulated tests based on tax haven lists in Dyreng and Lindsey (2009) and Hines and Rice (1994) show robust and qualitatively similar results.

Since our data collection approach also yields insights on domestic tax havens, we run a placebo test based on firm subsidiary presence in Delaware (U.S.). Delaware is well-known for its role as a domestic tax haven in the United States (Dyreng et al., 2013). In public CbC reports, Delaware (U.S.), just like any other U.S. state, is subsumed under the United States line item and therefore "hidden". Because the United States as a whole country is not considered a tax haven, firm presence in Delaware (U.S.) should not be subject to reputational costs induced by incremental tax transparency. However, public CbCR might have generated an increase of the general awareness for tax haven activities that could spill over to jurisdictions that are not disclosed in CbC reports. Therefore, it is an empirical question whether banks close subsidiaries in Delaware (U.S.) after the introduction of public CbCR.

Table 14 indicates a negative and statistically significant effect of the transparency regulation on firm presence in Delaware (U.S.). We view this result as evidence that an increase of general negative public scrutiny about tax haven activities in the context of the introduction of public CbCR led to an adjustment reaction even in tax haven jurisdictions that do not fall under the disclosure regulation.

"Table 14 around here"

6   Conclusion

In this paper, we study the effect of public CbCR on the subsidiary presence of multinational EU banks in tax haven countries. Although the information on the location of subsidiaries of banks was publicly available before the enforcement of public CbCR, this regulation significantly increased country-specific transparency and public awareness. It is therefore possible that its introduction leads to additional costs triggered by the increased attention from tax administrations, regulatory bodies, and the

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public. Incremental transparency could be costly, especially for banks, as they are subject to various strict regulatory requirements and face higher reputational risks, especially since the financial crisis.

Our results indicate that multinational EU banks reduce their presence in tax havens after the introduction of public CbCR relative to unaffected insurance firms. When distinguishing between dot havens (e.g., The Bahamas) and Big 7 havens (e.g., Singapore), we report a significantly negative effect only for dot havens. Furthermore, our results point towards the crucial role of haven heterogeneity for the observed effects since banks, in particular, reduce their number of subsidiaries in opaque tax havens with high financial secrecy, highlighting regulatory concerns in addition to tax matters that were the original intention of the regulation. We can also show that the effect of reducing haven subsidiaries is dominant in banks with high reputational risk. However, since we only focus on the biggest and most important banks in the EU, the findings in our study may not be generalizable to smaller banks, which are less exposed to public and regulatory scrutiny.

We contribute to the literature in several ways. First, we contribute to the literature on the real effects of financial disclosure (Leuz and Wysocki, 2016) and specifically on the global firm structure of MNEs (Kanodia and Sapra, 2016) by investigating the effect of a mandated transparency regime on banks' global footprint in tax and regulatory haven countries. Second, our study contributes to the growing literature on the reputational costs of firms' tax behavior (e.g., Graham et al., 2014; Dyreng et al., 2016; Austin and Wilson, 2017). We show that the effect of public CbCR on the global subsidiary network of EU banks is concentrated in banks exposed to high reputational risk levels. Third, we respond to Hanlon and Heitzman (2010), who call for more research on the taxation of financial institutions. Our study contributes to this strand of literature by providing evidence on the consequences of a regulatory attempt to curb tax aggressiveness by increasing tax transparency in the financial sector. Lastly, our study contributes to the literature on the economic consequences of regional variation in bank regulation (Houston et al., 2012; Ongena et al., 2013; Agarwal et al., 2014; Bischof et al., 2021), since our results indicate that public CbCR is not only about tax disclosure, but specifically spills over to other regulatory layers.

Our study is particularly relevant for policymakers in the current political debates about further tax transparency measures. Since the European Parliament adopted a provisional agreement for CbCR

to become public for all industries (European Parliament, 2021), the results of this paper provide much-needed empirical evidence contributing to this ongoing discussion. We present evidence that banks indeed react to additional disclosure requirements, and it is likely that large multinational firms from all industries reduce tax haven presence in response to public CbCR.

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Figure 1: Tax haven presence of banks and insurers
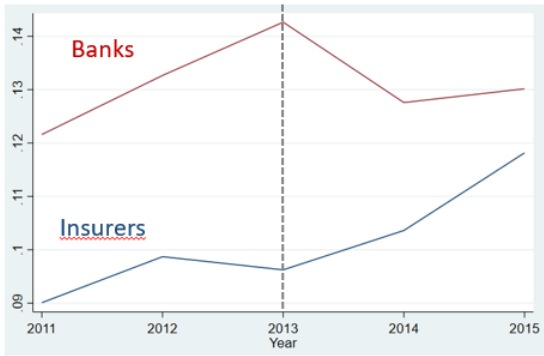
(a) Tax Haven Share
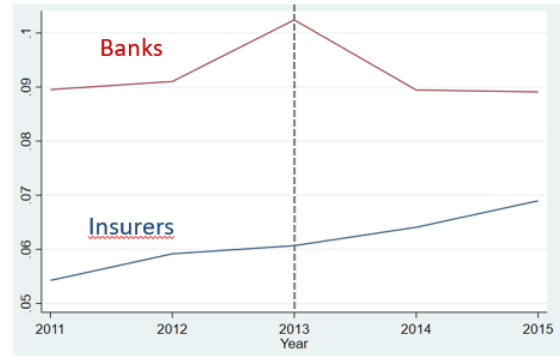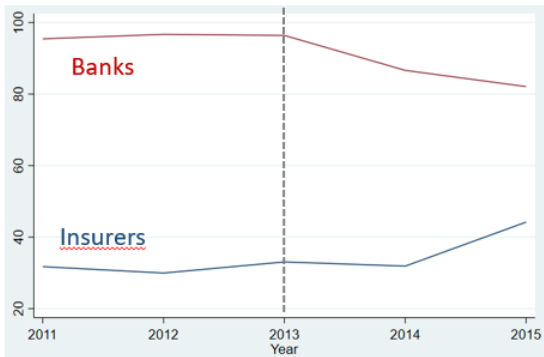
(b) Dot Haven Share

(c) Number of Tax Haven Entities
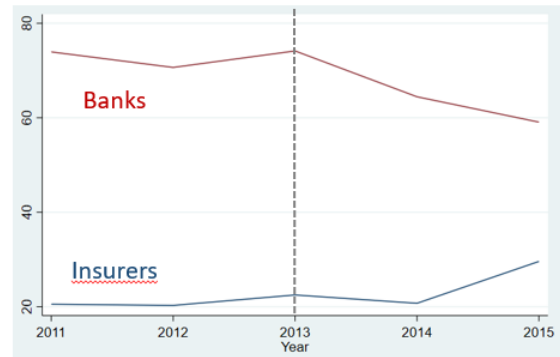
(d) Number of Dot Haven Entities

This figure illustrates the development of tax haven presence for banks and insurers over time. Graph (a) plots the average share of tax haven entities ($\frac{tax\ haven\ entities}{total\ entities}$) on an annual basis. Graph (b) plots the average share of dot haven entities ($\frac{dot\ haven\ entities}{total\ entities}$) on an annual basis. Graph (c) plots the average absolute number of tax haven entities on an annual basis. Graph (d) plots the average absolute number of dot haven entities on an annual basis. Tax havens are countries listed in Hines (2010). Dot havens are all tax havens in Hines (2010) except the Big 7 Havens (Hines and Rice, 1994; Desai, Foley and Hines, 2006). The dotted grey line marks the event of the reform.

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Figure 2: Plots of annual coefficients
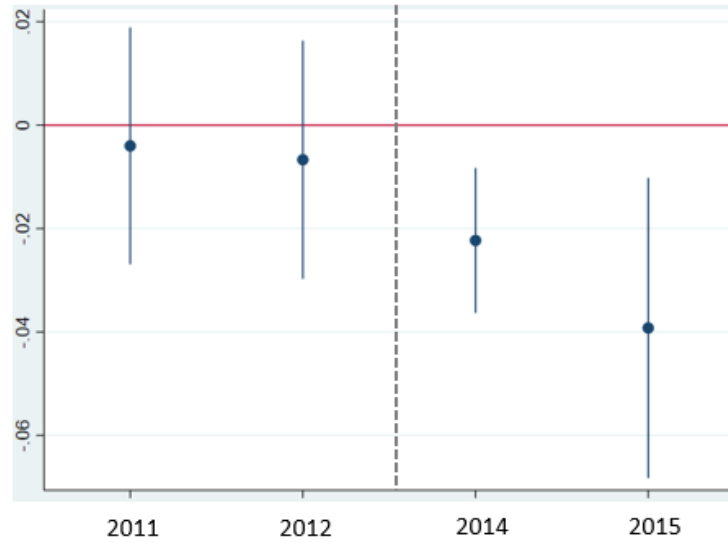
(a) Tax Haven Share
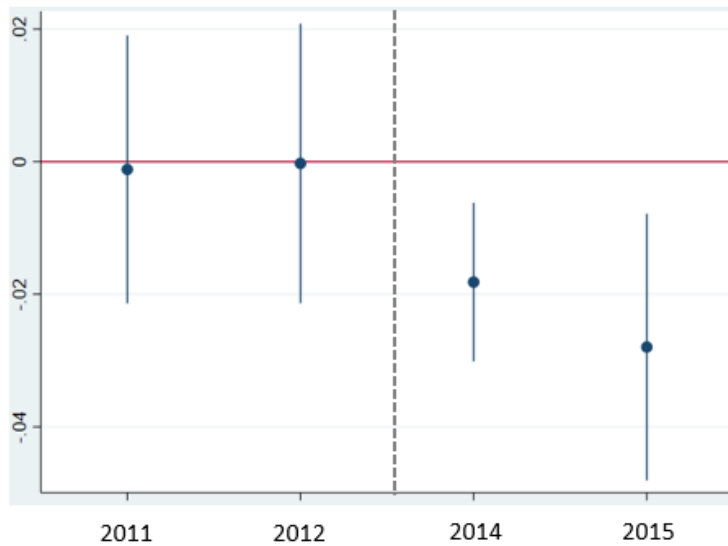
(b) Dot Haven Share

This figure plots annual coefficient estimates (annual difference-in-differences estimates). Graph (a) plots the coefficients for the average share of tax haven entities ($\frac{tax\ haven\ entities}{total\ entities}$) as the dependent variable. Graph (b) plots the average share of dot haven entities ($\frac{dot\ haven\ entities}{total\ entities}$) as the dependent variable. Tax havens are countries listed in Hines (2010). Dot havens are all tax havens in Hines (2010) except the Big 7 Havens (Hines and Rice, 1994; Desai, Foley and Hines, 2006). The coefficient estimates are constrained to zero for 2013, and the annual coefficient estimates have to be interpreted relative to this base year. The dotted grey line marks the event of the reform in 2013. Whisker bars represent 95 percent confidence intervals.

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Table 1.1: Sample selection EU banks

Selection criteria	Firms
European Banking Authority (EBA) list of global systemically important banks (G-SIB) as at 2015	37
Firm from Norway not subject to CBCR disclosure rules (DNB)	-1
Firms for which no consolidation scope could be obtained	-4
(ABN Amro, ING, Banca Monte Dei Paschi Di Siena, Nationwide)	
Purely domestic firm according to the consolidation scope (Banque Postale)	-1
Final sample	31

This table presents the sample selection for EU banks.

Table 1.2: Sample selection EU insurers

Selection criteria	Firms
European Insurance and Occupational Pensions Authority (EIOPA)	102
list of identified insurance groups for Supervision as at 2015	
Firms from EU countries not included in the primary sample of EU banks, e.g., Bulgaria or Greece	-19
Firms for which no consolidation scope could be obtained	-17
Firms for which English language financial statements could not be obtained	-8
Firms domiciled in tax havens	-2
Firms part of an EU bank	-22
Bankruptcy or merger during the sample period	-3
Purely domestic firms according to the consolidation scope	-2
Final sample	29

This table presents the sample selection for EU insurers.

Table 2.1

Composition by Country - EU Banks		
Country	**Firms**	**%**
Austria	1	3.23%
Belgium	1	3.23%
Denmark	1	3.23%
France	5	16.13%
Germany	7	22.58%
Italy	2	6.45%
Netherlands	1	3.23%
United Kingdom	5	16.13%
Spain	4	12.90%
Sweden	4	12.90%
Total	**31**	**100.00%**

This table shows the composition of headquarter countries of EU banks.

Table 2.2

Composition by Country - EU Insurers		
Country	**Firms**	**%**
Austria	2	6.90%
Belgium	1	3.45%
France	4	13.79%
Germany	9	31.03%
Italy	3	10.34%
United Kingdom	8	27.59%
Spain	2	6.90%
Total	**29**	**100.00%**

This table shows the composition of headquarter countries of EU insurers.

Table 3
Summary Statistics

Panel A						
Banks n=31						
	count	mean	sd	min	max	p50
Entities	151	536.78	490.36	23.00	2 097.00	337.00
Tax Haven Entities	151	92.46	147.06	1.00	801.00	29.00
Share Tax Haven	151	0.13	0.11	0.01	0.51	0.10
Totalassets	151	20.38	0.80	18.66	21.70	20.46
ROAA	148	0.20	0.42	-1.56	1.03	0.25
AverageFTE	150	10.81	1.01	8.77	12.20	10.93
ETR	126	26.30	30.77	-88.08	131.38	26.68

Panel B						
Insurers n=29						
	count	mean	sd	min	max	p50
Entities	144	262.80	293.77	9.00	1 304.00	162.00
Tax Haven Entities	144	34.41	49.41	0.00	213.00	12.50
Share Tax Haven	144	0.10	0.07	0.00	0.38	0.10
Totalassets	135	18.11	1.60	15.22	20.76	17.87
ROAA	134	0.75	0.87	-1.56	3.99	0.61
AverageFTE	132	9.22	1.54	5.02	11.91	9.30
ETR	128	30.56	25.18	-88.08	131.38	27.90

Panel C				
Banks vs. Insurers				
	mean banks	mean insurers	difference	t-stat
Entities	536.78	262.80	273.98***	5.85
Tax Haven Entities	92.46	34.41	58.05***	4.59
Share Tax Haven	0.13	0.10	0.03**	2.83
Totalassets	20.38	18.11	2.28***	14.97
ROAA	0.20	0.75	-0.55***	-6.68
AverageFTE	10.81	9.22	1.59***	10.11
ETR	26.30	30.56	-4.26***	-1.21

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Panel D											
Banks n=31		Pre-CbCR						Post-CbCR			
	count	mean	sd	min	max	p50	count	mean	sd	min	max	p50
Entities	90	548.04	522.42	27.00	2 097.00	332.50	61	520.16	442.54	23.00	1 656.00	359.00
Tax Haven Entities	90	97.83	157.88	1.00	801.00	35.00	61	84.52	130.33	1.00	705.00	28.00
Share Tax Haven	90	0.13	0.11	0.01	0.51	0.10	61	0.13	0.11	0.01	0.51	0.11
Totalassets	90	20.45	0.79	18.81	21.70	20.51	61	20.29	0.81	18.66	21.65	20.40
ROAA	88	0.14	0.47	-1.56	0.80	0.24	60	0.29	0.31	-0.63	1.03	0.30
AverageFTE	89	10.84	1.00	8.85	12.20	10.97	61	10.76	1.02	8.77	12.20	10.89
ETR	71	25.22	33.25	-88.08	131.38	26.54	55	27.69	27.47	-88.08	94.15	27.15

Panel E											
Insurers n=29		Pre-CbCR						Post-CbCR			
	count	mean	sd	min	max	p50	count	mean	sd	min	max	p50
Entities	86	254.57	280.05	11.00	1 304.00	157.00	58	275.00	315.12	9.00	1 261.00	165.00
Tax Haven Entities	86	31.88	47.06	0.00	213.00	13.50	58	38.16	52.91	0.00	196.00	11.00
Share Tax Haven	86	0.10	0.07	0.00	0.26	0.09	58	0.11	0.08	0.00	0.38	0.10
Totalassets	80	18.11	1.60	15.22	20.76	17.87	55	18.11	1.61	15.22	20.74	17.88
ROAA	80	0.67	0.93	-1.56	3.99	0.51	54	0.88	0.75	-0.03	3.99	0.66
AverageFTE	80	9.21	1.54	5.02	11.91	9.28	52	9.23	1.56	5.02	11.90	9.36
ETR	73	29.23	26.62	-88.08	121.72	27.93	55	32.33	23.26	-10.92	131.38	27.86

This table presents summary statistics for banks and insurers. Entities denotes the total number of entities collected from the list of shareholdings of banks and insurers, irrespective of their form of (non-)consolidation. Of these, Tax Haven Entities is the number of entities located in tax havens based on Hines (2010). Share Tax Haven is the number of Haven Entities scaled by Entities. Totalassets denotes total assets. ROAA is the return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two). AverageFTE is the average of the number of full-time-equivalent employees per year. ETR is the GAAP-effective tax rate. Panel A shows the summary statistics for banks over the years 2011-2015. Panel B shows the summary statistics for insurers over the years 2011-2015. The last two columns of Panel C show differences between the mean and t-statistics. ***, **, and * indicate significance at the 1%, 5% and 10% levels respectively. Panel D shows the summary statistics for banks separately for the pre-CbCR and post-CbCR year. Panel E shows the summary statistics for banks separately for the pre-CbCR and post-CbCR years.

Table 4
Public CbCR and Tax Haven Presence

Dependent variable:	Prediction	OLS (1) Tax Haven Share	OLS (2) Tax Haven Share	OLS (3) Tax Haven Share	Neg. Binominal (4) Number of tax haven entities	(5) Number of total entities
Banks			0.00696			
			(0.0228)			
PostCbCR			0.0157**			
			(0.00652)			
Banks*PostCbCR	-|-|-|-	**-0.0248****	**-0.0216****	**-0.0272*****	**-0.2863*****	**-0.0917**
		(0.0106)	**(0.0101)**	**(0.00933)**	**(0.1070)**	**(0.0677)**
log_TotalAssets			0.0194*	-0.0138	-0.1497	-0.0068
			(0.00997)	(0.0387)	(0.1951)	(0.1205)
ROAA			0.00216	-0.00392	-0.0059	-0.0404
			(0.00518)	(0.00587)	(0.1096)	(0.0608)
logFTE			-0.000957	-0.0126	0.1469	0.3084
			(0.0114)	(0.0409)	(0.1951)	(0.1273)
ETR			6.31e-07	-6.71e-05	-0.00094	-0.00062
			(4.70e-05)	(4.73e-05)	(0.001232)	(0.00078)
Constant		0.113***	-0.257**	0.500		
		(0.00295)	(0.117)	(0.739)		
Observations		295	250	250	240	248
R-squared		0.059	0.044	0.071	-	-
Controls		no	yes	yes	yes	yes
Firm & year fixed effects		yes	no	yes	yes	yes
Cluster		firm	firm	firm	-	-

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their tax haven presence in the period 2011-2015 with insurance firms. Banks is an indicator variable equal to 1 for banks and equal to 0 for insurers. PostCbCR is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise. The dependent variable in columns (1) - (3) is the number of tax haven entities scaled by the total number of entities ($\frac{tax\ haven\ entities}{total\ entities}$). The dependent variable in column (4) is the absolute number of tax haven entities and the absolute number of total entities in (5). Results in columns (1) – (5) are based on the tax haven list in Hines (2010). Log_TotalAssets is the natural log of total assets. ROAA is the return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two). Log_FTE is the natural log of the number of full-time-equivalent employees. ETR is the GAAP-effective tax rate.

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Table 5
Public CbCR and Tax Haven Presence

Dependent variable: share of subsidiaries located in	Prediction	OLS (1) Dot Havens	OLS (2) Big 7	OLS (3) EU Havens
Banks*PostCbCR	-|-|?	**-0.0223**</br>**(0.00846)**	**-0.00487**</br>**(0.00325)**	**-0.0206**</br>**(0.00855)**
log_TotalAssets		-0.0118</br>(0.0300)	-0.00203</br>(0.0258)	-0.0110</br>(0.0323)
ROAA		0.00107</br>(0.00428)	-0.00499</br>(0.00331)	-0.00147</br>(0.00398)
logFTE		-0.0813***</br>(0.0304)	0.0687**</br>(0.0297)	-0.0457*</br>(0.0258)
ETR		-1.77e-05</br>(3.86e-05)	-4.94e-05</br>(3.47e-05)	-4.77e-05</br>(3.03e-05)
Constant		1.107*</br>(0.569)	-0.608</br>(0.485)	0.713</br>(0.658)
Observations		250	250	250
R-squared		0.101	0.102	0.079
Controls		yes	yes	yes
Firm & year fixed effects		yes	yes	yes
Cluster		firm	firm	firm

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their tax haven presence in the period 2011-2015 with insurance firms. Banks is an indicator variable equal to 1 for banks and equal to 0 for insurers. PostCbCR is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise. The dependent variable in columns (1) - (3) is the number of tax haven entities scaled by the total number of entities ($\frac{tax\ haven\ entities}{total\ entities}$). Results in column (1) are based on dot havens" (Hines and Rice, 1994; Desai, Foley and Hines, 2006), in column (2) based on Big 7 havens (Hines and Rice, 1994; Desai, Foley and Hines, 2006) and column (3) based on EU members part of the tax haven list in Hines (2010). Log_TotalAssets is the natural log of total assets. ROAA is the return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two). Log_FTE is the natural log of the number of full-time-equivalent employees. ETR is the GAAP-effective tax rate.

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Table 6
Public CbCR and Tax Haven Presence and consolidation status

Dependent variable: share of subsidiaries located in	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)
	Tax Havens	Dot Havens	Big 7	Tax Havens	Dot Havens	Big 7
	fully consolidated entities			non-consolidated entities		
Banks*PostCbCR	**-0.0170**	**-0.0154***	**-0.00163**	**-0.00816**	**-0.00547**	**-0.00268**
	(0.0106)	**(0.00861)**	**(0.00396)**	**(0.00801)**	**(0.00572)**	**(0.00316)**
log_TotalAssets	-0.0369	-0.0300	-0.00691	0.0120	0.00893	0.00308
	(0.0526)	(0.0416)	(0.0265)	(0.0374)	(0.0307)	(0.0107)
ROAA	0.000378	0.00444	-0.00406	-0.00254	-0.00180	-0.000737
	(0.00684)	(0.00518)	(0.00292)	(0.00319)	(0.00312)	(0.00193)
logFTE	0.0437	-0.0214	0.0651**	-0.0513*	-0.0556**	0.00434
	(0.0401)	(0.0240)	(0.0313)	(0.0294)	(0.0251)	(0.00640)
ETR	-3.77e-05	2.02e-05	-5.79e-05**	-3.08e-05	-3.61e-05	5.24e-06
	(4.53e-05)	(3.38e-05)	(2.89e-05)	(3.32e-05)	(3.28e-05)	(1.82e-05)
Constant	0.355	0.840	-0.485	0.308	0.403	-0.0958
	(0.886)	(0.671)	(0.483)	(0.704)	(0.576)	(0.195)
Observations	250	250	250	250	250	250
R-squared	0.038	0.038	0.090	0.036	0.052	0.050
Controls	yes	yes	yes	yes	yes	yes
Firm & year fixed effects	yes	yes	yes	yes	yes	yes
Cluster	firm	firm	firm	firm	firm	firm

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their tax haven presence in the period 2011-2015 with insurance firms. Banks is an indicator variable equal to 1 for banks and equal to 0 for insurers. PostCbCR is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise. The dependent variable in columns (1) - (3) is the number of tax haven entities scaled by the total number of entities ($\frac{tax\ haven\ entities}{total\ entities}$). Results in column (1) are based on dot havens (Hines and Rice, 1994; Desai, Foley and Hines, 2006), in column (2) based on Big 7 havens" (Hines and Rice, 1994; Desai, Foley and Hines, 2006) and column (3) based on EU members part of the tax haven list in Hines (2010). Columns (1) – (3) are tests based on fully consolidated entities according to banks' and insurers' consolidation scopes. Columns (4) – (6) are tests based on non-consolidated entities according to banks' and insurers' consolidation scopes. Log_TotalAssets is the natural log of total assets. ROAA is the return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two). Log_FTE is the natural log of the number of full-time-equivalent employees. ETR is the GAAP-effective tax rate.

Table 7

Public CbCR and presence in countries with high/low financial secrecy

Dependent variable: share of entities located in countries with:	Prediction	OLS (1) High Secrecy	OLS (2) Low Secrecy
Banks*PostCbCR	-|?	**-0.00503**	**0.0181***
		(0.0129)	**(0.0103)**
log_TotalAssets		-0.00939	0.0494
		(0.0403)	(0.0359)
ROAA		-0.0147	-0.00813
		(0.0220)	(0.00903)
logFTE		-0.0949*	0.0317
		(0.0560)	(0.0306)
ETR		-3.49e-06	-8.27e-05
		(8.26e-05)	(6.74e-05)
Constant		1.821*	-1.010
		(0.929)	(0.773)
Observations		250	250
R-squared		0.085	0.053
Controls		yes	yes
Firm & year fixed effects		yes	yes
Cluster		firm	firm

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their presence in countries with high/low financial secrecy in the period 2011-2015 with insurance firms. *Banks* is an indicator variable equal to 1 for banks and equal to 0 for insurers. *PostCbCR* is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise. The dependent variable is the number of entities located in countries with high/low financial secrecy scaled by the total number of entities ($\frac{high/low\ secrecy\ entities}{total\ entities}$). Results in column (1) are based on countries having an above-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). Results in column (2) are based on countries having a below-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). *Log_TotalAssets* is the natural log of total assets. *ROAA* is the return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two). Log_FTE is the natural log of the number of full-time-equivalent employees. ETR is the GAAP-effective tax rate.

Table 8
Public CbCR and presence in tax and regulatory havens

Dependent variable: Share of entities located in:	Prediction	OLS (1) Tax & Regulatory Havens	OLS (2) Tax & Non-Regulatory Havens	OLS (3) Dot & Regulatory Havens	OLS (4) Dot & Non-Regulatory Havens
Banks*PostCbCR	-|-|-|-	**-0.0192****	**-0.00382**	**-0.0187****	**0.000514**
		(0.00865)	**(0.00297)**	**(0.00818)**	**(0.000432)**
log_TotalAssets		-0.0140	0.00745	-0.00677	0.00221
		(0.0322)	(0.0226)	(0.0297)	(0.00230)
ROAA		-0.00146	-0.00172	0.00135	0.000460
		(0.00627)	(0.00302)	(0.00391)	(0.000613)
logFTE		-0.0226	0.0155	-0.0751**	-0.000657
		(0.0433)	(0.0228)	(0.0292)	(0.00344)
ETR		-1.33e-05	-3.88e-05	-5.59e-06	2.82e-06
		(4.49e-05)	(3.07e-05)	(3.47e-05)	(5.03e-06)
Constant		0.571	-0.278	0.935*	-0.0342
		(0.648)	(0.440)	(0.559)	(0.0431)
Observations		250	250	250	250
R-squared		0.050	0.036	0.092	0.016
Controls		yes	yes	yes	yes
Firm & year fixed effects		yes	yes	yes	yes
Cluster		firm	firm	firm	firm

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their tax & regulatory haven presence in the period 2011-2015 with insurance firms. *Banks* is an indicator variable equal to 1 for banks and equal to 0 for insurers. *PostCbCR* is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise. The dependent variable is the number of tax haven entities scaled by the total number of entities ($\frac{tax\ haven\ entities}{total\ entities}$). Results in column (1) are based on tax haven countries in Hines (2010) having an above-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). Results in column (2) are based on tax haven countries in Hines (2010) having a below-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). Results in column (3) are based on dot haven countries having an above-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). Results in column (4) are based on dot haven countries having a below-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). *Log_TotalAssets* is the natural log of total assets. *ROAA* is the return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two). Log_FTE is the natural log of the number of full-time-equivalent employees. ETR is the GAAP-effective tax rate.

Table 9
Public CbCR and Reputational Risk

Dependent variable: share of subsidiaries located in:	Prediction	OLS (1) High Risk Tax Havens	OLS (2) Low Risk Tax Havens	OLS (3) High Risk Dot Havens	OLS (4) Low Risk Dot Havens
Banks*PostCbCR	-|?|-|?	**-0.0300****	**-0.0176**	**-0.0252***	**-0.0169***
		(0.0125)	**(0.0109)**	**(0.0125)**	**(0.00924)**
log_TotalAssets		0.00213	0.00326	0.00412	-0.00768
		(0.0564)	(0.0447)	(0.0467)	(0.0294)
ROAA		-0.00446	-0.00442	0.00214	0.000357
		(0.00485)	(0.00611)	(0.00373)	(0.00466)
logFTE		0.0204	-0.0165	-0.0695**	-0.0891***
		(0.0356)	(0.0410)	(0.0275)	(0.0300)
ETR		-6.87e-05	-7.87e-05	2.79e-06	-4.92e-06
		(5.54e-05)	(6.39e-05)	(4.07e-05)	(5.43e-05)
Constant		-0.131	0.187	0.681	1.044*
		(1.013)	(0.845)	(0.829)	(0.573)
Observations		187	188	187	188
R-squared		0.090	0.084	0.092	0.162
Controls		yes	yes	yes	yes
Firm & year fixed effects		yes	yes	yes	yes
Cluster		firm	firm	firm	firm

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their tax haven presence in the period 2011-2015 with insurance firms. Banks is an indicator variable equal to 1 for banks and equal to 0 for insurers. PostCbCR is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise. We split the treatment group of EU banks into banks with high/low reputational risk (columns 1 vs. 2 and 3 vs. 4). The control group always consists of unexposed multinational insurers. The dependent variable in all columns (1) - (4) is the number of tax haven or dot haven entities scaled by the total number of entities ($\frac{tax\ haven\ or\ dot\ haven\ entities}{total\ entities}$). Results in columns (1) and (3) are based on the tax haven list in Hines (2010). Results in columns (2) and (4) are based on dot havens. Log_TotalAssets is the natural log of total assets. ROAA is the return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two). Log_FTE is the natural log of the number of full-time-equivalent employees. ETR is the GAAP-effective tax rate.

Table 10
Public CbCR and Reputational Risk

Dependent variable: share of subsidiaries located in:	Prediction	OLS (1) High Risk Tax & Regulatory Havens	OLS (2) Low Risk Tax & Regulatory Havens	OLS (3) High Risk Dot & Regulatory Havens	OLS (4) Low Risk Dot & Regulatory Havens
Banks*PostCbCR	-|?|-|?	**-0.0232***	**-0.0120**	**-0.0232***	**-0.0122**
		(0.0125)	**(0.00950)**	**(0.0125)**	**(0.00841)**
log_TotalAssets		-0.00519	-0.00574	-0.00257	0.00445
		(0.0486)	(0.0319)	(0.0478)	(0.0269)
ROAA		-0.00243	-0.00220	0.000549	0.00124
		(0.00568)	(0.00659)	(0.00353)	(0.00398)
logFTE		-0.000967	-0.0277	-0.0654**	-0.0837***
		(0.0442)	(0.0436)	(0.0282)	(0.0291)
ETR		-1.00e-05	-3.14e-07	-4.76e-06	1.93e-05
		(4.79e-05)	(6.27e-05)	(3.84e-05)	(4.85e-05)
Constant		0.190	0.432	0.757	0.753
		(0.925)	(0.672)	(0.859)	(0.528)
Observations		187	188	187	188
R-squared		0.060	0.081	0.080	0.187
Controls		yes	yes	yes	yes
Firm & year fixed effects		yes	yes	yes	yes
Cluster		firm	firm	firm	firm

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their tax haven presence in the period 2011-2015 with insurance firms. Banks is an indicator variable equal to 1 for banks and equal to 0 for insurers. PostCbCR is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise. We split the treatment group of EU banks into banks with high/low reputational risk (columns 1 vs. 2 and 3 vs. 4). The control group always consists of unexposed multinational insurers. The dependent variable in all columns (1) - (4) is the number of tax haven or dot haven entities scaled by the total number of entities ($\frac{tax\ and\ regulatory\ haven\ or\ dot\ and\ regulatory\ haven\ entities}{total\ entities}$). Results in columns (1) and (3) are based on tax haven countries in Hines (2010) with an above-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). Results in columns (2) and (4) are based on dot havens with an above-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). Log_TotalAssets is the natural log of total assets. ROAA is the return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two). Log_FTE is the natural log of the number of full-time-equivalent employees. ETR is the GAAP-effective tax rate.

Table 11
Public CbCR and Reputational Risk

Dependent variable: share of subsidiaries located in:	Prediction	OLS (1) **High Risk** Tax & Non-Regulatory Havens	OLS (2) **Low Risk** Tax & Non-Regulatory Havens	OLS (3) **High Risk** Dot & Non-Regulatory Havens	OLS (4) **Low Risk** Dot & Non-Regulatory Havens
Banks*PostCbCR	?|?|?|?	**-0.00428**	**-0.000550**	**0.000498**	**0.000409**
		(0.00324)	**(0.00205)**	**(0.000487)**	**(0.000550)**
log_TotalAssets		0.000926	0.0249	0.000292	0.00374
		(0.0308)	(0.0322)	(0.00296)	(0.00283)
ROAA		-0.00282	-0.000702	0.000808	0.000631
		(0.00363)	(0.00347)	(0.000625)	(0.000680)
logFTE		0.0233	0.0152	-0.00208	-0.00145
		(0.0283)	(0.0254)	(0.00355)	(0.00347)
ETR		-6.22e-05	-4.92e-05	4.01e-06	4.92e-06
		(4.14e-05)	(4.35e-05)	(6.41e-06)	(5.30e-06)
Constant		-0.228	-0.590	0.0168	-0.0542
		(0.610)	(0.584)	(0.0489)	(0.0519)
Observations		187	188	187	188
R-squared		0.045	0.050	0.038	0.037
Controls		yes	yes	yes	yes
Firm & year fixed effects		yes	yes	yes	yes
Cluster		firm	firm	firm	firm

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their tax haven presence in the period 2011-2015 with insurance firms. Banks is an indicator variable equal to 1 for banks and equal to 0 for insurers. PostCbCR is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise. We split the treatment group of EU banks into banks with high/low reputational risk (columns 1 vs. 2 and 3 vs. 4). The control group always consists of unexposed multinational insurers. The dependent variable in all columns (1) - (4) is the number of tax haven or dot haven entities scaled by the total number of entities ($\frac{tax\ and\ non-regulatory\ haven\ or\ dot\ and\ non-regulatory\ haven\ entities}{total\ entities}$). Results in columns (1) and (3) are based on tax haven countries in Hines (2010) with an above-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). Resultscolumnslumn (2) and (4) are based on dot havens with an above-median rank in the Financial Secrecy Index (Tax Justice Network, 2015). Log_TotalAssets is the natural log of total assets. ROAA is the return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two). Log_FTE is the natural log of the number of full-time-equivalent employees. ETR is the GAAP-effective tax rate.

Table 12
Multivariate analysis for the parallel trend assumption

Dependent variable:	OLS (1) Tax Haven Share	OLS (2) Dot Haven Share	Neg. Binominal (3) Tax Haven Entities	Neg. Binominal (4) Dot Haven Entities
2011	-0.00880	-0.00759	-0.0942	-0.0501
	(0.00939)	(0.00793)	(0.157)	(0.152)
2012	0.000664	-0.00341	-0.0803	-0.0381
	(0.00683)	(0.00551)	(0.134)	(0.131)
2014	0.00764	0.00341	0.0651	0.0421
	(0.00465)	(0.00237)	(0.132)	(0.124)
2015	0.0202	0.00806	0.275**	0.419***
	(0.0153)	(0.00639)	(0.131)	(0.121)
Banks*2011	-0.00402	-0.00117	0.135	0.0606
	(0.0114)	(0.0101)	(0.183)	(0.185)
Banks*2012	-0.00670	-0.000267	0.0684	0.00716
	(0.0115)	(0.0105)	(0.163)	(0.167)
Banks*2014	**-0.0223***	**-0.0182***	**-0.152**	**-0.141**
	(0.00700)	**(0.00598)**	**(0.164)**	**(0.163)**
Banks*2015	**-0.0392***	**-0.0280***	**-0.425***	**-0.553***
	(0.0145)	**(0.0101)**	**(0.161)**	**(0.158)**
Observations	250	250	240	230
R-squared	0.082	0.106	-	-
Controls	yes	yes	yes	yes
Firm & year fixed effects	yes	yes	yes	yes
Cluster	firm	firm	-	-

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their tax haven presence in the period 2011-2015 with insurance firms, relative to the baseline year 2013. Banks is an indicator variable equal to 1 for banks and equal to 0 for insurers. The dependent variable in columns (1)-(2) is the number of tax or dot haven entities scaled by the total number of entities ($\frac{tax\ or\ dot\ haven\ entities}{total\ entities}$). The dependent variable in columns (3)-(4) is the absolute number of tax or dot haven entities. Results are based on tax haven countries in Hines (2010). Dot havens are all tax haven countries in Hines (2010) except the Big-7-Havens.

Table 13

Public CbCR and Tax Haven Country Presence

Dependent variable:	OLS (1)	OLS (2)	OLS (3)
	Number of Tax Haven Countries	Number of Tax Haven Countries	Number of Tax Haven Countries
Banks*PostCbCR	-0.280	-0.331	-0.697*
	(0.581)	(0.346)	(0.394)
log_TotalAssets	1.970		
	(1.714)		
ROAA	0.0252		
	(0.455)		
logFTE	-1.323		
	(1.188)		
ETR	-0.00336		
	(0.00274)		
Constant	-17.9189	7.438965	7.24759
	(27.25281)	(0.69286)	(0.14349)
Observations	241	284	284
R-squared	0.034	0.015	0.027
Controls	yes	no	no
Firm & year fixed effects	yes	no	yes
Cluster	firm	firm	firm

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm presence of multinational banks by comparing their presence in the absolute number of tax havens in the period 2011-2015 with insurance firms. Banks is an indicator variable equal to 1 for banks and equal to 0 for insurers. PostCbCR is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise. The dependent variable in columns (1)-(3) is the absolute number of tax haven countries in which a bank or insurance firm has subsidiaries. Results are based on tax haven countries in Hines (2010).

Table 14
Public CbCR and Presence in Delaware (U.S.)

Dependent variable: the number of entities located in Delaware (U.S.)	Prediction	OLS
Banks*PostCbCR	**?**	**-0.00472****
		(0.00221)
log_TotalAssets		-0.00778
		(0.00882)
ROAA		-0.00104
		(0.00150)
logFTE		-0.00588
		(0.00725)
ETR		-1.69e-05
		(1.70e-05)
Constant		0.221
		(0.166)
Observations		250
R-squared		0.058
Controls		yes
Firm & year fixed effects		yes
Cluster		firm

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

This table presents regression results on the effects of public CbCR on the firm structure of multinational banks by comparing their presence in Delaware (U.S.) in the period 2011-2015 with insurance firms. The dependent variable is the number of entities located in Delaware (U.S.) scaled by the total number of entities ($\frac{entities\ in\ Delaware\ (U.S.)}{total\ entities}$). Banks is an indicator variable equal to 1 for banks and equal to 0 for insurers. PostCbCR is an indicator variable equal to 1 for financial years 2014 and 2015 and equal to 0 otherwise.

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Variable Definitions

Variable	Definition
Bank	Indicator variable that is equal to one for banks and zero for insurance firms
Entities	Absolute number of subsidiaries of parent *i* in year *t*
ETR	GAAP-effective tax rate (tax expense/profit before tax)
Log_FTE	Natural log of the number of full-time-equivalent employees
Log_TotalAssets	Natural logarithm of total assets
Number of Tax Haven Entities	Absolute number of tax haven subsidiaries of parent *i* in year *t*
POST	Indicator variable that is equal to one for observations after 2013 and zero otherwise.
ROAA	Return on average assets (total average assets equals total assets at the beginning of the period, plus total assets at the end of the period, divided by two)
Tax Haven Entities	Absolute number of tax haven subsidiaries of parent *i* in year *t*
Tax Haven Share	The number of tax haven subsidiaries of parent *i* in year *t* scaled by the total number of subsidiaries

Appendix B: List of tax havens

	Jurisdiction		Jurisdiction		Jurisdiction
1	Andorra*	19	Guernsey*	37	Nauru*
2	Anguilla*	20	Hong Kong	38	Netherlands Antilles*
3	Antigua and Barbuda*	21	Ireland	39	Niue*
4	Aruba*	22	Isle of Man*	40	Panama
5	Bahamas*	23	Jersey*	41	Samoa*
6	Bahrain*	24	Jordan*	42	San Marino*
7	Barbados*	25	Lebanon	43	Seychelles*
8	Belize*	26	Liberia	44	Singapore
9	Bermuda*	27	Liechtenstein*	45	Saint Kitts and Nevis*
10	British Virgin Islands*	28	Luxembourg*	46	Saint Lucia*
11	Cayman Islands*	29	Macao*	47	Saint Martin*
12	Cook Islands*	30	Maldives	48	Saint Vincent and the Grenadines*
13	Costa Rica*	31	Malta*	49	Switzerland
14	Cyprus*	32	Marshall Islands*	50	Tonga*
15	Djibouti*	33	Mauritius*	51	Turks and Caicos Islands*
16	Dominica*	34	Micronesia*	52	Vanuatu*
17	Gibraltar*	35	Monaco*	53	Delaware (U.S.)*
18	Grenada*	36	Montserrat*		

This appendix lists the tax havens per Hines (2010) plus Delaware (U.S.). The "Big7" are Hong Kong, Ireland, Lebanon, Liberia, Panama, Singapore, and Switzerland (Hines and Rice, 1994; Desai, Foley and Hines, 2006). Tax havens except the "Big7" are considered dot havens and are marked with *.

This table illustrates the differences between the most related empirical studies and this study in the type of CbCR, treatment and control group, response channel, main drivers, sample period. Finally, this table presents the main results of each of these studies. Common or very similar characteristics of our study and prior study are highlighted in bold.

	disclosure	*treat*	*controls / moderators*	*response*	*period*
Brown (2020)	**public CbCR**	**multinational EU banks**	**multinational EU insurers tax havens**	tax payments	2010-2017
Brown, Jorgensen, and Pope (2019)	**public CbCR**	**multinational EU banks**	**multinational EU insurers | tax havens**	disclosure change	2012-2016
De Simone and Olbert (2021)	private CbCR	EU multinational groups with consolidated revenues just above €750 million	EU multinational groups with consolidated revenues just below €750 million | **tax havens**	**subsidiaries**	2012-2018
Dutt et al. (2019a)	**public CbCR**	**EU multinational banks**	**non-EU banks**	stock prices change	Event study 2013
Dutt et al. (2019b)	**public CbCR**	**EU multinational banks**	**n/a**	n/a	2014-2016
Fuest, Hugger, and Neumeier (2021)	individual private CbCR	German multinationals	n/a | **tax havens**	income shifting, tax payments	2016,2017
Johannesen and Larsen (2016)	public CbCR in the extractive industries	EU extractive firms	non-extractive firms listed in Europe and extractive firms listed outside Europe	stock prices change	Event study
Joshi et al. (2020)	**public CbCR**	**EU multinational banks**	**EU domestic banks, U.S./Canadian, multinational banks, and EU multinational insurance companies**	income shifting, tax payments	2011-2017
Hoopes, Robinson, and Slemrod (2018)	**public ATO disclosure**	Australian firms subject to ATO disclosure	different control groups for different tests | **reputational risk**	consumer perception disclosure change, stock prices	Ranging from 2011-2016
Langenmayr and Reiter (2020)	n/a	**EU banks**	n/a	income shifting by shifting specific assets	2010-2015

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Overesch and Wolff (2021)	**public CbCR**	**EU multinational banks**	**Domestic European banks, multinational US banking corporations, European financial service providers outside banking, and (iii) European multinational firms |** **tax havens,** **reputational risk**	tax payments	2010-2016
Rauter (2020)	mandatory extraction payment disclosures (EPD)	EU and CAN extractive firms	Non-EU and Non-CAN extractive firms	fiscal payments/investments	2010-2016
This study	**public CbCR**	**EU banks**	**EU Insurers |** **tax havens,** **reputational risk,** **financial secrecy havens**	**subsidiaries**	2011-2015