Public country-by-country reporting, tax avoidance and the cost of equity capital: Pan-European evidence

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Abstract

Purpose This paper investigates the role of tax avoidance in multinational corporations' management decisions to voluntarily disclose country-by-country (CbC) information in annual reports, and it examines investors' perceptions of these disclosures.

Design/methodology/approach: We use robust cluster standard errors pooled regression and a sample of 3,243 firm-year observations of European multinational corporations (MNCs) between 2007-2018. Country-by-country (CbC) reporting data are hand-collected from MNCs' annual reports, whereas the firm-level financial variables are obtained from the Thomson Reuters DataStream and IBES databases. Data for the Financial Secrecy Index (FSI) are obtained from the Tax Justice Network website.

Findings: Our study demonstrates that firms engaging in higher levels of tax avoidance tend to disclose less CbC information. Furthermore, we find that investors reward increased transparency and tax-responsible behavior by lowering the cost of equity capital. The analysis also shows that the impact of CbC reporting on the cost of equity is more pronounced for firms with lower tax avoidance. Additionally, we find that multinational corporations with high tax avoidance operating in countries with high financial secrecy are less likely to disclose CbC information.

Originality/value: This study contributes to the growing discourse on corporate tax behavior by offering policy-relevant insights for regulators, policymakers, and accounting standard-setters in support of mandatory public CbC reporting for non-financial multinational corporations.

Keywords: Country-by-country reporting; tax avoidance; the cost of equity capital; cross-country study.

JEL code: M16, M41, M48

1. INTRODUCTION

In this paper, we examine how tax avoidance by multinational corporations (MNCs) determines their decisions to disclose CbC information voluntarily in their annual reports, and the impact that such disclosure may have upon investors' perceptions of risk and, therefore, the cost of equity capital. Our study is motivated by a series of high-profile tax avoidance scandals involving MNCs, with companies such as Amazon engaging in flagrant and indefensible tax avoidance, paying virtually no tax in the UK from 2011 to 2013 despite a turnover of £7.6 billion (The Guardian, 2019). The State of Tax Justice report also reveals that MNCs are sheltering profits of £1 trillion in tax havens every year, causing annual global shortfalls of £179 billion in governments' direct tax revenues (Tax Justice Network, 2020b).

High-profile cases illustrate how tax authorities are increasingly challenging multinational corporations over aggressive tax strategies. For instance, a global mining giant settled a long-running dispute with the Australian Taxation Office by agreeing to pay A$613 million (approximately $424 million) amid allegations of profit shifting. In another notable case, a major U.S. fast-food chain agreed to pay €1.25 billion (around $1.31 billion) to the French tax authority following an investigation into its transfer pricing practices. These cases highlight the growing scrutiny over tax avoidance and the substantial financial risks companies face when engaging in opaque cross-border arrangements. This behaviour has inspired a series of media-driven campaigns, castigating MNCs for siting their registered offices in tax havens while conducting the bulk of their trade in other countries and exhorting all nations to undertake joint initiatives to prevent this abuse.

In pursuit of this objective, CbC reporting has been introduced to ensure that the corporate tax levied is commensurate with the economic activities conducted by an MNC in each country in which it trades, mandating them to increase the volume of information submitted privately to

tax authorities (Murphy, 2003; Murphy, 2009; Hoopes et al., 2018). Albeit several CbC reporting initiatives have been implemented, a paucity of studies has so far examined this critical phenomenon. Although firms may limit the disclosure of detailed country-by-country (CbC) information to safeguard competitive advantages and avoid revealing commercially sensitive data, the extant literature identifies tax avoidance as a primary driver behind such disclosure practices. Several studies suggest that firms engaging in aggressive tax strategies tend to obscure details of their global operations to mitigate public scrutiny and regulatory intervention. For example, Hope et al. (2013) and Akamah et al. (2018) argue that reduced transparency is a deliberate tactic employed to shield tax planning activities. Similarly, Brown et al. (2019) and Balakrishnan et al. (2019) find that firms involved in tax avoidance exhibit systematically lower levels of corporate transparency. Notably, Akamah et al. (2018) provide empirical evidence that such firms strategically withhold information that could reveal the nature and extent of structured transactions in foreign jurisdictions intended to minimize tax obligations.

Moreover, empirical studies provide conflicting evidence of how mandatory private CbC reporting affects tax avoidance. For example, Overesch and Wolff (2019) find that European multinational banks increased their tax expenses relative to banks that were not affected by regulations when CbC reporting became mandatory. However, Brown et al. (2019) and Joshi et al. (2019) report that CbC reporting has no impact on European banks' tax avoidance.

These few studies have two features in common. First, they examine mandatory public CbC reporting by financial institutions only, according to the Capital Requirements Directive 2013/36/EU (known as CRD IV) issued by the European Union (EU). Second, none of these studies examines how investors perceive CbC disclosures by MNCs. Joshi (2020) extends prior studies by analysing the impact of mandatory private CbC reporting by non-financial MNCs on tax avoidance, as required by the Base Erosion and Profit Shifting (BEPS) Action Item 13,

determining that it has a deterrent effect. An additional study of particular relevance to our own is conducted by Dutt et al. (2019), who investigate stock price reactions to the CRD IV obligation, observing that the implementation of the CbC reporting requirement for EU financial institutions does not provoke a noticeable response from investors.

In our study, we draw on agency and information asymmetry theories to extend existing research by examining public voluntary CbC reporting by non-financial MNCs. According to these two theories, public CbC reporting (as a proxy for corporate transparency) can provide useful information for understanding the geographical diversification strategy of MNCs when making judgments about their future cash flows and prospects for growth. Furthermore, such disclosures can potentially reveal MNCs' tax reporting behaviour (Hope et al., 2013; Akamah et al., 2018). Collectively, these factors should lead to reductions in estimation risk that investors may encounter with respect to the return or cash flow process and the cost of equity capital (Botosan, 1997; Lambert et al., 2007; Daske et al., 2013; Campbell et al., 2019).

Therefore, we first investigate the impact of MNCs' tax-avoiding behaviour on management decisions to disclose CbC information voluntarily in annual reports. In contrast to prior research (Overesch and Wolff, 2019; Brown et al., 2019; Joshi et al., 2019; Joshi, 2020), we argue that tax avoidance is a determinant rather than a consequence of CbC reporting. This is because CbC information disclosed in annual reports is voluntary and lacks clear guidelines and regulatory enforcement. We expect that MNCs involved in extensive tax avoidance will obviate pressure from the public by reducing the level of voluntary CbC information disclosed in their annual reports. Consistent with our expectations, we find that MNCs with lower tax avoidance tend to have higher levels of transparency and provide more CbC information in annual reports. This result indicates that the uncertainty created by tax avoidance among investors encourages MNCs to use CbC reporting to reveal the otherwise unobservable attribute of their lower tax avoidance (Lim, 2011; Goh et al., 2016; Chun et al., 2020), seeking

to convince stakeholders that they are acting responsibly, thus reducing agency costs. Conversely, MNCs with high tax avoidance disclose less CbC information, indicating that they attempt to avoid any reputational risk that may accrue from increased public scrutiny, as well as seeking to prevent damage to their relationships with governments.

Second, we investigate how investors perceive the decision of MNCs' management to disclose CbC information voluntarily in annual reports. More specifically, we examine the relationship between the level of public voluntary CbC reporting and the cost of equity capital. We align our sample selection with Action 13 of the OECD/G20 Base Erosion and Profit Shifting (BEPS) Project, which stipulates a consolidated revenue threshold of €750 million for country-by-country (CbC) reporting. Accordingly, our sample comprises large multinational corporations (MNCs) that are more likely to have cross-border operations and, thus, are in a position to voluntarily disclose CbC information in anticipation of or in response to regulatory expectations.

Our results demonstrate that MNCs that disclose more CbC information enjoy a lower cost of equity capital, which emphasizes the importance of the role of voluntary disclosure in capital markets (Botosan, 1997; Lambert et al., 2007; Daske et al., 2013). Third, we investigate whether investors can distinguish between MNCs that disclose a high level of CbC information while engaging in reduced tax avoidance and those that disclose a high level of CbC information to transmit a bogus signal implying a low level of tax avoidance. Thus, we test the joint effect of the level of CbC reporting and tax avoidance by MNCs on their cost of equity capital, arguing that the impact of CbC reporting on the cost of equity capital should be examined in the presence of tax avoidance because these two variables are expected to have a simultaneous influence on the perceptions of investors. Our results determine that the negative association between CbC reporting and the cost of equity capital is strengthened when a higher level of CbC reporting is combined with lower tax avoidance. This finding shows that investors

reward MNCs for their increased transparency and responsible tax policies. Our study demonstrates that investors exhibit diverse reactions towards MNCs' hypocritical CbC reporting strategies.

Next, we utilise a number of alternative model specifications to consolidate our findings further. First, we investigate differences between European countries, seeking to establish how laws and regulations protecting financial secrecy may facilitate tax avoidance by MNCs, arguing that financial secrecy will be a primary driver of such behaviour. Therefore, we control for the country-level financial secrecy in examining the relationship between tax avoidance and CbC reporting. Consistent with our proposition, our analysis reveals that the negative relationship between them is significantly stronger for MNCs operating in countries where the level of financial secrecy is high.

Second, we examine two potential channels via which CbC reporting constrains tax avoidance. We find that detection risk is one of the plausible channels through which tax avoidance can affect the level of voluntary public CbC reporting by MNCs, while we find no evidence that MNCs alter the level of their CbC reporting to avoid the political cost. Third, we employ alternative measures of tax avoidance and the cost of equity capital. For tax avoidance, we apply the cash effective tax rate (CETR) and the effective tax rate (ETR) instead of the long-term cash effective tax rate (Lr-CETR) and long-term effective tax rate (Lr-ETR) used in the main analysis. Second, while the main analysis measures the cost of equity capital as the average score of four ex-ante models, in the robustness tests, we repeat the analysis using each of these four models. Specifically, we utilize the price-earnings-growth ratio model (rPEG) (Easton, 2004); the modified price-earnings growth ratio model (rMPEG); the economy-wide growth model (Ohlson and Juettner-Nauroth, 2005) (rOJN); and the modified economy-wide growth model (Gode and Mohanram, 2003) (rGM). All the analyses using alternative measures of tax avoidance and the cost of equity capital support our main conclusions.

Finally, we apply a series of techniques to obviate the potential problem of endogeneity. Firstly, we exploit the adoption of the BEPS project in Europe in 2016, treating its impact as an exogenous shock to the level of CbC reporting by MNCs and its associations with tax avoidance and the cost of equity capital. We thus find that the level of CbC reporting is significantly lower for MNCs with higher tax avoidance after the adoption of the new regulations in 2016. We also find that the cost of equity capital is significantly lower for MNCs with a high level of CbC reporting and lower tax avoidance following their adoption of the new regulations in 2016. Secondly, we tackle the potential problem of sample selection bias using a Heckman two-stage model, finding a significant negative relationship between tax avoidance and CbC reporting, confirming that the potential for self-selection bias is not an issue for our study. Thirdly, we apply the instrumental variable estimation method to the key models to address endogeneity and find similar results that support our main findings. Fourthly, we deal with the reverse causality issue by using the dynamic panel system, GMM (Blundell and Bond, 1998), and our results continue to hold. This provides strong support for our conclusion that MNCs with higher tax avoidance are likely to report a lower level of CbC reporting.

Our study makes the following contributions to the accounting and finance literature. First, this is the only international study to examine public voluntary CbC reporting by non-financial MNCs in Europe. There is a very limited number of studies on the impact of CbC reporting on tax avoidance, and they focus solely on mandatory CbC reporting by financial institutions (Dutt et al., 2019; Overesch and Wolff, 2019; Brown et al., 2019; Joshi et al., 2019). The primary CbC reports are submitted privately to tax authorities rather than being made publicly available to investors. This supports the notion that the public and investors generally have access only to voluntarily disclosed CbC information in annual reports. This discretionary approach to CbC reporting in publicly available documents aligns with tax avoidance practices, as suggested in the literature (Akamah et al., 2018; Brown et al., 2019).Adopting a different perspective of

public voluntary CbC reporting by non-financial institutions, we examine the converse trajectory of causality, determining what level of CbC reporting an MNC's management will undertake in relation to their level of tax avoidance.

Second, this is the first study to examine the economic consequences of public voluntary CbC reporting by non-financial MNCs in Europe. Dutt et al. (2019) examine only the impact of mandatory CbC reporting by financial institutions on the stock price, whereas our study extends theirs by investigating the joint effect of tax avoidance and the level of voluntary CbC reporting by non-financial MNCs on their cost of equity capital.

Third, our research contributes to the continuing debate between the accounting standard-setting bodies (IASB and FASB) concerning public versus private disclosure of CbC information by non-financial institutions, the European Parliament and other non-governmental organizations. Notably, accounting standards issued by the IASB and the FASB are devoid of any detailed CbC reporting requirements.Further, we provide original insights into how public CbC reporting by non-financial MNCs can: (1) act as a possible deterrent to the tax-avoiding behaviour of MNCs; and (2) enable better-informed investment decisions based on lower information asymmetry and improved corporate-monitoring mechanisms, resulting in a lower cost of equity capital.

The remainder of this paper is structured as follows: Section 2 discusses the institutional background of CbC reporting, reviews prior studies, and develops hypotheses. Section 3 discusses the research design. Section 4 discusses the baseline results. Section 5 discusses the robustness tests. Finally, Section 6 concludes.

2. INSTITUTIONAL BACKGROUND, LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 Institutional Background

Many MNCs are accused of deliberately avoiding tax (PWYP, 2005; Tax Justice Network, 2020a). These allegations have been supported by recent leaks of confidential tax-related documents known as the "Lux Leaks" and the "Panama Papers" (Huesecken et al., 2018; Akamah et al., 2018). Indeed, the current international tax system for MNCs is problematic and struggles to address the challenges posed by the rise of modern, globally integrated MNCs (Murphy, 2010; Murphy, 2012b; Ting and Gray, 2019). In response, over the past decade, various initiatives have sought to make public CbC reporting mandatory as a means to deter tax avoidance, including the proposal of an international accounting standard (Murphy, 2003). For example, OECD and G20 countries have collaborated to support the BEPS project launched in 2013. Simultaneously, the European Parliament issued its first initiative—CRD IV—on 26 June 2013, which became effective in 2016, mandating public disclosure of CbC information by financial institutions. That same year, the UK government enacted a private CbC reporting requirement, obligating all UK-based groups preparing consolidated accounts to file information with HMRC for the year ending 31 December 2016, in line with the European financial institutions' requirements.

However, these initiatives have not persuaded regulators and accounting standard-setting bodies, such as the IASB and FASB, to make public CbC reporting mandatory. Currently, such disclosures are made solely to tax authorities. For instance, both the IASB and FASB argue that CbC reporting is intended to provide tax-related information rather than to serve general accounting purposes (Murphy, 2012a). Our study posits that CbC reporting offers benefits beyond tax accountability, including support for stewardship and enhanced information for

investors' decision-making. With the exception of MNCs in the extractive industry and financial institutions in Europe, CbC reporting remains voluntary worldwide. This context frames our investigation into the relationship between tax avoidance and the cost of equity capital for MNCs.

In the context of segmental reporting, the management approach requires entities to disclose revenues by geographical area, even if geography is not the primary basis for segment reporting. It mandates the disclosure of revenues attributed to specific countries, if such information is material, as part of entity-wide disclosures (IFRS 8). Although IFRS 8 has the potential to enhance transparency, its implementation is subject to managerial discretion. For example, geographic regions, including individual countries, can qualify as operating segments if they are monitored separately by the chief operating decision-maker (CODM). However, this flexibility introduces variability in disclosure practices, allowing firms to limit geographic information in ways that may obscure sensitive tax planning strategies. In our analysis, we account for the potential impact of IFRS 8 adoption by including a dummy variable representing the post-IFRS 8 adoption period. This enables us to control for its influence on the scope and quality of geographic disclosures.

In December 2019, the Global Reporting Initiative (GRI) introduced a new tax standard—GRI 207: Tax—which became effective for reports or other materials published on or after 1 January 2021. This standard has been incorporated into the GRI's sustainability reporting framework and includes provisions for public CbC reporting. Notably, GRI 207 is currently the only initiative that recommends public voluntary CbC reporting by MNCs across all sectors, thereby ensuring consistency with audited consolidated financial statements[1].

[1] According to GRI 207, organizations must reconcile the data disclosed under 207-4-b (items iv, vi, vii, and viii) with their audited consolidated financial statements or publicly filed financial data for the same reporting period. Any discrepancies must be explained (*GRI 207: Tax*, 2019).

2.2 Tax Avoidance and CbC Reporting

Regulators argue that CbC information is commercially sensitive and, if publicly disclosed, could have an adverse impact on the competitive advantage of MNCs, resulting in financial losses (European Parliament, 2016). Against this background, an increasing number of studies investigate the impact of CbC reporting by financial institutions on tax avoidance. For example, Overesch and Wolff (2019) analyze the effect of the European CRD IV directive that obliged multinational banks to publish CbC information. They reveal that European multinational banks increased their tax expenses relative to other banks that were not affected when CbC reporting became mandatory, concluding that CbC reporting can be an effective tool for policymakers for deterring tax avoidance.

In contrast, Brown et al. (2019) and Joshi et al. (2019) fail to support this conclusion. Brown et al. (2019) find that the issuance of CRD IV has a limited impact on the use of tax havens by European banks. Similarly, Joshi et al. (2019) examine the impact of the CRD IV issuance on the tax planning behaviour of European banks, suggesting that increased transparency from CbC reporting does not appear to have a material influence on their overall tax avoidance. While she fails to provide evidence for European banks, Joshi (2020) analyses the impact of private CbC reporting in compliance with BEPS Action Item 13 on tax avoidance by non-financial MNCs, concluding that CbC reporting can deter tax avoidance.

While these studies provide conflicting results, our investigation adopts a different approach by exploring the public voluntary CbC reporting of non-financial institutions. Given the unique settings of public voluntary CbC reporting, we contend that MNCs' management decisions to disclose CbC reporting information are predominantly driven by the extent of their tax avoidance. Therefore, the impact of tax avoidance on voluntary CbC reporting remains an unresolved question.

Based on agency theory, we expect MNCs with higher levels of tax avoidance to disclose less CbC information in their annual reports, arguing that tax-avoiding MNCs tend to withhold such information to obfuscate signals of their socially irresponsible tax behaviour. Furthermore, high levels of CbC reporting by MNCs may attract the attention of both tax authorities and regulators, increasing the likelihood of a tax audit and damaging their reputation in the event of infringement (Hope et al., 2013; Akamah et al., 2018; Brown et al., 2019). Thus, we expect to find a negative relationship between tax avoidance and the level of CbC reporting.

H1. Ceteris paribus, there is a negative relationship between tax avoidance and CbC information disclosed in the annual report.

2.3 CbC Reporting and The Cost of Equity Capital

The relationship between CbC reporting and the cost of equity capital has not yet been investigated empirically and remains an unresolved research question. Information asymmetry theory suggests that increased transparency can reduce the cost of capital by mitigating problems related to adverse selection and moral hazard (Lambert et al., 2007; Daske et al., 2013). Accordingly, we argue that CbC reporting, as a proxy for corporate transparency, can play a critical role in lowering the cost of equity capital. CbC reporting provides highly disaggregated information that helps investors gain a clearer understanding of the geographical diversification strategies of MNCs, aiding their assessment of the firm's overall operations and the prediction of future cash flows and growth prospects.

In particular, operating across different countries entails varying levels of profitability, risk, growth opportunities, and political stability (Herrmann and Thomas, 2000; Hope et al., 2009a). Thus, country-level disclosure offers stakeholders valuable information for their decision-making processes. This should, in turn, enhance an MNC's information environment and reduce estimation risk and the cost of equity capital (Botosan, 1997; Dhaliwal et al., 2011).

Moreover, investors may interpret CbC reporting as a signal of management's willingness to be transparent regarding tax practices. Conversely, low levels of CbC reporting may lead investors to infer that management is engaging in tax avoidance, thereby raising concerns about reputational risk and weakening the firm's image in terms of corporate social responsibility (CSR), potentially triggering negative reactions in equity markets (Wen et al., 2020).

Richardson et al. (2020) provide evidence that intensive use of tax haven subsidiaries is positively associated with the cost of bank loans. Akhtar et al. (2019) find that share prices decline following media announcements of tax avoidance. Similarly, Isin (2018) identifies a positive link between tax avoidance and loan spreads, while Wahab and Holland (2012) report a negative association between tax avoidance news and firm market value. Hanlon and Slemrod (2009) also observe a drop in stock prices in response to news of tax haven use.

A notable example of reputational risk triggering adverse market reactions is the case of Starbucks. In 2012, reports that the company paid no tax in the UK—despite the rapid expansion of its UK outlets—received widespread media coverage. The resulting public backlash led to consumer boycotts (Christensen et al., 2015), forcing Starbucks to close some locations and voluntarily commit to paying taxes in the future, despite having complied with UK tax law.

Given the foregoing, reputational damage arising from perceived tax avoidance is expected to increase the cost of equity capital by reducing current or expected future cash flows (Perry and De Fontnouvelle, 2005). Therefore, we propose a negative relationship between the level of CbC reporting and the cost of equity capital, stated in our second hypothesis as follows:

H2a Ceteris paribus, there is a negative relationship between CbC information disclosed in the annual report and the cost of equity capital.

We next explore how investors perceive MNCs' strategies in relation to CbC reporting and whether they can distinguish between MNCs that disclose CbC information genuinely to signal low tax avoidance and those that use such disclosure to mislead investors into believing they engage in low tax avoidance. We suggest that MNCs may attempt to camouflage their tax avoidance by manipulating the level of CbC reporting to influence and positively shape investor perceptions, thereby maintaining their legitimacy. This context provides a rich and nuanced theoretical lens through which to examine whether investors can differentiate between MNCs that disclose a high level of CbC reporting while having low tax avoidance, and those that disclose a high level of CbC reporting while simultaneously engaging in high tax avoidance. We posit that investor perceptions of CbC reporting are shaped largely by the underlying tax avoidance behaviour of MNCs. Consequently, we expect the effect of CbC reporting on the cost of equity capital to be more pronounced in MNCs with low tax avoidance compared to those with high tax avoidance.

Indeed, tax avoidance can undermine the quality of an MNC's information environment by increasing information asymmetry between managers and investors, which in turn can exacerbate agency problems (Lim, 2011; Goh et al., 2016; Chen et al., 2018; Chun et al., 2020). This increases investors' uncertainty about the firm's future cash flows and risk profile, leading to a higher cost of equity capital. Beyond its impact on information asymmetry, tax avoidance is also associated with significant reputational costs, which represent an important consideration in managerial decisions about tax planning (Graham et al., 2014; Sikes and Verrecchia, 2020). MNCs engaged in aggressive tax avoidance are more likely to face scrutiny from tax authorities, exposing them to direct costs such as penalties, and indirect costs such as reputational damage. These factors can diminish corporate value and increase the cost of capital (Desai and Dharmapala, 2009; Cook et al., 2017; Chen et al., 2019; Chun et al., 2020).

We argue that investors derive greater benefit from a high level of CbC reporting when it is accompanied by low tax avoidance, compared to the benefit of disclosure alone. Therefore, we

expect the impact of CbC reporting on the cost of equity capital to be stronger among MNCs with lower tax avoidance. Accordingly, we propose our third hypothesis:

H2b Ceteris paribus, the negative relationship between the CbC information disclosed in the annual report and the cost of equity capital is stronger for MNCs with lower tax avoidance.

3. RESEARCH DESIGN

3.1 Data and Sample

Our initial sample incorporates data from the largest European MNCs based on the Financial Times list. To align with the consolidated sales revenue threshold of €750 million for CbC reporting requirements, as specified in Action 13 of the BEPS project, our sample comprises European MNCs with consolidated sales revenues exceeding this threshold. Since mandatory CbC requirements under CRD IV apply only to financial institutions, we exclude these entities to facilitate the examination of public voluntary CbC reporting.

Accordingly, we begin with the top 500 European MNCs based on the Financial Times list, covering the period 2007–2018. The year 2007 is selected as the starting point due to the widespread absence of CbC information in annual reports prior to this year. After excluding 174 financial institutions, the sample is reduced to 326 non-financial MNCs. We then exclude MNCs with missing data, due to market exits or mergers and acquisitions, as well as those with negative income before tax, given the difficulty of interpreting the effective tax rate in such cases (e.g., Hoopes et al., 2012). Following prior literature, we also eliminate firms with abnormal effective tax rates, such as negative rates or rates exceeding one (Chen et al., 2010; Cheng et al., 2012; McGuire et al., 2012). These steps yield a sample of 315 unique MNCs.

Country-by-country (CbC) reporting data are hand-collected from MNCs' annual reports, while firm-level financial variables are obtained from the Thomson Reuters DataStream and IBES databases. Data for the Financial Secrecy Index (FSI) are sourced from the Tax Justice

Network website. To mitigate concerns about the influence of outliers, all continuous variables are winsorized at the 1st and 99th percentiles. We also remove firm-year observations lacking sufficient information to compute control variables. Applying these criteria results in a final sample of 3,243 firm-year observations.

Table 1 reports the number of firm-year observations by country. Our data show that Russia, Romania, and Turkey are the least represented, with only 5, 11, and 12 firm-year observations, respectively, while the UK is the most represented, with 895 firm-year observations (27.60% of the total sample). To address concerns about potential bias due to the high representation of the UK, we conduct a robustness test by excluding all UK observations from the sample.

[Insert Table 1 here]

3.2 Variables Measurement

3.2.1 Country-by-country (CbC) reporting

A CbC report includes detailed information on where profits arise and where they are taxed. Currently, however, the CbC reports of European non-financial institutions are submitted privately to tax authorities and are not available to the public. In April 2016, the European Commission launched an initiative encouraging MNCs to publish their CbC reports. However, European countries failed to reach an agreement on a public disclosure framework, due to concerns that publication could significantly diminish MNCs' competitive advantage in international business. The release of CbC information is considered commercially sensitive and may lead to financial losses or harm the competitive position of MNCs (European Parliament, 2016). At present, the only publicly available source of CbC information is typically found in a company's annual report, where such disclosures are usually presented in the notes to the financial statements.

As a proxy for the level of CbC reporting, we employ the country-level disaggregation of total consolidated sales revenues. The disclosure of sales information on a country-by-country basis is relevant not only for the stewardship of MNCs but also for earnings predictability and firm valuation (Hope et al., 2006; Hope et al., 2009a; Hope et al., 2009b). The literature generally maintains that disaggregated sales information enhances the quality of an MNC's information environment, enabling investors to make better-informed decisions regarding valuation and future performance (Murphy, 2017). Accordingly, we calculate the level of country-level sales disclosure as the ratio of sales revenue reported at the country level to the total consolidated sales revenues of the MNC. These data were manually collected from the annual reports of the MNCs. In Appendix B extracts, as examples, from the annual reports to show how CbC information capture the disclosed country-by-country (CbC) information (Swich Match, 2016 and Sandvik, 2016).

3.2.2 The cost of equity capital (CoE)

Finance studies suggest that cost of equity capital measures based on realized returns are unreliable (Fama and French, 1997). In contrast, ex-ante measures of the cost of equity capital are considered superior, as they better reflect expected returns and explicitly account for cash flows and growth potential (Hail and Leuz, 2006; Pástor et al., 2008; Lopes and de Alencar, 2010). Accordingly, we estimate the cost of equity capital using four widely adopted ex-ante models, derived from analysts' earnings forecasts and stock prices: the price-earnings-growth ratio model (r_{PEG}) (Easton, 2004); the modified price-earnings growth ratio model (r_{MPEG}) (Easton, 2004); the economy-wide growth model (r_{OJN}) (Ohlson and Juettner-Nauroth, 2005); and the modified economy-wide growth model (r_{GM}) (Gode and Mohanram, 2003). These models are based on either the dividend discount model or the residual income model, and they differ in their assumptions regarding future growth patterns and forecasting horizons.

There is no clear consensus in the literature on which model performs best. To reduce potential bias and measurement error in our regression analyses, we estimate the cost of equity capital

as the arithmetic average of these four ex-ante models (r_{MEAN}) (Dhaliwal et al., 2006; El Ghoul et al., 2011). Specifically, we calculate the four measures based on analysts' forecast data from June of each year, using observations with a positive consensus on earnings forecasts for the next two years and positive long-term growth forecasts. We then compute the cost of equity capital using the average of the four model estimates.

3.2.3 Tax avoidance (TaxAvoid)

The development of proxies for tax avoidance is challenging because tax avoidance activities are typically confidential, making accurate measurement difficult (Hanlon and Heitzman, 2010). Following prior studies, we employ two measures of tax avoidance in our main analysis: the long-run cash effective tax rate (*Lr-CETR*) and the long-run effective tax rate (*Lr-ETR*) (e.g., Chen et al., 2010; Rego and Wilson, 2012; Taylor and Richardson, 2012; Lennox et al., 2013; McClure et al., 2018). *Lr-CETR* is calculated as the five-year average of income taxes paid, divided by the five-year average of pre-tax income. *Lr-ETR* is computed as the five-year average of income tax expense, divided by the five-year average of pre-tax income.

Lr-CETR captures an MNC's ability to reduce its cash tax payments relative to earnings over the long term. It reflects both temporary and permanent book-tax differences (BTDs), and a lower *Lr-CETR* is more likely to indicate aggressive tax avoidance (Chen et al., 2010; Rego and Wilson, 2012; Lennox et al., 2013; McClure et al., 2018). As a cash-based measure, *Lr-CETR* is unaffected by opaque income tax accruals and thus provides a more accurate estimate of the actual cash taxes paid (Dhaliwal et al., 2004).

Both *Lr-ETR* and *Lr-CETR* are widely regarded as reliable proxies for tax avoidance because they capture persistent tax behavior and minimize the impact of short-term fluctuations. By averaging tax data over multiple years, typically five, these metrics smooth out one-time events, temporary BTDs, and annual changes in tax regulations, offering a clearer picture of

firms' sustained tax strategies (Dhaliwal et al., 2004; Lennox et al., 2013). Moreover, as a cash-based measure, *Lr-CETR* avoids distortions caused by accounting policies or accrual manipulations that may affect tax expense calculations, thereby providing a more accurate reflection of a firm's true tax burden (Dhaliwal et al., 2004; Rego and Wilson, 2012).

To ensure interpretability, we multiply *Lr-CETR* and *Lr-ETR* by -1 so that higher values indicate greater tax avoidance (Chen et al., 2010). In our robustness tests, we also include two additional tax avoidance measures: the cash effective tax rate (*CETR*) and the effective tax rate (*ETR*).

3.2.4 Control variables

To test the first hypothesis, examining the relationship between CbC reporting and tax avoidance, we introduce two sets of control variables. The first set concerns MNCs' financial characteristics. These include firm size (*Size*), measured as the natural logarithm of an MNC's total assets; leverage (*Lev*), measured as total debt divided by total assets; return on assets (*ROA*), calculated as net income divided by total assets; firm growth (Growth), measured as the natural logarithm of one plus the growth in the book value of equity over the previous year; audit quality (*Audit-Q*), represented by a dummy variable equal to 1 if an MNC is audited by a Big Four firm and 0 otherwise; and segment reporting quality (*Seg-Q*), measured by a dummy variable equal to 1 for years after the adoption of IFRS 8 and 0 otherwise. The second set relates to country-level characteristics, such as financial secrecy, which is measured using the Financial Secrecy Index (*FSI*). Year and industry fixed effects are also incorporated into the regressions.

We expect a positive relationship between CbC reporting and *Size, ROA, Growth, Audit-Q, and Seg-Q*. Consistent with prior disclosure studies, larger MNCs or those with stronger financial performance are expected to engage in higher levels of CbC reporting (Singhvi and Desai, 1971; Raffournier, 1995; Firth, 1979; Watson et al., 2002). Additionally, we anticipate that

CbC reporting will increase after the adoption of IFRS 8, serving as a proxy for *Seg-Q* (Aboud et al., 2018; Kang and Gray, 2019). Finally, we expect a negative relationship between CbC reporting and FSI, as high financial secrecy may discourage transparency.

To test the second hypothesis, we include several control variables that may influence the cost of equity capital (*CoE*), including Size, market Beta (*Beta*), Leverage (*Lev*), and Growth (Francis et al., 2005; Gray et al., 2009; Eliwa et al., 2016). Beta is measured using a five-year rolling beta estimated from the CAPM model, based on monthly data. Based on prior research, we expect a positive association between CoE and both Beta and Leverage, as firms with higher risk and greater reliance on debt are likely to face a higher cost of equity. In contrast, we anticipate a negative relationship between CoE and both Size and Growth, since larger and high-growth MNCs can generally raise equity capital at lower costs (Francis et al., 2005; Gray et al., 2009; Eliwa et al., 2016).

Previous studies also indicate that the international environment influences the strategies, operations, and disclosure practices of MNCs (Hillier et al., 2011; Qi et al., 2011; Ioannou and Serafeim, 2012; Shi et al., 2012). To control for cross-country differences in institutional quality, we adopt the accounting enforcement index proposed by Brown et al. (2014), which measures enforcement differences across countries based on two main dimensions: the quality of the auditing environment and the level of compliance with accounting standards. Brown et al. (2014) show that their index outperforms general legal proxies in capturing country-level enforcement characteristics (see also Preiato et al., 2015)[2]. Appendix A provides definitions for all variables used in this study.

4. EMPIRICAL RESULTS AND DISCUSSIONS

[2] In addition to year and industry fixed effects, the inclusion of the Financial Secrecy Index (FSI) for the first hypothesis and the Enforcement variable (Brown et al., 2014) for the second hypothesis ensures that our models adequately control for cross-country differences. These variables serve as proxies for country-fixed effects, capturing institutional variations across countries and mitigating the need for additional country-level fixed effects in our regression analyses.

4.1 Descriptive Statistics

Summary statistics are reported in Tables 2 and 3. Table 2 presents the average CbC reporting and tax avoidance measures by country. According to our data, the UK, which is the most frequently represented country in the sample, occupies a middle-range position in terms of the average CbC reporting score. Regarding tax avoidance, Italy shows the lowest tax avoidance score across all measures. This may be attributed to Italy's proactive stance over the past two decades in designing and implementing innovative legislation aimed at combating tax evasion and avoidance. Additionally, Italy's statutory corporate income tax rate declined by 13 percentage points—from 37% in 2000 to 24% in 2017, making it one of the European countries with the sharpest reductions in statutory corporate tax rates since 2000 (Manzitti, 2018). Conversely, Ireland records the highest tax avoidance score across all measures. Specifically, the mean *ETR* and *CETR* values for Ireland are –0.147 and –0.133, respectively, which, after being multiplied by −1 for interpretability, translate to 14.7% and 13.3%. These values fall slightly above the country's statutory corporate tax rate of 12.5%, indicating that, on average, MNCs in Ireland pay relatively less than their reported earnings would suggest. This aligns with Ireland's reputation as a tax haven and supports our use of these measures to capture aggressive tax planning behaviour. For instance, in August 2016, the European Commission accused Ireland of negotiating a special corporate tax arrangement with Apple, allowing the company to pay significantly less than the statutory rate for over a decade (Barrera and Bustamante, 2018). The UK also occupies a middle-range position in terms of tax avoidance scores.

[Insert Table 2 here]

For the pooled sample reported in Table 3, the mean cost of equity capital (*CoE*) is 0.11, and the median is 0.10, which is consistent with prior studies (see, for example, El Ghoul et al.,

2011). The mean and median values of CbC reporting are 0.41 and 0.39, respectively. For the long-run cash effective tax rate (*Lr-CETR*), both the mean and median are 0.27. The mean and median of the long-run effective tax rate (*Lr-ETR*) are 0.28.

Regarding the control variables, the mean and median of firm size (*Size*) are both 16. The mean leverage (*Lev*) is 0.25, with a median of 0.24. The mean value of firm growth (*Growth*) is 0.09, and the median is 0.08. The average market beta (*Beta*) is 0.96, with a median of 0.92. Finally, the mean return on assets (*ROA*) is 0.072, and the median is 0.065.

[Insert Table 3 here]

Table 4 reports the correlations between *CbC, Lr-CETR, Lr-ETR, CoE,* and the control variables. Consistent with our expectations, the univariate results indicate a significant negative correlation between CbC reporting and tax avoidance, and a positive correlation between *CoE* and tax avoidance. Additionally, there is a significant positive correlation between *CoE* and Beta. Furthermore, *CoE* is significantly negatively correlated with both *Size* and *ROA*.

[Insert Table 4 here]

4.2 Multivariate Tests: Results and Discussions

In the multivariate analyses, we examine the relationship between the level of CbC reporting and tax avoidance, with the results presented in Table 5. We further investigate the effect of CbC reporting on the cost of equity capital and report these findings in Table 6. Additionally, Table 6 presents the results for sub-samples of firms with low and high levels of tax avoidance, allowing us to assess whether the impact of CbC reporting on the cost of equity capital differs across these groups.

4.2.1 CbC reporting and tax avoidance

We investigate the relationship between tax avoidance and the level of CbC reporting (H1) using a pooled regression model with robust clustered standard errors, as specified in Model 1 below:

$$CbC_{i,t} = \alpha + \beta_1 TaxAvoid_{i,t} + \beta_2 Size_{i,t} + \beta_3 ROA_{i,t} + \beta_4 Lev_{i,t} + \beta_5 Growth_{i,t} + \beta_6 Audit\_Q_{i,t} + \beta_7 Seg\_Q_{i,t} + \beta_8 FSI_{i,t} + \beta_9 YearFixedEffect_t + \beta_{10} IndustryFixedEffect_i + \varepsilon_{i,t} \quad (1)$$

where:

CbC is the country by country reporting measured as the ratio of country-level sales to the total consolidated sales reported in the annual report.

TaxAvoid is the tax avoidance measured using lagged *Lr-CETR* and lagged *Lr-ETR*.

Lr-CETR is the long-run cash effective tax rate measured as the sum of cash taxes paid over a 5-year period divided by the sum of pre-tax earnings over the same 5 years multiplied by -1.

Lr-ETR is the long-run effective tax rate measured as the sum of income tax expenses over a 5-year period divided by the sum of pre-tax earnings over the same 5 years multiplied by -1.

Size is firm size measured as the natural logarithm of total assets of an MNC.

ROA is return on assets measured as the net income deflated by total assets of an MNC.

Lev is firm leverage measured as the total debt of an MNC deflated by its total assets.

Growth is firm growth measured as the log of one plus the MNC's growth in book value of equity over the previous year.

Audit-Q is audit quality measured using a dummy variable, which equals 1 if an MNC is audited by a Big-4 firm, and equals zero otherwise.

Seg-Q is segment reporting quality measured using a dummy variable, which equals 1 for years after the adoption of IFRS 8, and equals zero otherwise.

FSI is a financial secrecy index, which measures country-level financial secrecy by Financial Secrecy Index calculated by the Tax Justice Network.

Detailed definitions are provided in Appendix A.

The results are reported in Table 5. In the first and second columns, the coefficients of tax

avoidance, measured by lagged *Lr-CETR* and lagged *Lr-ETR*, are negative and statistically significant at the 5% level ($\beta = -0.15$; $p < 0.05$) and at the 1% level ($\beta = -0.29$; $p < 0.01$), respectively. From an economic perspective, the magnitude of these effects is also noteworthy. A one-unit increase in lagged *Lr-CETR* is associated with a 15 percentage point reduction in the level of CbC reporting, while a one-unit increase in lagged *Lr-ETR* corresponds to a 29 percentage point reduction. Given that the average CbC reporting score in our sample is 0.41, these estimates suggest that higher tax avoidance substantially reduces the extent of CbC disclosure. Even a more moderate increase in tax avoidance (e.g., 0.1) leads to a meaningful reduction in CbC reporting by 1.5 to 2.9 percentage points, which supports the practical relevance of our findings.

These results provide consistent evidence that MNCs with higher levels of tax avoidance tend to engage in lower levels of CbC reporting. This finding suggests that firms engaged in tax avoidance have less incentive to disclose CbC information, likely due to concerns over increased risk of detection and enforcement by tax authorities or heightened reputational risk from media exposure (Graham et al., 2014; Hanlon and Heitzman, 2010). EY (2015) reports that 89% of MNC managers expressed concern about media attention on their low effective tax rates. Similarly, Graham et al. (2014) find that 69.5% of surveyed firms consider potential reputational damage among the most important factors in deciding whether to engage in tax avoidance. Akamah et al. (2018) show that firms with high tax avoidance provide limited information that would facilitate understanding of their global operations and structured transactions in foreign jurisdictions, thereby avoiding public scrutiny. Bankman (2004) argues that tax avoidance reflects poor corporate citizenship and can adversely impact firm value. Balakrishnan et al. (2019) provide further evidence that firms engaging in tax avoidance exhibit lower levels of overall corporate transparency.

Supporting Hypothesis 1, our analysis presents strong evidence that tax avoidance acts as a

disincentive to providing detailed CbC disclosures. Tax-avoiding MNCs may fear that a high level of CbC reporting would partially reveal their global allocation of revenues and tax payments, potentially inviting negative media coverage and public criticism. As a result, managers of such firms may opt to disclose less CbC information to minimize reputational risk.

Regarding the control variables, Table 5 shows that MNCs audited by Big Four firms exhibit higher levels of CbC reporting. The coefficient on audit quality (*Audit-Q*) is positive and significant at the 5% level ($\beta = 0.058$), indicating that engagement with a Big Four auditor enhances the quality of public financial disclosures. This finding extends the existing literature, suggesting that CbC reporting, as a measure of tax transparency, is positively associated with audit quality (Lennox, 1999). It also implies that large audit firms, being more reputation-conscious, are more likely to work with MNCs that engage in transparent reporting.

Additionally, the level of CbC reporting has significantly increased following the introduction of IFRS 8 (*Seg-Q*), as evidenced by a positive and statistically significant coefficient at the 1% level ($\beta = 0.10$). This result suggests that the adoption of the management approach under IFRS 8 has contributed to improvements in the quality of CbC disclosures. We also find that MNCs with higher leverage tend to report lower levels of CbC information.

Regarding the Financial Secrecy Index (*FSI*), we find a negative and significant relationship with CbC reporting ($\beta = -0.0037$; $p < 0.01$), indicating that firms located in countries with high financial secrecy scores are less likely to provide detailed CbC disclosures. We revisit the moderating effect of FSI on the relationship between tax avoidance and CbC reporting in Section 5.5. This finding contributes to the international business literature by highlighting the importance of the institutional environment and demonstrating the role of the financial system in enhancing MNCs' tax transparency (Hillier et al., 2011; Qi et al., 2011; Ioannou and Serafeim, 2012; Shi et al., 2012).

[Insert Table 5 here]

To further address concerns regarding unobservable country-level heterogeneity, we re-estimate the models using country-fixed effects in addition to year and industry fixed effects. Since country dummies absorb all time-invariant country-level variation, we exclude the Financial Secrecy Index (*FSI*) from these specifications to avoid multicollinearity. As shown in Table 5 (columns 3 and 4), the coefficients on both tax avoidance measures remain negative and statistically significant ($\beta = -0.10$, $p < 0.05$ for *Lagged Lr-CETR*; $\beta = -0.23$, $p < 0.01$ for *Lagged Lr-ETR*), consistent with our baseline findings. These results confirm that the inverse relationship between tax avoidance and CbC reporting is robust to unobservable, time-invariant country-level factors, and not driven by omitted heterogeneity across jurisdictions.

4.2.2 CbC reporting and the cost of equity capital (CoE)

In the previous section, we established that tax avoidance is negatively associated with the level of CbC reporting. In this section, we build on that finding by examining how investors perceive the level of CbC reporting. Specifically, we investigate the effect of CbC reporting on the cost of equity capital (H2a), as well as the joint effect of CbC reporting and tax avoidance on the cost of equity capital (H2b). The estimation model is specified in Model 2 below:

$$\begin{aligned} CoE_{i,t} = \alpha + \beta_1 CbC_{i,t} + \beta_2 TaxAvoid_{i,t} + \beta_3 CbC_{i,t} * TaxAvoid_{i,t} + \beta_4 Size_{i,t} \\ + \beta_5 Lev_{i,t} + \beta_6 Beta_{i,t} + \beta_7 Growth_{i,t} + \beta_8 Enforcement_{i,t} \\ + \beta_9 YearFixedEffect_t + \beta_{10} IndustryFixedEffect_i + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where

CoE is the cost of equity capital measured using the average of four ex-ante measures: (r_{PEG}), (r_{MPEG}), (r_{OJN}) and (r_{GM}).

Beta is the market beta measure based on the 60 months' rolling beta obtained from CAPM estimates.

Enforcement is a measure of the institutional difference in accounting enforcement between countries, based on an index proposed by Brown et al. (2014).

Detailed definitions of the variables are provided in Appendix A.

The results for testing H2a and H2b are presented in Table 6. Columns 1 and 2 report the results for H2a, using two different measures of tax avoidance (*Lr-CETR* and *Lr-ETR*), while columns 3 to 8 report the results for H2b by examining the relationship between CbC reporting and tax avoidance in low and high tax avoidance sub-samples, and through interaction terms between CbC reporting and both tax avoidance measures.

[Insert Table 6 here]

The results in columns 1 and 2 show a significant negative association between CbC reporting and the cost of equity capital (*CoE*) at the 1% level ($\beta = -0.0054$; $p < 0.01$ and $\beta = -0.0047$; $p < 0.01$, respectively), supporting Hypothesis H2a. In terms of economic significance, the size of the effect is also meaningful. A one-point increase in CbC reporting is associated with a reduction in the cost of equity capital of approximately 47 to 54 basis points. Given the average cost of equity in our sample is 11%, this represents a 4.5% to 5.5% decrease relative to the mean. Even a modest increase in CbC reporting by 0.1 (e.g., 10 percentage points) is linked to a reduction in *CoE* of around 5–6 basis points, which can translate into substantial capital cost savings for large multinational firms. This highlights the practical relevance of CbC transparency for investors.

This finding indicates that investors value CbC information, as it enhances their decision-making and confidence in an MNC's transparency, ultimately reducing the cost of equity capital. This result aligns with information asymmetry theory and previous research suggesting that higher disclosure levels lower the cost of equity capital (e.g., Diamond and Verrecchia, 1991; Botosan, 1997; Leuz, 2000; Botosan and Plumlee, 2002).

CbC reporting provides more granular, country-level information, which is easier to interpret

and more useful for assessing risk concentrations compared to broader regional disclosures (Doupnik and Seese, 2001). As a result, CbC reporting helps investors better assess firm-specific risk, returns, and growth potential, improving the information environment and reducing estimation risk. Furthermore, high levels of CbC reporting signal greater tax transparency (Akamah et al., 2018; Balakrishnan et al., 2019; Oats and Tuck, 2019), and are likely interpreted by investors as evidence of lower tax avoidance. Prior studies show that tax avoidance negatively affects firm value, either by increasing information asymmetry between managers and investors (Lim, 2011; Goh et al., 2016; Chen et al., 2018; Chun et al., 2020), or by incurring reputational costs (Graham et al., 2014; Sikes and Verrecchia, 2020).

Consistent with this literature, our results indicate a positive relationship between tax avoidance and the cost of equity capital. The coefficients on *Lr-CETR* and *Lr-ETR* are both positive and statistically significant ($\beta = 0.0013$; $p < 0.05$ and $\beta = 0.0021$; $p < 0.01$, respectively), as shown in Table 6 (columns 1 and 2). This suggests that investors perceive tax avoidance as a value-diminishing, risky activity, leading to a higher cost of equity capital (Goh et al., 2016; Balakrishnan et al., 2019; Chun et al., 2020). Overall, our findings indicate that public CbC information supports more accurate assessments of profitability and financial risk at the country level and helps investors evaluate the true extent of MNCs' tax avoidance behaviour. These findings support the case for public CbC disclosure, as advocated by tax activists and non-governmental organisations.

With respect to H2b, we expect the negative relationship between CbC reporting and *CoE* to be stronger among MNCs with lower tax avoidance. Columns 3 to 8 in Table 6 present the results. We divide the sample into two groups based on the median values of *Lr-CETR* and *Lr-ETR*. Firms below the median are classified as low tax avoidance, while those at or above the median are classified as high tax avoidance. Columns 3 and 4 report results based on the Lr-*CETR* median split, while columns 5 and 6 use the *Lr-ETR* median. In columns 3 and 5, the

coefficients on CbC are negative and statistically significant at the 10% level (β = -0.0025) and 5% level (β = -0.0040), respectively, indicating that CbC reporting is associated with lower *CoE* for firms with low tax avoidance. In contrast, the coefficients in columns 4 and 6 are positive and statistically insignificant (β = 0.0021 and β = 0.0040), suggesting that high tax avoidance weakens the benefits of CbC reporting.

To further test this interaction, we include interaction terms between CbC reporting and each tax avoidance measure. As shown in columns 7 and 8, the coefficients of the interaction terms (*Lr-CETR × CbC and Lr-ETR × CbC*) are negative and significant at the 10% level (β = -0.018 and β = -0.0079, respectively). These results confirm that the beneficial effect of CbC reporting on the cost of equity is stronger for firms with lower tax avoidance, supporting Hypothesis H2b.

From an economic standpoint, these effects are also meaningful. For MNCs with lower tax avoidance, a 0.1-point increase in CbC reporting is associated with a reduction in the cost of equity capital of approximately 2.5 to 4 basis points. While modest, this reduction represents up to 3.6% of the average *CoE* in our sample, which can yield considerable savings in capital costs for large firms. Furthermore, the interaction effects suggest that when CbC transparency is combined with low tax avoidance, the reduction in *CoE* is even greater, up to 18 basis points (column 7). This reinforces the view that investors reward genuine transparency and tax compliance, emphasising the practical value of credible CbC reporting strategies.

There are two main reasons for this moderating effect. First, tax avoidance increases information opacity and is often associated with more aggressive financial reporting, undermining the reliability of accounting information and increasing uncertainty about future cash flows (Frank et al., 2009; Balakrishnan et al., 2011). Second, tax-avoiding firms face higher potential compliance and reputational costs if their behaviour is uncovered, which can reduce expected future cash flows and increase the cost of capital (Lim, 2011; Goh et al., 2016;

Chen et al., 2018; Campbell et al., 2019; Chun et al., 2020).

Another plausible explanation is that investors reward MNCs that demonstrate both high transparency—via CbC reporting—and low engagement in tax avoidance, by granting them a lower cost of equity capital. These investors may be able to identify MNCs employing "hypocritical" CbC disclosure strategies and differentiate them from firms making genuine transparency efforts. Indeed, our findings show that the synergistic benefit of high CbC reporting combined with low tax avoidance (β = -0.020) exceeds the benefit of CbC reporting alone (β = -0.0024). This finding is consistent with recent research showing that some firms engage in symbolic or superficial disclosure to manage stakeholder impressions and preserve legitimacy (Cho et al., 2015; She and Michelon, 2019).

ADDITIONAL AND ROBUSTNESS TESTS

In this section, we present additional and robustness tests to examine whether the main findings on the relationships between CbC reporting, tax avoidance, and the cost of equity capital remain robust under alternative model specifications and assumptions.

5.1. The Effect of Country-Level Financial Secrecy

The recent leaks of confidential tax-related documents—known as the "Lux Leaks" and the "Panama Papers"—have provided new insights into the harm caused by financial secrecy (Janský et al., 2018). Financial secrecy refers to the extent to which a country's tax and financial systems enable individuals and corporations to conceal their financial activities from regulatory authorities, thereby facilitating tax avoidance (Tax Justice Network, 2020b). In addition to enabling tax avoidance and related offences, financial secrecy has been linked to illegal activities such as drug and arms trafficking and money laundering (Sharman, 2010). Policies that promote financial secrecy are expected to contribute to higher levels of tax avoidance by MNCs. For instance, from 2018 to 2020, the Cayman Islands increased its level

of financial secrecy by 24%, becoming the world's leading facilitator of tax evasion and avoidance, and contributing to an estimated £34.7 billion in global tax revenue losses (Tax Justice Network, 2020b).

We argue that variation in financial secrecy laws and regulations across European countries may incentivize MNCs to engage in greater tax-avoiding behaviour. To test this proposition, we introduce an interaction term, *Lagged Lr-CETR * FSI*, into Model 1 to assess the moderating effect of country-level financial secrecy on the relationship between tax avoidance and the level of CbC reporting. We hypothesize that MNCs with high levels of tax avoidance and domiciled in jurisdictions with high financial secrecy will exhibit lower levels of CbC reporting. The results, reported in Table 7, column 3, show a statistically significant positive interaction effect ($\beta = 0.015$; $p < 0.05$), supporting our hypothesis. This finding aligns with prior research that links corruption and weak institutional environments to increased tax avoidance (e.g., Al-Hadi et al., 2021).

These results highlight the potential for mandating public CbC reporting to serve as a powerful tool in combating financial secrecy. However, such efforts must be framed as part of a global reporting initiative rather than targeting individual high-secrecy jurisdictions in isolation. If one country tightens its financial secrecy regulations, tax-avoiding MNCs can quickly adapt by relocating to alternative jurisdictions with weaker enforcement (ICIJ, 2013). As such, improving transparency in a single country does not necessarily resolve the global issue of financial secrecy.

Indeed, some high-secrecy jurisdictions have resisted even private CbC reporting initiatives, such as the OECD's BEPS Action 13 project. Eccleston and Woodward (2014) critique the bilateral, on-request exchange of CbC reports for its failure to deter tax avoidance effectively. Similarly, Woodward (2016) argues that OECD information exchange policies invite "mock compliance" from high-secrecy countries. This scepticism is validated by Bilicka and Fuest

(2014), who find that countries with high financial secrecy systematically undermine OECD information exchange frameworks. These jurisdictions often sign treaties with irrelevant business partners, meeting the minimum requirement for exchange agreements while avoiding meaningful cooperation with relevant partners involved in tax-avoiding activities.

This remains a significant obstacle to the transition from private to public CbC reporting. Addressing this challenge is essential if CbC reporting is to serve as an effective mechanism for enhancing global tax transparency and curbing cross-border tax avoidance.

[Insert Table 7 here]

5.2 Channel Analysis

The strength of the relationship between tax avoidance and CbC reporting may vary among MNCs in our sample. Therefore, we test two potential channels that could explain differences in the strength of this relationship: political cost and detection risk. We expect both factors to influence management's decision to disclose higher levels of CbC reporting. In our baseline model, we find a negative relationship between CbC reporting and tax avoidance, suggesting that tax avoidance acts as a disincentive to detailed CbC disclosure. Building on this, we further argue that managers of tax-avoiding MNCs may be particularly motivated to limit CbC disclosures to reduce exposure to political scrutiny or detection by tax authorities.

To examine the effect of political cost, we use the relative ranking of MNCs' total equity within each country, following Joshi et al. (2020). MNCs ranking in the top five in total equity in each country are classified as the high political cost group, while the remaining MNCs form the low political cost group. For detection risk, we restrict our analysis to the post-implementation period of BEPS Action 13 and classify MNCs into high and low detection risk groups based on their pre-implementation detection risk levels. Specifically, MNCs are considered to face high detection risk if their pre-implementation detection risk exceeds the sample median, and

low detection risk otherwise. We proxy for detection risk as the difference between the average Lr-CETR and the statutory tax rate in the MNCs' headquarters country during the pre-implementation period.

The results, reported in Table 8, show that the negative relationship between tax avoidance and CbC reporting is statistically significant at the 1% level when detection risk is low ($\beta = -0.72$; $p < 0.01$), but becomes insignificant when detection risk is high ($\beta = -0.34$; $p > 0.10$). The contrast between these coefficients suggests that detection risk is a plausible channel through which tax avoidance influences voluntary public CbC reporting.

Regarding political cost, both coefficients for high and low political cost groups are negative and statistically significant ($\beta = -0.22$; $p < 0.10$ and $\beta = -0.16$; $p < 0.05$, respectively). Thus, we do not find supporting evidence for the expectation that MNCs strategically alter their CbC reporting to mitigate political cost. Instead, our results imply that political cost alone may not be a decisive factor in MNCs' disclosure decisions concerning CbC information.

[Insert Table 8 here]

5.3 Alternative Measures of Tax Avoidance, the Cost of Equity Capital and Model Specifications

First, we replace the main measures of tax avoidance (*Lr-CETR and Lr-ETR*) with *CETR* and *ETR* in Models 1 and 2 to examine whether the relationships are sensitive to the tax avoidance proxies used. The results, reported in columns 1 and 2 of Table 7, show a significant negative relationship between the *lagged CETR* and *lagged ETR* and CbC reporting ($\beta = -0.11$; $p < 0.01$ and $\beta = -0.19$; $p < 0.01$, respectively). These findings provide strong support for the argument that MNCs with higher tax avoidance disclose less CbC information, thereby limiting transparency into their global operations. This confirms that tax avoidance serves as a clear

disincentive to detailed CbC reporting. Furthermore, as shown in Table 9, column 3, we find a significant positive relationship between *CoE* and *ETR* ($\beta = 0.019$; $p < 0.05$), and a significant negative interaction between ETR and CbC reporting ($\beta = -0.013$; $p < 0.10$). These results reinforce our baseline findings and suggest that investors reward firms for greater transparency with lower equity costs, especially among MNCs with lower tax avoidance.

[Insert Table 9 here]

Second, we examine the robustness of the joint effect of CbC reporting and tax avoidance on the cost of equity capital using four alternative measures of *CoE*. Specifically, we employ the price-earnings-growth ratio model (r_{PEG}) (Easton, 2004); the modified price-earnings-growth ratio model (rMPEG) (Easton, 2004); the economy-wide growth model (r_{OJN}) (Ohlson and Juettner-Nauroth, 2005); and the modified economy-wide growth model (r_{GM}) (Gode and Mohanram, 2003). These models are defined in Appendix A. The results, reported in Table 10, consistently support our main finding of a significant negative relationship between CbC reporting and the cost of equity capital.

[Insert Table 10 here]

Third, as shown in Table 1, our sample includes a high proportion of UK-based MNCs (approximately 26%), which is a common feature in European datasets (e.g., Daske et al., 2008; Aharony et al., 2010; Byard et al., 2011; Glaum et al., 2013). To ensure the robustness of our results, we exclude UK firms from the sample and re-estimate all models. The findings remain consistent with our main results, confirming that our conclusions are not driven by the overrepresentation of UK MNCs.

Fourth, we address the potential concern regarding the limited representation of certain countries in our dataset. As shown in Table 1, some countries, such as Russia (5 firm-year observations), Romania (11), and Turkey (12), have very small sample sizes over the 2007–

2018 period. Following prior cross-country studies (e.g., Glaum et al., 2013), we apply a minimum threshold of 15 firm-year observations to ensure the reliability of country-level inference. We re-estimate all main models after excluding these countries, which together represent less than 1% of the total sample. The results remain qualitatively unchanged, supporting the robustness and generalisability of our findings.

5.4 The Effect of BEPS Action 13 Adoption

Another concern in our main analysis is the potential endogeneity between CbC reporting, tax avoidance, and the cost of equity capital. Endogeneity in regression models arises when explanatory variables (e.g., CbC reporting and tax avoidance in our model) are correlated with the error term. This can result from common method variance, measurement errors, or omitted variable bias (Lin et al., 2017; Ullah et al., 2020). To mitigate endogeneity concerns, we employ several alternative procedures.

First, we exploit the adoption of BEPS Action 13 in Europe as an exogenous shock to test the robustness of our results. The OECD introduced BEPS Action 13, requiring MNCs with at least €750 million in annual revenue to file CbC reports for fiscal years beginning on or after January 1, 2016. While these reports are not publicly disclosed, the requirement may encourage MNCs to voluntarily disclose more CbC information in their annual reports. Given that CbC reports are already prepared for submission to tax authorities, the marginal cost of including this information in public disclosures is minimal. Thus, the implementation of BEPS Action 13 serves as a valid exogenous instrument that predicts our key explanatory variable (CbC reporting) while remaining independent of the model's structural error term.

To conduct this analysis, we introduce a dummy variable (*Y2016*), which equals 1 for years 2016 and onward, into our principal models. For Model 1, we examine the interaction between tax avoidance and *Y2016* on *CbC* reporting. The coefficient on Y2016 is positive and

significant at the 1% level ($\beta = 0.12$; $p < 0.01$), providing clear evidence that the level of publicly available CbC information increased after the introduction of the new regulation. This is notable given that BEPS only mandates private disclosure to tax authorities. Moreover, we observe a significant interaction effect between *Lagged Lr-CETR* and Y2016 on CbC reporting ($\beta = -0.36$; $p < 0.05$), as reported in column 4 of Table 7. This supports our contention that MNCs with higher levels of tax avoidance disclosed less CbC information after the implementation of BEPS Action 13.

[Insert Table 11 here]

Regarding Model 2, we analyze the interaction between tax avoidance and *Y2016* on the cost of equity capital. Our findings show that the positive association between *Lagged ETR* and *CoE* is strengthened post-regulation ($\beta = -0.043$; $p < 0.01$), as presented in column 1 of Table 11. Additionally, we examine a three-way interaction among CbC reporting, tax avoidance, and Y2016. The results, reported in column 2 of Table 11, demonstrate that CoE is significantly reduced for MNCs with high levels of CbC reporting and low levels of *Lr-CETR* in the post-BEPS period ($\beta = -0.036$; $p < 0.10$).

These findings reinforce the robustness of our main results and suggest that the introduction of BEPS Action 13 has influenced both disclosure behavior and investor perceptions of tax transparency.

5.5 Sample Selection Bias: Heckman Two-Stage Procedure

We acknowledge that our analysis of the relationship between tax avoidance and the level of CbC reporting may be subject to non-random sample selection. Specifically, focusing on MNCs that engage in tax avoidance introduces the possibility of omitted variable bias and endogeneity (Certo et al., 2016), as firms disclosing less CbC information may also be more likely to engage in aggressive tax avoidance. In other words, the decision to engage in tax

avoidance may not be random, potentially leading to self-selection bias. To address this concern, we apply the Heckman (1977) two-stage procedure to mitigate potential endogeneity.

In the first stage, we estimate a Probit model (see Model 3 below) to calculate the probability that an MNC engages in high tax avoidance. Following Wen et al. (2020), we include Size, ROA, Leverage (*Lev*), Growth, and Audit Quality (*Audit-Q*) as explanatory variables in the selection equation. Since the Heckman model requires an exclusion restriction—a variable that influences selection but not the outcome—we use the mean industry-level percentage of tax avoidance within the same industry and year (*IndTaxAvoid*) as an instrument. This variable captures the idea that MNCs in similar industrial environments may face comparable incentives to engage in tax avoidance, while their industry peers' tax behaviour is unlikely to directly affect an individual firm's level of CbC reporting.

$$\begin{aligned} TaxAvoid_{i,t} = \alpha + \beta_1 Size_{i,t} + \beta_2 Lev_{i,t} + \beta_3 ROA_{i,t} + \beta_4 Growth_{i,t} \\ + \beta_5 Audit\_Q_{i,t} + \beta_6 IndTaxAvoid_{i,t} + \beta_7 FSI_{i,t} \\ + \beta_8 YearFixedEffect_t + \beta_9 IndustryFixedEffect_i + \varepsilon_{i,t} \end{aligned} \quad (3)$$

Panel A of Table 12 reports the results from estimating Model (3). We find that larger MNCs with higher profit margins are more likely to engage in tax avoidance, whereas MNCs with higher leverage and those audited by Big Four firms are less likely to do so. Notably, the coefficient on IndTaxAvoid is positive and significant at the 10% level, supporting the validity of the exclusion restriction used in the first-stage regression. This stage generates the inverse Mills ratio (*IMR*), which is included in the second-stage regression to correct for potential self-selection bias. The control variables used in the second-stage regression mirror those in our main model.

Panel B of Table 12 presents the second-stage results, which show that the relationship between *Lagged Lr-CETR* and CbC reporting remains negative and statistically significant (β = -0.29;

$p < 0.01$). These findings indicate that self-selection bias is unlikely to influence the validity of our main results.

[Insert Table 12 here]

Similarly, we apply the Heckman two-stage method to address potential endogeneity concerns in our second hypothesis, which examines the relationship between the cost of equity capital (*CoE*) and CbC reporting. In the first stage, we use the mean percentage of CbC reporting within an MNC's industry and year (*IndCbC*) as an exogenous variable. The results confirm that the negative relationship between CoE and CbC remains statistically significant.

In summary, we find consistent evidence across all models and robustness tests, indicating that our core findings are not driven by sample selection bias or estimation technique.

5.6 Instrumental Variable (IV) Approach

Despite the inclusion of several control variables in our models, it is still possible that unobserved firm-specific or regional characteristics may influence tax avoidance. Such omitted variables could potentially drive our baseline results. To address this concern, we adopt an instrumental variables approach and employ the two-stage least squares (2SLS) method to control for potential endogeneity bias. However, it is well established that 2SLS may yield misleading results if the instruments used are not valid (Larcker and Rusticus, 2010; Ullah et al., 2020). A valid instrumental variable must meet three key criteria: (i) it must be causally related to the endogenous explanatory variable, (ii) it should influence the dependent variable only through its effect on the endogenous variable (i.e., satisfy the exclusion restriction), and (iii) it must be uncorrelated with the error term in the outcome equation (Larcker and Rusticus, 2010; Ullah et al., 2020).

Following Wen et al. (2020), we adopt two instrumental variables for the endogeneity tests: (1) the industry average percentage of MNCs' effective tax rate (*ETR*), and (2) a dummy variable

indicating whether the firm reported negative earnings in the previous year (*Loss*). The industry average ETR is a suitable instrument because it captures the overall tax environment within an industry, which influences individual firms' tax avoidance behaviours but is unlikely to directly affect a specific firm's CbC reporting, thus satisfying the exclusion restriction (Chen et al., 2010; Lennox et al., 2013). The loss dummy is also relevant, as firms reporting losses in the prior year may pursue different tax strategies and reporting incentives, which are plausibly exogenous to current voluntary disclosure decisions.

We perform several post-estimation diagnostics to assess the validity of our instruments. The Anderson LM test for under-identification ($\chi^2(2) = 111.08$, $p < 0.01$) confirms that our instruments are relevant. The Cragg-Donald F-statistic ($F = 57.015$) exceeds the Stock-Yogo critical value of 19.93 at the 10% maximal IV size, indicating that the instruments are not weak. Additionally, the Sargan test of over-identification ($\chi^2(1) = 0.404$, $p = 0.5250$) supports the validity of the instruments, suggesting they are uncorrelated with the error term.

The first-stage regression results confirm that the coefficient on IndTaxAvoid is positive and statistically significant at the 1% level, as expected. The second-stage regression shows that the coefficient on *Lagged Lr-CETR* remains significantly negative ($\beta = -0.34$; $p < 0.05$). These results confirm that the observed negative association between tax avoidance and CbC reporting persists even after accounting for endogeneity concerns. The full results are presented in Table 13.

(Insert Table 13 here)

One potential concern with our analysis is the possibility of reverse causality. While it may be argued that MNCs disclosing a low level of CbC information are more likely to engage in high tax avoidance behaviour, we contend that this form of endogeneity is unlikely, as our models use lagged measures of tax avoidance. This approach helps ensure that most tax avoidance

activities occur before CbC disclosures are reported in the annual reports, reducing the likelihood that current disclosure influences prior tax behaviour.

Nonetheless, to robustly address the issue of reverse causality, we employ the dynamic panel system Generalized Method of Moments (GMM) estimator developed by Blundell and Bond (1998). This method allows us to control for endogeneity arising from potential feedback effects between CbC reporting and tax avoidance. Specifically, we incorporate lagged tax avoidance measures and IndTaxAvoid into our main model as instruments.

The results, presented in Table 14, demonstrate consistency between the GMM estimates and our main findings. Our results remain robust after accounting for dynamic reverse causality, providing strong support for our conclusion that MNCs with higher levels of tax avoidance are more likely to report lower levels of CbC disclosure.

[Insert Table 14 here]

5 DISCUSSION AND CONCLUSION

Our study is the first to investigate the relationship between public voluntary Country-by-Country (CbC) reporting, tax avoidance, and the cost of equity capital. Using a sample of the top 500 European non-financial multinational corporations (MNCs) over the period 2007–2018, we provide robust evidence that the extent of CbC disclosure in MNCs' annual reports is significantly influenced by their tax avoidance behaviour. This finding aligns with prior research suggesting that geographic aggregation in financial disclosures is often motivated by tax minimization strategies (Akamah et al., 2018; Hope et al., 2013; Brown et al., 2019).

We further contribute to the literature by demonstrating a significant negative association between CbC reporting and the cost of equity capital. Investors appear to reward firms that provide transparent disclosures, interpreting higher levels of CbC reporting as a signal of lower risk and improved accountability. Expanding on this, we examine the joint effect of CbC

reporting and tax avoidance on the cost of equity and find that investors value both transparency and responsible tax behaviour. Importantly, our findings suggest that investors are capable of discerning between genuine and strategic (or "hypocritical") disclosure practices, valuing CbC information only when supported by low levels of tax avoidance. This extends the work of Joshi (2020) by focusing on voluntary public rather than mandatory private CbC reporting among non-financial institutions.

The broader implications of our findings underscore the challenges of enforcing global tax compliance, especially when some MNCs possess revenues comparable to the GDP of smaller nations. As highlighted during the COVID-19 crisis, countries such as Denmark, Poland, and France denied financial support to MNCs registered in tax havens (The Guardian, 2020). However, such symbolic measures are unlikely to recover the £179 billion in global annual direct tax revenue losses estimated in 2019 (Tax Justice Network, 2020b). This highlights the urgent need for coordinated international action to regulate corporate tax practices and enhance transparency.

Our findings suggest that MNCs are highly sensitive to the reputational risks and financial consequences of tax avoidance. This reinforces the call for a globally enforced CbC reporting framework underpinned by international law. Policymakers and regulators across jurisdictions must recognise that unchecked corporate tax avoidance erodes social trust and economic equity. In an increasingly interconnected world, collaborative solutions are essential to combat systemic tax evasion.

We argue that the current CbC reporting requirements for non-financial MNCs should transition from private submission to public disclosure. Public CbC reporting would empower stakeholders—governments, investors, civil society—to make informed assessments of tax fairness and regulatory effectiveness. Despite the BEPS Action 13 initiative, transparency

remains limited: as of 2020, only 89 of the 135 countries required to implement it had established exchange relationships for CbC reports (OECD, 2020). This lack of global coverage impedes international dialogue on tax policy and weakens enforcement efforts.

Unlike BEPS, which remains a private disclosure regime, the Global Reporting Initiative's GRI 207 standard is the only framework that mandates public CbC reporting. We therefore strongly advocate for the integration of GRI 207 into MNCs' disclosure strategies to ensure comprehensive and accessible tax transparency.

While we use the effective tax rate (ETR) as our primary proxy for tax avoidance—consistent with previous studies—we acknowledge that tax haven status is a relevant and complementary indicator. Future research could explore matched samples of firms operating in tax havens versus non-haven jurisdictions, or compare CbC disclosers to non-disclosers, to provide deeper insights into tax avoidance strategies and disclosure practices.

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Appendix A: Variable definition

Variable	Definition
CbC	The country by country reporting measured as the ratio of country-level sales to the total consolidated sales reported in the annual report.
CoE	The cost of equity capital measured using the average of four ex-ante measures; (r_{PEG}), (r_{MPEG}), (r_{OJN}) and (r_{GM}).
(r_{PEG})	The price-earnings growth ratio model (PEG) (Easton, 2004), which is measured using the following equation $$r_{PEG} = \sqrt{\frac{E(eps_2) - E(eps_1)}{P_0}}$$ Where: eps_t= earnings per share at the period *t*. *P* = Stock price at the period *t*.
(r_{MPEG})	The modified price-earnings-growth ratio method (Easton, 2004), which is measured using the following equation $$r_{MPEG} = A + \sqrt{A^2 + (E(eps_2) - (E(eps_1))/P_0}$$ $$A = E(dps_1)/2P_0$$ where: dps_t = dividends per share at the period *t*.
(r_{OJN})	The economy-wide growth model (Ohlson and Juettner-Nauroth, 2005), which is measured using the following equation

	$$r_{OJN} = A + \sqrt{A^2 + \left(\frac{eps_{t+1}}{P_t}\right) \times \left\{\frac{\frac{eps_{t+3} - eps_{t+2}}{eps_{t+2}} + \frac{eps_{t+5} - eps_{t+4}}{eps_{t+4}}}{2} - (\gamma - 1)\right\}}$$ Where: γ = the rate of growth in abnormal earnings post forecast horizon. In implementing the model, γ is equal to the risk-free rate less 3%, where the 3 % represents economy-wide growth.
(r_{GM})	The modified economy-wide growth model (Gode and Mohanram, 2003), which is measured using the following equation $$r_{OJN} = A + \sqrt{A^2 + \left(\frac{eps_1}{P_0}\right) \times \left(\frac{eps_2 - eps_1}{eps_1} - (\gamma - 1)\right)}$$ Where: $$A = \frac{1}{2}\left(\gamma - 1 + \frac{dps_1}{P_0}\right)$$
ETR	Tax avoidance proxy, which is the effective tax rate measured as current income tax expense divided by total pre-tax accounting income multiplied by -1.
CETR	Tax avoidance proxy, which is the cash effective tax rate measured as cash taxes paid divided by total pre-tax accounting income multiplied by -1.
Lr-ETR	Tax avoidance proxy, which is the long-run effective tax rate measured as the sum of income tax expense over 5 years divided by the sum of pre-tax earnings over 5 years multiplied by -1.

Lr-CETR	Tax avoidance proxy, which is the long-run Cash effective tax rate measured as the sum of cash taxes paid over 5 years divided by the sum of pre-tax earnings over 5 years multiplied by -1.
Size	Firm size measured as the natural logarithm of an MNC's total assets.
Lev	Firm leverage measured as the total debt of an MNC deflated by total assets.
ROA	Return on assets measured as the net income deflated by total assets.
Growth	Firm growth measured as the log of one plus the MNC's growth in book value of equity over the previous year.
Audit-Q	Audit quality measured using a dummy variable, which equals 1 if an MNC is audited by a Big-4 firm and equals zero otherwise.
Seg-Q	Segment reporting quality measured using a dummy variable, which equals 1 for years after the adoption of IFRS 8 and equals zero otherwise.
Beta	Market beta measure as the 60 months rolling beta obtained from CAPM estimates.
FSI	The financial secrecy index is a measure of country-level financial secrecy and is measured using the financial Secrecy index calculated by the Tax Justice Network.
Enforcement	A measure of the institutional differences in accounting enforcement between countries that is based on an index proposed by Brown et al. (2014).

Notes: Table by authors

Appendix B: Two Extracts of CbC information:

Extract 1: External sales and fixed assets are distributed per significant country as follows:

Country	Sales to external customers 2016 MSEK	Percent	Sales to external customers 2015 MSEK	Percent	Fixed assets 2016 MSEK	Percent	Fixed assets 2015 MSEK	Percent
Sweden	7,763	50	7,283	50	4,811	69	6,669	79
USA	5,679	37	5,163	36	1,324	19	1,195	14
Rest of the world	2,109	14	2,040	14	856	12	601	7
Total	**15,551**	**100**	**14,486**	**100**	**6,991**	**100**	**8,465**	**100**

[1] *Non-current assets other than financial instruments, deferred tax assets and pension assets. Source:* ***Swedish Match, Annual Report 2016***

Extract 2 :Information By Country, Continuing Operations Revenue By Country, Group

Country	**2015**	**2016**
USA	13,598	11,951
Germany	6,980	6,707
China	6,406	5,569
Australia	3,625	4,286
Italy	3,245	3,561
Sweden	3,525	3,189
France	2,834	2,839
UK	3,799	2,824
Russia	2,350	2,792

Country	**2015**	**2016**
South Africa	2,979	2,736
India	3,200	2,560
Mexico	2,197	2,356
Canada	2,499	2,113
Japan	2,079	2,197
Indonesia	1,542	1,577
Other countries	25,887	24,196
Total	**85,845**	**81,553**

Source: ***Sandvik Annual Report 2016***

Table 1: Total number of firm-year observations per country

Country	Number of firm-year observations	Percent
Austria	30	0.93
Belgium	81	2.50
Denmark	118	3.64
Finland	64	1.97
France	576	17.76
Germany	406	12.52
Ireland	36	1.11
Italy	106	3.27
Netherlands	188	5.80
Norway	68	2.10
Poland	28	0.86
Portugal	23	0.71
Romania	11	0.33
Russia	5	0.15
Spain	111	3.42
Sweden	214	6.60
Switzerland	271	8.36
Turkey	12	0.37
UK	895	27.60
Total	**3,243**	**100.00**

Notes. The sample consists of 3,243 firm-year observations over the period 2007 to 2018 (8 industries). Appendix A outlines definitions and data sources for all variables. Table by authors

Table 2: The average of CbC reporting and tax avoidance per country

Country	*CbC*	*Lr-CETR*	*Lr-ETR*	*CETR*	*ETR*
Austria	0.354	-0.224	-0.225	-0.231	-0.234
Belgium	0.490	-0.277	-0.273	-0.269	-0.268
Denmark	0.296	-0.270	-0.270	-0.267	-0.263
Finland	0.325	-0.244	-0.259	-0.227	-0.247
France	0.339	-0.278	-0.287	-0.277	-0.285
Germany	0.330	-0.286	-0.302	-0.284	-0.295
Ireland	0.373	-0.133	-0.148	-0.133	-0.147
Italy	0.441	-0.317	-0.299	-0.310	-0.300
Netherlands	0.424	-0.258	-0.266	-0.256	-0.261
Norway	0.570	-0.274	-0.299	-0.280	-0.292
Poland	0.632	-0.255	-0.225	-0.228	-0.212
Portugal	0.432	-0.197	-0.224	-0.204	-0.240
Romania	0.666	-0.189	-0.178	-0.176	-0.178
Russia	0.193	-0.197	-0.229	-0.189	-0.211
Spain	0.555	-0.271	-0.288	-0.272	-0.283
Sweden	0.550	-0.268	-0.272	-0.261	-0.269
Switzerland	0.345	-0.244	-0.248	-0.236	-0.242
Turkey	0.399	-0.227	-0.219	-0.220	-0.220
UK	0.469	-0.270	-0.277	-0.263	-0.272
Total sample	**0.413**	**-0.268**	**-0.276**	**-0.264**	**-0.271**

Notes. The sample consists of 3,243 firm-year observations over the period 2007 to 2018 (8 industries). All tax avoidance measures (*Lr-CETR, Lr-ETR, CETR, ETR*) are multiplied by −1 so that higher values reflect greater tax avoidance, consistent with prior literature (e.g., Chen et al., 2010; Rego and Wilson, 2012). Appendix A outlines definitions and data sources for all variables. Table by authors

Table 3: Descriptive Statistics of CbC reporting, the cost of equity capital, tax avoidance and control variables

Variable	Mean	0.250	Median	0.750
CbC	0.413	0.037	0.392	0.705
CoE	0.107	0.0813	0.0971	0.123
R_{PEG}	0.098	0.070	0.088	0.115
R_{MPEG}	0.111	0.083	0.101	0.129
R_{OJN}	0.105	0.083	0.099	0.120
R_{GM}	0.116	0.088	0.106	0.134
Lr-CETR	-0.268	-0.331	-0.269	-0.203
Lr-ETR	-0.276	-0.340	-0.282	-0.212
CETR	-0.264	-0.346	-0.258	-0.168
ETR	-0.271	-0.345	-.279	-0.201
Beta	0.964	0.650	0.920	1.220
Size	16.12	15.24	15.98	17.07
Lev	0.252	0.147	0.240	0.344
Growth	0.088	-.011	0.078	0.169
ROA	0.072	0.039	0.065	0.097
Enforcement	45.06	42	45	54
FSI	48	41	45	56
Audit-Q	0.928	1	1	1
Seg-Q	0.852	1	1	1

Notes. The sample consists of 3,243 firm-year observations over the period 2007 to 2018 (8 industries). Appendix A outlines definitions and data sources for all variables. Table by authors

Table 4: Pearson correlations for the CbC reporting, the cost of equity capital, tax avoidance and control variables

	CoE	*Lr-CETR*	*Lr-ETR*	*CbC*	*Beta*	*Size*	*Lev*	*Growth*	*ROA*	*Enforcement*
CoE	1									
Lr-CETR	-0.0261	1								
	<0.0001									
Lr-ETR	-0.099	0.8267	1							
	<0.0001	*<0.0001*								
CbC	-0.0548	-0.0544	-0.0974	1						
	0.0021	*0.0019*	*<0.0001*							
Beta	0.1178	0.0020	0.0474	-0.0272	1					
	<0.0001	*0.8732*	*0.0001*	*0.1193*						
Size	-0.081	-0.0394	0.0022	0.0311	0.0144	1				
	<0.0001	*0.0015*	*0.8457*	*0.0736*	*0.2308*					
Lev	0.1138	-0.0061	0.0537	0.0100	-0.0175	0.1535	1			
	<0.0001	*0.6254*	*<0.0001*	*0.5667*	*0.1465*	*<0.0001*				
Growth	-0.1411	0.0454	-0.0094	-0.0367	0.0198	-0.1349	-0.0769	1		
	<0.0001	*0.0003*	*0.4264*	*0.0360*	*0.1059*	*<0.0001*	*<0.0001*			
ROA	-0.3178	0.0132	-0.0068	-0.0046	-0.0646	-0.2369	-0.1646	0.2629	1	
	<0.0001	*0.2888*	*0.5614*	*0.7923*	*<0.0001*	*<0.0001*	*<0.0001*	*<0.0001*		
Enforcement	-0.0981	0.0535	0.1197	0.0104	0.0397	0.2311	0.0909	0.0236	0.0189	1
	<0.0001	*<0.0001*	*<0.0001*	*0.5448*	*0.0009*	*<0.0001*	*<0.0001*	*0.0481*	*0.1036*	
Audit-Q	-0.0159	-0.0396	-0.0785	0.0195	0.0204	-0.0254	-0.0530	-0.0082	0.0362	0.0281
	0.1936	*0.0014*	*<0.0001*	*0.2575*	*0.0872*	*0.0271*	*<0.0001*	*0.4877*	*0.0009*	*0.0080*

Notes. The sample consists of 3,243 firm-year observations over the period 2007 to 2018 (8 industries). Appendix A outlines definitions and data sources for all variables. *** p-value<0.01, ** p-value <0.05, * p-value <0.1. Significance levels are shown in italics. Table by authors

Table 5: The relationship between CbC reporting and tax avoidance

	(1) *CbC*	(2) *CbC*	(3) *CbC*	(4) *CbC*
Lagged Lr-CETR	-0.15**		-0.10**	
	(-2.39)		*(-2.23)*	
Lagged Lr-ETR		-0.29***		-0.23***
		(-4.19)		*(-3.24)*
Size	0.0054	0.0045	0.014***	0.012**
	(1.00)	*(0.85)*	*(2.60)*	*(2.30)*
ROA	0.0071	-0.018	-0.17	-0.18
	(0.049)	*(-0.12)*	*(-1.16)*	*(-1.23)*
Lev	-0.18***	-0.16***	-0.23***	-0.20***
	(-4.06)	*(-3.59)*	*(-5.06)*	*(-4.51)*
Growth	-0.028	-0.031	-0.018	-0.021
	(-0.67)	*(-0.74)*	*(-0.43)*	*(-0.52)*
Audit-Q	0.058**	0.053**	0.042	0.036
	(2.23)	*(2.13)*	*(1.56)*	*(1.39)*
Seg-Q	0.10***	0.097***	0.077***	0.076***
	(3.31)	*(3.24)*	*(2.61)*	*(2.62)*
FSI	-0.0037***	-0.0037***		
	(-6.93)	*(-7.07)*		
Constant	0.40***	0.45***	0.11	0.16
	(4.07)	*(4.66)*	*(0.94)*	*(1.41)*
N	3,152	3,243	3,152	3,243
adj. R^2	0.058	0.061	0.114	0.113
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes
Country Dummies	No	No	Yes	Yes

This table reports the results of testing the relationship between CbC reporting and tax avoidance. Tax avoidance is measured using two proxies: *Lagged Lr-CETR* and *Lagged Lr-ETR*. Columns (1) and (2) present baseline models including year and industry fixed effects. Columns (3) and (4) re-estimate the same models with the addition of country-fixed effects to control for unobservable, time-invariant country-specific factors. In line with standard practice, time-invariant country-level variables such as the Financial Secrecy Index (FSI) are excluded from the country-fixed effects specifications to avoid multicollinearity. All continuous variables are winsorized at the 1st and 99th percentiles. Appendix A outlines definitions and data sources for all variables.

***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. *t*-statistics based on standard errors clustered at the firm level are reported in parentheses. Table by authors

Table 6: The relationship between CbC reporting, tax avoidance and the cost of equity capital

	(1)	(2)	(3) High Tax Avoidance	(4) Law Tax avoidance	(5) High Tax Avoidance	(6) Low Tax avoidance	(7)	(8)
	CoE	*CoE*	*CoE*	*CoE*	*CoE*	*CoE*	*CoE*	*CoE*
CbC	-0.0054***	-0.0047***	-0.0056**	-0.0050**	-0.0086***	-0.0025	-0.0057	-0.0060
	(-3.06)	*(-2.66)*	*(-2.12)*	*(-2.07)*	*(-3.18)*	*(-1.08)*	*(-1.04)*	*(-1.08)*
Lr-CETR	0.013**						0.023***	
	(1.96)						*(2.61)*	
Lr-ETR		0.021***						0.026***
		(2.87)						*(2.72)*
*Lr-CETR * CbC*							-0.018*	
							(-1.70)	
*Lr-ETR * CbC*								-0.0079*
								(-1.75)
Size	0.0047***	0.0049***	0.0046***	0.0048***	0.0042***	0.0052***	0.0047***	0.0049***
	(9.24)	*(9.62)*	*(6.02)*	*(6.89)*	*(5.30)*	*(7.91)*	*(9.24)*	*(9.62)*
Beta	0.018***	0.015***	0.019***	0.016***	0.014***	0.016***	0.018***	0.015***
	(13.3)	*(12.1)*	*(10.7)*	*(7.79)*	*(8.25)*	*(8.27)*	*(13.3)*	*(12.1)*
Lev	0.022***	0.019***	0.014**	0.028***	0.011*	0.025***	0.022***	0.019***
	(4.82)	*(4.33)*	*(2.23)*	*(4.45)*	*(1.76)*	*(4.17)*	*(4.82)*	*(4.33)*
Growth	-0.024***	-0.022***	-0.016***	-0.033***	-0.015**	-0.034***	-0.024***	-0.022***
	(-5.86)	*(-5.53)*	*(-2.79)*	*(-5.59)*	*(-2.56)*	*(-5.87)*	*(-5.86)*	*(-5.53)*
Enforcement	-0.00030***	-0.00027***	-0.00023*	-0.00041***	-0.00034**	-0.00033***	-0.00030***	-0.00027***
	(-3.48)	*(-3.12)*	*(-1.73)*	*(-3.53)*	*(-2.55)*	*(-2.94)*	*(-3.48)*	*(-3.13)*
Constant	0.032***	0.034***	0.028**	0.032***	0.047***	0.022*	0.032***	0.034***
	(3.46)	*(3.71)*	*(1.99)*	*(2.61)*	*(3.16)*	*(1.88)*	*(3.34)*	*(3.52)*
N	3,045	3,116	1,456	1,589	1,475	1,641	3,045	3,116
adj. R^2	0.236	0.228	0.246	0.231	0.234	0.232	0.236	0.226
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table reports the results of testing the relationship between *CoE*, *CbC* and tax avoidance. Tax avoidance is measured using two measures (*Lr-CETR and Lr-ETR*). Appendix A outlines definitions and data sources for all variables. The sample ranges between 3,045 to 3,116 firm-year observations over the period 2007 to 2018 (8 industries).
*** p-value<0.01, ** p-value <0.05, * p-value <0.1. *t*-statistics in parentheses and italics, which are based on standard errors adjusted for clustering at the firm level. All continuous variables are winsorized at the 1st and 99th percentiles. Table by authors

Table 7: The relationship between CbC reporting and tax avoidance

	(1) *CbC*	(2) *CbC*	(3) *CbC*	(4) *CbC*
Lagged CETR	-0.11***			
	(-2.76)			
Lagged ETR		-0.19***		
		(-3.84)		
Lagged Lr-CETR			-0.55*	-0.064
			(-1.88)	*(-0.87)*
*Lagged Lr-CETR * FSI*			0.015**	
			(2.45)	
Y2016				0.12***
				(2.61)
*Y2016 * Lagged Lr-CETR*				-0.36**
				(-2.47)
Size	0.0073	0.0027	0.0043	0.0050
	(1.34)	*(0.52)*	*(0.80)*	*(0.92)*
ROA	0.038	-0.032	-0.022	-0.0061
	(0.26)	*(-0.22)*	*(-0.15)*	*(-0.042)*
Lev	-0.19***	-0.16***	-0.18***	-0.18***
	(-4.25)	*(-3.58)*	*(-3.98)*	*(-4.06)*
Growth	-0.042	-0.029	-0.027	-0.027
	(-0.98)	*(-0.70)*	*(-0.65)*	*(-0.64)*
Audit-Q	0.056**	0.049*	0.057**	0.059**
	(2.16)	*(1.96)*	*(2.19)*	*(2.27)*
Seg-Q	0.11***	0.10***	0.10***	0.071**
	(3.47)	*(3.46)*	*(3.36)*	*(2.36)*
FSI	-0.0040***	-0.0037***	-0.00011	-0.0037***
	(-7.41)	*(-7.08)*	*(-0.068)*	*(-6.87)*
Constant	0.38***	0.45***	0.25**	0.39***
	(3.76)	*(4.65)*	*(2.17)*	*(3.87)*
N	3,085	3,238	3,152	3,152
adj. R^2	0.061	0.061	0.059	0.059
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes

This table reports the results of testing the relationship between *CbC* and tax avoidance. Tax avoidance is measured using three measures (*Lagged Lr-CETR*, *Lagged CETR* and *Lagged ETR*). Appendix A outlines definitions and data sources for all variables. The sample ranges between 3,085 and 3,152 firm-year observations over the period 2007 to 2018 (8 industries). *** p-value<0.01, ** p-value <0.05, * p-value <0.1. *t*-statistics in parentheses and italics, which are based on standard errors adjusted for clustering at the firm level. All continuous variables are winsorized at the 1st and 99th percentiles. Table by authors

Table 8: The relationship between CbC reporting, tax avoidance, political cost and detection risk

	Detection Risk (high)	*Detection Risk (low)*	*Political Cost (high)*	*Political Cost (low)*
	CbC	*CbC*	*CbC*	*CbC*
Lagged Lr-CETR	-0.34	-0.72***	-0.22*	-0.16**
	(-1.40)	*(-3.60)*	*(-1.88)*	*(-1.99)*
Size	-0.029*	0.043**	-0.031***	0.0022
	(-1.76)	*(2.48)*	*(-2.67)*	*(0.30)*
RoA	0.15	0.0032	-0.63**	0.087
	(0.33)	*(0.0070)*	*(-2.12)*	*(0.52)*
Lev	-0.46***	-0.28**	0.12	-0.15***
	(-3.38)	*(-2.21)*	*(1.35)*	*(-2.89)*
Growth	0.053	0.062	0.074	-0.021
	(0.42)	*(0.48)*	*(0.84)*	*(-0.45)*
Audit-Q	0.026	-0.027	0.016	0.067**
	(0.41)	*(-0.35)*	*(0.37)*	*(2.06)*
Seg-Q			0.075	0.11***
			(1.39)	*(2.99)*
FSI	-0.0026	-0.0075***	-0.0017	-0.0038***
	(-1.30)	*(-4.90)*	*(-1.61)*	*(-6.09)*
Constant	1.09***	0.32	1.08***	0.39***
	(3.65)	*(1.03)*	*(5.67)*	*(2.91)*
N	358	454	814	2,338
adj. R^2	0.104	0.139	0.231	0.043
Year Dummies	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes

This table reports the results of testing the relationship between CbC reporting and tax avoidance through channel analysis. Tax Avoidance is measured using *Lagged Lr-CETR*. Appendix A outlines definitions and data sources for all variables. The sample ranges between 814 and 2,338 firm-year observations. *** p-value<0.01, ** p-value <0.05, * p-value <0.1. *t*-statistics in parentheses and italics, which are based on standard errors adjusted for clustering at the firm level. All continuous variables are winsorized at the 1st and 99th percentiles. Table by authors

Table 9: The relationship between CbC reporting, tax avoidance and the cost of equity capital

	(1) *CoE*	(2) *CoE*	(3) *CoE*
CbC	-0.0053***	-0.0048***	-0.00030
	(-2.95)	*(-2.74)*	*(-0.077)*
CETR	0.0097*		
	(1.86)		
ETR		0.0095*	0.019**
		(1.94)	*(2.36)*
ETR * CbC			-0.013*
			(-1.70)
Size	0.0046***	0.0048***	0.0048***
	(8.97)	*(9.44)*	*(9.44)*
Beta	0.018***	0.015***	0.015***
	(13.4)	*(12.4)*	*(12.3)*
Lev	0.022***	0.019***	0.019***
	(4.86)	*(4.40)*	*(4.40)*
Growth	-0.025***	-0.022***	-0.022***
	(-5.92)	*(-5.51)*	*(-5.52)*
Enforcement	-0.00033***	-0.00029***	-0.00029***
	(-3.89)	*(-3.37)*	*(-3.37)*
Constant	0.032***	0.033***	0.035***
	(3.39)	*(3.54)*	*(3.74)*
N	2,981	3,111	3,111
adj. R^2	0.232	0.225	0.226
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes

This table reports the results of testing the relationship between *CoE*, *CbC* and tax avoidance. Tax avoidance is measured using two measures (*CETR and ETR*). Appendix A outlines definitions and data sources for all variables. The sample ranges between 2,981 and 3,111 firm-year observations over the period 2007 to 2018 (8 industries).
*** p-value<0.01, ** p-value <0.05, * p-value <0.1. *t*-statistics in parentheses and italics, which are based on standard errors adjusted for clustering at the firm level. All continuous variables are winsorized at the 1st and 99th percentiles. Table by authors

Table 10: The relationship between CbC reporting, tax avoidance and the cost of equity capital measures

	(1) r_{peg}	(2) r_{peg}	(3) r_{mpeg}	(4) r_{mpeg}	(5) r_{gm}	(6) r_{gm}	(7) r_{ojn}	(8) r_{ojn}
CbC	-0.0091***	-0.00074	-0.0063***	-0.0045	-0.0070***	-0.0047	-0.0048***	-0.010**
	(-2.77)	*(-0.59)*	*(-3.12)*	*(-0.71)*	*(-3.42)*	*(-0.74)*	*(-3.44)*	*(-2.39)*
Lr-CETR	0.020**	0.031**	0.017**	0.020*	0.017**	0.021*	0.0041	0.013
	(2.48)	*(2.51)*	*(2.18)*	*(1.67)*	*(2.15)*	*(1.67)*	*(0.76)*	*(1.53)*
*Lr-CETR * CbC*		-0.040***		-0.025**		-0.024*		0.0091
		(-3.23)		*(-2.04)*		*(-1.94)*		*(1.08)*
Size	0.0036***	0.0036***	0.0049***	0.0049***	0.0048***	0.0048***	0.0039***	0.0039***
	(6.05)	*(6.00)*	*(8.49)*	*(8.47)*	*(8.06)*	*(8.04)*	*(9.57)*	*(9.58)*
Beta	0.019***	0.019***	0.016***	0.016***	0.017***	0.017***	0.012***	0.012***
	(11.9)	*(11.9)*	*(10.5)*	*(10.5)*	*(10.9)*	*(10.9)*	*(11.6)*	*(11.7)*
Lev	0.020***	0.020***	0.019***	0.019***	0.019***	0.019***	0.020***	0.020***
	(3.87)	*(3.83)*	*(3.71)*	*(3.70)*	*(3.62)*	*(3.61)*	*(5.53)*	*(5.58)*
Growth	-0.018***	-0.017***	-0.027***	-0.027***	-0.028***	-0.028***	-0.0096***	-0.0096***
	(-3.64)	*(-3.63)*	*(-5.74)*	*(-5.74)*	*(-5.91)*	*(-5.91)*	*(-2.91)*	*(-2.93)*
Enforcement	-0.00040***	-0.00039***	-0.00042***	-0.00042***	-0.00052***	-0.00052***	-0.00021***	-0.00021***
	(-3.90)	*(-3.88)*	*(-4.29)*	*(-4.29)*	*(-5.16)*	*(-5.15)*	*(-3.06)*	*(-3.10)*
Constant	0.046***	0.049***	0.043***	0.044***	0.053***	0.054***	0.033***	0.030***
	(4.21)	*(4.38)*	*(4.06)*	*(3.99)*	*(4.91)*	*(4.84)*	*(4.46)*	*(4.00)*
N	2,730	2,730	2,746	2,746	2,679	2,679	2,864	2,864
adj. R^2	0.178	0.178	0.197	0.196	0.211	0.210	0.234	0.234
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table reports the results of testing the relationship between *CoE, CbC* and tax avoidance. Tax avoidance is measured as *Lr-CETR*. The cost of equity capital is measured using four measures (r_{PEG}, r_{MPEG}, r_{GM}, *and* r_{OJN}). Appendix A outlines definitions and data sources for all variables. The sample ranges between 2,679 to 2,864 firm-year observations over the period 2007 to 2018 (8 industries).

*** p-value<0.01, ** p-value <0.05, * p-value <0.1. *t*-statistics in parentheses and italics, which are based on standard errors adjusted for clustering at the firm level. All continuous variables are winsorized at the 1st and 99th percentiles. Table by authors

Table 11: The relationship between CbC reporting, tax avoidance and the cost of equity capital

	(1) *CoE*	(2) *CoE*
CbC	-0.0060	-0.0056
	(-1.09)	*(-0.83)*
Lr-CETR	0.024**	0.025**
	(2.13)	*(2.00)*
*Lr-CETR * CbC*	-0.0011	-0.0015
	(-0.054)	*(-0.062)*
*Lr-CETR * Y2016*	-0.043***	-0.046**
	(-2.88)	*(-2.02)*
*CbC * Y2016*		-0.0014
		(-0.12)
*Lr-CETR * CbC * Y2016*		-0.036*
		(-1.68)
Y2016	-0.018***	-0.019***
	(-3.83)	*(-2.76)*
Size	0.0048***	0.0048***
	(9.36)	*(9.36)*
Beta	0.018***	0.018***
	(13.1)	*(13.1)*
Lev	0.021***	0.021***
	(4.75)	*(4.74)*
Growth	-0.024***	-0.024***
	(-5.85)	*(-5.84)*
Enforcement	-0.00028***	-0.00028***
	(-3.29)	*(-3.29)*
Constant	0.033***	0.034***
	(3.50)	*(3.48)*
N	3,045	3,045
adj. R^2	0.238	0.237
Year Dummies	Yes	Yes
Industry Dummies	Yes	Yes

This table reports the results of testing the relationship between *CoE*, *CbC* and tax avoidance. Tax avoidance is measured using *Lr-CETR*. Appendix A outlines definitions and data sources for all variables. The sample consists of 3,045 firm-year observations over the period 2007 to 2018 (8 industries).

*** p-value<0.01, ** p-value <0.05, * p-value <0.1. *t*-statistics in parentheses and italics, which are based on standard errors adjusted for clustering at the firm level. All continuous variables are winsorized at the 1st and 99th percentiles. Table by authors

Table 12: Heckman Two-stage test

Panel A: First Stage (Selection Model)	(1) *Lr-CETR*	Panel B: Second Stage (Outcome Model)	(2) *CbC*
Size	0.12***	*Size*	0.0097
	(4.00)		*(1.03)*
ROA	1.11	*ROA*	0.033
	(1.43)		*(0.20)*
Lev	-0.49**	*Lev*	-0.18***
	(-2.18)		*(-3.20)*
Growth	0.15	*Growth*	-0.025
	(0.68)		*(-0.58)*
Audit-Q	0.28**	*Audit-Q*	0.067**
	(2.31)		*(2.04)*
IndTaxAvoid	3.27*	*Seg-Q*	0.14*
	(1.68)		*(1.85)*
FSI	-0.0029	*FSI*	-0.0038***
	(-0.97)		*(-6.68)*
		Lagged Lr-CETR	-0.29***
			(-4.19)
		IMR	0.19
			(0.67)
Constant	-2.07**	Constant	0.30
	(-2.29)		*(1.23)*
N	3,515		3,240
Year Dummies	Yes		Yes
Industry Dummies	Yes		Yes

This table presents the results of the Heckman two-stage model. Panel A (first stage) uses *Lr-CETR* as the dependent variable in a Probit regression [see model (3)], with *IndTaxAvoid* as an exogenous variable, calculated as the mean *Lr-CETR* within the firm's industry in year *t*, excluding the firm itself. Panel B (second stage) includes the inverse Mills ratio (IMR) from the first stage in the main regression, where *Lr-CETR* is regressed on *CbC* and control variables. Robust *t*-statistics, adjusted for clustering at the firm level, are reported in parentheses and italics.
Significance levels are denoted as follows: *** p < 0.01, ** p < 0.05, * p < 0.1. Table by authors

Table 13: Endogeneity test using 2SLS approach

	IV *CbC*
Lagged Lr-CETR	-0.73*
	(-1.95)
Size	0.0084
	(1.34)
ROA	0.023
	(0.15)
Lev	-0.16***
	(-3.69)
Growth	-0.035
	(-0.85)
Audit-Q	0.059**
	(2.30)
Seg-Q	0.070**
	(2.24)
FSI	-0.0040***
	(-6.90)
Constant	0.54***
	(4.76)
N	3,243
adj. R^2	0.057
Year Dummies	Yes
Industry Dummies	Yes
Post-estimation tests	
Under-identification (Anderson LM)	$\chi^2(2) = 111.084$
Weak identification (Cragg-Donald F)	57.015
Stock-Yogo Critical Value (10%)	19.93
Over-identification (Sargan Test)	$\chi^2(1) = 0.404$

This table reports the results of testing the relationship between *CbC* and tax avoidance. Tax avoidance is measured as *Lagged Lr-CETR* based on the instrumental estimation approach. Appendix A outlines definitions and data sources for all variables. The sample consists of 3,243 firm-year observations over the period 2007 to 2018 (8 industries).

*** p-value<0.01, ** p-value <0.05, * p-value <0.1. *t*-statistics in parentheses and italics, which are based on standard errors adjusted for clustering at the firm level. All continuous variables are winsorized at the 1st and 99th percentiles. Table by authors

Table 14: Endogeneity test using GMM technique

	GMM *CbC*
Lagged CbC	2.18***
	(56.7)
Lagged Lr-CETR	-0.17*
	(-1.67)
Size	0.017**
	(2.23)
ROA	-0.076
	(-0.42)
Lev	-0.16***
	(-2.73)
Growth	0.059
	(0.98)
Audit-Q	0.046
	(1.58)
Seg-Q	-0.020
	(-0.57)
FSI	-0.00027
	(-0.37)
Constant	-2.25***
	(-15.8)
N	2,917
Year Dummies	Yes
Industry Dummies	No

This table reports the results of testing the relationship between *CbC* and tax avoidance. Tax avoidance is measured as Lagged Lr-CETR based on the system GMM technique after adding a lag of *CbC* to the model as an explanatory variable. Appendix A outlines definitions and data sources for all variables. The sample consists of 2,917 firm-year observations over the period 2007 to 2018 (8 industries).
*** p-value<0.01, ** p-value <0.05, * p-value <0.1. *t*-statistics in parentheses and italics, which are based on standard errors adjusted for clustering at the firm level. All continuous variables are winsorized at the 1st and 99th percentiles. Table by authors