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Research Papers

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Real Effects of Public Country-by-Country Reporting and the Firm Structure of European Banks

Abstract:

European regulation mandates public country-by-country reporting for banks and is expected to increase costs of tax haven activities. We hand-collect data from IFRS consolidation scopes for European banks and test whether the availability of additional public information on banks' global activity reduces their tax haven presence. In a difference-in-difference analysis, we find that indeed tax haven presence has declined significantly after the introduction of mandatory public country-by-country reporting for European banks, as compared to the insurance industry, which is not subject to this regulation. In further tests, we show that this negative association is particularly driven by a reduction of subsidiaries in "Dot-Havens" and tax havens with high financial secrecy.

Keywords: country-by-country reporting, real effects, tax haven, tax disclosure

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1   INTRODUCTION

In this study, we examine whether and to what extent multinational banks adjust their presence in the form of subsidiaries in tax haven countries in the aftermath of the implementation of extended mandatory tax disclosure. We analyze the real effects of public Country-by-Country Reporting (CbCR) as a newly introduced tax disclosure on the organizational structure of the disclosing banks, as such disclosure may incur tax, regulatory, and reputational costs. We follow Leuz and Wysocki (2016) by investigating a situation in which disclosing firms change their behavior upon disclosure in the real economy.

CbCR has been introduced in response to the on-going public debate about aggressive tax planning of multinational enterprises (MNE). CbCR, both private vis-à-vis tax authorities, and public, is deemed to allow additional insights into MNE´s tax behavior. CbCR represents a per-country breakdown of key financial information about MNE's global activities. In this vein, mandatory public CbCR, as the most comprehensive form of CbCR, was introduced for financial institutions with activities in the European Union (EU) in 2014. Based on an initiative by a group of EU parliamentarians to increase tax fairness and transparency in the financial sector (Dutt et al. 2019a), Article 89 was added to the Credit Requirement Directive IV (CRD IV). Under this directive, regulated financial institutions such as banks and investment funds are required to inform the public on activities of their subsidiaries and branches at the country level, including sales, employees etc. and also taxes on profit or loss.

We use this regulatory change and hand-collect data on European banks` subsidiaries to study potential behavioral responses of affected banks. We are interested in whether and how the deemed incremental tax transparency affects the subsidiary location of banks by means of a subsidiary in low tax countries. This question is interesting as it is not upfront clear whether CbCR really is an effective tool to trigger behavioral adjustments in multinational banks, i.e. responses in their organizational structure. As information on the location of subsidiaries of banks was available to financial statement users already before the introduction of public CbCR, from segment reporting and, more detailed, from the list of IFRS consolidated entities, the incremental informational value of public CbCR is doubted.

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However, given that banks are under specific public scrutiny (both by institutional monitoring bodies and by the broader public), and are exposed to a negative perception of their activities after the financial crisis, users of CbCR might be very sensitive to information about the location of subsidiaries. Aggregating and extending locational information at country level might channel awareness in a yet unknown pronounced way to the location of subsidiaries even though the underlying information had been accessible before. We expect this reputational effect and further costs considerations to be dominant. We assume that large banks, who are in the spotlight of authorities and the public, anticipate special user sensitivity and respond at short notice in adjusting their tax haven subsidiaries' presence, to reduce costs.

Costs may result from three different sources. First, *reputational costs* from public scrutiny relating to taxation include negative market reactions to 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). 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 (Hardeck et al., 2018; Asay et al., 2018). Second, *tax costs* from tax administration scrutiny (expected higher tax payments) may arise from more tax risk-focused and additional tax audits prompted by information provided by CbCR. In a US 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, Sansing, and Seidelman (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. Third, given that tax havens are often also regulatory havens, and frequently provide strong bank secrecy, CbCR may incur additional *regulatory costs.* The supervising authority (European Central Bank, assisted by domestic bank supervision) may increase their scrutiny of haven activity, for instance for know-your-customer- and anti-money-laundering-requirements in bank-secrecy-states. These anticipated costs, i.e., reputational, tax, and regulatory, may thus offset the benefits of a lower overall tax liability on profits from business in tax havens.

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Recent literature shows that public pressure can indeed have effects on MNE's tax behavior. Dyreng et al. (2016) show that NGO-campaigning of ActionAid pressured non-compliant UK firms to become compliant with specific transparency requirements. Also, these previously non-compliant firms subsequently decrease the proportion of their subsidiaries located in low tax countries relative to compliant firms. Prior research also shows that incremental disclosure, i.e. the presentation of already available information in a more convenient way for information users, may have real effects. Christensen et al. (2017) argue that the mandatory inclusion of safety disclosures in US mining firms' financial reports leads to less accidents in mines, even though this information was already publicly available in the internet before it mandatory inclusion in financial statements. Again, the authors attribute the observed effect to the increased public awareness that lead to a specific firm reaction, in this case to higher investments into mine safety. Although the research settings of the aforementioned studies differ from our study, their results indicate that also public CbCR may lead to real consequences for firms that are part of our analysis.

We contribute to the extant research in at least three ways. First, by investigating the association between tax transparency and the firm structure of multinational banks, we add to the under-researched area of the *taxation of financial firms* (Hanlon and Heitzmann, 2010). Second, we provide evidence on the *real effects of financial disclosure* (Leuz and Wysocki 2016) and specifically on the global firm structure of MNEs (Kanodia and Sapra, 2016). In this sense, we respond to Dyreng and Maydew (2018) who call for more research on how disclosure of tax information affects real behavior. Third, we contribute to the strand of literature and on-going discussion about the *tax disclosure by CbC-reports* of firms (European Parliament and the Council, 2017; Brown, 2018; De Simone and Olbert, 2019; Joshi et al., 2019; Overesch and Wolff, 2019; Dutt et al., 2019a, 2019b,).

While Dyreng et al. (2016) focus on a UK setting and compare the effect of a public shaming campaign on non-compliant companies we focus on European banks that become subject to mandatory public CbCR in 2014 in EU countries. In contrast to Dyreng et al. (2016) the banks in our sample were neither blamed to be non-compliant nor explicitly targeted by a public shaming campaign and thus do not suffer from prior reputation costs due to a firm-specific public pressure. Moreover, to the best of our knowledge, at no point in our observation period, is there an indication that banks in our

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sample do not meet their mandatory disclosure requirements. The banks in the sample can be assumed to be compliant and fulfilling all their reporting obligations. However, we expect the banks to anticipate future potential reputation costs from their tax haven activities under public CbCR and thus adjust their organizational structure. In a study on the consequences of private CbCR, De Simone and Olbert (2019) report a decrease of subsidiary presence in tax havens for firms that are obliged to share their CbC-reports with tax authorities but not with the public. We complement this study by generally confirming their result of diminishing subsidiaries in tax havens for the largest EU banks. We study the magnitude of these organizational adjustments and additionally highlight the role of reputational and regulatory 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. In comparison to Christensen et al. (2017) we go beyond analyzing the direct effect of mandatory disclosure of tax-related information on tax planning behavior, as intended by the regulator, but examine how tax information disclosure is associated with spill-overs to fundamental organizational decisions.

While previous studies analyze the association between public CbCR and tax avoidance behavior (Overesch and Wolff, 2019; Joshi et al., 2019; Brown, 2018), we are interested in whether and how the deemed incremental tax transparency affects the subsidiary location of banks by means of a subsidiary in low tax countries. Overall, it is ex-ante unclear whether the incremental information provided by public CbCR is actually relevant to and will be used by investors and the public. On the one hand, public CbCR enables its readers to build value ratios about banks' activity on a per-country basis. For instance, unusually high profits in low tax countries relative to only a small number of employees may indicate tax avoidance[3] and trigger stakeholder responses. On the other hand, an important part of the information on firms' global presence in tax havens was already available prior to the introduction of public CbCR. According to International Financial Reporting Standards (IFRS), the

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

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accounting standard of most firms of our study[4], companies are required to list subsidiaries including their location in their financial reports. Consequently, interested stakeholders were, at least partly, already able to infer on the magnitude of tax haven usage by simply analyzing the global distribution of banks' subsidiaries. Hence, it is possible that the incremental information provided by public CbCR is only, if at all, of little extra value for investors and might not trigger stakeholder responses (for the limited information value of CbCR for the evaluation of a firm's tax avoidance behavior see Bornemann and Eberhartinger, 2017). Dutt et al. (2019b) mitigate some of these concerns. They comprehensively analyze whether public CbC reports from EU banks reveal profit shifting and conclude that public CbCR indeed increases transparency with respect to worldwide profits and real activities and is also indicative of a more distinct tax sensitivity compared to estimations based on conventional databases. However, their study does not provide indication for CbCR increasing transparency about tax haven subsidiaries. To summarize, none of these studies specifically examine the association of public CbCR for European banks' and their group structure by using a difference-in-difference research design.

We hand-collect the number of banks' global subsidiaries and distinguish between tax havens and non-tax havens, before and after the public CbCR requirement came into force. As a control group, in line with prior literature, we choose large European insurance companies and their global subsidiaries. We collect the information on subsidiaries' countries of residence from the list of shareholdings according to consolidated group statements. We differentiate between fully consolidated, at-equity consolidated and non-consolidated entities.

Our findings support the view that increased tax transparency is associated with a reduction of tax haven presence. On average, multinational banks under the scope of CRD IV reduce their total share of tax haven entities by -2.38 percentage points relative to our control group. Additional model specifications indicate an economically meaningful reduction of banks' subsidiaries in tax havens of more than 28% relative to insurance firms after the introduction of public CbCR. When splitting the tax haven countries into small tax havens, mostly islands countries with a small population, so called "*Dot-*

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[4] 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.

Havens" (e.g., Caymans Islands), and other tax havens with a larger population, so called "*Big 7 Havens*" (e.g., Singapore), we can observe a significantly negative association between tax transparency and tax haven presence in Dot-Havens only. Further tests indicate that tax haven presence is particularly reduced in tax haven countries that are also characterized by a relatively high degree of financial secrecy.

The remainder of the paper is structured as follows. In the next section, we describe the institutional accounting background and details about mandatory tax transparency under European law and review prior literature. In Section 3 we develop our hypothesis.. The data and our empirical model are described in Section 4 and 5 and we discuss our results in Section 6. Section 7 concludes.

2   INSTITUTIONAL BACKGROUND AND PRIOR LITERATURE

2.1   Tax Transparency under CRD IV

In response to the financial crisis and to 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 (CRD 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., 2019). This is 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 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).

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 compared to their peers with headquarters in the EU. For banks, Article 89 of CRD IV therefore brought additional transparency from 2014 onwards, as compared to merely disclosing consolidated entities, with regard to detail, as listed above, with regard to the entities included, not only subsidiaries, but also branches and "other relevant entities", and with regard to 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.[5] 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[6], IFRS 11 contains provisions on joint arrangements[7], and IFRS 12 provides for disclosure in the notes[8]. Under IFRS,

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[5] Article 4 Regulation (EC) 606/2002.
[6] 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.
[7] IFRS 11 replaces IAS 31 and its interpretation SIC 13.
[8] 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, 2017.

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normally an entity is fully consolidated if it is controlled by the parent entity. This is usually the case if the parent directly or indirectly owns more than half of the voting rights of the entity. 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 fall under this group.

However, IFRS 10 includes an important difference to the previous rules of IAS 27 and SIC 12. The new standard introduces a single consolidation model and also establishes a uniform criterion of control applicable to all entities, *including* structured entities. Irrespective, 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.

2.3   Prior Literature

Several studies in prior literature investigate the consequences of tax transparency on firm behavior, and their findings are inconclusive. Overesch and Wolff (2019), Joshi et al. (2019) and Brown (2018) all analyze the effect of CRD IV on the tax avoidance behavior of multinational EU banks, operationalized by ETR measures. While the first study reports significantly higher ETRs of multinational banks in the post-CbCR periods compared to their domestic peers, Joshi et al. (2019) do not find a robust increase of ETRs using, among other, insurance firms as a control group. Contrary to the findings in these studies, Brown (2018) shows decreasing ETRs for EU banks relative to EU insurers. ETR changes may be due to many different effects, and we focus on tax haven presence as one specific channel of tax aggressive strategies. In this respect, our main research question differs from prior studies, and teases out whether higher levels of tax transparency have spillovers 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. A multinational bank 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.

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Bouvatier et al. (2018) provide a study using a comprehensive database of public CbCR for the 36 largest European banks. By applying a standard gravity model to identify abnormal amounts of financial transactions, their findings suggest that banks' activity in tax havens is three times larger than the model's predictions on average. Moreover, German and British banks seem to display the most aggressive tax strategies, and the Channel Islands, Luxembourg and Monaco serve as the most prominent European tax havens. Concerning the commercial presence of banks in tax havens, the authors do not find a significant change in average turnover figures in tax havens, in the CbC-reports for the years 2015 and 2016. However, as public CbCR was already in place for both years of their analysis, it is not possible to draw conclusions on how the introduction of CbCR affects tax haven presence. By contrast, we use the number of subsidiaries of multinational banks 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.

In a related research setting, 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. Hence, investors perceive CbCR for the extractive industry negatively, because CbCR is seen as a tool to curb aggressive tax planning opportunities, and reducing firm's expected future (net) earnings. It is possible that bank managers view these findings as a signal for future reputational costs connected to similar disclosure regulations in the financial sector and make real changes to their firm decisions. Importantly, our study differs from Johannesen and Larsen (2016) as we are concerned about the effects of public CbCR on the group structure of multinational banks, and we focus on changes in the number of subsidiaries rather than in abnormal returns. In a related event study, Dutt et al. (2019a) do not find a significant stock market reaction around the announcement dates of public CbCR in the financial sector.

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 UK firms to disclose a complete list of their subsidiaries including the geographical location. The authors report that the NGO

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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 tax administration and regulatory supervision instead of actual reputational costs as a result of an NGO campaign.

In a non-tax related study, Christensen et al. (2017) provide evidence that incremental financial statement information may lead to real effects: compulsory inclusion of information on safety violations in the financial statements of US mining companies led to fewer accidents in mines, although this information has been previously disclosed in the Internet before being included in the financial reports. Moreover, the observed effect leading to real effects in the form of higher investments in mine safety is attributed to ex-ante concerns of mine managers about political and reputational costs as well as concerns about activism by investors or other parties. Apart from the obvious fact that our study addresses a very different research setting, we argue that the information about banks' presence in tax havens was, in principle, also available in financial reports before public CbCR was available. Consistent with Christensen et al., however, it is possible that the dissemination of incremental tax transparency by CRD IV triggers changes in the firm structure of affected banks because the form of the disclosure may facilitate the analysis of firms' global economic footprint.

In one of the few existing studies on profit-shifting in the financial sector, Langenmayr and Reiter (2017) identify an important and bank-specific profit-shifting channel. They find that banks strategically relocate their proprietary trading units to low-tax countries. Proprietary trading is a highly mobile and profitable business activity that reacts particularly sensitive to a change in the corporate income tax rate. Consequently, 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 (2017) abstract from specific disclosure regulation but rather cater to the importance of tax avoidance in the financial industry. According for their finding and further for potential reputational

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concerns from disclosed tax haven usage, we expect multinational banks to react very sensitive to the disclosure of tax haven activities in face of public CbCR.

To the best of our knowledge, no prior study addresses the consequences of public CbCR on the firm structure of European banks by using data of banks' subsidiaries from consolidation scopes that are available before and after the introduction of CRD IV. Our research question is of interest as in face of enormous regulatory requirements for banks, CbCR is expected to provide only very limited additional information to stakeholders in this industry.

3 Hypothesis

On a general level, our main research question is whether and to what extent incremental information, which is potentially costly, affects firm´s organizational choices. More precisely, we investigate whether multinational banks reduce their tax haven presence, i.e. their number of subsidiaries, after the introduction of public CbCR.

Stakeholders such as activist groups (e.g., Oxfam, 2017) or the public press (e.g., The Independent, 2015) blame banks of shifting profits to low-tax jurisdictions. Also, the literature provides some evidence about tax avoidance behavior of the financial sector, e.g., Langenmayr and Reiter (2017), and Merz and Overesch (2016). However, little is known about the subsidiaries of banks 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 tax haven subsidiaries. On the one hand, it is likely that public CbCR negatively influences tax haven presence. While before as well as after the introduction of public CbCR, stakeholders can inform themselves on tax haven presence from the IFRS list of consolidated entities, public CbCR not only adds to the salience of such information, but also contains 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. Tax aggressive multinational banks can be identified more easily as "poor corporate citizens" by customers, media, and policy makers, resulting in reputational costs (Hanlon and Slemrod, 2009). Reputational concerns have been aggravated by the financial crisis from 2008, and by the use of taxpayer´s money for bail-out. In

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face of this increased sensitivity towards reputational issues and to avoid further reputational damage, banks may withdraw from tax havens. Such responses to reputational concerns are consistent with the institutional theory, assuming that firms will conform to institutional expectations ("reduce profit shifting"), formed by, e.g., policy makers or the media, by adopting institutional norms (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' tax haven exposure. Moreover, public CbCR may reduce tax aggressiveness as it gives tax authorities roadmaps for tax audits, i.e. orientation on which financial institution and tax issue to challenge in their auditing processes.

Other costs may result from increased regulatory scrutiny, which is in line with prior literature showing that increased regulatory attention on firm's tax disclosure has a deterring effect on tax aggressiveness. Kubick et al. (2016) document that firms who received a tax related comment letter from the United States Securities and Exchange Commission (SEC) have higher ETRs in the years after the receipt of a comment letter.

Furthermore, many tax havens offer provide also strict banking secrecy facilitating the obfuscation of economic activity (regulatory-havens). Hence, banks may worry about increased know-your-customer inquiries or anti-money-laundering laws as a result from as public CbCR (Dutt et al. (2019b). Expected regulatory costs may play are particular role 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 are 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 make organizational adjustment unlikely.

It is therefore an empirical question whether the introduction of public CbCR has an effect on the group structure of multinational banks and their presence in tax havens. We state the following hypotheses:

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

4   Data and sample selection

We estimate tax haven presence 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. We prefer the relative number of tax haven entities to the absolute number, because such, we also capture the general trend of reducing the number of entities, which has been observed since the financial crisis. As an alternative specification, we also use the absolute number of tax haven entities as a dependent variable while controlling for the total number of subsidiaries. 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 as shown in annual reports of the Global Systemically Important Institutions (G-SIIs) headquartered in the EU as defined by the EBA (2015) for the years 2011-2015. Of the 37 G-SIIs, we have to drop 6 banks and therefore include 31 banks in our analysis. Table 1.1 presents the sample selection process for EU banks.[9]

"Table 1.1 around here"

The data includes the name and type of the entity, the geographical location, the consolidation status and other details over time. We differentiate between fully consolidated entities, associated entities under the equity method and non-consolidated entities.

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 to banks in many

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[9] In general our data panel is balanced, however a small amount of firm-year observations is missing due to unavailability of the data. For instance, the consolidation scopes of HSBC Holdings plc could only be obtained for the years 2012 and 2015. Requests for data to e.g. investor relations teams of the relevant firms remained unsuccessful.

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regards. However, in line with prior literature (e.g., Bischof and Daske, 2013; Chircop and Novotny-Farkas, 2016; Beatty at al., 1996; Overesch and Wolff, 2018), we still find that they form an adequate control group for our purposes. First, both types of firms serve as financial intermediaries who do business internationally, and who both 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 subject to supervision, and to 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).[10] 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 (EIOPA, 2015). The total control sample consists of 27 EU insurers. Table 1.2 presents the sample selection process. We obtain financial data for our control variables from S&P Global Market Intelligence.

"Table 1.2 around here"

5   Empirical Design

In order to assess our main research question, we apply a difference-in-difference (DiD) research design to isolate the effect of incremental tax transparency on banks' group structures and their presence in tax havens relative to a group of firms not affected by public CbCR. Figure 1 graphically illustrates the research question in Libby Boxes.

"Figure 1 around here"

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

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Hence, we choose the share of tax haven entities on the total number of entities as our dependent variable ($\frac{tax\ haven\ entities}{total\ entities}$). As 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. In addition, we control for time-varying bank and insurer characteristics that may be correlated with tax haven usage. 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. The coefficient of interest in our model is therefore β_3 capturing the average effect of public CbCR on banks relative to insurers. Given that we carefully hand-collected data for our dependent variable and as the sample size is small, we refrain from any outlier treatment in the form of e.g. winsorizing or truncating.

(I) $\quad y_{i,t} = \beta_0 + \beta_1 postCbCR_t + \beta_2 Bank_i + \beta_3 Bank_i * postCbCR_{i,t} + \sum \beta_k\ controls_{i,t} + \varepsilon_{i,t}$

6   Results

Public CbCR represents an increase of incremental tax transparency for multinational banks that fall under the scope of CRD IV. In this subsection, we present our results based on descriptive statistics and DiD-specifications using a treatment and control sample for the years 2011-2015. 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.

Tables 2.1 and 2.2 give an overview about the 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.

"Tables 2.1 and 2.2 around here"

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Figure 2 illustrates the tax haven presence for banks and insurers graphically over time. It shows that banks increase their relative tax haven presence (i.e. the share of tax haven subsidiaries) in the pre-CbCR period. However, for financial years after 2013 when public CbCR is applied, banks reduce their share of tax haven subsidiaries. In contrast, insurance firms increase their share of tax haven subsidiaries in every year except 2013.

Table 3 shows the summary statistics separately for the treatment and control group. On average, and not surprisingly, banks are bigger in size and less profitable. Their mean number of total entities and entities located in tax haven is greater than the equivalent figures for insurers over the whole sample period. Moreover, the mean ratio of banks' tax haven entities and banks' total entities ("Share Haven") is 12.7% compared to 8.9% for insurers. Banks have on average also more employees and pay fewer taxes measured by the GAAP effective tax rate.

"Table 3 around here"

Table 4 illustrates our regression results. For all columns the dependent variable is the share of tax haven entities ($\frac{tax\ haven\ entities}{total\ entities}$) based on the respective tax haven list. 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. The result in column (1) suggests that, on average, banks decrease their overall share of tax haven entities by 2.38 percentage points relative to insurance firms, which are not affected by public CbCR[11]. Additional tests reveal that this reduction is predominantly centered on fully consolidated subsidiaries (untabulated).

"Table 4 around here"

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[11] 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 is not part of the original lists in Dyreng and Lindsey (2009), we run our regressions again excluding Delaware from the list of tax havens. The non-tabulated results are qualitatively similar to the results shown in Table 3.

Next, we check whether the reduction of tax haven entities depends on the type of tax haven country. Appendix A shows our lists of tax havens. Therefore, we differentiate the tax haven countries into Dot-Havens and Big 7 Havens following Hines & Rice (1994). Dot-Havens are tax haven countries with a population of less than 1 million and usually represent small islands economies. By contrast, Big 7 Havens are tax haven countries with a population exceeding 1 million. It is likely that in these countries economic substance rather than tax or bank secrecy drive firm's presence. We expect that one channel why banks reduce their tax haven presence in response to public CbCR is due to reputational concerns. Consequently, we expect that banks who are 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.

Our results confirm this prediction. Table 4 reports a negative and significant reduction of the share of entities that are located in Dot-Havens (column (2)). Applying the same method only for Big 7 Havens shows a contrary result. Table 4 column (3) 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 EU tax havens.[12] Table 4 column (4) shows a negative coefficient of the interactions term, which is, however, smaller and less significant compared to columns (1) and (2).

In order to check for robustness and to mitigate concerns about outliers in the data, we alter our model of equation (I) into a log-level specification and use the natural logarithm of the absolute number of tax haven subsidiaries as the dependent variable. Additionally, we add the natural logarithm of the total number of subsidiaries to the right-hand side of the regression to control for a general change in the number of subsidiaries. Table 5 shows the results that are generally consistent with the previous model specification. The results are also economically meaningful as the coefficient of the interaction term in Table 5 indicates a reduction of banks tax haven presence of -28.1%[13] after the introduction of

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[12] Based on the tax haven list of Dyreng and Lindsey (2009), EU tax havens are Cyprus, Gibraltar, Ireland, Latvia, Luxembourg and Malta.
[13] $100 \cdot (e^{-0.330} - 1)\%$.

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public CbCR relative to the control group. This result is again more pronounced for Dot-Havens (-35.1%).

"Table 5 around here"

Next, we run a placebo test based on firm subsidiary presence in Delaware (U.S.) to present further evidence for the role of reputational costs in expectation to increased tax transparency. In public CbC reports, Delaware, 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 are not considered a tax haven, firm presence in Delaware should not be subjects to reputational costs in the context of public CbCR disclosure. We therefore do not expect a decrease of subsidiaries in Delaware after the introduction of public CbCR. The results in table 6 are in line with our expectation. The coefficient of the interaction term is negative, however statistically insignificant.

"Table 6 around here"

As mentioned earlier, also regulatory concerns could play a role for managers when deciding about 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). We therefore create a list of tax havens that display high financial secrecy, i.e. a strong banking secrecy or the unwillingness to engage in information sharing with other countries. First, we match the countries from our tax haven list based on Dyreng and Lindsey (2009) with the Financial Secrecy Index (FSI) of the Tax Justice Network (2015). 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.

In a next step, we create a list of "tax & regulatory havens" that are defined as tax havens 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

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country-level (Dutt et al., 2019b), we expect the decrease of subsidiaries located in opaque tax havens ("tax & regulatory havens") to be stronger compared to relatively transparent tax havens ("tax & non-regulatory havens"). The results in Table 7 confirm our expectation. We only find a significant negative association between public CbCR and 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 "non-regulatory" tax havens. Accordingly, we expect this negative association to exist also for Dot-Havens that are characterized by high financial secrecy but not for Dot-Havens with relatively 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.

"Table 7 around here"

As an additional robustness check, we examine whether country-specific financial secrecy alone affects subsidiary presence of banks over time without differentiating countries into tax havens. Hence, we perform a median-split of the FSI list and run our DiD model for countries above and below the median-rank separately. Table 8 reports an insignificant result for countries that display relatively high financial secrecy and a positive and statistically significant result for countries with relatively low financial secrecy.

"Table 8 around here"

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.

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7   Conclusion

In this paper, we study the association of public CbCR and subsidiary presence of multinational EU banks in tax haven countries. Although the information on the location of subsidiaries of banks was publicly available already before, public CbCR increased country-specific transparency at the intensive margin. It is therefore possible that its introduction leads to additional costs triggered by the increased attention from tax administrations, regulatory bodies and the public. Incremental transparency could be costly, especially for banks, as they are subject to a variety of strict regulatory requirements and face a 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 differentiating our tax havens into Dot-Havens (e.g. Bahamas) and Big 7 Havens (e.g. Singapore), we report a significantly negative association only for Dot-Havens. Furthermore, our results suggest that banks particularly close 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 contribute to the literature in several ways. First, we refer to Hanlon and Heitzman (2010), who call for more research on the taxation of financial institutions. Our study contributes to this stream of literature by providing evidence on the consequences of a regulatory attempt to curb tax aggressiveness by increasing tax transparency in the financial sector.

Second, our study contributes to the growing literature of "real" effects of financial transparency by shedding light on the impact of a targeted disclosure regulation on the financial industry (Kanodia and Sapra, 2016). We investigate whether the introduction of public CbCR has an effect on the group structure of multinational banks, especially on their presence in tax havens. We find an association between CbCR and bank' subsidiaries in tax havens even though CbCR in the banking industry provides only very little information that has not been available to stakeholders before.

Finally, our study is of particular relevance for policy makers in the current political debate. Since the European Parliament and the Council urge CbCR to become public for all industries (European

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Parliament and the Council, 2017), results of this paper provide much needed empirical evidence contributing to this on-going discussion.

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Appendix

Figure 1: Libby Boxes

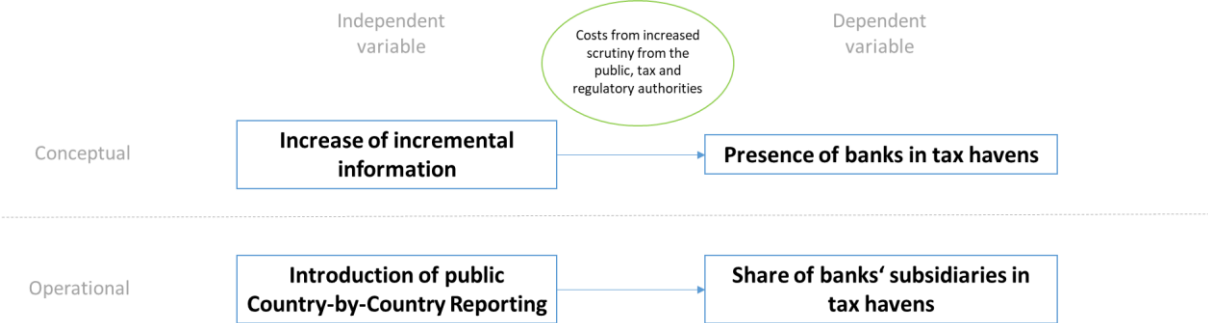|	Independent variable		Dependent variable
		Costs from increased scrutiny from the public, tax and regulatory authorities	
Conceptual	Increase of incremental information	→	Presence of banks in tax havens
Operational	Introduction of public Country-by-Country Reporting	→	Share of banks' subsidiaries in tax havens

Figure 2: Tax haven presence of banks and insurers
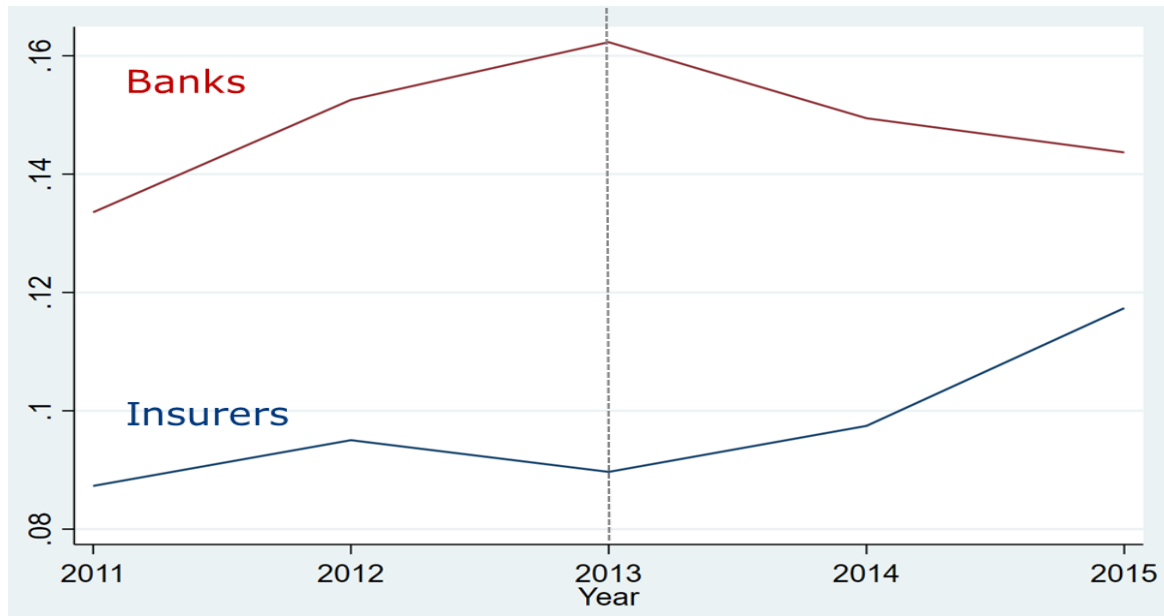
This figure illustrates the development of tax haven presence for banks and insurers over time. We plot the average share of tax haven entities ($\frac{tax\ haven\ entities}{total\ entities}$) on an annual basis.

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	-20
Firms for which no consolidation scope could be obtained	-16
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
Firms with missing data to calculate control variables	-2
Purely domestic firms according to the consolidation scope	-2
Final sample	27

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	7.41%
Belgium	1	3.70%
France	4	14.81%
Germany	9	33.33%
Italy	3	11.11%
United Kingdom	6	22.22%
Spain	2	7.41%
Total	27	100.00%

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

Table 3

Summary Statistics

Banks n=31							
	mean	sd	min	max	p25	p50	p75
Entities	516	478	23	2 097	168	334	843
Haven Entities	85	144	0	795	7	28	97
Share Haven	0.13	0.10	0.00	0.42	0.06	0.10	0.17
Totalassets	947 000 000	731 000 000	127 000 000	2 810 000 000	358 000 000	737 000 000	1 480 000 000
ROAA	0.18	0.70	-6.83	1.03	0.09	0.26	0.44
AverageFTE	75 183	61 750	6 470	274 496	20 823	54 034	122 000
ETR	24.64	34.79	-206.63	100.26	20.50	26.68	35.85

Insurers n=27							
	mean	sd	min	max	p25	p50	p75
Entities	267	305	9	1 304	61	162	303
Haven Entities	31	45	0	207	2	10	28
Share Haven	0.09	0.06	0.00	0.38	0.05	0.08	0.12
Totalassets	241 000 000	295 000 000	3 795 800	1 040 000 000	26 700 000	79 200 000	428 000 000
ROAA	0.80	0.93	-1.80	4.75	0.34	0.61	1.00
AverageFTE	28 025	35 775	147	149 165	4 723	13 853	35 723
ETR	29.32	25.51	-99.14	131.38	20.95	27.83	36.25

This table presents summary statistics for banks and insurers. *Entities* is the total number of entities collected from the list of shareholdings of banks and insurers, irrespective of their form of (non-)consolidation. Of these, *Haven Entities* is the number of entities located in tax havens based on Dyreng and Lindsey (2009). *Share Haven* is the number of *Haven Entities* scaled by Entities.TotalAssets is 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.

Table 4

Public CbCR and Tax Haven Presence

VARIABLES	(1) TaxHavens	(2) DotHavens	(3) Big7	(4) EUHavens
PostCbCR	0.0150**	0.0126***	0.00710	0.0151**
	(0.00662)	(0.00387)	(0.00564)	(0.00697)
Banks*PostCbCR	**-0.0238****	**-0.0235*****	**-0.00527**	**-0.0174***
	(0.0111)	**(0.00876)**	**(0.00519)**	**(0.0103)**
log_TotalAssets	-0.0261	-0.0110	-0.0105	-0.0213
	(0.0295)	(0.0241)	(0.0124)	(0.0207)
ROAA	-7.03e-05	-0.00127	-0.00123	-0.00167
	(0.00575)	(0.00459)	(0.00249)	(0.00405)
logFTE	-0.0521	-0.0788**	0.0728**	-0.0434
	(0.0316)	(0.0311)	(0.0323)	(0.0281)
ETR	-0.000125	-9.76e-05	-4.18e-05	-6.58e-05
	(0.000103)	(7.53e-05)	(3.04e-05)	(4.18e-05)
Constant	1.142*	1.070*	-0.490	0.903*
	(0.647)	(0.560)	(0.305)	(0.520)
Observations	234	234	234	234
R-squared	0.053	0.086	0.094	0.055
Firm-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. 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 the tax haven list in Dyreng and Lindsey (2009), in column (2) based on "Dot-Tax Havens" (Hines and Rice, 1994), in column (3) based on "Big7-Tax Havens" (Hines and Rice, 1994) and column (4) based on EU members part of the tax haven list in Dyreng and Lindsey (2009). *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 5

Public CbCR and Tax Haven Presence

VARIABLES	(1) TaxHavens	(2) DotHavens	(3) Big7	(4) EUHavens
PostCbCR	0.202***	0.267***	0.101	0.307***
	(0.0681)	(0.0844)	(0.0792)	(0.109)
Banks*PostCbCR	**-0.330****	**-0.432*****	**-0.147**	**-0.365****
	(0.125)	**(0.154)**	**(0.117)**	**(0.162)**
logsubnum	1.024***	1.146***	1.099***	1.110***
	(0.113)	(0.149)	(0.160)	(0.192)
log_TotalAssets	-0.335	-0.279	-0.424	-0.215
	(0.352)	(0.416)	(0.386)	(0.317)
ROAA	-0.135	-0.0324	-0.0463	-0.133
	(0.127)	(0.132)	(0.0979)	(0.108)
logFTE	-1.065**	-1.476***	1.136*	-1.288**
	(0.415)	(0.520)	(0.604)	(0.554)
ETR	-0.00212	-0.00224	-0.00253	0.000188
	(0.00232)	(0.00325)	(0.00219)	(0.000870)
Constant	14.88*	16.87*	-7.260	13.72
	(7.754)	(9.579)	(9.786)	(9.227)
Observations	225	214	194	209
R-squared	0.403	0.411	0.440	0.466
Firm-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. The dependent variable is the natural log of the number of tax haven entities. Results in column (1) are based on the tax haven list in Dyreng and Lindsey (2009), in column (2) based on "Dot-Tax Havens" (Hines and Rice, 1994), in column (3) based on "Big7-Tax Havens" (Hines and Rice, 1994) and column (4) based on EU members part of the tax haven list in Dyreng and Lindsey (2009). *Logsubnum* is the natural log of the total numbers of entities. *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 6

Public CbCR and Delaware

VARIABLES	(1) Delaware
PostCbCR	0.0012
	(0.00102)
Banks*PostCbCR	**-0.00354**
	(0.0023)
log_TotalAssets	-0.0001
	(0.00773)
ROAA	-0.00141
	(0.00144)
logFTE	-0.0138
	(0.00961)
ETR	-0.00004
	(0.000037)
Constant	0.157
	(0.124)
Observations	234
R-squared	0.025
Firm-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. *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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Table 7

Public CbCR and tax and regulatory havens

Variables	(1) Tax & RegHavens	(2) Tax & NonRegHavens	(3) Dot & RegHavens	(4) Dot & NonRegHavens
PostCbCR	0.0138**	2.91e-05	0.00947**	-0.000122
	(0.00647)	(0.000595)	(0.00359)	(0.000363)
Banks*PostCbCR	**-0.0242****	**0.00399**	**-0.0178****	**-0.000402**
	(0.0104)	**(0.00456)**	**(0.00813)**	**(0.000397)**
log_TotalAssets	-0.0216	-0.00396	-0.00939	-0.00276
	(0.0267)	(0.00412)	(0.0224)	(0.00292)
ROAA	0.00168	-0.000483	-0.000988	0.000598
	(0.00542)	(0.00126)	(0.00416)	(0.000461)
logFTE	-0.0421	0.00360	-0.0766**	-0.00128
	(0.0295)	(0.00626)	(0.0294)	(0.00311)
ETR	-8.25e-05	-2.28e-06	-5.59e-05	4.39e-06
	(7.32e-05)	(1.40e-05)	(5.71e-05)	(3.17e-06)
Constant	0.936	0.0448	1.012*	0.0676
	(0.613)	(0.0759)	(0.522)	(0.0407)
Observations	234	234	234	234
R-squared	0.050	0.044	0.074	0.039
Firm-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. 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 Dyreng and Lindsey (2009) 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 Dyreng and Lindsey (2009) 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 an 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 countries with high/low financial secrecy

VARIABLES	(1) High Financial Secrecy	(2) Low Financial Secrecy
PostCbCR	0.00455	-0.00786**
	(0.00421)	(0.00377)
Banks*PostCbCR	**-0.00744**	**0.0209***
	(0.0126)	**(0.0111)**
log_TotalAssets	-0.0448	0.0216
	(0.0378)	(0.0324)
ROAA	0.00999	-0.0112
	(0.0104)	(0.0102)
logFTE	-0.0214	0.0489
	(0.0408)	(0.0435)
ETR	-5.75e-05	-0.000149**
	(0.000107)	(7.22e-05)
Constant	1.742*	-0.637
	(0.893)	(0.730)
Observations	234	234
R-squared	0.039	0.051
Firm-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 tax haven entities scaled by the total number of entities ($\frac{tax\ haven\ entities}{total\ entities}$). 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.

Appendix A: List of tax havens

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

This appendix lists the tax havens per Dyreng and Lindsey (2009) plus Delaware (U.S.). * denotes jurisdictions considered 'dot' tax havens as defined by Hines & Rice (1994) plus Delaware (U.S.). The 'Big 7' are Hong Kong, Ireland, Lebanon, Liberia, Panama, Singapore and Switzerland (Hines and Rice, 1994). EU tax havens are Cyprus, Gibraltar, Ireland, Latvia, Luxembourg and Malta (EU members part of the list in Dyreng and Lindsey (2009).