Essays on Tax Regulations and Firm Responses

Inauguraldissertation

zur

Erlangung des Doktorgrades

der

Wirtschafts- und Sozialwissenschaftlichen Fakultät

der

Universität zu Köln

2021

vorgelegt von

Mathias Dunker, M.Sc.

aus

Bergisch Gladbach

Referent: Prof. Dr. Michael Overesch, Universität zu Köln

Korreferent: Prof. Dr. Carsten Homburg, Universität zu Köln

Tag der Promotion: 20.12.2021

Vorwort

Die vorliegende Arbeit entstand während meiner Tätigkeit als wissenschaftlicher Mitarbeiter am Seminar für ABWL und Unternehmensbesteuerung der Universität zu Köln. Sie wurde im Oktober 2021 von der Wirtschafts- und Sozialwissenschaftlichen Fakultät der Universität zu Köln als Dissertation angenommen. Das Entstehen dieser Arbeit wurde durch die qualifizierte Unterstützung zahlreicher Personen geprägt, denen ich an dieser Stelle meinen Dank aussprechen möchte.

Mein herzlichster Dank gilt meinem Doktorvater Herrn Prof. Dr. Michael Overesch für seine hilfsbereite und uneingeschränkte Unterstützung während meiner Promotionszeit. Seine wertvollen Anregungen, konstruktiven Kritiken sowie der fachliche Austausch haben maßgeblich zum Gelingen der Arbeit beigetragen. Zudem danke ich Herrn Prof. Dr. Carsten Homburg für die Erstellung des Zweitgutachtens und Herrn Prof. Dr. Dieter Hess für die Übernahme des Vorsitzes der Prüfungskommission. Ich danke ferner Herrn Prof. Dr. Martin Fochmann für die konstruktive und fachlich sehr gute Zusammenarbeit bei einem Forschungsprojekt, das Bestandteil dieser Dissertation ist.

Ein großer Dank gebührt auch meinen Kolleginnen und Kollegen am Seminar für ABWL und Unternehmensbesteuerung der Universität zu Köln. Die freundschaftliche und produktive Atmosphäre sowie zahlreiche gemeinsame Unternehmungen und Lehrstuhlausflüge werden mir in bester Erinnerung bleiben. Namentlich hervorheben möchte ich meinen Büronachbarn Herrn Dr. Tobias Kölle und Herrn Max Pflitsch, mit denen mich eine über die Arbeit hinausgehende Freundschaft verbindet. Besonderer Dank gilt Frau Sina Willkomm und Herrn Max Pflitsch, mit denen ich jeweils ein Forschungsprojekt entwickeln und umsetzen durfte. Abschließend möchte ich aus dem Kreis des Lehrstuhlteams Frau Dr. Sabine Strüder und Frau Tanja Breuer danken, die beide für mich immer ein offenes Ohr hatten und mich vielfältig bei meiner Promotion unterstützt haben.

Zutiefst dankbar bin ich meinem Bruder Thomas und meinen Eltern Rita und Bernd Dunker, die mich auf meinem bisherigen Lebensweg stets dabei bedingungslos unterstützt haben, meine Ziele zu verfolgen. Mein größter Dank gilt meiner Frau Julia für ihre liebevolle Art, ihren unerschöpflichen Zuspruch und ihre schier unendliche Geduld. Sie hat mir während meiner Promotionszeit den notwendigen und uneingeschränkten Rückhalt gegeben.

Köln, im Oktober 2021 Mathias Dunker

Content

Chapter 1

Introduction

Chapter 1

1.1 Motivation and Object of Research

The COVID-19 pandemic has added about $24 trillion to global debt in 2020 as shown by a study of the Institute of International Finance (IIF, 2021). The IIF estimates that half of the rise accounts for government support programs aiming to cushion adverse consequences for firms and private households. In turn, investigative journalists and researchers of the Tax Justice Network report that multinational enterprises [MNEs] are shifting profits into tax haven countries causing governments around the world to lose approximately $245 billion in tax revenues every year (Tax Justice Network, 2021). Moreover, according to a recent study from the U.S. Department of Treasury, the top one percent of the highest-earning U.S. households dodge around $163 billion in annual taxes.[1] This mismatch of countries being more indebted than ever before in modern history and MNEs and private taxpayers massively engaging in tax avoidance, thereby preventing to pay what is commonly known as their 'fair share of taxes', highlights the need for well-grounded research on tax regulations more than ever.

The phenomenon of MNEs avoiding taxes on a large scale is not new to academic research and policymakers (Shackelford and Shevlin, 2001; Hanlon and Heitzman, 2010).[2] For more than a decade now, also the media coverage of corporate tax avoidance has incrementally increased (Lee, 2015; Chen, Schuchard and Stomberg, 2019). Anecdotal evidence suggests that numerous profitable MNEs engage in various forms of tax avoidance. Mostly U.S. MNEs have received a lot of media attention in recent years for exploiting the international tax landscape by shifting profits to low-tax jurisdictions or tax haven countries, leading to effective tax rates [ETRs] in the single digits.[3] The revelation of highly sensitive data on state-aided aggressive

[1] Press release by the *U.S. Department of Treasury* (07/09/2021), available at: https://home.treasury.gov/news/featured-stories/the-case-for-a-robust-attack-on-the-tax-gap. The data on the tax gap, i.e., the difference between taxes owed and taxes collected, is retrieved from Guyton et al. (2021).

[2] For example, Dyreng, Hanlon, Maydew and Thornock (2017) find a substantial decrease in effective tax rates of multinational and domestic firms over the past 25 years that can hardly be explained by declining statutory tax rates.

[3] *The Washington Post* (24/07/2018), available at: https://www.washingtonpost.com/business/2018/07/24/across-globe-taxes-corporations-plummet/, *The Guardian* (07/10/2019), available at: https://www.theguardian.com/business/2019/oct/07/corporate-tax-avoidance-climate-crisis-inequality and *Institute on Taxation and Economic Policy* (29/07/2021), available at: https://itep.org/corporate-tax-avoidance-under-the-tax-cuts-and-jobs-act/.

tax avoidance schemes and harmful tax planning structures in the global tax scandals of Luxembourg Leaks in 2014, the Panama Papers in 2016 or the Paradise Papers in 2017 have once more fueled the debate on a fairer taxation of MNEs (Huesecken and Overesch, 2015; O'Donovan, Wagner and Zeume, 2019).[4]

Governments around the world and supranational organizations have not been idle over the past decade to limit excessive tax avoidance of MNEs. Numerous regulations have been implemented on a national or global scale aiming at fostering tax compliance and reducing tax planning opportunities of the firms. For instance, the 'Base Erosion and Profit Shifting' [BEPS] project of the Organization for Economic Co-operation and Development [OECD] proposes an international framework of 15 action items, primarily in order to effectively limit profit shifting from high-tax to low-tax countries of MNEs (OECD, 2015). Amongst others, enhancing transparency around a firm's tax affairs is considered as one of the most important policy tools to curb tax avoidance and raise tax revenues (European Commission, 2015; Her Majesty's Revenue and Customs [HMRC], 2015; OECD, 2017). Tax transparency regulations are expected to limit tax avoidance via three channels (Müller, Spengel and Vay, 2020): First, tax authorities could make use of the disclosed information to improve tax audits; second, the new information could help to detect legal loopholes causing adjustments of the tax law; and, third, *public* tax transparency requirements could increase public scrutiny that may incentivize firms to alter their tax behavior. On a global level, the private Country-by-Country [CbC] reporting, which is being introduced by several countries participating in the BEPS project, represents a significant tax transparency regulation and requires the disclosure of various key financial indicators by reference to an MNE's geographic economic presence.[5] Moreover, regarding

[4] Very recently, in October 2021 the International Consortium of Investigative Journalists [ICIJ] published 11.9 million leaked documents uncovering information concerning secretive offshore finance and tax haven usage. Press release by the *ICIJ* (03/10/2021), available at: https://www.icij.org/investigations/pandora-papers/about-pandora-papers-investigation/.

[5] So far, more than 90 jurisdictions worldwide have introduced CbC reporting filing obligations. Information on CbC reporting by jurisdictions can be retrieved from https://www.oecd.org/tax/automatic-exchange/country-specific-information-on-country-by-country-reporting-implementation.htm.

public transparency requirements, large firms in the U.K. are obliged to publish information on their tax strategies since 2017, including a description on their attitude towards tax planning.

Besides tax transparency requirements, more specific anti-tax avoidance regulations have been implemented or amended on a national and international scale within the last couple of years. These regulations comprise, for example, thin capitalization rules or controlled foreign company [CFC] rules (OECD, 2015). In this regard, the U.S. administration under Donald Trump installed the 'Global Intangible Low-Taxed Income' [GILTI] provision, an anti-abuse provision as part of the U.S. tax reform of 2017, aiming at deterring alleged abusive firm structures in low-tax jurisdictions and building up intellectual property [IP] in the USA.

This thesis aims to enhance the understanding of the effects of tax regulations on firm behavior. Particularly, the thesis addresses the question of how firms respond to tax transparency regulations and anti-tax avoidance measures. Many tax regulations, such as the U.K. tax strategy disclosure requirement or the GILTI provision as part of the U.S. tax reform, have only been in force for a few years and, thus, not been extensively analyzed yet. Accordingly, in order to provide guidance for adequate policy making, it is worth and necessary to study how firms react to (new) regulatory tax requirements. The four independent essays of my thesis address three challenges concerning different dimensions of firm responses on current tax regulations.

The *first challenge* lies in evaluating the informativeness of *qualitative* tax transparency regulations. A well-known strand of prior research has already investigated how informative *quantitative* disclosures such as the reporting of Uncertain Tax Benefits [UTBs] according to the U.S. FIN 48 regulation or CbC reporting are about a firm's tax behavior (Lisowsky, 2009; Lisowsky, Robinson and Schmidt, 2013; Hanlon, 2018; Brown, Jorgensen and Pope, 2019). Although these studies provide a crucial basis for assessing the information content in terms of tax planning activities, they effectively face the problem that the actual tax behavior of a firm per se is unobservable. A complementary source of information about firms' tax behavior is

seen in *qualitative* tax disclosures that researchers incrementally begin to examine. In contrast to quantitative disclosures that contain numerical information such as tax payments or taxable income, qualitative disclosures in annual reports or other publications provide text-based statements or descriptions of certain firm aspects. Qualitative disclosures are more versatile and the management has more discretion in terms of the length, wording or even the start of these disclosures (Law and Mills, 2015; Inger, Meckfessel, Zhou and Fan, 2018). Assumingly, managers will be reluctant to disclose anything that might result in adverse consequences for the firm, for example, discussing tax planning schemes or profit shifting activities in detail in case this will alarm stakeholders (Ehinger, Lee, Stomberg and Towery, 2020). However, the existing literature has not yet sufficiently scrutinized what qualitative tax disclosures effectively signal and if these disclosures can be attributed to real economic aspects or if managers only provide vague and boilerplate information. Drawing conclusions on the informativeness of qualitative tax disclosures is of particular importance for the recipients of these disclosures to retrieve information useful for decision-making. Moreover, insights on the informativeness of these disclosures could provide guidance for policymakers to readjust disclosure requirements and thus, foster tax transparency and create confidence in qualitative tax disclosures of firms.

The *second challenge* in empirical tax research is to evaluate anti-tax avoidance measures in terms of their effectiveness in limiting corporate tax avoidance and to provide a basis for policymakers to readjust or implement these measures. Political initiatives to restrict corporate tax avoidance are manifold and a myriad number has already been implemented on a national and global level in the last couple of years. As elaborated above, increased mandatory transparency regarding firms' approach to tax is considered as one such possible corrective to unacceptable tax avoidance. However, legislative initiatives enhancing *qualitative* tax transparency of firms are still in their initial stages. Insights if these initiatives successfully reduce firms' improper tax behaviors or if they simply represent a 'check the box' rule for the firms to follow without leading to desired changes are highly demanded (Oats and Tuck, 2019;

Müller, Spengel and Vay, 2020). So far, little is known about how firms respond to mandatory qualitative tax transparency.

Moreover, anti-tax avoidance regulations do not solely aim at increasing tax expenditures of firms being accused for not paying their 'fair share of taxes'. Particularly nationally implemented anti-abuse provisions are supposed to provide disincentives for certain real economic activities like cross-border investments in low-tax countries, thereby fostering the domestic economy. Analyzing how firms react to new legislative requirements is essentially important to evaluate if these rules have achieved their goals or if legislative readjustments are necessary (Dharmapala, 2018; Wilde and Wilson, 2018; Oats and Tuck, 2019).

The *third challenge* tax researchers face relies on the public accessibility of tax data. Tax data is usually limited to what is required to be disclosed in financial statements and corporate reports. Thus, empirical-archival studies are oftentimes not feasible to gain knowledge on certain tax-related issues such as internal tax-relevant processes of a firm or personal motives and attitudes of managers towards tax planning (Graham, Hanlon, Shevlin and Shroff, 2014). Data acquisition regarding corporate tax information that go beyond publicly available data is arduous or for reasons of confidentiality not possible. Particularly information about internal processes in a tax department of a firm or within a tax consulting firm is treated highly confidential because this data may reveal commercially sensitive information that can attract tax authorities' or competitors' interest. Acquiring and analyzing this information could tremendously extend the knowledge of how firms react to environmental tax influences, like the taxation procedure, and structure their internal tax-related processes. Moreover, legislative inefficiencies might be uncovered. Based on this knowledge, insights on the demand for internal renewals of firm processes and the need for legislative changes could be gained.

The four essays of this thesis aim to address the presented challenges in tax research. The first essay *"Tax (Risk) Disclosures in Annual Reports and Tax Positions of Firms"* is co-authored by Martin Fochmann, Chair of Accounting and Taxation at the Free University of

Berlin, and Michael Overesch, Chair of Business Taxation at the University of Cologne. The paper analyzes the effects of tax risk disclosures in annual reports of European firms on their tax positions. We find that tax risk disclosing firms experience a significant decline in ETRs and ETR volatilities after an initial disclosure relative to firms that abstain from a disclosure. Our results suggest that tax risk disclosures signal a more refined tax management and a more professionalized approach to tax risks, thereby influencing tax planning opportunities and the exposure to tax risks. Thus, the paper provides evidence on the informativeness of tax disclosures and related firm behavior. Amongst others, my contribution to the essay was the data collection and processing, the execution of empirical analyses and writing the scientific paper. The paper was presented at the *Doctoral Research Seminar in Cologne 2018*, the *4th Vienna Doctoral Consortium in Taxation at the WU University of Economics and Business 2018*, the *42nd European Accounting Association Annual Congress in Paphos 2019*, and the *VHB Annual Conference in Rostock 2019*.

The second essay *"Tax Transparency through Mandatory Qualitative Disclosures – Determinants and Effects of U.K. Tax Strategy Reports"* is co-authored by Sina Willkomm, doctoral research assistant at the Chair of Business Taxation at the University of Cologne. We examine the determinants of the qualitative and public U.K. tax strategy reports and investigate the effectiveness of these disclosures in curbing corporate tax avoidance. We show that tax-avoiding firms provide less transparent tax strategy reports. Moreover, we document a significant increase in ETRs of U.K. firms subject to the disclosure regulation relative to unaffected peers. We reason that qualitative and publicly available information about firms' tax strategies can serve as an adequate instrument for policymakers to effectively curb tax avoidance. My co-author and I were equally responsible for the development of the research idea, the data collection and processing, the empirical data analyses and writing the scientific essay. Earlier versions of this paper were presented at the *Doctoral Research Seminar in*

Cologne 2020 and the *8th Annual Conference of the Tax Administration Research Centre in Exeter 2020*.

The third essay *"The Effects of the U.S. Tax Reform on Investments in Low-Tax Jurisdictions – Evidence from Cross-Border M&As"* is co-authored by Michael Overesch, Chair of Business Taxation at the University of Cologne, and Max Pflitsch, doctoral research assistant at the Chair of Business Taxation at the University of Cologne. In this paper, we scrutinize the effects of the U.S. tax reform of 2017 on cross-border M&As of U.S. acquirers. In particular, we demonstrate that a new and widely discussed anti-abuse provision of the tax reform is effective at deterring investments in low-tax jurisdictions. My co-authors and I were equally responsible for the data collection, the implementation of empirical analyses and writing the scientific essay.

The thesis concludes with the essay *"The Review of Trade Tax Assessment Notices – Evidence from the Field"*, which is single-authored. Except for making the contact to employees of a tax consulting firm, the paper has been developed by myself and thus is my sole responsibility. I conduct a series of interviews with employees of a large tax consulting firm in order to gain knowledge about the current review process of trade tax assessment notices and thus, about the relevance to digitize this process. The interview results indicate that the review of trade tax assessment notices is not an overly extensive process within the tax declaration function of a tax consulting firm. Nonetheless, my results suggest that a digitally supported review of tax assessment notices is a promising approach to streamline the review process.

1.2 Tax (Risk) Disclosures in Annual Reports and Tax Positions of Firms

1.2.1 Research Question and Design

The first essay "Tax (Risk) Disclosures in Annual Reports and Tax Positions of Firms" examines the effects of disclosures about tax risks in European firms' annual reports on their tax positions. Since 2005, European firms are required to describe the principal risks and

uncertainties in their annual reports that they face (Directive 2003/51/EC). However, the disclosure of information about tax risks is not explicitly prescribed in the European Union. Therefore, the management has some discretion to decide whether or not to provide information on tax risks in its annual report. Our explorative analysis reveals a remarkable increase of tax risk disclosures in annual reports of European firms since 2005. In an era of incremental political and media focus on corporate taxes, we investigate if this disclosure phenomenon can be attributed to an ordinary time trend or if tax risk disclosures are associated with altered tax positions of the firms. More precisely, we scrutinize a potential effect of initial tax risk disclosures in annual reports on firms' future ETRs and ETR volatilities.

We review a dataset of 5,760 annual reports of STOXX Europe 600 firms for information about tax risks over a period from 2005 to 2015. Using a software-based text mining approach and a manual examination, we identify annual reports that explicitly include information on tax risks. In order to analyze the disclosure effect on firms' tax positions, we employ Propensity Score Matching [PSM]. The PSM alleviates concerns regarding a self-selection bias and compares tax avoidance behaviors and tax risk exposures of disclosing firms with similar firms that do not disclose. Using this matched sample of similar disclosing and non-disclosing firms, we deploy a Difference-in-Differences [DiD] approach embedded in an OLS regression model.

1.2.2 Results and Contribution to the Literature

Our results suggest that tax risk disclosing firms experience a significant decline in their ETRs relative to their non-disclosing peers after an initial disclosure. In particular, the ETR decreases on average by 2.6 percentage points after a firm has started to disclose tax risks in its annual report. Moreover, we find a negative association between an initial disclosure and firms' future tax risks, measured by the ETR volatility. That is, the ETR volatility decreases on average by 1.2 percentage points for disclosing firms relative to firms that abstain from any tax risk

disclosure. Based on our findings, we conjecture that tax risk disclosures signal an amendment of tax affairs within the firm and an implementation of a professionalized tax risk management, thereby enhancing tax planning opportunities and limiting future tax risk exposures.

Our study contributes to the informativeness of risk disclosures in annual reports. While prior studies find that risk factor disclosures provide meaningful information (Kravet and Muslu, 2013; Campbell et al., 2014), our results suggest that managers systematically avoid disclosures of unpleasant tax risk information. Rather, tax risk disclosures signal good news such as the implementation of a more refined tax management. Moreover, we add to the recent debate on tax transparency and the discussion about voluntary and mandatory disclosures of tax information. Previous studies mainly investigate settings of mandatory tax transparency (Dyreng, Hoopes and Wilde, 2016; Joshi, 2020; Overesch and Wolff, 2021). These studies find a positive effect of mandatory tax transparency on future ETRs. We show that an effectively voluntary tax disclosure in annual reports is associated with lower future ETRs. Our results are in line with findings of Kao (2019) who finds a positive relation between voluntary tax disclosures in Corporate Social Responsibility [CSR] reports and corporate tax avoidance. Firms clearly take advantage of the leeway when disclosing specific information on taxes in annual reports or other publications (e.g., Hope, Ma and Thomas, 2013; Neuman, Omer and Shelley, 2013; Akamah, Hope and Thomas, 2018).

1.3 Tax Transparency through Mandatory Qualitative Disclosures – Determinants and Effects of U.K. Tax Strategy Reports

1.3.1 Research Question and Design

The second essay "Tax Transparency through Mandatory Qualitative Disclosures – Determinants and Effects of U.K. Tax Strategy Reports" analyzes the determinants and effects of obligatory disclosures concerning firms' tax strategies in the U.K. In the past decade, tax transparency initiatives have been discussed and implemented by policymakers worldwide,

particularly intending to curb corporate tax avoidance. For example, the European Commission stated in 2015 that it gives "high priority to improving tax transparency" for securing fairer taxation and enhancing tax compliance, thereby tackling aggressive tax planning (EU Commission, 2015). So far, most tax transparency regulations require the disclosure of key financial data (cf. OECD's CbC reporting regulation) and are not public. Empirical evidence on the determinants and effects of *qualitative* and *public* tax disclosures is rather scarce (Oats and Tuck, 2019).

The U.K. tax strategy disclosure regulation, enacted in the U.K. Finance Act 2016, is a unique tax transparency requirement because it mandates large firms to *publicly* disclose *qualitative* information about their tax strategy. Effectively for financial years ending December 31, 2017, affected firms have to report on four mandatory tax-related categories such as their attitude towards tax planning or their approach towards dealings with the U.K. tax authority HMRC. The regulation aims at improving transparency around a firm's tax behavior towards the HMRC, consumers and other stakeholders and, second, limiting tax avoidance (HMRC, 2015). For our analysis, we hand-collect more than 2,000 tax strategy reports of large U.K. firms and MNEs. We partition each report into the prescribed categories and perform several text mining steps. We construct variables regarding the textual characteristics of the reports such as length, similarity among the reports, and usage of uncertainty words (Belnap, 2019; Loughran and McDonald, 2011). Based on our text mining approach, we investigate if the scope and the textual characteristics of a tax strategy report are related to tax avoidance and other firm characteristics.

Second, we use this regulatory event as an exogenous shock and analyze ETR levels of affected U.K. firms around the implementation of the regulation. More precisely, we conduct several independent OLS regression approaches to test the impact of the tax transparency requirement on affected firms' tax avoidance relative to several unaffected control groups.

Ensuring comparability between affected firms and their unaffected peers, we apply various PSM algorithms.

1.3.2 Results and Contribution to the Literature

With respect to our text mining analysis, we find that firms with low ETRs are more likely to omit certain mandated categories within their reports and provide shorter reports with more uncertainty word usage. Our results suggest that tax-avoiding firms use the legal leeway when preparing the reports and publish on average less transparent reports: These firms are less likely to fully comply with the regulation.

With respect to the regulations' effectiveness in curbing tax avoidance, we document an increase in ETRs of approximately 4.7 percentage points for U.K. firms subject to the disclosure regulation compared to unaffected U.K. firms. This finding is supported by several robustness checks. For example, we find that only U.K. firms subject to the disclosure regulation experience a significant increase in their ETRs relative to similar European peers.

Our study contributes to the recent debate on tax transparency and its effect on corporate tax behavior. Until now, little is known about the efficiency of qualitative tax disclosures to convey information that is incrementally useful for recipients (Müller, Spengel and Vay, 2020). Using a large sample of tax strategy reports, we are the first to perform a detailed empirical analysis of the appearance and textual characteristics of tax strategy reports. We show that tax-avoiding firms use the discretion when preparing the reports and reduce the level of transparency relative to compliant firms. This finding should be kept in mind when deriving useful information from the reports. Moreover, we contribute to prior literature that investigates the effects of tax transparency regulations on corporate tax avoidance. Previous studies show that disclosure regulations demanding for quantitative information influence the scope of international tax avoidance (Henry, Massel and Towery, 2016; Dyreng et al., 2016; Joshi, 2020;

Overesch and Wolff, 2021). We are the first to provide evidence of the effectiveness of *qualitative* and *public* tax disclosures in curbing tax avoidance.

1.4 The Effects of the U.S. Tax Reform on Investments in Low-Tax Jurisdictions – Evidence from Cross-Border M&As

1.4.1 Research Question and Design

The essay "The Effects of the U.S. Tax Reform on Investments in Low-Tax Jurisdictions – Evidence from Cross-Border M&As" investigates the effects of the U.S. tax reform of 2017 on cross-border acquisition patterns of U.S. firms. Undoubtedly, the 'Tax Cuts and Jobs Act' [TCJA] of 2017 is the most significant tax reform in the U.S. for decades. For example, the TCJA reduced the corporate tax rate significantly from 35 percent to 21 percent and changed the existing worldwide tax system into a territorial one. Due to the abolition of the worldwide tax systems, foreign profits can be repatriated without additional home-country taxes. This is likely to render income earned in low-tax countries preferential relative to income earned domestically. Accordingly, U.S. firms might be expected to acquire more often target firms in low-tax countries than in high-tax countries after the reform came into effect.

However, the TCJA also instituted the 'Global Intangible Low-Taxed Income' [GILTI] provision. This provision is an important exception to the territorial tax system and aims at deterring low-taxed foreign investments. We expect GILTI-affected firms to be less likely to acquire targets in low-tax jurisdictions after the TCJA.

We retrieve global M&A data from Refinitiv's SDC database and consolidated financial statement data from the Compustat North America and Global database. We restrict the sample period to years from 2010 to 2019, with years 2018 and 2019 belonging to the post-TCJA period. For our empirical analyses, we model the investment decision of a U.S. firm to either invest in a low-tax or high-tax country, using a logit regression model. We define a low-tax target country as having a below-median statutory tax rate in our sample. In an additional

setting, we investigate whether the share of U.S. acquisitions in the global M&A market has changed after the TCJA.

1.4.2 Results and Contribution to the Literature

Our results confirm that the outbound acquisition pattern changed significantly for those U.S. acquirers that are affected by the GILTI provision. Across our GILTI measures, we find that this provision effectively deters investments in low-tax jurisdictions of U.S. acquirers. This finding is supported by a series of robustness tests. Furthermore, GILTI-affected firms are also less likely to invest in tax haven countries, defined by Dyreng and Lindsey (2009). In addition, we find weak evidence for changes in cross-border M&A activities of U.S. firms that are unaffected by GILTI. The results suggest that these firms invest more often in low-tax countries after the TCJA. This finding is in accordance with incentives for U.S. firms to invest in low-tax jurisdictions due to the adoption of a territorial tax system.

Prior literature has documented that both, the corporate tax rate and the tax system, i.e., the worldwide versus the territorial tax system, affect M&A decisions (Barrios, Huizinga, Laeven and Nicodème, 2012; Arulampalam, Devereux and Liberini, 2019). In this regard, two contemporaneous studies have already investigated the effects of the U.S. tax reform of 2017 on firms' M&A decisions. Atwood, Downes, Henley and Mathis (2020) show that after the TCJA the likelihood and the number of domestic and foreign acquisitions by U.S. firms decreased on average. Amberger and Robinson (2020) analyze the overall effect of the tax reform on cross-border M&A decisions of U.S. firms and find a reduced probability of foreign target acquisitions by U.S. firms after the reform. We add to this literature that investigates real-economic effects of a major tax reform concerning M&A patterns. We provide evidence that the GILTI anti-avoidance rule is effective at deterring investments in low-tax jurisdictions. Thereby, we also add to the ongoing debate across OECD countries in effectively combatting international tax avoidance. Lastly, examining the GILTI-induced effects is of particular

importance since the new U.S. administration is considering to significantly expand and enhance the GILTI regime.

1.5 The Review of Trade Tax Assessment Notices – Evidence from the Field

1.5.1 Research Question and Design

The article "The Review of Trade Tax Assessment Notices – Evidence from the Field" examines the relevance of the review process of trade tax assessment notices in tax consultancy in light of a digitization of the reviews via software implementation. Besides constitutional and fiscal concerns, the German trade tax system is widely criticized for its long-winded and complex taxation procedure. Trade tax assessment notices are issued annually by the municipalities and the number of these assessment notices depends on the number of maintained permanent establishments in Germany by the taxpayer. Additionally, the municipalities issue prepayment assessment notices and, if necessary, interest assessment notices. Therefore, the number of issued assessment notices can be considerably high, particularly for firms with physical presence in several municipalities in Germany. Apparently, the large number of assessment notices with respect to trade tax makes the review of the assessment notices, which is performed by the firm or its tax advisors, a long-lasting and thus, costly process. A digitization of the review process might be a feasible solution to simplify and reduce the manual review process.

The digitization of the economic world will significantly impact and reshape the tax function of a firm and the tax consultancy sector. Particularly the tax declaration function, which is characterized by routine activities such as filing of tax returns or review of tax assessment notices, can widely be digitized (Hinerasky and Kurschildgen, 2016; Mayr and Meyer-Pries, 2017). In practice, however, the digitization of the tax declaration function often fails due to different software solutions associated with a media disruption within the firm, but

also between the firm and the tax administration. In the status quo, high efforts for the firms and their advisors to digitize the tax declaration function are inevitable.

I conduct semi-structured interviews with nine employees of a large tax consulting firm in Düsseldorf in order to determine the potential of time and cost savings and to identify the relevance of a digitized review process of trade tax assessment notices. A semi-structured interview is the most common form of qualitative research methods (Alvesson and Deetz, 2000) and allows the interviewer to individually respond to the interviewees' answers in order to elicit more elaborate responses. I formulated the interview questions in advance (DiCicco-Bloom and Crabtree, 2006), but depending on the course of interview, I asked additional questions in order to be able to specifically determine qualitative findings.

1.5.2 Results and Contribution to the Literature

Surprisingly, the interview results suggest that the current review process of trade tax assessment notices is neither quantitatively nor qualitatively a relevant process within the tax declaration function of a tax consulting firm. There are two reasons for this. First, the clients of the tax consulting firm that annually receive a large amount of trade tax assessment notices usually review the assessment notices themselves. Second, relative to the trade tax *base amount* assessment notice issued by the local tax office, trade tax assessment notices are rarely incorrect in terms of calculation. Hence, the interviewees stated that the average time to review a single trade tax assessment notice amounts to 30 minutes. Given that a representative client receives on average four trade tax assessment notices per fiscal year, the review process is apparently not an extensive and relevant process for a tax consulting firm.

Nonetheless, a digitally supported review of trade tax assessment notices can be a promising approach to streamline the review process. For this, the interviewees stated that some challenges have to be overcome. First, although the error rate in the assessment notices is very low, the error detection rate has to be increased, and, second, the time spent for the entrusted

employee must be significantly reduced when reviewing the digitally pre-reviewed assessment notices. If the process optimization via digitization effectively leads to time savings, additional clients could be allured concerning the review of assessment notices. Moreover, employees in tax consultancy can be entrusted with other activities, for example in tax planning projects.

I contribute to the literature regarding the German trade tax system. Amongst others, the taxation procedure is criticized for being too complex and long-winded, particularly in comparison to international taxation of multinational firms (Keen, 2002; Hoppe, Rechbauer and Sturm, 2019). An abolition of German trade tax and a reorganization of the municipalities' finances are still demanded (Wollmershäuser et al., 2017; Hentze, 2021). My results support a reorganization of the trade tax procedure. Second, I contribute to the current topic of the transformation of the tax consultancy sector. In a widely discussed study, Frey and Osborne (2017) find that the 'tax preparer' is among the top ten jobs (out of 702 identified jobs) endangered by digitization. An antipathy of employees in tax consultancy towards digitization might be the result. In contrast, my interview results suggest that the employees' acceptance of tax technologies to optimize review processes in a large tax consulting firm is very high.

References

Akamah, H., Hope, O. K., & Thomas, W. B. (2018). Tax havens and disclosure aggregation. *Journal of International Business Studies*, 49(1), 49-69.

Alvesson, M., & Deetz, S. (2000). Doing critical management research. Sage. Thousand Oaks, CA.

Amberger, H., & Robinson, L. (2020). The effect of the 2017 US tax reform on US acquisitions of foreign firms. *Working paper*.

Arulampalam, W., Devereux, M. P., & Liberini, F. (2019). Taxes and the location of targets. *Journal of Public Economics*, 176, 161-178.

Atwood, T. J., Downes, J., Henley, J., & Mathis, M. (2020). The Impact of US tax reform on US firm acquisitions of domestic and foreign targets. *Working paper*.

Barrios, S., Huizinga, H., Laeven, L., & Nicodème, G. (2012). International taxation and multinational firm location decisions. *Journal of Public Economics*, 96(11-12), 946-958.

Belnap, A. (2019). Brass necks and boilerplate: How US multinationals treat UK requirements for tax strategy disclosure. *Working paper*.

Brown, R. J., Jorgensen, B. N., & Pope, P. F. (2019). The interplay between mandatory country-by-country reporting, geographic segment reporting, and tax havens: Evidence from the European Union. *Journal of Accounting and Public Policy*, 38(2), 106-129.

Campbell, J. L., Chen, H., Dhaliwal, D. S., Lu, H. M., & Steele, L. B. (2014). The information content of mandatory risk factor disclosures in corporate filings. *Review of Accounting Studies*, 19(1), 396-455.

Chen, S., Schuchard, K., & Stomberg, B. (2019). Media coverage of corporate taxes. *The Accounting Review*, 94(5), 83-116.

Dharmapala, D. (2018). The consequences of the Tax Cut and Jobs Act's international provisions: Lessons from existing research. *National Tax Journal*, 71(4), 707-728.

DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interview. *Medical Education*, 40(4), 314-321.

Dyreng, S. D., Hanlon, M., Maydew, E. L., & Thornock, J. R. (2017). Changes in corporate effective tax rates over the past 25 years. *Journal of Financial Economics*, 124(3), 441-463.

Dyreng, S. D., Hoopes, J. L., & Wilde, J. H. (2016). Public pressure and corporate tax behavior. *Journal of Accounting Research*, 54(1), 147-186.

Dyreng, S. D., & Lindsey, B. P. (2009). Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries on US multinational firms' tax rates. *Journal of Accounting Research*, 47(5), 1283-1316.

Ehinger, A., Lee, J. A., Stomberg, B., & Towery, E. (2020). The relative importance of tax reporting complexity and IRS scrutiny in voluntary tax disclosure decisions. *Working paper*.

European Commission (2003). Directive 2003/51/EC.

European Commission (2015). A fair and efficient corporate tax system in the European Union: 5 key areas for action. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015DC0302&from=EN.

Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological forecasting and social change*, 114, 254-280.

Graham, J. R., Hanlon, M., Shevlin, T., & Shroff, N. (2014). Incentives for tax planning and avoidance: Evidence from the field. *The Accounting Review*, 89(3), 991-1023.

Guyton, J., Langetieg, P., Reck, D., Risch, M., & Zucman, G. (2021). Tax evasion at the top of the income distribution: Theory and evidence. *Working paper*.

Hanlon, M. (2018). Country-by-country reporting and the international allocation of taxing rights. *Bulletin for International Taxation*, 72(4/5), 209-217.

Hanlon, M., & Heitzman, S. (2010). A review of tax research. *Journal of Accounting and Economics*, 50(2-3), 127-178.

Henry, E., Massel, N., & Towery, E. (2016). Increased tax disclosures and corporate tax avoidance. *National Tax Journal*, 69(4), 809-829.

Hentze, T. (2021). Reformen gefordert. Experte fordert: Gewerbesteuer abschaffen. Available at: https://kommunal.de/krise-reformanstoss-Gewerbesteuer.

Hinerasky, A., & Kurschildgen, M. (2016). Digitalisierung in der Steuerberatung: Künstliche Intelligenz und Blockchain – neue Technologien in der Besteuerungspraxis. *Der Betrieb*, 69(47), 35-39.

HMRC (2015). Improving large business tax compliance. Available at: https://www.gov.uk/government/consultations/improving-large-business-tax-compliance.

Hope, O. K., Ma, M. S., & Thomas, W. B. (2013). Tax avoidance and geographic earnings disclosure. *Journal of Accounting and Economics*, 56(2-3), 170-189.

Hoppe, T., Rechbauer, M., & Sturm, S. (2019). Steuerkomplexität im Vergleich zwischen Deutschland und Österreich – Eine Analyse des Status quo. *Arqus Discussion Paper No. 240*.

Huesecken, B., & Overesch, M. (2015). Tax avoidance through advance tax rulings – evidence from the LuxLeaks firms. *Working paper*.

Inger, K. K., Meckfessel, M. D., Zhou, M., & Fan, W. (2018). An examination of the impact of tax avoidance on the readability of tax footnotes. *The Journal of the American Taxation Association*, 40(1), 1-29.

Institute of International Finance (IIF) (2021). Global debt monitor: COVID drives debt surge – stabilization ahead? Available at: https://www.iif.com/Research/Capital-Flows-and-Debt/Global-Debt-Monitor.

Joshi, P. (2020). Does private country-by-country reporting deter tax avoidance and income shifting? Evidence from BEPS Action Item 13. *Journal of Accounting Research*, 58(2), 333-381.

Kao, W. C. (2019). The relation between tax avoidance and voluntary disclosures of taxation in United Kingdom. *Working paper*.

Keen, M. (2002). The German tax reform of 2000. *International Tax and Public Finance*, 9(5), 603-621.

Kravet, T., & Muslu, V. (2013). Textual risk disclosures and investors' risk perceptions. *Review of Accounting Studies*, 18(4), 1088-1122.

Law, K. K., & Mills, L. F. (2015). Taxes and financial constraints: Evidence from linguistic cues *Journal of Accounting Research*, 53(4), 777-819.

Lee (2015). News media coverage of corporate tax avoidance and corporate tax reporting. *Working paper*.

Lisowsky, P. (2009). Inferring U.S. tax liability from financial statement information. *The Journal of the American Taxation Association*, 31(1), 29–63.

Lisowsky, P., Robinson, L., & Schmidt, A. (2013). Do publicly disclosed tax reserves tell us about privately disclosed tax shelter activity? *Journal of Accounting Research*, 51(3), 583–629.

Loughran, T., & McDonald, B. (2011). When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *The Journal of finance*, 66(1), 35-65.

Mayr, R., & Meyer-Pries, L. (2017). Digitalisierung in der Steuerberatungskanzlei - Ausblicke und Einschätzungen. *Die Steuerberatung*, 14(5), 210-222.

Müller, R., Spengel, C., & Vay, H. (2020). On the determinants and effects of corporate tax transparency: Review of an emerging literature. *ZEW Discussion Paper*, No. 20-063.

Neuman, S. S., Omer, T. C., & Shelley, M. K. (2013). Corporate transparency, sustainable tax strategies, and uncertain tax activities. *Working paper*.

O'Donovan, J., Wagner, H. F., & Zeume, S. (2019). The value of offshore secrets: Evidence from the Panama Papers. *The Review of Financial Studies*, 32(11), 4117-4155.

Oats, L., & Tuck, P. (2019). Corporate tax avoidance: Is tax transparency the solution? *Accounting and Business Research*, 49(5), 565-583.

OECD (2015). Base erosion and profit shifting project – Executive summaries 2015 final reports. Available at: https://www.oecd.org/ctp/beps-reports-2015-executive-summaries.pdf.

OECD (2017). Global forum on transparency and exchange of information for tax purposes. Tax transparency 2017. Available at: https://www.oecd.org/tax/transparency/global-forum-annual-report-2017.pdf.

Overesch, M., & Wolff, H. (2021). Financial transparency to the rescue: Effects of public country-by-country reporting in the EU banking sector on tax avoidance. *Contemporary Accounting Research*, 38(3), 1616-1642.

Shackelford, D. A., & Shevlin, T. (2001). Empirical tax research in accounting. *Journal of Accounting and Economics*, 31(1-3), 321-387.

Tax Justice Network (2021). The state of tax justice 2020: Tax justice in the time of COVID-19. Available at: https://taxjustice.net/wp-content/uploads/2020/11/The_State_of_Tax_ Justice_2020_ ENGLISH.pdf.

Wilde, J. H., & Wilson, R. J. (2018). Perspectives on corporate tax planning: Observations from the past decade. *The Journal of the American Taxation Association*, 40(2), 63-81.

Wollmershäuser, T., Delrio, S., Fuest, C., Göttert, M., Grimme, C., Krolage, C., Lautenbacher, S., Lehmann, R., Nierhaus, W., Peichl, A., Reif, M., Šauer, R., Schröter, F., Schuler, T., Stöckli, M., Wohlrabe, K., Wolf, A., & Zeiner, C. (2017). ifo Konjunkturprognose 2017–2019: Deutsche Wirtschaft auf dem Weg in die Hochkonjunktur. Available at: https://www.ifo.de/publikationen/2017/aufsatz-zeitschrift/ifo-konjunkturprognose-2017-2019-deutsche-wirtschaft-auf-dem.

Chapter 2

Tax (Risk) Disclosures in Annual Reports and Tax Positions of Firms

Tax (Risk) Disclosures in Annual Reports and Tax Positions of Firms

Mathias Dunker
Department of Business Taxation, University of Cologne, dunker@wiso.uni-koeln.de

Martin Fochmann
Department of Finance, Accounting, Controlling, and Taxation, Free University of Berlin, martin.fochmann@fu-berlin.de

Michael Overesch
Department of Business Taxation, University of Cologne, overesch@wiso.uni-koeln.de

Abstract:

In this paper, we examine the effects of tax risk disclosures in annual reports on firms' tax positions. Using a text mining software tool, we screen a large sample of annual reports of European multinational firms and find a remarkable increase in tax risk disclosures since 2005. Empirical results show a significant decline in effective tax rates [ETRs] and ETR volatilities after a firm has started tax risk disclosure in its annual report relative to firms that abstain from a disclosure. Our results suggest that an initial tax risk disclosure signals a more refined tax management and a professionalized approach to tax risks.

JEL Classification: M41, D8, F23, H32

Keywords: Disclosure, Tax Risk, Tax Avoidance, Textual Analysis

Acknowledgments: We appreciate helpful comments on earlier versions of this paper. We would like to thank Jens Müller (discussant at the Vienna Doctoral Consortium in Taxation at the WU University of Economics and Business) and Cinthia Valle Ruiz (EAA discussant). We also thank seminar participants at the University of Cologne and at the Vienna Doctoral Consortium in Taxation at the WU University of Economics and Business as well as conference participants at the EAA Annual Congress in Paphos and the VHB Annual Conference in Rostock.

Chapter 2

Tables

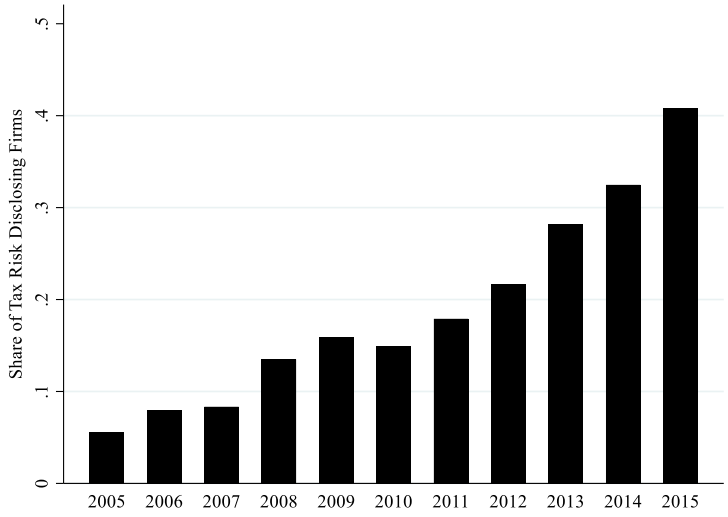
Figures

2.1 Introduction

For more than a decade now, tax risks have become an important type of business risks. The incremental focus on tax risks for corporate taxpayers is documented by several practitioner-based survey studies (e.g. EY, 2012; EY, 2014; Lloyd's, 2013; Graham, Hanlon, Shevlin and Shorff, 2014). However, the disclosure of information about tax risks is not explicitly regulated in accounting standards. Since 2005, the EU accounting directives stipulate that European firms have to describe the principal risks and uncertainties they face. However, it is mainly at the management's discretion to identify those risks and to choose the most important ones for presentation in their annual reports. Hence, the disclosure of tax risks can effectively be considered voluntary.

In an explorative analysis of a sample of large European listed firms, we find a remarkable increase of tax risk disclosures in annual reports over the time period from 2005 to 2015. Within this period, 214 firms out of 584 sample firms start to disclose information about tax risks. In 2005, only 5.5 percent of the firms disclosed tax risks in their annual reports, whereas in 2015 approximately 41 percent of the firms are tax risk-disclosing (Figure 1). Taking this phenomenon into account, we investigate the tax positions of our sample firms around an initial tax risk disclosure. In particular, we scrutinize if effective tax rates [ETRs] and ETR volatilities significantly change for firms that have started an explicit tax risk disclosure.

Figure 1: Development of Tax Risk Disclosures in Annual Reports



Notes: Figure 1 presents the share of large European listed firms (STOXX Europe 600 firms) that disclose information on tax risks in their annual reports over a period from 2005 to 2015.

However, it is unclear if and how tax risk disclosures are related to future tax avoidance and tax risks. The disclosure phenomenon might be attributed to an ordinary time trend in an era of high political and media focus on corporate taxes. If so, we will find no effect on the tax position of a firm in the aftermath of an initial disclosure. Yet, starting tax risk disclosure in annual reports might also be associated with significant changes in the tax position of a firm. On the one hand, we can expect *higher* tax expenses and *increasing* ETR volatilities in the future. Identified and disclosed tax risks could materialize. Moreover, the disclosures could draw tax authorities' attention. On the other hand, an initial tax risk disclosure can signal an improvement of the tax position in the near future. Starting an explicit disclosure about tax risks could signal capital market participants that the firm has started to consider tax issues including tax risks more carefully. Moreover, a first disclosure about tax risks could signal a comprehensive and more refined tax risk identification, assessment and management. Specifically, managers will be reluctant to disclose information on excessive risk-taking because this will alarm stakeholders and could result in adverse consequences for the firm. Only those firms will start the disclosure that have amended their approach to tax. If so, we could expect *lower* ETRs and *decreasing* ETR volatilities after an initial tax risk disclosure.

We test the relationship between an initial tax risk disclosure and the tax position of the firm empirically. We review annual reports of European firms listed on the STOXX Europe 600 index covering a period from 2005 to 2015. Using a software-based text mining approach and, ultimately, a manual examination of tax risk-related text passages, we identify annual reports that explicitly include information on tax risks. Using this database, we investigate how the tax position has changed if a firm discloses tax risk information for the first time. In particular, we consider the firms' ETR, a commonly used measure of tax avoidance, and the volatility of ETRs as a quantitative measure of tax risks.

In order to investigate the disclosure effect on the firms' tax positions, we employ Propensity Score Matching [PSM]. The PSM alleviates concerns regarding a self-selection bias and compares tax avoidance behaviors and tax risk exposures of disclosing firms with similar firms that do not disclose. Our matched sample analysis supports the view that an initial tax risk disclosure is associated with an improvement of the firm's tax position. We find a negative association between an initial tax risk disclosure in annual reports and firms' future ETRs. Our results suggest that – relative to non-disclosing firms – tax risk disclosing firms experience a decline in ETRs of around 2.6 percentage points after they have started to disclose tax risks. In addition, we find declining tax risks for firms that have started a tax risk disclosure. Our results suggest that a disclosure of tax risks signals an increased management awareness of those risks, i.e., a better risk identification and assessment, and a more refined tax management. However, for the first year after an initial tax risk disclosure, we find a positive or at least, non-negative development of the ETR. This finding suggests adjustment costs of a refined tax management.

In an additional analysis, we also consider our matched sample of similar firms and compare tax positions of firms that have started tax risk disclosure and firms that abstain from any tax risk disclosure during the period *before* the disclosure has been started. Our analysis suggests that an initial tax risk disclosure is associated with significantly higher ETR volatilities during the period in advance of the disclosure. For instance, the ETR volatility of tax risk

disclosing firms is about 1.5 percentage points higher in the run-up to the disclosure. Again, our results support the view that a tax risk disclosure is associated with an amendment of tax affairs within the firm. Firms with high ETR volatilities can benefit most from a more comprehensive and advanced tax management approach. However, the level of ETRs of tax risk disclosing firms and non-disclosing firms is not significantly different before an initial disclosure.

Our study contributes to existing literature. First, we add to the literature that examines the informativeness of risk disclosures in corporate filings. Prior research finds a positive relation between risk factor disclosures in Form 10-K filings of U.S. firms and variables that proxy firm risk, suggesting that firms facing greater risks disclose more information on risks in their annual reports (Li, 2006; Campbell et al., 2014; Kravet and Muslu, 2013). In a related study, Campbell et al. (2019) however find that tax risk factor disclosures lead to future tax savings which implies that managers utilize discretion and rather disclose firm value-increasing risks. Moreover, Neuman, Omer and Schmidt (2020) likewise find a positive association between their tax risk measure and future long-run tax avoidance.[6] However, the literature is silent to what an *initial* tax risk disclosure signals. Drawing conclusions on what tax risk disclosures effectively reveal is of particular importance for the recipients of these disclosures to retrieve useful information. Our results suggest that managers systematically avoid disclosures of unpleasant tax risk information but rather disclose tax risks that signal good news such as the implementation of a more refined tax management.

Second, we add to the recent debate about tax transparency and its relation to tax avoidance and tax risks. Prior studies primarily focus on the effectiveness of quantitative tax disclosures (e.g., Henry, Massel and Towery, 2016; Joshi, 2020; Overesch and Wolff, 2021).

[6] In contrast to these studies, we explicitly search for keywords 'tax', 'taxes' and 'taxation' in combination with risk disclosure. Thereby, we ensure to identify only those annual reports which effectively comprise tax risk-related information. Moreover, we consider panel data that allow for an identification of effects associated with the beginning of tax risk disclosure of a firm.

However, empirical evidence on the effects of qualitative disclosures on firms' tax positions is scarce so far. Two recent studies by Xia (2020) and Bilicka, Casi-Eberhard, Seregni and Stage (2021) find no effects of disclosed information about a firm's tax strategy on tax avoidance or altered tax behaviors. We however find an association between qualitative tax risk disclosures in annual reports and an improvement of a firm's tax position. Our results are in line with findings of Kao (2019) who finds a positive relation between corporate tax avoidance and voluntary tax disclosures in Corporate Social Responsibility [CSR] reports. Firms clearly take advantage of the leeway when disclosing specific information on taxes in annual reports or other publications (e.g., Hope, Ma and Thomas, 2013; Neuman, Omer and Shelley, 2013; Akamah, Hope and Thomas, 2018).

Therefore, our study also contributes to the discussion on voluntary and mandatory disclosures of tax information. Previous studies mainly investigate settings of mandatory tax transparency like the introduction of a Country-by-Country reporting (Joshi, 2020; Overesch and Wolff, 2021) or the disclosure of the location and profits of foreign subsidiaries (Hope, Ma and Thomas, 2013; Dyreng, Hoopes and Wilde, 2016). These studies find a positive effect of mandatory tax transparency on future ETRs. On the other hand, studies analyzing voluntary tax disclosures show that managers at tax-avoiding firms voluntarily increase tax-related disclosures to mitigate agency conflicts due to an opaque firm structure (Balakrishnan, Blouin and Guay, 2019). However, managers face a tradeoff between the benefits and costs of voluntary tax disclosures (Ehinger, Lee, Stomberg and Towery, 2020). We show that an effectively voluntary tax disclosure in annual reports is associated with lower future ETRs.

The remainder of our study is organized as follows. Section 2.2 presents institutional details regarding risk disclosures and develops our hypotheses. In Section 2.3, we describe our data and research design. Section 2.4 presents our results. Section 2.5 concludes.

2.2 Initial Tax Risk Disclosures and Firms' Tax Positions

In the European Union, risk reporting[7] is aligned since 2005 due to the Directive 2003/51/EC. The accounting directive stipulates EU firms to include non-financial information in their annual reports. Particularly, firms are required to describe the principal risks and uncertainties that they actually face.[8] The reporting on qualitative information about risks is intended to provide financial statement users with supplemental insights about a firm's risk exposures and to reduce information asymmetry between the management and the financial statement users. In 2013, the EU Directive 2013/34/EU repeals the old accounting directives and prescribes risk reporting to be included in the management report and requires reporting on internal control and risk management systems in the consolidated management report. Moreover, since 2010, the International Financial Reporting Standards [IFRS] provide a non-binding framework for presenting a management commentary including a firm's principal risk exposures and changes in those risks (IASB, 2010).[9]

Tax risks have become an important type of business risks within the last couple of years (Wunder, 2009; EY, 2014). So far, no universal definition of the term *tax risk* exists. We rely on prior literature and define tax risk as a potential deviation of future tax outcome from planned targets (Wunder, 2009; Guenther, Matsunaga and Williams, 2017; Drake, Lusch and Stekelberg, 2019). Sources of tax risks are manifold. In a recent study, Neuman et al. (2020) identify three main channels of tax risks referred to as economic risk, tax law uncertainty, and inaccurate information processing. Economic risk is the general uncertainty that an investment entails and thus, leads to a spread of possible outcomes. Tax law uncertainty may arise from

[7] Note that we use the terms 'risk reporting' and 'risk disclosure' synonymous.
[8] For more details, please refer to the Directive 2003/51/EC of 18th June 2003, Art. 1 (14)(a), Art. 2 (10)(a) of the European Commission.
[9] Since 1st January 2005, IFRS have to be applied for the consolidated accounts of all EU listed firms. Note that if there is a conflict between IFRS and the EU accounting directive, the treatment prescribed in the IFRS takes precedence. In several European countries, risk reporting requirements are in place that are beyond the scope of the Europe-wide regulations. National Accounting Standard Boards provide users with requirements and guidelines on how and what to disclose regarding corporate risks (see for example, the German Accounting Standard 20 from 2012 or, in the U.K., the Guidance on Risk Management of the Financial Reporting Council from 2014). These guidelines significantly differ in terms of scope and content across countries.

difficulties to proper apply domestic and international tax law or from diverging interpretations of the law by tax authorities, courts and the taxpayers. Finally, inaccurate information processing may occur due to human or mechanical errors in information accumulation and dissemination such as incorrect tax filings or failure in internal control procedures.

In an explorative analysis, we find a remarkable increase of tax risk disclosures in annual reports of large European listed firms since 2005 which emphasizes the firms' awareness of tax risks. However, it is unclear what tax risk disclosures in annual reports effectively signal. Different relations between these disclosures and firms' tax positions are possible:

First, the disclosure phenomenon might be a result of an ordinary time trend in an era of incremental political and media focus on corporate taxes. For instance, national and global initiatives in combating harmful tax avoidance schemes of multinational enterprises [MNEs], such as the OECD's 'Base Erosion and Profit Shifting' [BEPS] initiative, could have incentivized firms to discuss tax risks in their annual reports without influencing their tax affairs. Therefore, the disclosures may only provide boilerplate information with no relation to the future tax position of the firm.

Second, firms that engage in excessive and high risk-taking tax planning structures and transactions might feel compelled by the European accounting directives to inform on tax risks in their annual reports. European firms are obliged to explicitly describe those risks they are effectively exposed to. In turn, this could also draw tax authorities' scrutiny. In this context, Bozanic, Hoopes, Thornock and Williams (2017) show that specific parts of financial statements, namely the Uncertain Tax Benefit [UTB] accounts according to the U.S. FIN 48 regulation, increase the financial statement attention of the U.S. tax authority. Furthermore, aggressive tax planning activities could also undermine the cooperation with tax authorities. As a consequence, short-term tax incentives and uncertain tax positions are unlikely to be upheld in tax audits, leading to higher tax expenses, back taxes or fines after an initial disclosure of tax

risks. If so, we could expect an increase in ETR levels of disclosing firms in the aftermath of an initial tax risk disclosure.

Moreover, tax risk disclosures in annual reports might not only be indicative for an excessive engagement in tax avoidance, but also for unsustainable tax positions leading to more volatile tax rates after an initial disclosure. Dyreng, Hanlon and Maydew (2019) support this view as they provide evidence that tax-avoiding firms bear significantly greater tax uncertainty. In addition, Li (2006) and Campbell et al. (2014) find that managers usually provide informative risk disclosures reflecting those risks the firms actually face. Practitioner-based survey studies have documented an incremental relevance of tax risks for corporate taxpayers over the last couple of years (EY, 2012; EY, 2014; Lloyd's, 2013; Graham et al., 2014). For example, a study by EY (2014) outlines that 68 percent of the surveyed tax and finance executives report that tax audits tend to be more aggressive in previous years which implies an increased exposure to tax risks. If a firm is exposed to tax risks that are of principal nature, the management is obliged to provide a description. Thus, after an initial disclosure, tax risks may materialize which is reflected in more volatile and unpredictable tax positions in the future. Based on the arguments above, we state the following hypotheses on the relation between an initial tax risk disclosure and firms' tax positions:

H1a: An initial tax risk disclosure in annual reports is associated with higher ETRs after the disclosure.

H2a: An initial tax risk disclosure in annual reports is associated with higher ETR volatilities after the disclosure.

Third, tax risk disclosures could signal capital market participants that tax issues and also tax risks have deliberately and appropriately been taken into account. Since European firms have some discretion regarding the decision to report on specific risks in annual reports, the management could deliberately decide to start the disclosure on tax risks. This relation is

supported by Campbell et al. (2019) who find that tax risk factor disclosures in U.S. Form 10-K filings are positively associated with future cash flows. The authors argue that tax risk factor disclosures reflect those risks the firms have taken that lead to tax savings and, ultimately an increase in firm value. Specifically, managers will be reluctant to discuss information on excessive risk-taking because this will alarm stakeholders and could result in adverse consequences for the firm. From this perspective, we expect managers who voluntarily start the disclosure on tax risks to put a stronger focus on their tax management activities. As a consequence, we expect decreasing ETRs in the aftermath of an initial tax risk disclosure.

Moreover, an initial disclosure about tax risks could also signal an increased management awareness of tax risks which results in a comprehensive and more refined risk identification, assessment and management. In line with this notion, only those firms will start the disclosure that have a more professionalized approach to tax risks and, ultimately have amended their tax affairs. Accordingly, we test the following to H1a and H2a contrarian hypotheses:

H1b: An initial tax risk disclosure in annual reports is associated with lower ETRs after the disclosure.

H2b: An initial tax risk disclosure in annual reports is associated with lower ETR volatilities after the disclosure.

2.3 Data

2.3.1 Tax Risk Disclosure in Annual Reports

In order to analyze information on corporate tax risks, we exploit annual reports of European firms listed on the STOXX Europe 600 index consisting of the 600 largest European firms. In a first step, we collect annual reports of the European firms from their official websites

for years from 2005 to 2015.[10] Our final hand-collected dataset consists of 5,760 annual reports of 584 large European firms. Despite increasing additional corporate disclosures, the annual report is still one of the most important communication channels with corporate stakeholders, receiving a lot of media attention.[11] Therefore, we focus on firms' tax risk disclosure behavior within their annual reports.[12]

We perform a text mining approach seeking annual reports that contain information on tax risks. A text mining software tool screens all narrative sections[13] of each annual report for the keywords 'tax', 'taxes' and 'taxation' and at a distance of 15 words left and 15 words right to the keywords for the context words 'risk' or 'risks'.[14] The text mining algorithm leads to more than 29,000 potentially tax risk-related text passages of the annual reports.

As the keyword and the context word may appear incoherently within the textual corpus, we manually review each text passage found by the text mining software, which allows the detection of explicit tax risk disclosure in annual reports.[15] Building on the manual evaluation, we create a dummy variable (*Disclosing_Firm*) that is set equal to one if a firm has started to disclose tax risk information in its annual report across the eleven-year observation period.[16]

[10] Since risk reporting requirements came into force in all EU member states in 2005 (Directive 2003/51/EC of 18th June 2003), the observation period for our analysis likewise starts in 2005. Furthermore, for the fiscal year 2005, we have at least access to more than 400 annual reports for our sample firms.

[11] For the relevance of financial statement information and annual report communication, see for example Atwood and Reynolds (2008), De Franco, Kothari and Verdi (2011) or De Franco, Wong and Zhou (2011).

[12] We acknowledge that the U.K. tax strategy disclosure regulation mandates certain large firms to publish their tax strategies, including information on tax risks. Being effective for calendar years ending December 31, 2017, this disclosure requirement is not applicable for our sample period and has therefore no effect on our results.

[13] Most tax risk disclosures can be found in management report sections or strategic report sections within the annual report, but some are retrieved from shareholder information sections, the notes to the consolidated accounts, supplemental sections or appendices. Hence, we do not narrow the text mining analysis to the management report or strategic report, but search the entire annual report.

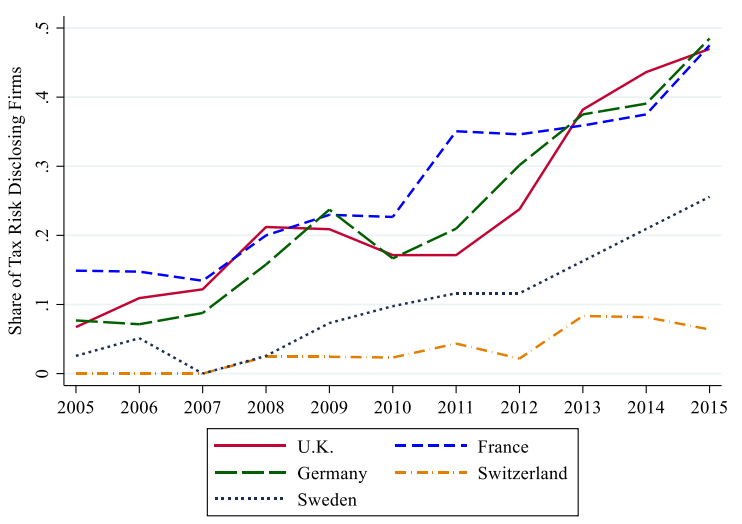
[14] A distance of a maximum of 15 words between the keyword and context word appears appropriate to identify most of the text passages in annual reports that give attention to tax risks. For some randomly selected reports, we also employed the text mining software with a maximum distance of 10 words left and right to the context word as well as with a 20 words-distance. However, the textual output with a 10 words-distance leads to insufficient results because some tax risk-related text passages were not identified, while utilizing a 20 words-distance resulted in an almost unmanageable amount of text passages that largely do not all relate to tax risks.

[15] We acknowledge, one weakness of content analysis is its inevitably subjectivity (Jones and Shoemaker, 1994; Linsley and Shrives, 2006; Abraham and Cox, 2007).

[16] See Table A4 in the Appendix for text passages that deal with tax risks for selected annual reports.

Based on the remarkable disclosure pattern of tax risks in European firms' annual reports from 2005 to 2015, we provide some descriptive statistics on the development of tax risk disclosures. Figure 2 illustrates the disclosure of tax risks by countries of incorporation over time. For the sake of clarity, we focus on firms incorporated in the five countries that are most frequently represented in our sample.[17] Tax risk disclosures in annual reports seem to vary significantly across countries, suggesting a country-specific disclosure phenomenon. This is in line with studies providing evidence that aligned tax reporting systematically varies across countries (e.g., Kvaal and Nobes, 2013). While firms incorporated in the U.K., France and Germany show a rather similar development of tax risk disclosures in annual reports, firms from Switzerland and Sweden on average disclose substantially less information on tax risks.

Figure 2: Development of Tax Risk Disclosures per Country



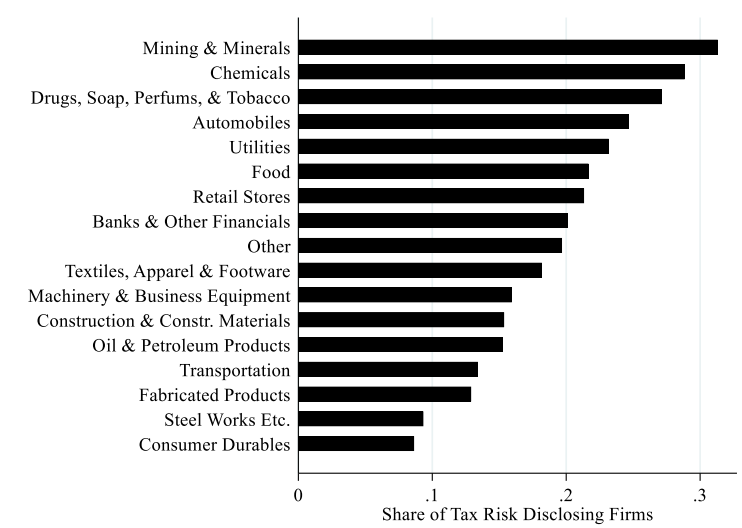
Notes: Figure 2 depicts the share of firms that disclose information on tax risks in their annual reports by country of incorporation over a period from 2005 to 2015. Firms illustrated in Figure 2 are incorporated in the U.K., France, Germany, Switzerland and Sweden, the five most represented countries in our sample.

Moreover, our data suggest an industry-specific disclosure phenomenon. Figure 3 presents the share of tax risk disclosing firms out of all sample firms per industry pooled over

[17] For a cross-sectional overview of tax risk disclosures by all countries in our sample in the year 2015, please refer to Panel B of Table A2 in the Appendix.

the full observation period and indicates a high industry variation.[18] For instance, firms in the Mining & Minerals industry disclose tax risks in roughly 32 percent of their annual reports, while firms in the Consumer Durables industry merely disclose tax risks in 9 percent of cases. This industry-specific disclosure phenomenon may be due to heightened scrutiny of certain industries by fiscal and supervisory authorities or the public and media in such a way that firms in these industries are more likely to disclose tax risks in annual reports (e.g., Kvaal and Nobes, 2013; Campbell et al., 2014).[19] Apparently, managers of firms in certain industries see a need to disclose more information on tax risks.[20]

Figure 3: Tax Risk Disclosures per Industry



Notes: Figure 3 presents the share of firms that disclose information on tax risks in their annual reports by industries pooled over the full sample period. The industry classification is based on the 17 different industries from Fama and French.

[18] We employ the industry classification from Fama and French based on 17 different industries. Updated Fama and French industry classifications can be retrieved from the following website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_17_ind_port.html.

[19] For example, in June 2013, the European Parliament approved a new directive that requires listed and large non-listed firms in the extractive and logging industry to disclose their payments to governments on a country-by-country and project-by-project basis. For financial institutions, the EU Directive 2013/36/EU mandates to publicly disclose key financial information on a country-by-country basis for years from 2014 onwards. Moreover, the Basel III regulatory frameworks impose guidance on market liquidity risks for the banking sector worldwide.

[20] For a cross-sectional overview of tax risk disclosures per industry, see Panel C of Table A2 in the Appendix. We acknowledge that due to low and significantly varying number of observations for some industries in our sample, we cannot draw a reliable conclusion for an industry-specific disclosure phenomenon.

2.3.2 Sample Selection

For our empirical analysis on the association between tax risk disclosure and the tax position of a firm, we consider our sample of STOXX Europe 600 firms and the information on tax risk disclosure in annual reports as described in Section 2.3.1. We match this data with financial statement data from Compustat Global and capital market data from Refinitiv's Eikon database. We require comprehensive financial data for each firm-year observation.[21] This leaves us with 3,074 annual reports of 500 firms (see Table 1).

Table 1: Sample Selection

	Observations	
	No. of Firms	No. of Annual Reports
Retrieved Annual Reports	584	5,760
Non-Missing Variables	500	3,074
Matched Sample	214	1,807
thereof Disclosing Firms	137	1,157
thereof Non-Disclosing Firms	77	650

Notes: Table 1 describes the sample selection process. The matched sample is based on a one to one nearest neighbor PSM with a caliper value of less than 0.03. Moreover, we perform the matching algorithm with replacement of matched control firms.

Following prior accounting literature, we utilize the ETR as the measure of corporate tax avoidance (e.g., Dyreng, Hanlon and Maydew, 2008; Hanlon and Slemrod, 2009; Dyreng, Hanlon and Maydew, 2010).[22] A lower ETR represents a higher engagement in tax avoidance. We focus on the GAAP ETR which is defined as the ratio of a firm's worldwide tax expenses (*txt*) to worldwide pre-tax income (*pi*). We adjust the denominator for extraordinary items (*xi*). Moreover, we require non-missing components of the ETR, i.e., we delete observations with missing tax expenses or pre-tax income.[23] In addition, we utilize the standard deviation (volatility) of the annual GAAP ETR over a three-year period [*ETR_VOL*] as a measure of tax

[21] Please refer to Table A1 in the Appendix for a definition of employed variables.
[22] The ETR, though not without controversy, is an important indicator of a firm's tax burden (Hanlon and Heitzman, 2010). Simultaneously, the ratio is widely used as a benchmark for cross-company comparisons, to compensate managers and executives, to make and evaluate important business decisions or to measure the performance of the tax department.
[23] Finally, to limit the influence of undue outliers, we truncate the ETR at values of 0 and 1 (Bauer and Klassen, 2014; Campbell et al., 2014).

risk. A greater ETR volatility suggests greater tax risks. This measure is also considered by prior studies that define tax risks as the potential deviation of taxable outcomes from planned targets (Guenther et al., 2017; Drake et al., 2019; Hutchens and Rego, 2015).[24]

In Table 2, we present descriptive statistics of the variables used in our regression analysis with *ETR* and *ETR_VOL* as dependent variables, illustrated each for tax risk disclosing firms and non-disclosing firms of the STOXX Europe 600 firms.[25] Considering our dependent variables, two interesting patterns occur. The mean (median) *ETR* of both groups is very similar and amounts to 26.2 percent (25.9 percent), suggesting a rather similar engagement in tax avoidance over the entire observation period. However, summary statistics for the ETR volatility clearly differ between the two groups. Whereas the mean (median) *ETR_VOL* of non-disclosing firms is 4.6 percent (2.7 percent), the mean (median) *ETR_VOL* of tax risk disclosing firms amounts to 5.4 percent (3.2 percent). Across the entire observation period, this indicates higher tax risks for disclosing firms.

[24] Admittedly, alternative measures were utilized in empirical studies to proxy corporate tax risks (for example, Hanlon, Maydew and Saavedra, 2017; Hutchens and Rego, 2015; Beck and Lisowsky, 2014). These studies primarily use the ending balance or additions to the UTB accounts according to the U.S. FIN 48 regulation. Due to our European sample approach, we are not able to use the UTB accounts as a proxy for tax risks.

[25] Note that if a firm decides to start disclosing information on tax risks in its annual report, the disclosure behavior remains unchanged for most of the sample firms in subsequent years.

Table 2: Descriptive Statistics

	Non-Tax Risk Disclosing Firms (*Disclosing_Firm* = 0)						Tax Risk Disclosing Firms (*Disclosing_Firm* = 1)					
VARIABLES	**N**	**Mean**	**Std. Dev.**	**Q1**	**Median**	**Q3**	**N**	**Mean**	**Std. Dev.**	**Q1**	**Median**	**Q3**
ETR	1,348	0.262	0.107	0.200	0.259	0.310	1,726	0.262	0.109	0.206	0.259	0.305
ETR_VOL	1,348	0.046	0.054	0.013	0.027	0.058	1,726	0.054	0.063	0.014	0.032	0.071
Size	1,348	15.786	1.685	14.577	15.490	16.928	1,726	16.030	1.723	14.922	15.897	17.127
Leverage	1,348	0.172	0.134	0.064	0.158	0.255	1,726	0.205	0.145	0.092	0.191	0.294
Inventories	1,348	0.100	0.128	0.007	0.074	0.145	1,726	0.089	0.103	0.012	0.069	0.136
RoA	1,348	0.105	0.158	0.048	0.081	0.123	1,726	0.098	0.080	0.048	0.077	0.126
Capital Intensity	1,348	0.423	0.312	0.162	0.361	0.693	1,726	0.452	0.331	0.178	0.392	0.719
MtB	1,348	4.834	32.334	1.491	2.358	3.735	1,726	3.566	12.749	1.680	2.610	4.017
Word Count	1,348	11.213	0.629	10.831	11.216	11.613	1,726	11.366	0.579	10.996	11.348	11.723

Notes: Table 2 presents descriptive statistics for firms that do not disclose information on tax risks in their annual reports during the sample period (Non-Tax Risk Disclosing Firms) and for those firms that disclose information on tax risks in their annual reports in at least one year of the sample period (Tax Risk Disclosing Firms). Variables are defined in Table A1 in the Appendix.

2.3.3 Research Methodology

In accordance with our hypotheses, we examine the effects of tax risk disclosures on firms' tax positions. We investigate how tax measures (*ETR* and *ETR_VOL*) change if a firm has started to disclose tax risks in its annual report compared to firms that abstain from any explicit tax risk disclosure. While our sample of European MNEs includes several firms that have started tax risk disclosure during the last decade, a simple comparison of disclosing and non-disclosing firms might suffer from biases associated with confounding factors and self-selection. Therefore, we use matching procedures. The PSM is a feasible technique to identify an adequate control group regarding confounding factors that explain systematical differences between disclosing and non-disclosing firms and to cope with a potential self-selection bias (Caliendo and Kopeinig, 2008; Titus, 2007; Shipman, Swanquist and Whited, 2017). We expect the identified control group and the tax risk disclosing group to be almost identical regarding their tax planning opportunities and exposures to tax risks before the treatment event took place. The only difference between the groups is the decision to start an explicit tax risk disclosure in annual reports or not.

PSM requires a two-step approach (Rosenbaum and Rubin, 1983): The first step involves a probit model including a vector of all relevant pre-treatment observables to predict a propensity score, i.e., the probability to become a tax risk disclosing firm. As shown in prior literature, we include variables that influence both a firm's tax planning opportunities and exposure to tax risks (Gupta and Newberry, 1997; Plesko, 2003; Rego, 2003; Chen, Chen, Cheng and Shevlin, 2010; Hoopes, Mescall and Pittman, 2012; Guenther et al., 2017) as well as the decision to disclose information about corporate risks (Lang and Lundholm, 1993; Linsley and Shrives, 2006; Campbell et al., 2014; Balakrishnan et al., 2019). As an additional prerequisite, the propensity score for the disclosing firms is computed one year prior to their first tax risk disclosure. Table 3 depicts the probit regression that indicates which firm characteristics determine the decision to become a tax risk disclosing firm. The results show

that larger firms, firms with more long-term debt, and firms with more comprehensive annual reports are more likely to become a tax risk disclosing firm.

Table 3: Probit Regression – Dependent Variable: *Disclosing_Firm*

VARIABLES	***Disclosing_Firm***
Size	0.047**
	(0.025)
Leverage	0.711***
	(0.000)
Inventories	0.133
	(0.631)
RoA	-0.135
	(0.665)
Capital Intensity	-0.034
	(0.738)
MtB	-0.002
	(0.161)
Word Count	0.257***
	(0.000)
Industry FE	✓
Country FE	✓
Observations	3,074
Pseudo R^2	0.182

Notes: Table 3 presents the probit regression result used for predicting the propensity score for the PSM. The dependent variable is a dummy variable that is equal to one for those firms that have disclosed information on tax risks in at least one fiscal year within the sample period, and zero otherwise. Variables are defined in Table A1 in the Appendix. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

In the second step, we apply a one to one nearest neighbor matching algorithm, using the propensity scores derived from the first step.[26] Further, we require that only observations from the same year and country are matched.[27] The overall good matching quality is presented in Table A3 in the Appendix. The one to one nearest neighbor matching algorithm leads to a

[26] In order to ensure that the results are not driven by the choice of matching algorithm, we additionally match treatment firms to a maximum of three (one to three nearest neighbor matching) and a maximum of five (one to five nearest neighbor matching) non-disclosing firms, respectively.

[27] Following prior literature, we set the caliper, the maximum deviation between the propensity score of treated and matched control firms, to 0.03 (Austin, 2011; Lunt, 2014).

total number of 137 tax risk disclosing firms that we are able to match with 77 non-disclosing firms.[28]

Using this matched sample of similar disclosing and non-disclosing firms, we deploy the following OLS regression model[29]:

$$ETR\_Measure_{it} = \beta_0 + \beta_1 Disclosing\_Firm_i + \beta_2 Disclosing\_Firm_i \; x \; Post_{it} + \beta_j X_{it} + Year\ FE + Industry\ FE + Country\ FE + u_{it} \quad (1)$$

The dependent variable is either the level of ETR [*ETR*] or the volatility of ETR [*ETR_VOL*] of firm *i* in year *t*. The variable *Disclosing_Firm* is an indicator which equals one for STOXX Europe 600 firms that have started to disclose tax risks in the observation period, and zero otherwise (see Section 2.3.1). The variable *Post* is an indicator which is set to one for years after a disclosing firm has started to disclose and for corresponding control firm years, and zero for years prior to the disclosure, i.e., we exclude the first disclosure year from our analysis. The coefficient of interest is β_2. It measures the relative change in firms' ETR levels or volatilities after the management has decided to initially disclose tax risks in its annual report.

The vector X_{it} includes control variables that could also determine the tax position of a firm (Gupta and Newberry, 1997; Plesko, 2003; Rego, 2003; Chen et al., 2010). Moreover, we include year fixed effects in order to control for annual trends in ETRs and business cycle effects. Furthermore, we consider industry fixed effects to control for different tax planning opportunities and tax risks across industries (Balakrishnan et al., 2019). Lastly, we integrate country fixed effects in our regression framework to account for country specifics such as home country tax rates, different tax enforcement or tax code complexities.

[28] Employing the PSM, our original sample clearly decreases. This is due to the strict matching prerequisites embedded in the PSM. We require matching pairs from the same year and country with a caliper value of less than 0.03. As we require a matching algorithm *with* replacement, the PSM does not lead to the same number of treatment and matched control firms.

[29] As PSM selects the control group by observable variables only, there might exist omitted variables that negatively influence the matching quality and our results. Therefore, we combine the PSM with Difference-in-Differences [DiD] approaches that account for time-invariant unoberservables and thus, mitigate a potential omitted variables bias (Heckman, Ichimura, Smith and Todd, 1998).

2.4 Results

2.4.1 Effects on Firms' Tax Positions

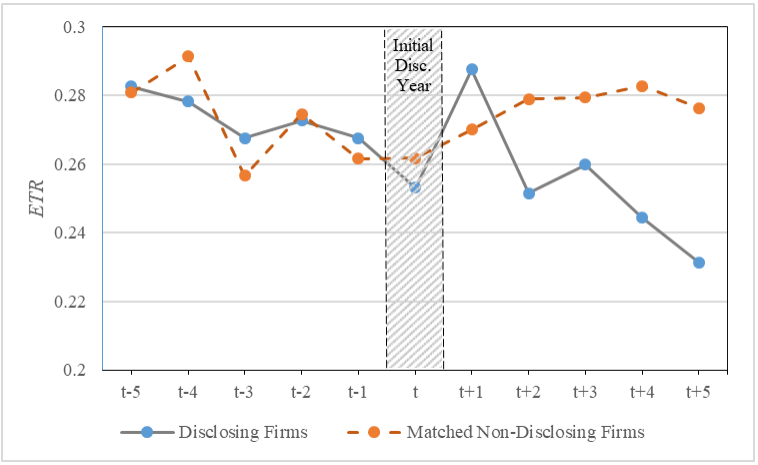
In the following analysis, we empirically test our hypotheses by investigating the effects of initial tax risk disclosures on firms' tax positions. In particular, we consider a firm's ETR and its ETR volatility.

We start with an explorative analysis to validate if disclosing and non-disclosing firms exhibit parallel trends with regard to their ETRs and ETR volatilities prior to an initial disclosure. In Figure 4, we plot ETRs and ETR volatilities of both groups over time. The two lines of Panel A suggest a parallel trend in ETRs between disclosing and non-disclosing firms before the disclosure has been started. In addition, Panel B provides a parallel trend for ETR volatilities. However, the two lines illustrate a structural difference in ETR volatilities prior to a first time disclosure. We observe higher ETR volatilities for tax risk disclosing firms in years prior to a first tax risk disclosure.

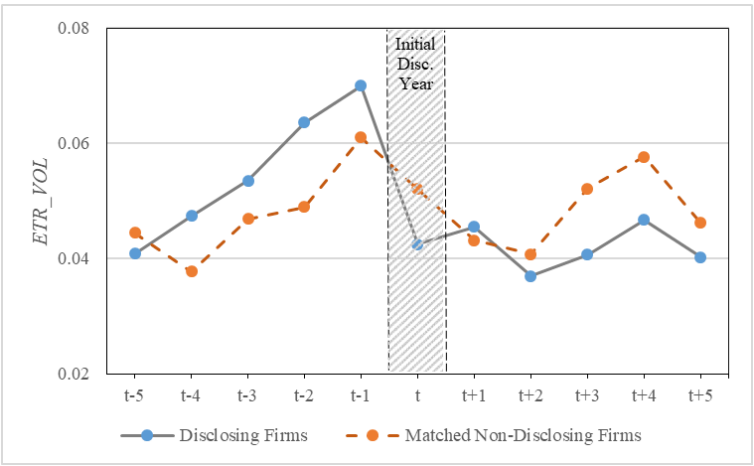
Moreover, Figure 4 also suggests changes in tax positions if a firm has started to disclose tax risk information. Panel A indicates that ETRs for disclosing firms significantly decrease in the post-period, whereas for non-disclosing firms the ETRs remain largely unchanged. Only in the first year after an initial disclosure, the ETR of disclosing firms increases. We will further scrutinize this pattern in our regression analyses. Panel B of Figure 4 shows that the ETR volatility of the disclosing firms becomes even lower compared to matched non-disclosing firms during the disclosure period, whereas we observe the opposite relation during fiscal years prior to any tax risk disclosure.

Figure 4: Parallel Trends of ETR Measures of Disclosing and Non-Disclosing Firms

Panel A: *ETR* Development



Panel B: *ETR_VOL* Development



Notes: Panel A of Figure 4 shows *ETR* developments of tax risk disclosing firms (blue line) and matched non-disclosing firms (orange line) five years before and five years after a first time disclosure. The hatched area represents the first year of tax risk disclosure. Correspondingly, Panel B shows *ETR_VOL* developments of the two groups.

In Table 4, we provide simple mean difference tests. In Panel A, we compare tax avoidance and tax risk levels within the group of disclosing firms before and after an initial disclosure based on the PSM sample (see Section 2.3.3). We find that the *ETR* significantly decreases by 2.3 percentage points after a firm has started to disclose. In addition, the ETR volatility experiences a significant decline of 0.9 percentage points.

In Panel B, we compare means of *ETRs* and *ETR_VOLs* between disclosing firms and non-disclosing firms. In Column (2), we consider the difference in tax measures between disclosing firms *before* they start to disclose and non-disclosing firms. The *ETR* for disclosing

firms is 1.0 percentage points higher, yet not significantly different. However, the *ETR_VOL* is 1.3 percentage points higher for disclosing firms before the disclosure. In Column (3), we compare our tax measures of disclosing firms *after* an initial disclosure with those of non-disclosing firms. Interestingly, the *ETR* is significantly lower for disclosing firms after the disclosure. The *ETR_VOL*, however, is not significantly different after the disclosure. The results of this analysis suggest that an initial tax risk disclosure is associated with significantly lower ETR measures.

Table 4: Mean Difference Tests

Panel A: Comparison of Tax Risk Disclosing Firms pre and post a first time disclosure after PSM

	(1) Tax Risk Disclosing Firms *before* first time disclosure		(2) Tax Risk Disclosing Firms *after* first time disclosure		
VARIABLES	Mean	Obs.	Mean	Obs.	**Diff.**
ETR	0.280	730	0.257	427	**-0.023*** (0.007)**
ETR_VOL	0.060	810	0.051	307	**-0.009** (0.005)**

Panel B: Comparison of Non-Tax Risk Disclosing Firms with Tax Risk Disclosing Firms

	(1) Non-Tax Risk Disclosing Firms		(2) Tax Risk Disclosing Firms *before* first time disclosure			(3) Tax Risk Disclosing Firms *after* first time disclosure		
VARIABLES	Mean	Obs.	Mean	Obs.	**Diff.**	Mean	Obs.	**Diff.**
ETR	0.270	650	0.280	730	**0.010 (0.006)**	0.257	427	**-0.013* (0.007)**
ETR_VOL	0.048	609	0.060	810	**0.013*** (0.004)**	0.051	307	**0.003 (0.004)**

Notes: Table 4 presents mean difference tests (two-tailed t-tests) of *ETRs* and *ETR_VOLs* after 1:1 nearest neighbor PSM. Panel A shows mean difference tests within the group of tax risk disclosing firms. Column (2) reports the mean difference between tax risk disclosing firms *before* and *after* the first time disclosure. Panel B shows mean difference tests between non-tax risk disclosing firms and tax risk disclosing firms. Column (2) reports mean differences *before* the first time disclosure, and Column (3) reports mean differences *after* the first time disclosure. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

We proceed with multivariate regression analyses based on our matched sample as described in Section 2.3.3. In Table 5, we examine the influence of tax risk disclosure on the *ETR*. In Columns (1) to (3), the *Post* variable comprises the entire post-period of disclosing firms and matched non-disclosing firms. In Columns (4) to (6), we split the *Post* variable into *Post_1* and *Post_2*. *Post_1* indicates the first year after an initial disclosure, and *Post_2* all

years *after* the first year after an initial disclosure. In Columns (1) and (4), we report estimation results with year, industry and country fixed effects. The other columns include additional control variables and different fixed effects. The overall coefficient of interest in Columns (1) to (3) is the interaction term of *Disclosing_Firm* and *Post*. Throughout these columns, the coefficient is negative, yet not statistically significant. If we split the post-period (Columns (4) to (6)), the interaction coefficient of *Disclosing_Firm* and *Post_1* is positive, but statistically insignificant. However, if we consider the post-period except the first year after the disclosure starts (interaction coefficient of *Disclosing_Firm* and *Post_2*), we find a significant reduction in ETRs. For example, Column (5) suggests that the ETR decreases by 2.6 percentage points for disclosing firms relative to firms that abstain from a disclosure.

The results in Table 5 suggest that tax risk disclosing firms are able to reduce their ETRs in the aftermath of a first disclosure. This finding confirms H1b. We conjecture that an initial tax risk disclosure is associated with an advanced tax management leading to future tax savings. However, our results suggest a time-lag. One interpretation of this finding could be adjustment costs for a refined tax management in the first year.

Regarding tax positions before the initial tax risk disclosure, we find a non-significant coefficient throughout all specifications (variable *Disclosing_Firm*). This means that ETR levels of tax risk disclosing firms do not significantly differ from those of non-disclosing firms before an initial disclosure.

Table 5: Effects of Tax Risk Disclosure on *ETR* after PSM

	(1)	(2)	(3)	(4)	(5)	(6)
			ETR			
VARIABLES	Full *Post* Period			Split of *Post* Period		
Disclosing_Firm	0.005	0.005	-0.001	0.005	0.005	0.001
	(0.406)	(0.433)	(0.900)	(0.380)	(0.404)	(0.918)
*Disclosing_Firm*Post*	-0.009	-0.013	-0.004			
	(0.289)	(0.156)	(0.679)			
*Disclosing_Firm*Post_1*				0.019	0.017	0.019
				(0.264)	(0.321)	(0.265)
*Disclosing_Firm*Post_2*				-0.021**	-0.026***	-0.019*
				(0.013)	(0.004)	(0.065)
Size		0.000	-0.002		0.000	-0.002
		(0.973)	(0.517)		(0.916)	(0.470)
Leverage		0.077***	0.116***		0.080***	0.118***
		(0.002)	(0.000)		(0.001)	(0.000)
Inventories		0.046**	0.013		0.046**	0.015
		(0.021)	(0.675)		(0.021)	(0.614)
RoA		-0.065	-0.122**		-0.067*	-0.124**
		(0.102)	(0.020)		(0.093)	(0.018)
Capital Intensity		0.023*	0.057***		0.022*	0.056***
		(0.057)	(0.000)		(0.071)	(0.000)
Year FE	✓	✓	✓	✓	✓	✓
Industry FE	✓	✓		✓	✓	
Country FE	✓	✓		✓	✓	
Pair FE			✓			✓
Observations	1,807	1,807	1,807	1,807	1,807	1,807
R^2	0.147	0.160	0.281	0.152	0.166	0.285

Notes: Table 5 presents OLS regression results corresponding to equation (1) with GAAP ETR (*ETR*) as dependent variable. All regressions are based on a one to one nearest neighbor PSM between tax risk disclosing firms (*Disclosing_Firm* = 1) and non-tax risk disclosing firms (*Disclosing_Firm* = 0). In Columns (1) to (3), the *Post* variable comprises the full pre- and post-period of the sample period. In Columns (4) to (6), we split the *Post* variable into *Post_1* and *Post_2*. *Post_1* is set equal to one for the *first year after* an initial disclosure (*t+1*), whereas *Post_2* is set equal to one for *all years after the first year* after an initial disclosure (> *t+1*). In all columns, the maximum difference in propensity score is set to 0.03. Moreover, we perform a matching algorithm with replacement of matched control firms. In all regressions, we employ robust standard errors. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

In Table 6, we test our hypotheses H2a and H2b concerning the disclosure effect on tax risks. As dependent variable we consider the ETR volatility. Analogous to Table 5, in Columns (1) to (3) we use the *Post* variable that comprises the entire post-period, while in Columns (4) to (6), we split the *Post* variable. The coefficient of the interaction term of *Disclosing_Firm* and *Post* is negative and statistically significant. For instance, in Column (2) we detect a decline in

ETR volatilities for disclosing firms of 1.2 percentage points.[30] We find similar results when we omit the first year after an initial disclosure (see interaction term of *Disclosing_Firm* and *Post_2* in Columns (4) to (6)). The results of Table 6 are in line with H2b and suggest that a first disclosure of tax risks signals a more refined approach to tax with a heightened awareness of tax risks, a better risk identification, assessment and management resulting in decreasing tax risks.

Regarding the ETR volatility prior to an initial tax risk disclosure, the effect of the *Disclosing_Firm* variable is highly significant and positive throughout all specifications. This suggests that tax risk disclosing firms bear higher overall tax risks before they start the disclosure compared to non-disclosing firms. Accordingly, firms with high ETR volatilities appear to benefit most from a more refined tax management approach.

[30] Results are robust if we modify the calculation of the ETR volatility. We likewise find a reduction in the ETR volatility if we extend the calculation period from a three-year to a four-year period (untabulated).

Table 6: Effects of Tax Risk Disclosure on *ETR_VOL* after PSM

	(1)	(2)	(3)	(4)	(5)	(6)
	ETR_VOL					
VARIABLES	Full *Post* Period			Split of *Post* Period		
Disclosing_Firm	0.012***	0.015***	0.016***	0.012***	0.015***	0.016***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
*Disclosing_Firm*Post*	-0.011**	-0.012**	-0.017***			
	(0.028)	(0.015)	(0.004)			
*Disclosing_Firm*Post_1*				-0.006	-0.006	-0.009
				(0.531)	(0.531)	(0.366)
*Disclosing_Firm*Post_2*				-0.013***	-0.014***	-0.021***
				(0.009)	(0.003)	(0.001)
Size		-0.003***	-0.006***		-0.003***	-0.006***
		(0.005)	(0.000)		(0.006)	(0.000)
Leverage		-0.011	-0.008		-0.011	-0.008
		(0.395)	(0.558)		(0.409)	(0.580)
Inventories		-0.041***	-0.057***		-0.041***	-0.057***
		(0.001)	(0.009)		(0.001)	(0.008)
RoA		-0.268***	-0.271***		-0.268***	-0.271***
		(0.000)	(0.000)		(0.000)	(0.000)
Capital Intensity		-0.002	0.003		-0.002	0.003
		(0.821)	(0.696)		(0.807)	(0.686)
Year FE	✓	✓	✓	✓	✓	✓
Industry FE	✓	✓		✓	✓	
Country FE	✓	✓		✓	✓	
Pair FE			✓			✓
Observations	1,726	1,726	1,726	1,726	1,726	1,726
R^2	0.056	0.135	0.224	0.057	0.135	0.225

Notes: Table 6 presents OLS regression results corresponding to equation (1) with GAAP ETR Volatility (*ETR_VOL*) as dependent variable. All regressions are based on a one to one nearest neighbor PSM between tax risk disclosing firms (*Disclosing_Firm* = 1) and non-tax risk disclosing firms (*Disclosing_Firm* = 0). In Columns (1) to (3), the *Post* variable comprises the full pre- and post-period of the sample period. In Columns (4) to (6), we split the *Post* variable into *Post_1* and *Post_2*. *Post_1* is set equal to one for the *first year after* an initial disclosure (*t+1*), whereas *Post_2* is set equal to one for *all years after the first year* after an initial disclosure (> *t+1*). In all columns, the maximum difference in propensity score is set to 0.03. Moreover, we perform a matching algorithm with replacement of matched control firms. In all regressions, we employ robust standard errors. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

2.4.2 Robustness Tests

In additional analyses, we present robustness checks of the applied statistics. Assuring that the results found in the previous section are not driven by the chosen matching algorithm, Table 7 presents results of alternative matched samples with *ETR* as dependent variable. Columns (1) to (4) are based on a one to three nearest neighbor matching and Columns (5) to (8) on a one to five nearest neighbor matching. Analogous to Table 5, we find a significant

reduction in the ETR of around 2.8 percentage points (Columns (3) and (7)). Considering the interaction of *Disclosing_Firm* and *Post_1*, we find again a non-negative effect on the ETR. All in all, these findings are in line with results of Table 5 and confirm robustness.

In Table 8, we present results of alternative matched sample analyses with ETR volatility as dependent variable. Throughout all specifications, the results suggest decreasing ETR volatilities of disclosing firms after they have started their tax risk disclosure. The findings of Table 7 and 8 suggest that the results found in Section 2.4.1 are not driven by the chosen one to one nearest neighbor matching algorithm.

In an additional specification, we narrow the pre- and post-period in our regression framework to four years before and after the first time disclosure. The matching of disclosing and non-disclosing firms is based on a one to one nearest neighbor matching. Table 9 presents the corresponding results. We show that the effects of the disclosure on the ETR and ETR volatility carry over if we consider a shorter observation period.

Table 7: Alternative Matching Algorithm – *ETR* Development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				ETR				
	1:3 NN Matching				**1:5 NN Matching**			
VARIABLES	Full *Post* Period		Split of *Post* Period		Full *Post* Period		Split of *Post* Period	
Disclosing_Firm	0.013**	0.010*	0.014**	0.012**	0.015***	0.013**	0.015***	0.015**
	(0.014)	(0.082)	(0.012)	(0.048)	(0.006)	(0.021)	(0.005)	(0.011)
*Disclosing_Firm*Post*	-0.015*	-0.007			-0.017**	-0.018*		
	(0.069)	(0.496)			(0.045)	(0.074)		
*Disclosing_Firm*Post_1*			0.016	0.018			0.014	0.009
			(0.345)	(0.280)			(0.386)	(0.568)
*Disclosing_Firm*Post_2*			-0.028***	-0.021**			-0.029***	-0.034***
			(0.001)	(0.025)			(0.000)	(0.001)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Industry FE	✓		✓		✓		✓	
Country FE	✓		✓		✓		✓	
Pair FE		✓		✓		✓		✓
Observations	2,207	2,207	2,207	2,207	2,335	2,335	2,335	2,335
R^2	0.164	0.233	0.169	0.236	0.165	0.232	0.170	0.236

Notes: Table 7 presents OLS regression results corresponding to equation (1) with GAAP ETR (*ETR*) as dependent variable. Columns (1) to (4) are based on a one to three nearest neighbor PSM between tax risk disclosing firms (*Disclosing_Firm* = 1) and non-tax risk disclosing firms (*Disclosing_Firm* = 0) and Columns (5) to (8) are based on a one to five nearest neighbor PSM. In Columns (1), (2), (5) and (6), the *Post* variable comprises the full pre- and post-period of the sample period. In Columns (3), (4), (7) and (8), we split the *Post* variable into *Post_1* and *Post_2*. *Post_1* is set equal to one for the *first year after* an initial disclosure (*t+1*), whereas *Post_2* is set equal to one for *all years after the first year* after an initial disclosure (> *t+1*). In all columns, the maximum difference in propensity score is set to 0.03. In all regressions, we employ robust standard errors. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 8: Alternative Matching Algorithm – *ETR_VOL* Development

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ETR_VOL							
	1:3 NN Matching				**1:5 NN Matching**			
VARIABLES	Full *Post* Period		Split of *Post* Period		Full *Post* Period		Split of *Post* Period	
Disclosing_Firm	0.011***	0.010***	0.011***	0.010***	0.012***	0.011***	0.012***	0.012***
	(0.000)	(0.005)	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)
*Disclosing_Firm*Post*	-0.011**	-0.017***			-0.011**	-0.018***		
	(0.017)	(0.004)			(0.019)	(0.001)		
*Disclosing_Firm*Post_1*			-0.006	-0.009			-0.006	-0.010
			(0.528)	(0.395)			(0.526)	(0.298)
*Disclosing_Firm*Post_2*			-0.014***	-0.021***			-0.013***	-0.022***
			(0.005)	(0.001)			(0.006)	(0.000)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Industry FE	✓		✓		✓		✓	
Country FE	✓		✓		✓		✓	
Pair FE		✓		✓		✓		✓
Observations	2,070	2,070	2,070	2,070	2,215	2,215	2,215	2,215
R^2	0.077	0.155	0.077	0.156	0.076	0.154	0.076	0.154

Notes: Table 8 presents OLS regression results corresponding to equation (1) with GAAP ETR Volatility (*ETR_VOL*) as dependent variable. Columns (1) to (4) are based on a one to three nearest neighbor PSM between tax risk disclosing firms (*Disclosing_Firm* = 1) and non-tax risk disclosing firms (*Disclosing_Firm* = 0) and Columns (5) to (8) are based on a one to five nearest neighbor PSM. In Columns (1), (2), (5) and (6), the *Post* variable comprises the full pre- and post-period of the sample period. In Columns (3), (4), (7) and (8), we split the *Post* variable into *Post_1* and *Post_2*. *Post_1* is set equal to one for the *first year after* an initial disclosure (*t+1*), whereas *Post_2* is set equal to one for *all years after the first year* after an initial disclosure (> *t+1*). In all columns, the maximum difference in propensity score is set to 0.03. In all regressions, we employ robust standard errors. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 9: Effects of Tax Risk Disclosure on *ETR* and *ETR_VOL* (Short Pre- and Post-Period)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ETR				***ETR_VOL***			
VARIABLES	Full *Post* Period		Split of *Post* Period		Full *Post* Period		Split of *Post* Period	
Disclosing_Firm	0.004	0.003	0.004	0.004	0.010***	0.010**	0.010***	0.011**
	(0.551)	(0.729)	(0.540)	(0.552)	(0.009)	(0.015)	(0.009)	(0.010)
*Disclosing_Firm*Post*	-0.005	-0.004			-0.014***	-0.018**		
	(0.603)	(0.711)			(0.009)	(0.014)		
*Disclosing_Firm*Post_1*			0.018	0.014			-0.005	-0.009
			(0.290)	(0.388)			(0.576)	(0.382)
*Disclosing_Firm*Post_2*			-0.017*	-0.021*			-0.019***	-0.025***
			(0.069)	(0.075)			(0.000)	(0.001)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Industry FE	✓		✓		✓		✓	
Country FE	✓		✓		✓		✓	
Pair FE		✓		✓		✓		✓
Observations	1,395	1,395	1,395	1,395	1,166	1,166	1,166	1,166
R^2	0.163	0.298	0.167	0.301	0.154	0.275	0.156	0.277

Notes: Table 9 presents OLS regression results corresponding to equation (1). We narrow the observation period to four years before and after an initial disclosure. In Columns (1) to (4), the dependent variable is the GAAP ETR (*ETR*). In Columns (5) to (8), the dependent variable is the GAAP ETR Volatility (*ETR_VOL*). In Columns (1), (2), (5) and (6), the *Post* variable comprises the full pre- and post-period of the sample period. In Columns (3), (4), (7) and (8), we split the *Post* variable into *Post_1* and *Post_2*. *Post_1* is set equal to one for the *first year after* an initial disclosure (*t+1*), whereas *Post_2* is set equal to one for *all years after the first year* after an initial disclosure (*> t+1*). In all Columns, we perform a one to one nearest neighbor PSM with a maximum difference in propensity score of 0.03. In all regressions, we employ robust standard errors. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

2.5 Conclusion

This study examines the effects of tax risk disclosures in European firms' annual reports on tax positions. In particular, we investigate if the level of ETRs and the ETR volatilities significantly change for firms that have started tax risk disclosure. The disclosure of information about tax risks in annual reports is not explicitly regulated within the European Union (see Directive 2003/51/EC and Directive 2013/34/EU). Thus, the management has some leeway to decide whether or not to discuss tax risks in its annual report. Various initiatives like the OECD's BEPS action plan have been introduced combating MNEs' harmful tax practices, which apparently lead to an awareness of tax-related risks. Accordingly, we are keen to analyze if the disclosure behavior about tax risks in annual reports likewise increased during the past decade and scrutinize potential effects on the firms' engagement in tax avoidance and exposure to tax risks.

Using a text mining software that screens annual reports of European firms for tax risks followed by a manual examination, we find a remarkable increase of tax risk disclosures over a period from 2005 to 2015. Multivariate regression results show that disclosing firms report ETRs that are on average 2.6 percentage points lower after an initial disclosure relative to their peers. Additionally, disclosing firms even exhibit ETR volatilities that are 1.2 percentage points lower after an initial disclosure. We suggest that both findings may be attributed to an amendment of tax affairs within the firm and an implementation of a tax risk management system, thereby influencing tax planning opportunities and the exposure to tax risks. All in all, tax risk disclosures might be indicative for a more professionalized approach towards tax and thus, signal good news. Interestingly, the finding on the ETR only holds if we omit the first year after the initial disclosure. Apparently, there are adjustment costs regarding a restructuring of tax affairs in the first year after the disclosure which lead to an increase in the ETR in this year.

Our study contributes to the informativeness of risk disclosures in annual reports and to the recent debate about tax transparency. From our analysis, we conclude that firms deliberately use the vagueness of the European accounting directives and systematically avoid disclosures of unpleasant tax risk information. Rather firms disclose tax risks that signal good news. Therefore, our study also contributes to our understanding of the potentially different effects of voluntary versus mandatory tax transparency regulations.

We acknowledge that our study is subject to some limitations. First, there may exist other public tax risk disclosures, for example, included in documents on corporate websites. Nevertheless, prior literature indicates that the annual report is still one of the most important communication channels with corporate outsiders. Second, we admit that one weakness of our categorization of annual reports is its inevitably subjectivity which is primarily due to the large number of text passages to be categorized. Finally, when analyzing firms' annual reports in terms of tax risks, we are not able to draw reliable conclusions whether and to what extent a firm has restructured its tax affairs or implemented a tax risk management. Therefore, we especially appreciate future research on the implications and effects of an implemented tax risk management on corporate tax policies and measures.

Appendix

Table A1: Variable Definitions

Variable		Definition
Disclosing_Firm	=	Indicator variable, which equals one if a firm discloses information on tax risks in at least one annual report within the sample period and zero for firms that do not disclose tax risks in their annual reports in any year of the sample period.
Post	=	Indicator variable, which is missing for the year of the initial tax risk disclosure, one for the following years, and zero otherwise.
Post_1	=	Indicator variable, which is missing for the year of the initial tax risk disclosure, one for the first year following the initial tax risk disclosure, and zero otherwise.
Post_2	=	Indicator variable, which is missing for the year of the initial tax risk disclosure, one for years after the first year after the initial tax risk disclosure, and zero otherwise.
ETR	=	GAAP Effective Tax Rate of a firm, i.e., the ratio of total income tax expense (txt) to pre-tax income (pi) less extraordinary items (xi).
ETR_VOL	=	Volatility of ETR, i.e., the standard deviation of the annual ETR over year *t-2* through year *t*.
Size	=	Size of a firm, i.e., the natural logarithm of total assets (at).
Leverage	=	Leverage of a firm, i.e., the ratio of long-term-debt (dltt) to total assets (at).
Inventories	=	Inventory usage of a firm, i.e., the ratio of inventories (invt) to total assets (at).
RoA	=	Return on assets, calculated as pre-tax income (pi) divided by total assets (at).
Capital Intensity	=	Property, plant, and equipment (ppegt) divided by total assets (at).
MtB	=	Market-to-Book ratio, i.e., the natural logarithm of market value of equity to common book equity.
Word Count	=	The natural logarithm of total words of the annual report.

Table A2: Sample Distribution

Panel A: Sample Distribution by Year

Fiscal Year	Total No. of Annual Reports	Percentage of Tax Risk Disclosure
2005	416	5.5
2006	465	8.0
2007	480	8.3
2008	504	13.5
2009	523	15.9
2010	536	14.9
2011	553	17.9
2012	559	21.7
2013	564	28.2
2014	579	32.5
2015	581	40.8

Panel B: Sample Distribution by Country of Incorporation in 2015

Country of Incorporation	Total No. of Annual Reports	Percentage of Tax Risk Disclosure
Austria	8	25.0
Belgium	15	20.0
Bermuda	1	100.0
Cayman Islands	1	100.0
Czech Republic	2	50.0
Denmark	22	18.2
Finland	14	21.4
France	80	47.5
Germany	66	48.5
Ireland	9	55.6
Isle of Man	2	50.0
Italy	28	28.6
Jersey	10	70.0
Luxembourg	6	33.3
Malta	1	100.0
Netherlands	34	55.9
Norway	9	22.2
Portugal	3	33.3
Spain	30	70.0
Sweden	43	25.6
Switzerland	47	6.4
United Kingdom	150	47.3

Table A2: Sample Distribution (continued)

Panel C: Sample Distribution by Industry in 2015

Industry	Total No. of Annual Reports	Percentage of Tax Risk Disclosure
Automobiles	16	56.3
Banks, Insurance Companies & Other Financials	138	37.0
Chemicals	23	56.5
Construction & Construction Materials	28	14.3
Consumer Durables	8	25.0
Drugs, Soap, Parfums, Tobacco	28	53.6
Fabricated Products	3	33.3
Food	20	50.0
Machinery & Business Equipment	45	40.0
Mining & Minerals	10	80.0
Oil & Petroleum Products	17	35.3
Other	146	37.0
Retail Stores	26	57.7
Steel Works Etc	7	28.6
Textiles, Apparel & Footware	8	37.5
Transportation	35	37.1
Utilities	23	56.5

Notes: Table A2 gives an overview of tax risk disclosures of the STOXX Europe 600 firms in annual reports in terms of fiscal year, country of incorporation and industry. Note that Table A2 represents the full sample without requiring non-missing values for all variables. Panel A lists the total number of annual reports per fiscal year and the percentage of tax risk disclosures in annual reports per fiscal year. Panel B lists the total number of annual reports per country in the fiscal year 2015 and the respective percentage of tax risk disclosures in annual reports. Panel C lists the total number of annual reports per industry in the fiscal year 2015 and the respective percentage of tax risk disclosures in annual reports. The industry classification is based on the 17 different industries from Fama and French.

Table A3: One to One Nearest Neighbor Matching Quality

Nearest Neighbor 1:1		Mean		Bias	Bias Reduction	t-test	
		Treated	Control	(in %)	(in %)	t	p>t
Size	Unmatched	16.073	15.758	18.6		2.39	0.017
	Matched	16.020	15.897	7.3	61.0	0.56	0.578
Leverage	Unmatched	0.216	0.173	29.1		3.95	0.000
	Matched	0.205	0.212	-4.9	83.0	-0.39	0.698
Inventories	Unmatched	0.089	0.098	-7.3		-0.90	0.369
	Matched	0.091	0.089	1.7	76.1	0.13	0.896
RoA	Unmatched	0.094	0.099	-3.9		-0.43	0.666
	Matched	0.099	0.100	-0.6	84.4	-0.07	0.947
Capital Intensity	Unmatched	0.451	0.423	8.6		1.14	0.252
	Matched	0.402	0.412	-2.9	66.0	-0.24	0.807
MtB	Unmatched	2.845	4.315	-6.6		-0.67	0.506
	Matched	2.735	2.863	-0.6	91.3	-0.11	0.911
Word Count	Unmatched	11.401	11.215	30.1		3.72	0.000
	Matched	11.386	11.301	13.7	54.4	1.15	0.251

Notes: Table A3 shows the matching quality of relevant matching characteristics between treatment firms (tax risk disclosing firms) and control firms (non-tax risk disclosing firms) before and after the matching. The control group is determined by the propensity score in the year prior to the first time disclosure of a tax risk disclosing firm. Moreover, we require a matching partner from the same country. The results are formed on a one to one nearest neighbor matching requiring a difference in propensity scores of less than 0.03 (caliper). Variables are defined in Table A1 in the Appendix.

Table A4: Examples of Tax Risk Disclosures in Annual Reports

Company Name	Text Passages concerning Tax Risks
Airbus	**Annual Report 2013, p. 12** Risk Factors (…) – Tax Issues As a multinational group with operations in numerous jurisdictions and sales around the world, the Company is subject to tax legislation in a number of countries. The Company manages its business so as to create value from the synergies and commercial capacities of its different entities, and therefore endeavours to structure its operations and transactions in a tax-efficient manner (...). There can be no assurance that the tax authorities will not seek to challenge such interpretations, in which case the Company or its affiliates could become subject to tax claims. Moreover, the tax laws and regulations that apply to the Company's business may be amended by the tax authorities—for example as a result of changes in fiscal circumstances or priorities—which could affect the overall tax efficiency of the Company.
Aviva	**Annual Report 2010, p. 163** (...) We operate in numerous tax jurisdictions around the world. Tax risk is the risk associated with changes in tax law or in the interpretation of tax law. It also includes the risk of changes in tax rates and the risk of failure to comply with procedures required by tax authorities. Failure to manage tax risks could lead to an additional tax charge. It could also lead to a financial penalty for failure to comply with required tax procedures or other aspects of tax law. If, as a result of a particular tax risk materialising, the tax costs associated with particular transactions are greater than anticipated, it could affect the profitability of those transactions.
Daimler	**Annual Report 2015, p. 151** Tax risks. Daimler AG and its subsidiaries operate in many countries worldwide and are therefore subject to numerous differing statutory provisions and tax audits. Within the Group, the tax assessments of several years are not yet final. Changes in local tax legislation and court verdicts, and differing interpretations by the fiscal authorities in the various jurisdictions – especially in the field of cross-border transactions – can lead to negative effects on the Group's net profit and cash flows. (...)
Endesa	**Annual Report 2014, p. 123** Tax risks ENDESA is exposed to risks related to taxes and changes in tax regulations. ENDESA could be significantly harmed by changes in the various tax regimes to which it is subject, by international treaties and by administrative regulations or practices, in addition to being affected by changes in tax legislation specific to the electricity industry. ENDESA is particularly vulnerable to such changes in Spain. ENDESA's commercial activities are subject to the tax regulations of the markets in which it operates and, therefore, the Company calculates its tax obligations in accordance with the tax laws, treaties, regulations and requirements imposed by the tax authorities in these markets. ENDESA's interpretation of the tax regime, treaties and regulations applicable may be deemed incorrect by the tax authorities. Furthermore, the tax laws, regulations or administrative practices and activities could change in the future, and even take effect retroactively. Any change to the tax legislation applicable or to regulations or decisions adopted by the tax authorities could affect ENDESA's tax obligations, entailing fines, extra costs or increases in its obligations which could adversely affect its business activities, outlook, financial position, operating results and cash flows. (...)

Table A4: Examples of Tax Risk Disclosures in Annual Reports (continued)

Company Name	Text Passages concerning Tax Risks
GlaxoSmithKline	**Annual Report 2009, p. 46** (...) Furthermore, given the scale and international nature of the Group's business, intra-group transfer pricing is an inherent tax risk as it is for other international businesses. Changes in tax laws or in their application with respect to matters such as transfer pricing, foreign dividends, controlled companies, R&D tax credits or a restriction in tax relief allowed on the interest on intra-Group debt, could increase the Group's effective tax rate and materially and adversely affect its financial results.
Royal Bank of Scotland	**Annual Report 2005, p. 56** The Group is exposed to the risk of changes in tax legislation and its interpretation and to increases in the rate of corporate and other taxes in the jurisdictions in which it operates The Group's activities are subject to tax at various rates around the world computed in accordance with local legislation and practice. Action by governments to increase tax rates or to impose additional taxes would reduce the profitability of the Group. Revisions to tax legislation or to its interpretation might also affect the Group's results in the future.

References

Abraham, S., & Cox, P. (2007). Analysing the determinants of narrative risk information in UK FTSE 100 annual reports. *The British Accounting Review*, 39(3), 227-248.

Akamah, H., Hope, O.-K., & Thomas, W. B. (2018). Tax havens and disclosure aggregation. *Journal of International Business Studies*, 49, 49-69.

Atwood, T. J., & Reynolds, J. K. (2008). The pricing of realized tax benefits from NOL carryforwards: Effect of income statement presentation. *The Journal of the American Taxation Association*, 30(1), 1-27.

Austin, P. C. (2011). Optimal caliper widths for propensity-score matching when estimating differences in means and differences in proportions in observational studies. *Pharmaceutical Statistics*, 10, 150-161.

Balakrishnan, K., Blouin, J., & Guay, W. (2019). Tax aggressiveness and corporate transparency. *The Accounting Review*, 94(1), 54-69.

Bauer, A. M., & Klassen, K. J. (2014). Estimating downside tax risk using large unfavorable tax payments. *Working paper*.

Beck, P. J., & Lisowsky, P. (2014). Tax uncertainty and voluntary real-time tax audits. *The Accounting Review*, 89(3), 867-901.

Bilicka, K., Casi-Eberhard, E., Seregni, C., & Stage, B. M. B. (2021). Qualitative information disclosure: Is mandating additional tax information disclosure always useful? *CESifo Working Paper No. 2021-9030.*

Bozanic, Z., Hoopes, J. L., Thornock, J. R., & Williams, B. M. (2017). IRS attention. *Journal of Accounting Research*, 55(1), 79-114.

Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, 22(1), 31-72.

Campbell, J. L., Cecchini, M., Cianci, A. M., Ehinger, A. C., & Werner, E. M. (2019). Tax-related mandatory risk factor disclosures, future profitability, and stock returns. *Review of Accounting Studies*, 24(1), 264-308.

Campbell, J. L., Chen, H., Dhaliwal, D. S., Lu, H., & Steele, L. B. (2014). The information content of mandatory risk factor disclosures in corporate filings. *Review of Accounting Studies*, 19(1), 396-455.

Chen, S., Chen, X., Cheng, T., & Shevlin, T. J. (2010). Are family firms more tax aggressive than non-family firms? *Journal of Financial Economics*, 95(1), 41-61.

De Franco, G., Kothari, S. P., & Verdi, R. S. (2011). The benefits of financial statement comparability. *Journal of Accounting Research*, 49(4), 895-931.

De Franco, G., Wong, M. F., & Zhou, Y. (2011). Accounting adjustments and the valuation of financial statement note information in 10-K filings. *The Accounting Review*, 86(5), 1577-1604.

Drake, K. D., Lusch, S. J., & Stekelberg, J. (2019). Does tax risk affect investor valuation of tax avoidance? *Journal of Accounting, Auditing & Finance*, 34(1), 151-176.

Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2008). Long-run corporate tax avoidance. *The Accounting Review*, 83(1), 61-82.

Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2010). The effects of executives on corporate tax avoidance. *The Accounting Review*, 85(4), 1163-1189.

Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2019). When does tax avoidance result in tax uncertainty? *The Accounting Review*, 94(2), 179-203.

Dyreng, S. D., Hoopes, J. L., & Wilde, J. H. (2016). Public pressure and corporate tax behavior. *Journal of Accounting Research*, 54(1), 147-186.

Ehinger, A., Lee, J. A., Stomberg, B., & Towery, E. (2020). The relative importance of tax reporting complexity and IRS scrutiny in voluntary tax disclosure decisions. *Working paper*.

Ernst & Young (EY) (2012). 2011-12 Tax risk and controversy survey. Available at: http://www.ey.com/GL/en/Services/Tax/2011-12-Tax-risk-and-controversy-survey.

Ernst & Young (EY) (2014). 2013-14 Tax risk and controversy survey. Available at: https://www.eytax.jp/tax-library/other-report/pdf/Tax-Risk-and-Controversy-Survey-2014_E.pdf.

European Commission (2003). Directive 2003/51/EC.

European Commission (2013). Directive 2013/34/EU.

European Commission (2013). Directive 2013/36/EU.

Graham, J. R., Hanlon, M., Shevlin, T., & Shroff, N. (2014). Incentives for tax planning and avoidance: Evidence from the field. *The Accounting Review*, 89(3), 991-1023.

Guenther, D. A., Matsunaga, S. R., & Williams, B. R. (2017). Is tax avoidance related to firm risk? *The Accounting Review*, 92(1), 115-136.

Gupta, S., & Newberry, K. (1997). Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data. *Journal of Accounting and Public Policy*, 16(1), 1-34.

Hanlon, M., & Heitzman, S. (2010). A review of tax research. *Journal of Accounting and Economics*, 50(2-3), 127-178.

Hanlon, M., Maydew, E. L., & Saavedra, D. (2017). The taxman cometh: Does tax uncertainty affect corporate cash holdings? *Review of Accounting Studies*, 22(3), 1198-1228.

Hanlon, M., & Slemrod, J. (2009). What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement. *Journal of Public Economics*, 93(1-2), 126-141.

Heckman, J., Ichimura, H., Smith, J., & Todd, P. (1998). Characterizing selection bias using experimental data. *Econometrica*, 66, 1017-1098.

Henry, E., Massel, N., & Towery, E. (2016). Increased tax disclosure and corporate tax avoidance. *National Tax Journal*, 69(4), 809-830.

Hoopes, J. L., Mescall, D., & Pittman, J. A. (2012). Do IRS audits deter corporate tax avoidance? *The Accounting Review*, 87(5), 1603-1639.

Hope, O.-K., Ma, M., & Thomas, W. B. (2013). Tax avoidance and geographic earnings disclosure. *Journal of Accounting and Economics*, 56(2-3), 170-189.

Hutchens, M., & Rego, S. O. (2015). Does greater tax risk lead to increased firm risk? *Working Paper*.

International Accounting Standards Board (IASB) (2010). IFRS Practice Statement – Management Commentary.

Jones, M. J., & Shoemaker, P. A. (1994). Accounting narratives: A review of empirical studies of content and readability. *Journal of Accounting Literature*, 13, 142-184.

Joshi, P. (2020). Does private country-by-country reporting deter tax avoidance and income shifting? Evidence from BEPS action item 13. *Journal of Accounting Research*, 58(2), 333-381.

Kao, W. C. (2019). The relation between tax avoidance and voluntary disclosures of taxation in United Kingdom. *Working Paper*.

Kravet, T., & Muslu, V. (2013). Textual risk disclosures and investors' risk perceptions. *Review of Accounting Studies*, 18(4), 1088-1122.

Kvaal E., & Nobes, C. (2013). International variations in tax disclosures. *Accounting in Europe*, 10(2), 241-273.

Lang, M., & Lundholm, R. (1993). Cross-sectional determinants of analyst ratings of corporate disclosures. *Journal of Accounting Research*, 31(2), 246-271.

Li, F. (2006). Do stock market investors understand the risk sentiment of corporate annual reports? *Working Paper*.

Linsley, P. M., & Shrives, P. J. (2006). Risk reporting: A study of risk disclosures in the annual reports of UK companies. *The British Accounting Review*, 38(4), 387-404.

Lloyd's (2013). Risk Index 2013. Available at: https://www.ipsos.com/sites/default/files/publication/1970-01/loyalty-lloyds-risk-index-2013-report.pdf.

Lunt, M. (2014). Selecting an appropriate caliper can be essential for achieving good balance with propensity score matching. *American Journal of Epidemiology*, 179(2), 226-235.

Neuman, S. S., Omer, T. C., & Schmidt, A. P. (2020). Assessing tax risk: Practitioner perspectives. *Contemporary Accounting Research*, 37(3), 1788-1827.

Neuman, S. S., Omer, T. C., & Shelley, M. K. (2013). Corporate transparency, sustainable tax strategies, and uncertain tax activities. *Working Paper*.

Overesch, M., & Wolff, H. (2021). Financial transparency to the rescue: Effects of public country-by-country reporting in the EU banking sector on tax avoidance. *Contemporary Accounting Research*, 38(3), 1616-1642.

Plesko, G. (2003). An evaluation of alternative measures of corporate tax rates. *Journal of Accounting and Economics*, 35(2), 201-226.

Rego, S. O. (2003). Tax-avoidance activities of U.S. multinational corporations. *Contemporary Accounting Research*, 20(4), 805-833.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1), 41-55.

Shipman, J. E., Swanquist, Q. T., & Whited, R. L. (2017). Propensity score matching in accounting research. *The Accounting Review*, 92(1), 213-244.

Titus, M. A. (2007). Detecting selection bias, using propensity score matching, and estimating treatment effects: An application to the private returns to a master's degree. *Research in Higher Education*, 48(4), 487-521.

Wunder, H. F. (2009). Tax risk management and the multinational enterprise. *Journal of International Accounting, Auditing and Taxation*, 18(1), 14-28.

Xia, J. (2020). Qualitative disclosure as a tax enforcement mechanism: Evidence from the U.K. tax strategy disclosure requirement. *Working Paper*.

Chapter 3

Tax Transparency through Mandatory Qualitative Disclosures – Determinants and Effects of U.K. Tax Strategy Reports

Tax Transparency through Mandatory Qualitative Disclosures – Determinants and Effects of U.K. Tax Strategy Reports

Mathias Dunker
Department of Business Taxation, University of Cologne, dunker@wiso.uni-koeln.de

Sina Willkomm
Department of Business Taxation, University of Cologne, willkomm@wiso.uni-koeln.de

Abstract:

This paper examines the determinants and effects of qualitative and public tax disclosures. The U.K. tax strategy disclosure regulation, enacted in the U.K. Finance Act [FA] 2016, mandates large firms to publicly disclose information about their tax strategy. The regulation is intended to improve transparency around a firm's approach to tax, thereby aiming to limit tax avoidance. Using a sample of hand-collected tax strategy reports, we find that firms provide poor disclosures when prior tax avoidance is high. Our results suggest that tax-avoiding firms use the legal leeway when preparing the tax strategy reports. Moreover, we document increasing effective tax rates [ETRs] for affected U.K. firms after the regulation came into effect. Our results indicate that qualitative tax disclosures are effective in curbing tax avoidance. In light of an ongoing call for more corporate tax transparency, our findings should be of interest for policymakers worldwide when designing tax transparency regulations.

Keywords: Tax Transparency, Tax Strategy, Tax Avoidance, Disclosure, Text Mining

JEL Classification: M41, D8, H25, H26, F23

Acknowledgments: We are grateful to helpful comments from Michael Overesch and Max Pflitsch. We would also like to thank seminar participants at the University of Cologne and conference participants at the Annual Conference of the Tax Administration Research Centre in Exeter.

Chapter 3

Tables

Figures

3.1 Introduction

In recent years, various disclosure initiatives have been introduced on a national and global scale to enhance corporate tax transparency, which is considered a possible corrective to aggressive tax planning of multinational enterprises [MNEs]. However, the impact of tax transparency to effectively curb tax avoidance is unclear. While some prior studies find that tax disclosures can limit corporate tax avoidance (Gupta, Mills and Towery, 2014; Henry, Massel and Towery, 2016; Dyreng, Hoopes and Wilde, 2016; Joshi, 2020; Overesch and Wolff, 2021), others find no or only minor effects in this regard (Honaker and Sharma, 2017; Hoopes, Robinson and Slemrod, 2018). In this study, we examine the determinants and effects of specific qualitative and public tax disclosures, namely the U.K. tax strategy reports. In light of increasing relevance of qualitative disclosures and ongoing efforts to combat aggressive tax planning, insights on the determinants and effectiveness of these disclosures are of particular interest (Müller, Spengel and Vay, 2020).

The tax strategy disclosure regulation, enacted in the U.K. Finance Act [FA] 2016, mandates large firms to publicly disclose qualitative information in an entirely tax-related document (tax strategy report). The regulation is effective for financial years starting after 15 September 2016 and requires that the tax strategy report has to be published online on an annual basis. The regulation applies to 'qualifying' U.K. companies and groups with a turnover exceeding £200 million and/or a balance sheet total above £2 billion and to MNEs with U.K. presence. The legislation mandates information on U.K. taxation to be disclosed in four separate categories: (1) approach to risk management and governance arrangements, (2) attitude towards tax planning, (3) level of accepted risk and (4) approach towards dealings with Her Majesty's Revenue and Customs [HMRC]. Additional disclosures on tax can be provided voluntarily.

The purpose of the regulation is twofold. First, the regulation aims to improve transparency around a firm's tax behavior towards the U.K. tax authority HMRC, consumers and other stakeholders. Second, the regulation is expected to curb tax avoidance (HMRC,

2015a). Accordingly, our study is divided into two parts. First, we investigate if tax avoidance and certain firm characteristics determine the shape and the level of detail of a tax strategy report. Second, we provide evidence if the regulation is useful to restrict tax avoidance.

The HMRC argues that the content of a tax strategy report is a clear indicator for tax avoidance (HMRC, 2015b). Firms engaging in risky tax planning are assumed not to comply with the regulation and to use more formalized reports. Prior literature shows that firms reduce the quality of their disclosures in an attempt to mask their engagement in tax avoidance (Hope, Ma and Thomas, 2013; Akamah, Hope and Thomas, 2018; Dyreng, Hoopes, Langetieg and Wilde, 2020). In addition, a firm's tax behavior is found to be associated with textual characteristics of corporate disclosures (Law and Mills, 2015; Inger, Meckfessel, Zhou and Fan, 2018; Beuselinck, Blanco, Dhole and Lobo, 2018).

Regarding the tax strategy disclosure regulation, firms have considerable leeway in preparing the reports with respect to the length, usage of boilerplate (similar) language or a specific tone. This makes the regulation a perfect setting to investigate if and how firms strategically formulate public tax disclosures. However, the relation between a firm's tax behavior and the report's content and textual characteristics is unclear. On the one hand, the corporate culture theory posits that all decisions of a firm reflect a shared belief about the 'right' corporate behavior (Kreps, 1990; Hermalin, 2001). If a firm considers tax avoidance activities as part of the right corporate behavior, thus contributing less to society, the tax strategy report as a mean of transparency is more likely to be shorter and qualitatively lower. On the other hand, the legitimacy theory assumes the existence of a 'social contract' between a firm and society (Shocker and Sethi, 1973; Mathews, 1997). To avoid adverse consequences due to the revelation of tax avoidance schemes, which are likely perceived as a breach of the social contract, firms engaging in tax avoidance might use the report strategically to change external perception (Deegan, 2002). Accordingly, these firms are more transparent by disclosing longer and qualitatively higher reports.

To compose our sample of tax strategy reports, we first identify all firms that are subject to the disclosure regulation and collect their reports using a specific search algorithm, which results in a sample of 2,012 reports. If possible, we divide each report into the four mandatory categories and the additional voluntary category. Moreover, we perform several text mining steps to generate variables that capture the reports' disclosure characteristics.

Our regression results suggest that the disclosure characteristics of a tax strategy report are determined by the level of prior tax avoidance. We proxy a firm's engagement in tax avoidance by a long-run GAAP effective tax rate [ETR] (Dyreng, Hanlon and Maydew, 2008). We find that prior tax avoidance is negatively associated with corporate transparency, which is in line with the corporate culture theory. Firms with low ETRs tend to be not fully compliant with the regulation by omitting certain prescribed categories. We also find that firms with low ETRs provide less information about the 'attitude towards tax planning' category, make less voluntary disclosures and use more uncertainty words in their reports. Taken together, firms provide less transparent tax strategy reports and are less likely to fully comply with the regulation if prior tax avoidance is high.

In the second part of our paper, we test if the disclosure regulation is useful to reduce tax avoidance. The HMRC expects the regulation to restrict aggressive tax planning via two mechanisms. The first mechanism relies on public scrutiny of a firm's tax strategy. Survey and empirical studies document an effect of public scrutiny on tax avoidance (e.g., Graham, Hanlon, Shevlin and Shroff, 2014; Hoopes et al., 2018). Based on the signaling theory, a firm might be identified as a tax avoider due its tax strategy report (Spence, 1973; Bergh, Connelly, Ketchen and Shannon, 2014) resulting in reputational costs because the public has negative sentiments towards harmful tax practices (e.g., Dyreng et al., 2016). These costs might induce the firm to change its tax behavior. The second mechanism is based on a more pronounced discussion and an obligatory approval of the tax strategy by the firm's executive board. Tax avoidance might actively be discouraged if the board takes responsibility for the tax strategy (HMRC, 2015b).

However, approving the tax strategy might even tempt the board to maximize profits by tax avoidance activities (Freedman, Loomer and Vella, 2009). Ex ante, it is unclear if the disclosure regulation is effective in limiting tax avoidance. Therefore, we test the regulations' effectiveness empirically.

We employ OLS regression models embedding different matching and reweighting techniques to test if U.K. firms subject to the regulation reduce their tax avoidance. First, we perform a regression using an unmatched sample of 50 firms above the legal turnover threshold and 50 firms below the turnover threshold as control firms. Moreover, in additional regressions we employ Propensity Score Matching [PSM], a commonly used matching technique to alleviate concerns regarding a self-selection bias and to improve covariate balance. Our results indicate that U.K. firms subject to the regulation exhibit significantly higher ETRs relative to unaffected firms. This finding is supported by a series of robustness tests. In sum, our results clearly suggest that the tax strategy disclosure regulation is capable to limit corporate tax avoidance.

Our study contributes to existing literature on tax transparency. First, we add to the literature on the determinants of tax disclosures. Empirical studies suggest a direct link between firms' engagement in tax avoidance and the quality of disclosures. Robinson and Schmidt (2013) document that tax aggressive firms provide lower quality disclosures in terms of completeness and clarity regarding the U.S. FIN 48 regulation on Uncertain Tax Benefits [UTBs]. Kubick, Lynch, Mayberry and Omer (2016) show that firms engaging in tax avoidance are more likely to receive a tax-related comment letter by the U.S. SEC.[31] Moreover, tax aggressive firms are found to have less readable financial statements (Beuselinck et al., 2018) and provide more complex tax footnotes in financial statements (Inger et al., 2018). Using a large sample of tax strategy reports, we are the first to perform a sound empirical analysis on

[31] Receiving a tax-related SEC comment letter is an indication for low quality tax disclosures in financial statements.

the determinants of mandatory and qualitative tax-related public disclosures. We show that tax-avoiding firms use the leeway when preparing the reports and reduce the level of transparency. This finding should be kept in mind when deriving useful information from the reports.

Second, we contribute to the literature that investigates the effects that a disclosure regulation has on corporate tax avoidance. Prior studies on tax transparency primarily examine the effects of *quantitative* disclosures by investigating the change of corporate tax behavior, investor reactions or other economic consequences (Henry et al., 2016; Dyreng et al., 2016; Joshi, 2020; Overesch and Wolff, 2021). Empirical evidence on the effects of *qualitative* disclosure requirements to alter firms' tax behavior is scarce so far. Providing public and non-numeric information, the U.K. regulation represents a unique research setting and thus, allows us to expand the literature on the effects in light of a novel tax transparency requirement. Our finding on the regulation's effectiveness in tackling tax avoidance suggests that qualitative tax disclosures are a useful tax enforcement tool. Our paper provides insights that are of particular interest if policymakers worldwide consider to impose similar transparency regulations.

Two contemporaneous studies are closely related to our paper. Xia (2020) and Bilicka, Casi-Eberhard, Seregni and Stage (2021) also examine the effectiveness of the U.K. regulation. However, both studies find no significant change in affected firms' ETRs. In order to corroborate the consistency of results regarding regulatory effects, different research designs are demanded because empirical studies often share similar identification and measurement problems (Leuz and Wysocki, 2016). A distinct identification of treatment and control firms as well as ensuring comparability of these two groups is essential. Therefore, we verify if firms subject to the regulation have actually published a report and non-affected firms did not. Additionally, we increase the comparability of treatment and control firms by performing PSM and reweighting techniques (St. Clair and Cook, 2015). Moreover, prior research provides only limited evidence regarding the determinants of tax strategy reports (Belnap, 2019; Xia, 2020; Bilicka et al., 2021).

The remainder of the paper is structured as follows. Section 3.2 describes the institutional background. Section 3.3 develops our hypotheses. In Section 3.4, we discuss our data and sample selection process. The empirical design and results on the determinants of tax strategy reports are presented in Section 3.5. Section 3.6 contains the empirical design and results regarding the effects of the reports. Section 3.7 concludes.

3.2 Institutional Background

The insistent demand for tax transparency of MNEs, once initiated by tax activists and NGOs, has developed into a political movement on a global level. Tax transparency is considered a possible corrective to tax avoidance (Christians, 2013; Oats and Tuck, 2019). The call for more transparency originates from revelations of mismatches between profits and taxes paid by well-known MNEs such as Starbucks, Google, Apple and Amazon. These disparities have been widely criticized by society as immoral and unethical (Barford and Holt, 2013) and caused dissatisfaction because the public and other stakeholders considered that large firms do not pay their 'fair share of taxes' (Gribnau and Jallai, 2017). Therefore, tax transparency has moved into focus of policymakers worldwide intending to leverage public scrutiny to limit corporate tax avoidance. For example, the European Commission stated in 2015 that it gives "high priority to improving tax transparency" since it is crucial for securing fairer taxation and can improve tax compliance, thereby tackling aggressive tax planning (European Commission, 2015).

Tax disclosure initiatives differ with respect to the nature of content (quantitative vs. qualitative disclosures), the level of confidentiality (non-public vs. public disclosures) and the level of obligation (voluntary vs. mandatory disclosures). *Quantitative* disclosure initiatives have been the most prevalent so far. Initially, these initiatives targeted firms from specific industries to disclose their payments and other financial figures to governments. In the last years, however, mandatory tax transparency regulations have emerged that are not limited to

certain industries. While some of these disclosure requirements such as the U.S. Foreign Account Tax Compliance Act [FATCA] or the OECD's Country-by-Country [CbC] reporting demand confidential information to authorities, there is a trend for public disclosures (PwC, 2015). In line with this development, a public disclosure of CbC reports has been advocated by the European Commission and several countries, however, it is not implemented so far. In some countries (e.g., Denmark, Finland, Sweden, Norway and Australia), certain quantitative corporate tax information is already available for the public (PwC, 2016).

Although tax transparency initiatives are increasing in numbers, requirements mandating firms to disclose *qualitative* information on tax are so far scarce. Existing qualitative disclosure regulations are either non-public or voluntary. For instance, non-public tax disclosure requirements comprise Schedule UTP in the U.S. (disclosure of concise descriptions of uncertain tax positions), the EU Directive 2011/16/EU (disclosure of cross-border arrangements), or the U.K. Disclosure of Tax Avoidance Schemes regulation (disclosure of the nature and design of tax avoidance activities). Recently, in the Australian federal budget 2016/2017, a public and voluntary tax transparency regulation has been introduced in Australia.

In contrast to the aforementioned requirements, the U.K. tax strategy disclosure regulation stands out due to its qualitative content, obligatory nature and publicly accessible information. The objective of the new regulation is to ameliorate corporate tax transparency towards several stakeholders. The HMRC aims for the publication of tax strategies because they "ensure greater transparency around a business's approach to tax to HMRC, shareholders and consumers" (HMRC, 2015a). Also, it is supposed to alter corporate tax behavior and to improve tax compliance due to public scrutiny and an obligatory approval of the report by the firm's executive board.

The U.K. tax strategy disclosure regulation, codified in Schedule 19 of the U.K. FA 2016, mandates large firms with operations in the U.K. to publicly disclose a tax strategy report on an annual basis for financial years starting after 15 September 2016. The disclosure

requirement applies to so-called 'qualifying companies' and 'qualifying groups', including U.K. companies, (sub-)groups and partnerships with a turnover exceeding £200 million and/or a balance sheet total above £2 billion in the previous financial year.[32] MNEs with U.K. presence and more than €750 million global turnover are also covered.[33] According to Para. 17 (1) of Schedule 19, a tax strategy must include contents on the following four categories: (1) approach to risk management and governance arrangements, (2) attitude towards tax planning, (3) level of accepted risk and (4) approach towards dealings with HMRC. Moreover, firms are free to integrate supplementary disclosures relating to taxation.[34] A tax strategy report is required to be approved by the firm's executive board and published on the corporate website before the end of the current financial year. In order to ensure compliance, the regulation sets out a penalty of £7,500 if the firm does not publish a tax strategy, if the report does not include all mandatory categories or if the report does not remain available free of charge. However, no penalties exist if the presented tax strategy is actually not applied by the firm.

3.3 Hypotheses Development

3.3.1 Determinants of Tax Strategy Reports

The U.K. tax strategy disclosure regulation does not prescribe a minimum disclosure quality and the effort to comply with the legal requirements seems to be rather low. This allows firms to exercise discretion concerning the scope of information and the level of detail in their reports. To this regard, we are keen to analyze what determines a report's disclosure characteristics. Specifically, we scrutinize the relation of the report's disclosure characteristics and a firm's prior engagement in tax avoidance. This relation is unclear ex ante.

[32] For groups and sub-groups, consolidated turnovers or balance sheet totals of all relevant entities are taken into account. For details on the scope of regulation, please consult Schedule 19 of the U.K. FA 2016, Paras. 2-15.
[33] 'MNE' has the same meaning as under the OECD's CbC Reporting Implementation Package from 2014. For MNEs, no de minimis threshold exists. A minor U.K. subsidiary or branch already qualifies an MNE as 'qualifying company'.
[34] We consider these voluntary disclosures as a fifth category. See Table A3 in the Appendix for examples of tax strategy reports.

The corporate culture theory posits that a firm's culture influences its behavior. All firm decisions reflect a set of shared values and beliefs in the 'right' corporate behavior (Kreps, 1990; Hermalin, 2001). Lee (2020) describes the corporate culture of firms engaging in tax avoidance as a 'pro-shareholder culture' because these firms dismiss the interest of non-financial stakeholders and hence, do not contribute to society. This notion is in line with empirical studies indicating that the corporate culture systematically affects corporate policies (e.g., Hoi, Wu and Zhang, 2013). Providing information in public disclosures to non-financial stakeholders is no integral part of the corporate culture of a tax-avoiding firm.

The relevance of the corporate culture is stressed by the HMRC stating that "[C]ulture was seen to be hugely influential for tax strategy" (HMRC, 2015b). In a concise survey study, the HMRC states that the content of a tax strategy report is a clear indicator for tax avoidance (HMRC, 2015b). The survey results suggest that more detailed tax strategies are published by lower risk-appetite and compliance-focused firms, whereas high-risk firms often do not disclose information.[35]

Moreover, public disclosures of tax-related information could be costly for the firms. Firms could be exposed to considerable reputational risks if they publicly disclose sensitive information on tax planning or tax risks. This may result in public shaming of the firms, leading to consumer boycotts if the information is perceived as unethical. For example, survey evidence indicates that reputational concerns play a critical role in tax planning decisions of firms (Graham et al., 2014). Additionally, tax disclosures can impose costs on affected firms in form of increased regulatory scrutiny and adverse political actions if the disclosures provide new information to tax authorities and regulators (Leuz and Wysocki, 2016). Finally, there may exist proprietary costs if disclosures reveal commercially sensitive information that may attract competitors or trigger suppliers or customers to renegotiate their contracts (Evers, Meier and

[35] Due to the small number of interviewed participants (35 decision-makers), the HMRC survey does not necessarily provide a convincing base for a new legislative requirement (Freedman and Vella, 2016).

Spengel, 2016). Consequently, based on the corporate culture theory and potential costs of sensitive tax disclosures, tax-avoiding firms are incentivized to withhold information and provide more opaque tax disclosures.

Despite low requirements for compliance, the negligible financial penalty for non-compliance with the U.K. tax strategy disclosure regulation might not encourage tax-avoiding firms to disclose information on all mandatory categories. Our explorative analysis shows that not all firms report on all prescribed categories (Section 3.5.2). It could be more advantageous for tax-avoiding firms not to publish sensitive information in order to avoid reputational adversities or tax authorities' scrutiny.

Moreover, textual characteristics of a tax strategy report are assumed to be determined by a firms' engagement in tax avoidance. Prior studies show that tax avoidance is related to textual information conveyed by the firm (Inger et al., 2018; Beuselinck et al., 2018), whereas others find that text-based measures even predict corporate tax avoidance (Law and Mills, 2015). While it is mandatory for a qualifying company to publish a tax strategy report, firms have considerable discretion on how and what to disclose. Neither the report's length nor the quality are prescribed. As a result, firms might limit their report to just a few words, use boilerplate, i.e. similar, language or a certain tone to shape the way the information is perceived. Hence, firms can strategically decide on the report's textual characteristics like *length*, *similarity* among each other and *tone*[36].

Taken together, based on the corporate culture theory and potential costs of sensitive tax disclosures, we might expect firms with low prior ETRs to omit certain categories within their reports. Moreover, we might expect these firms to formulate less detailed and more similar tax strategy reports with more uncertainty word usage. We state the following hypothesis:

[36] Instead of frequently used negative or positive words to measure a document's *tone*, we focus on uncertainty words. Analyzing a report's linguistic uncertainty is more appropriate in the context of tax strategy reports (HMRC, 2015b). In particular, the usage of uncertainty words might facilitate the obfuscation of the actual tax behavior. For a description of textual characteristics employed in our study, please refer to Section 3.4.

H1a: Tax-avoiding firms provide poor (less transparent) tax strategy reports.

However, the opposite relation between tax avoidance and tax transparency might exist. According to the legitimacy theory, a social contract between a firm and society exists (Shocker and Sethi, 1973; Mathews, 1997). For the firm, adverse consequences may occur if the public perceives the contract to be violated. Tax avoidance is commonly perceived as a breach of the social contract (Christensen and Murphy, 2004). As a result, firms engaging in tax avoidance might use corporate disclosures strategically in order to change external perception and improve or regain legitimacy (Deegan, 2002).

Some empirical studies document a positive relation between tax transparency and tax avoidance. For example, Balakrishnan, Blouin and Guay (2019) show that managers of tax aggressive firms attempt to mitigate agency conflicts evolving from the financial complexity of the firm by increasing various tax-related disclosures and Kao (2019) finds that tax avoidance is positively associated with voluntary tax disclosures in firms' Corporate Social Responsibility [CSR] reports. Consistent with the legitimacy theory, we might expect tax-avoiding firms to exploit the legal leeway in order to legitimize their behavior. Tax strategy reports of these firms are supposed to be longer, less similar with less uncertainty word usage. In particular, we expect this association to be more pronounced for the category on tax planning because this category is likely the most effective in shaping societal perception for legitimacy. Furthermore, tax-avoiding firms might be more likely to include all categories within their reports. Hence, we state the following to H1a contrarian hypothesis:

H1b: Tax-avoiding firms provide superior (more transparent) tax strategy reports.

3.3.2 Effects on Tax Avoidance

The U.K. tax strategy disclosure regulation also aims at mitigating tax avoidance. The HMRC expects the disclosure regulation to reduce tax avoidance via two mechanisms. First, scrutiny on the firm's approach towards tax planning and tax compliance by the public and

HMRC is assumed to affect corporate tax behavior (HMRC, 2015c). Leveraging public scrutiny can be costly for firms if it leads to reputational damages that may result in consumer boycotts. Besides anecdotal evidence of consumer boycotts of Starbucks and Amazon in the U.K., the effects of public scrutiny and reputational costs on tax avoidance have been documented by survey evidence and empirical studies (Graham et al., 2014; Hanlon and Slemrod, 2009; Dyreng et al., 2016; Austin and Wilson, 2017; Hoopes et al., 2018).

For the regulation to successfully lead to effective public scrutiny, the tax strategy report must provide stakeholders with meaningful information about a firm's tax behavior. The signaling theory suggests that a separating equilibrium occurs in which tax avoiders and tax compliant firms send different signals (Spence, 1973; Bergh et al., 2014). If a tax avoider presents itself as a responsible taxpayer and this signal is revealed to be inaccurate by other sources of information (e.g., annual reports or newspaper articles), adverse consequences for the firm will occur. Accordingly, only tax compliant firms will signal a responsible tax behavior through their tax strategy reports. Tax avoidance is likely identified and the risk of adverse reputational effects increases. Particularly in the U.K., the risk of reputational costs is high. The British society generally condemns tax avoidance (Fair Tax Mark, 2020). Consequently, anticipated public scrutiny on tax strategies might induce firms to reduce tax avoidance.

Nonetheless, a tax strategy might not always signal if a firm is tax aggressive or compliant. Due to the obligatory nature of the disclosure regulation, a pooling equilibrium might occur in which all firms send the same signal (Middleton and Muttonen, 2020). If tax strategy reports are formulated in a boilerplate language irrespective of the firms' approach to tax, they cannot be used to distinguish tax aggressive from compliant firms. Firms will not feel restrained in their tax avoidance behavior (Freedman and Vella, 2016). The effectiveness of reputational costs to curb tax avoidance has been questioned by empirical studies (Hasegawa, Hoopes, Ishida and Slemrod, 2013; Gallemore, Maydew and Thornock, 2014; Chen, Schuchard and Stomberg, 2019).

Scrutiny by tax authorities can also impact disclosure costs and influence corporate tax behavior. HMRC explicitly points out that material inconsistencies between published tax strategies and tax returns will be accounted for in the regular risk review (HMRC, 2015c). Accordingly, firms aim to avoid that a 'red flag' is raised in order to maintain advantages of being classified as low-risk. All else equal, additional costs associated with a higher risk rating due to HMRC's scrutiny of tax strategies could incentivize firms to alter their tax behavior.

The second mechanism is based on a more pronounced discussion and the approval of the tax strategy by the firm's executive board (HMRC, 2015a). Aggressive tax planning might actively be discouraged if the board takes responsibility for the tax strategy (HMRC, 2015b). The discussion and approval of the tax strategy might increase the board's awareness of a potential harm of the firm's reputation (Freedman and Vella, 2016). On the contrary, although the board might be concerned about the firm's reputation, maximizing profits by tax avoidance activities could have a higher priority for the board than for the tax department (Freedman et al., 2009). Ultimately, the board's attitude will be impacted by investors' preferences of either stability and low reputational risks or cost minimization.

Taking the contradictory theories and prior empirical results into account, we cannot predict unambiguously if the U.K. tax strategy disclosure regulation can reduce tax avoidance. Nonetheless, we state that the regulation is capable to reduce tax avoidance:

H2: Firms that are affected by the U.K. tax strategy disclosure regulation experience an increase in their ETRs relative to unaffected firms.

3.4 Data and Sample Selection

We start our sample selection process by identifying all firms that are subject to the U.K. tax strategy disclosure regulation. In a first step, we use the ownership structure of Bureau van Dijk Amadeus database to determine all U.K. groups, sub-groups and stand-alone companies

that are mandated to publicly disclose a tax strategy.[37] We merge the ownership dataset with financial statement data of Bureau van Dijk's Amadeus financials database to test if the turnover and/or the balance sheet total threshold per qualifying company is exceeded. Using Compustat Global and North America databases, we include MNE groups with U.K. presence in our sample that are also covered by the regulation. To ensure U.K. presence, we merge the MNE dataset with ownership data of Bureau van Dijk Amadeus and identify MNEs with at least one subsidiary in the U.K.[38]

Based on our thorough list of affected firms and groups, we perform a manual search by entering a predetermined sequence of search terms per firm on Google in order to obtain the tax strategy report.[39] If we do not find a report via our search algorithm, we manually check the firm's website, in particular by screening investor relations and corporate governance documents. We end up with a dataset of 2,498 U.K. tax strategy reports. For our explorative and regression analyses, we examine the firms' initial report, leading to 2,012 tax strategy reports.[40]

We then perform text preprocessing steps to obtain the mere content of each report. We start by converting the documents into text files and perform manual quality checks. We remove parts of the documents that do not per se relate to the tax strategy report such as addresses,

[37] The term 'U.K. group' means a group of firms whose head is incorporated in the U.K. A 'sub-group' consists of two or more firms incorporated in the U.K. that are members of a larger group headed by a firm outside the U.K. The regulation considers a firm to be a member of a group or sub-group if it is a 51 percent subsidiary of another firm. Correspondingly, we require an ownership link of 51 percent or more between a member of a group and its subsidiary.

[38] We acknowledge that the regulation also covers permanent establishments of foreign groups and U.K. partnerships that exceed the thresholds. Due to missing financial data, these groups and firms are not included in our sample.

[39] For each firm or group in our list, we perform a search combining the firm/group name with the following five terms on Google: (1) U.K. tax strategy, (2) U.K. tax statement, (3) U.K. approach to tax, (4) U.K. tax policy, (5) U.K. tax schedule 19 finance act 2016.

[40] The number of retrieved reports is in line with predictions that approximately 2,000 firms are subject to the legislation (Seely, 2019).

hyperlinks, table of contents, page numbers, unrelated footnotes etc. If possible, we then divide each report into the five categories as defined by the law.[41]

Using Python, we conduct several parsing and text mining steps to finally transform the raw qualitative content into quantitative measures. We perform cleaning steps like removing punctuations, tokenizing and removing so-called stopwords. We generate text mining variables that are commonly used in textual analysis (e.g., Tetlock, 2007; Loughran and McDonald, 2011). To obtain a measure for length (*Word Count*), we count the words in the report and in each category using NLTK, a prepackaged solution to parse words. Furthermore, we are interested in the degree of boilerplate language between the reports. Firms might be encouraged to adopt text passages from other reports. We construct a report's highest overall score of similar phrases compared to all other tax strategy reports in our sample (*Similarity*) by using the open-source software WCopyFind, following Belnap (2019). Lastly, we create a variable that reflects a report's degree of uncertainty word usage (*Uncertainty*). The *Uncertainty* variable is based on a list of uncertainty words from Loughran and McDonald (2011) aiming to capture imprecision. As proposed by the authors, we perform minor adjustments to assure that the word list is adequate for our setting.[42]

Lastly, we obtain firm and country level data from various databases. Consolidated financial data is retrieved from Compustat Global and North America. We merge in capital market data from Refinitiv's Eikon database. Using the Bureau van Dijk Amadeus ownership file and financials database, we identify the firms' total number of U.K. subsidiaries and tax haven subsidiaries and generate a variable for U.K. intensity. We require non-missing data for each variable. This leaves us with 1,122 tax strategy reports. Table 1 depicts the sample selection.

[41] Because there is no distinct denotation of each category header, we do not perform machine learning steps to divide the text passages of each report. In contrast, we perform a manual breakdown of each report by headlines or, in case that those are missing, by content. Moreover, the classification was double-checked.
[42] Just as for the *Word Count* variable, we also build the *Similarity* and *Uncertainty* variables for each category.

Table 1: Sample Selection

Description	Observations
Retrieved tax strategy reports	2,498
Keeping only the initial tax strategy report per firm	(486)
Subtotal	2,012
Not included in Compustat	(69)
Subtotal	1,943
Observations with missing variables	(821)
Final Sample	1,122

Notes: Table 1 describes the sample selection process.

3.5 Determinants of Tax Strategy Reports

3.5.1 Research Methodology

In accordance with our hypotheses H1a and H1b, we test the relation between disclosure characteristics of tax strategy reports and prior tax avoidance. We estimate several regression models with different dependent variables (*Disclosure Measure*) in equation (1) that focus on the disclosure of categories and textual characteristics of a tax strategy report[43]:

$$\begin{aligned} Disclosure\ Measure_i = {} & \beta_0 + \beta_1 ETR5_i + \beta_2 Tax\ Haven_i + \beta_3 Size_i + \beta_4 Leverage_i \\ & + \beta_5 MtB_i + \beta_6 RoA_i + \beta_7 B2C_i + \beta_8 Big4_i + \beta_9 UK\ Distance_i \\ & + \beta_{10} UK\ Intensity_i + Industry\ FE + u_i \end{aligned} \quad (1)$$

To begin, we examine the association of the disclosure of categories in the reports and prior engagement in tax avoidance. Therefore, we first estimate a poisson regression model with *No. of Categories* as dependent variable, counting the number of separate categories in a report running from one to five. Additionally, we estimate probit regression models with different indicators as dependent variables. We use an indicator (*All Categories*) that equals one if a firm reports on all five categories. We also focus on the disclosure of specific categories. That is, we employ three separate indicators that equal one if a firm explicitly discloses a *Tax*

[43] The variable *Disclosure Measure* is a wildcard for several variables concerning disclosure characteristics, as described below.

Planning category, *Level of Risk* category, or a *Voluntary Disclosure* category, respectively.[44] Second, we test if the reports' textual characteristics are related to tax avoidance. As described in Section 3.4, we utilize three separate measures (*Word Count*, *Similarity* and *Uncertainty*) to capture the textual characteristics. For these specifications, we use an OLS regression model.

The independent variable of interest is *ETR5* that measures a firm's prior engagement in tax avoidance using a five-year GAAP ETR. We average the ETR over the period from 2011 to 2015 to rule out year-to-year variation in the ETR. Thereby, we likewise avoid confounding effects of the regulation on the ETR and alleviate concerns of endogeneity. Moreover, we include the variable *Tax Haven* that represents the share of subsidiaries incorporated in countries denoted as tax havens by Dyreng and Lindsey (2009) relative to all subsidiaries of a firm.

In all regressions, we control for several firm characteristics that have been shown to be associated with corporate disclosures in prior literature (Li, 2008; Campbell et al., 2014; Inger et al., 2018). The variables *Size*, *Leverage* and *RoA* are based on financial data from Compustat. We include *MtB* (Market-to-Book ratio) and *Big4*, an indicator equal to one if a firm is audited by a Big Four firm, both based on data from Refinitiv's Eikon database. We use the indicator *B2C* (Business-to-Consumer) that equals one if a firm belongs to the Business-to-Consumer sector as defined by Srinivasan, Lilien and Sridhar (2011). We employ two variables that refer to a firm's geographic and economic relation to the U.K. (*UK Distance* and *UK Intensity*). In all regressions, we use *Industry* fixed effects to account for assumed industry-specific variation. By analyzing firms' initial tax strategy reports, we perform a cross-sectional analysis. Thus, we do not include year fixed effects or firm fixed effects in the regression models of equation (1). All financial variables are winsorized at the 1st and 99th percentiles. A definition of employed variables can be found in Table A1 in the Appendix.

[44] We do not consider the *Risk Management* and *Approach towards HMRC* categories (categories (1) and (4)), because almost all firms include these two categories in their reports.

3.5.2 Descriptive Statistics and Explorative Analysis

In this section, we provide descriptive statistics and an explorative analysis for the variables employed in equation (1). Panel A of Table 2 shows descriptive statistics for the analysis of determinants of tax strategy reports. On average, firms include four categories (mean value of 4.2) out of five possible categories in their reports (*No. of Categories*), suggesting a rather high overall level of compliance. However, only 35.9 percent of the firms include all five categories (*All Categories*). Summary statistics regarding textual characteristics are largely consistent with prior literature. An average report in our sample exhibits a *Word Count* (logarithmized number of words) of 5.96, equaling 427 words. A firm's highest *Similarity* score with another report is on average 33.57 percent which is in line with findings of Belnap (2019). Lastly, the variable *Uncertainty* shows that on average 1.2 out of 100 words can be categorized as uncertainty words.

Table 2: Descriptive Statistics

VARIABLES	Obs.	Mean	Std. Dev.	Q1	Median	Q3
Panel A: Determinants of Tax Strategy Reports						
No. of Categories	1,122	4.238	0.657	4.000	4.000	5.000
All Categories	1,122	0.359	0.480	0.000	0.000	1.000
Tax Planning	1,122	0.951	0.216	1.000	1.000	1.000
Level of Risk	1,122	0.676	0.468	0.000	1.000	1.000
Voluntary Disclosure	1,122	0.634	0.482	0.000	1.000	1.000
Word Count	1,122	5.962	0.427	5.680	5.958	6.234
Similarity	1,122	33.571	24.327	15.000	24.500	47.000
Uncertainty	1,122	1.200	0.736	0.687	1.099	1.619
ETR5	1,122	0.279	0.094	0.223	0.280	0.334
Tax Haven	1,122	0.077	0.108	0.000	0.045	0.111
Size	1,122	9.077	1.783	7.832	8.831	10.164
Leverage	1,122	0.184	0.141	0.074	0.166	0.274
MtB	1,122	0.901	0.825	0.297	0.884	1.404
RoA	1,122	0.086	0.067	0.042	0.071	0.111
B2C	1,122	0.237	0.425	0.000	0.000	0.000
Big4	1,122	0.562	0.496	0.000	1.000	1.000
UK Distance	1,122	6.593	3.969	6.205	8.625	8.813
UK Intensity	1,122	0.277	0.381	0.021	0.065	0.388
Panel B: Effects on Tax Avoidance						
ETR	494	0.239	0.144	0.182	0.212	0.260
Size	494	5.531	0.989	4.803	5.387	6.309
RoA	494	0.114	0.080	0.055	0.099	0.157
Leverage	494	0.093	0.112	0.000	0.042	0.158
Capital Intensity	494	0.208	0.215	0.040	0.140	0.299
R&D	494	0.017	0.033	0.000	0.000	0.019
Sales Growth	494	0.094	0.213	-0.012	0.068	0.167
Intangibles	494	0.244	0.238	0.034	0.175	0.437

Notes: Table 2 presents descriptive statistics for our sample firms, requiring non-missing values for all variables. Panel A is based on a sample for the determinants of tax strategy reports. Panel B is based on a sample for the effects on tax avoidance as presented in Section 3.6. For a detailed description of variables employed, see Table A1 in the Appendix.

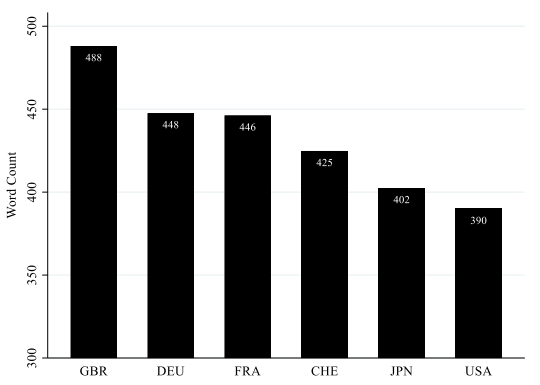
We also examine if the textual characteristics are country- and industry-specific. Panel A and B of Figure 1 illustrate the overall *Word Count* and *Similarity* per country.[45] The figure clearly suggests that the reports' *Word Count* and *Similarity* are country-specific which is in line with studies providing evidence of variations in tax reporting across countries (e.g., Kvaal and Nobes, 2013). The variation reflects differences in firms' perceived relevance of the U.K. regulation. Explicitly, there is some kind of 'home-bias' showing that U.K.-based firms have

[45] For the sake of brevity, we do not plot *Uncertainty* per country and industry.

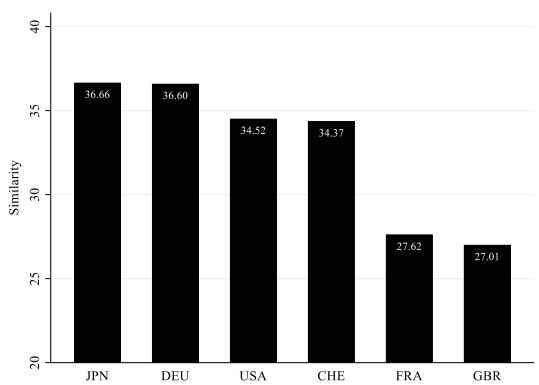
significantly longer and more individual reports. Also, our data suggest that tax strategy reports clearly differ across industries (Panel C and D). Specifically, reports of firms in the extractive and finance industries are more individual. In addition, firms in the finance industry provide the longest reports. Firms in high transparent industries[46] seem to have superior internal governance structures and reporting guidelines, leading to more tax transparency.

Figure 1: Bar Charts on *Word Count* and *Similarity* per Country and Industry

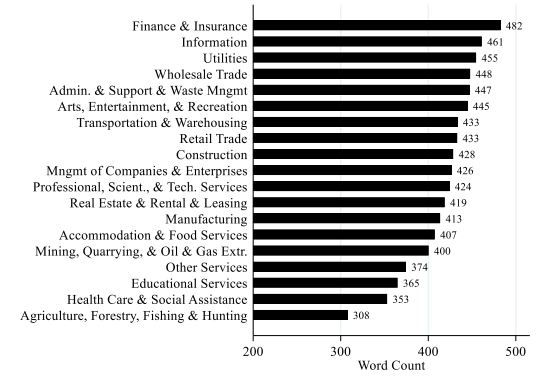
Panel A: *Word Count* per Country



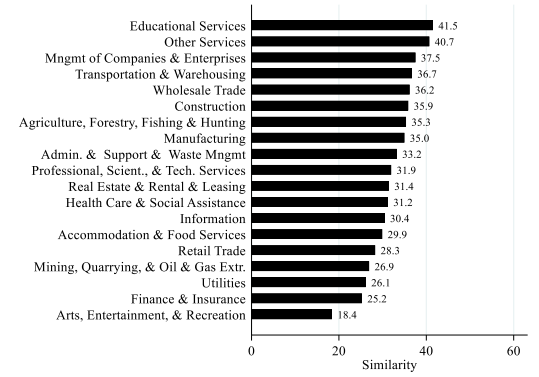
Panel B: *Similarity* per Country



Panel C: *Word Count* per Industry



Panel D: *Similarity* per Industry



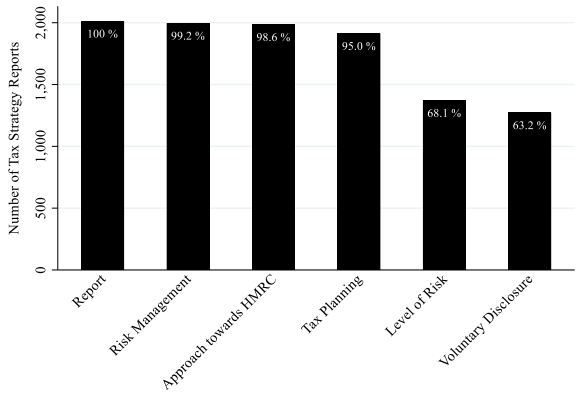
Notes: Panel A and B of Figure 1 show the average *Word Count* and *Similarity* for those countries that are most frequently represented in our sample with descending order. Panel C and D show the average *Word Count* and *Similarity* per industry with descending order. The industry classification is based on 19 different industries using the NAICS sector codes. Note that Figure 1 represents the full sample of 2,012 tax strategy reports without requiring non-missing values for all variables.

In the following, we provide explorative insights on the level of compliance to the law. In Figure 2, we examine if firms are compliant by providing all categories in their reports. The

[46] We consider industries as transparent if they are imposed by additional transparency requirements like the EU Directive 2013/36/EU for financial institutions or mandatory regulations for the extractive industries (see Section 3.2).

category *Tax Planning* is discussed in 95.0 percent of the reports. However, only 68.1 percent of the sample firms include a *Level of Risk* and 63.2 percent a *Voluntary Disclosure* category, indicating a reluctance to disclose these categories. These findings are in line with results of Xia (2020) and suggest that some firms fail to meet the legal requirements, although the effort to comply with the regulation seems to be rather low (Forstater, 2016).

Figure 2: Disclosure of Categories in Tax Strategy Reports

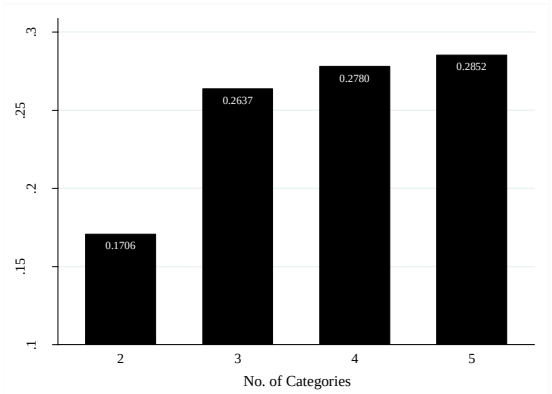


Notes: Figure 2 illustrates the total number of each category in all tax strategy reports from our sample. The number inside the bar shows the relative frequency of categories in the reports for all sample firms. Note that Figure 2 represents the full sample of 2,012 tax strategy reports without requiring non-missing values for all variables.

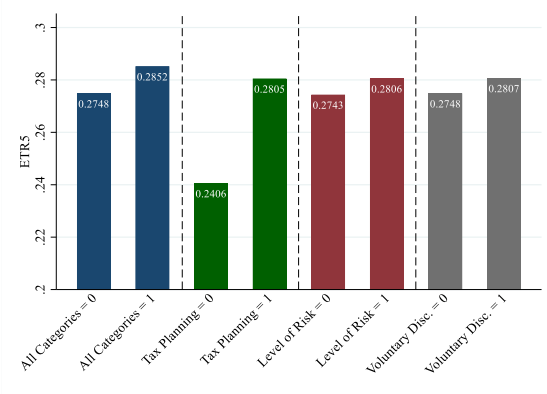
In Figure 3, we investigate the univariate relation of a firm's prior engagement in tax avoidance and some disclosure characteristics of a tax strategy report. Panel A illustrates a positive relation between the *No. of Categories* and *ETR5*. Compared to the overall sample mean of 27.9 percent, firms that only disclose information in two or three categories have an *ETR5* of 17.06 percent or 26.37 percent, respectively. Panel B presents similar results. Firms that abstain from reporting on all five categories (*All Categories* = 0) have an *ETR5* which is 1.04 percentage points lower than for firms including all categories. Furthermore, we find that firms not reporting on *Tax Planning* show an exceptionally low *ETR5* of 24.06 percent. This result still holds for the *Level of Risk* and the *Voluntary Disclosure* category, albeit to a lesser degree. Results of Figure 3 indicate that firms engaging in tax avoidance do not fully comply with the disclosure requirement by omitting certain categories in their reports.

Figure 3: Tax Avoidance and Disclosure of Categories in Tax Strategy Reports

Panel A: *ETR5* over *Number of Categories*



Panel B: *ETR5* over Category Disclosures



Notes: Panel A of Figure 3 shows average *ETR5* per *No. of Categories* for tax strategy reports. Panel B presents average *ETR5* regarding 4 different dummy variables in terms of categories of tax strategy reports. The two bars on the very left side of Panel B represent the variable *All Categories*, the bars on the middle left side the variable *Tax Planning*, the bars on the middle right side the variable *Level of Risk* and the bars on the very right side the variable *Voluntary Disclosure*. Note that Figure 3 is based on the full sample requiring non-missing values for all variables used in the regression analysis. This leads to a sample comprising of 1,122 tax strategy reports.

3.5.3 Empirical Results

Tables 3 and 4 present results based on equation (1) regarding the association of a firm's prior tax avoidance and several separate disclosure measures. Table 3 contains the results in terms of the disclosure of categories within the reports. In the first column, we use the *No. of Categories* as dependent variable. The coefficient β_1 is positive and statistically significant, suggesting that firms include more categories when their engagement in tax avoidance is low. In a similar vein, in Column (2) we find that the *ETR5* is significantly higher for firms that report on all five categories. Additionally, this finding is reinforced when we separately consider individual categories of the reports. In particular, firms that bear higher prior *ETR5* are more likely to include a *Tax Planning* or a *Voluntary Disclosure* category in their reports. The coefficient of the *Level of Risk* category is also positive, yet insignificant. Overall, these results are consistent with H1a. Firms engaging in tax avoidance provide poor tax strategy reports by abstaining to disclose information in specific categories. In all columns, the coefficient for *Tax Haven* (β_2) is statistically insignificant, showing no association between firms' tax haven usage and the reports' categories.

Table 3: Determinants of Category Disclosures

	(1)	(2)	(3)	(4)	(5)
VARIABLES	***No. of Categories***	***All Categories***	***Tax Planning***	***Level of Risk***	***Voluntary Disclosure***
ETR5	0.14**	1.04**	2.26***	0.22	0.80*
	(0.01)	(0.02)	(0.01)	(0.62)	(0.06)
Tax Haven	0.00	0.45	0.38	-0.09	0.00
	(1.00)	(0.24)	(0.54)	(0.81)	(1.00)
Size	-0.00	-0.03	-0.07	-0.02	-0.01
	(0.14)	(0.34)	(0.11)	(0.39)	(0.71)
Leverage	0.02	0.09	0.36	0.13	0.06
	(0.58)	(0.78)	(0.52)	(0.68)	(0.84)
MtB	-0.02**	-0.12*	-0.21**	0.00	-0.10
	(0.02)	(0.06)	(0.03)	(1.00)	(0.12)
RoA	0.24***	1.76**	1.97	1.19	0.59
	(0.01)	(0.03)	(0.15)	(0.15)	(0.47)
B2C	0.01	0.08	-0.07	0.00	0.16
	(0.29)	(0.48)	(0.70)	(0.98)	(0.15)
Big4	-0.00	-0.02	-0.11	-0.05	-0.01
	(0.75)	(0.80)	(0.44)	(0.56)	(0.89)
UK Distance	-0.00	-0.02	0.02	0.03**	-0.04***
	(0.95)	(0.11)	(0.31)	(0.01)	(0.00)
UK Intensity	0.01	-0.07	0.40*	0.03	-0.00
	(0.44)	(0.56)	(0.07)	(0.81)	(1.00)
Industry FE	✓	✓	✓	✓	✓
Observations	1,122	1,119	1,073	1,119	1,119
Pseudo R^2	0.02	0.03	0.07	0.02	0.02

Notes: Table 3 provides regression results with different dependent variables regarding the categories of tax strategy reports displayed at the top of each column. In Column (1), we estimate a poisson regression using a count variable as dependent variable (*No. of Categories*) that counts the number of categories running from one to five. Column (2) presents probit regression results using a dummy variable (*All Categories*) that is equal to one if a firm reports information on each of the five categories in its tax strategy report. In Columns (3) to (5), we utilize three different dummy variables as dependent variables that are set equal to one if a firm discloses information on *Tax Planning*, *Level of Risk* and *Voluntary Disclosure*, respectively, again estimating probit regressions. For the independent variable of interest *ETR5*, we employ a long-run approach by computing the GAAP ETR using a five-year period. In all regressions, we employ industry fixed effects. All estimation results are based on robust standard errors. P-values are shown in parentheses. ***, **, * indicate statistical significance at the level of 1%, 5%, and 10%, respectively.

Table 4 shows multivariate regression results analyzing the determinants of the reports' textual characteristics. The first four columns show regression results with *Word Count* as dependent variable, for the overall report (Column (1)) and the *Tax Planning*, *Level of Risk* and *Voluntary Disclosure* categories (Columns (2) to (4)). In Columns (1) and (3), the coefficient β_1 is positive, but statistically insignificant. Particularly, we do not find that prior tax avoidance is correlated with the length of the overall report. However, as illustrated in Columns (2) and (4), firms engaging in tax avoidance provide significantly less detailed categories on *Tax*

Planning and *Voluntary Disclosure*. This result is in line with H1a. For tax aggressive firms, tax transparency seems to be no integral part of their corporate culture.

Columns (5) to (8) of Table 4 depict regression results with *Similarity* as dependent variable. The coefficients for *ETR5* provide only mixed evidence. Firms' prior tax avoidance is not significantly associated with similarity scores of the overall report (Column (5)) and the *Tax Planning* category (Column (6)). Solely for the *Level of Risk* category, we find a positive and statistically significant coefficient, whereas for the category *Voluntary Disclosure*, we find the opposite relation. Overall, with regard to the *Similarity* variable, no distinct statement for H1a or H1b can be made.

Furthermore, the tone variable *Uncertainty* is used as dependent variable in Columns (9) to (12). For the overall report and the *Tax Planning* category, we find a negative association between the ETR measure and *Uncertainty*. Again, this result is in line with H1a. Using linguistic uncertainty in the reports, tax avoiders attempt to stay more flexible regarding their tax behavior. Across the textual characteristic variables H1a can largely be confirmed.

Finally, some other interesting relations between firm characteristics and the reports' textual characteristics occur. The length of the overall report increases in firm size, while the reports' similarity decreases in firm size (Columns (1) and (5)). This is in line with prior studies identifying a positive association between firm size and the level of compliance with mandatory tax disclosure requirements (Robinson and Schmidt, 2013; Belnap, 2019). Moreover, firms that are audited by a Big Four firm exhibit less detailed reports (Column (1)). Lastly, for the variable *UK Distance*, we find that tax strategy reports of firms geographically close to the U.K. are more detailed and less similar. This result is in line with explorative findings indicating a 'home-bias'.

Table 4: Determinants of *Word Count*, *Similarity* and *Uncertainty*

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Word Count				***Similarity***				***Uncertainty***		
VARIABLES	*Report*	*Tax Planning*	*Level of Risk*	*Voluntary Disclosure*	*Report*	*Tax Planning*	*Level of Risk*	*Voluntary Disclosure*	*Report*	*Tax Planning*	*Level of Risk*	*Voluntary Disclosure*
ETR5	0.04	1.24**	0.31	2.29**	-4.59	4.20	24.83**	-24.31**	-0.52**	-1.96***	0.37	-0.34
	(0.80)	(0.03)	(0.76)	(0.03)	(0.58)	(0.67)	(0.05)	(0.04)	(0.05)	(0.00)	(0.73)	(0.31)
Tax Haven	0.07	0.17	-0.45	0.28	-6.72	-0.57	15.32*	-21.09*	0.05	-0.25	1.42*	0.44
	(0.54)	(0.66)	(0.58)	(0.78)	(0.26)	(0.94)	(0.07)	(0.05)	(0.80)	(0.64)	(0.09)	(0.38)
Size	0.03***	-0.03	-0.05	0.02	-2.05***	-1.72***	-1.61**	-2.99***	0.01	0.05	0.08	0.02
	(0.00)	(0.45)	(0.43)	(0.76)	(0.00)	(0.00)	(0.03)	(0.00)	(0.68)	(0.20)	(0.21)	(0.58)
Leverage	0.01	0.27	0.23	0.17	-7.24	-10.08	-19.08**	-0.21	0.27	0.57	0.67	0.21
	(0.89)	(0.50)	(0.75)	(0.84)	(0.22)	(0.14)	(0.02)	(0.98)	(0.11)	(0.18)	(0.33)	(0.56)
MtB	0.02	-0.13*	0.05	-0.19	-2.01	-1.91	-2.44	-3.95**	-0.00	0.04	-0.04	0.03
	(0.45)	(0.07)	(0.77)	(0.26)	(0.14)	(0.22)	(0.20)	(0.04)	(0.94)	(0.66)	(0.78)	(0.68)
RoA	0.17	1.26	2.43	1.75	2.72	8.70	-18.50	18.61	0.21	1.37	0.18	0.21
	(0.54)	(0.16)	(0.18)	(0.39)	(0.86)	(0.64)	(0.39)	(0.43)	(0.64)	(0.20)	(0.92)	(0.77)
B2C	0.03	-0.06	-0.08	0.37	-1.35	-4.25*	1.23	-2.74	-0.03	-0.09	-0.02	0.03
	(0.47)	(0.63)	(0.77)	(0.17)	(0.53)	(0.09)	(0.70)	(0.40)	(0.62)	(0.57)	(0.94)	(0.74)
Big4	-0.06**	-0.07	-0.21	-0.07	-1.42	-2.50	1.13	1.06	-0.03	-0.05	0.04	-0.06
	(0.02)	(0.45)	(0.28)	(0.73)	(0.35)	(0.17)	(0.62)	(0.67)	(0.56)	(0.67)	(0.82)	(0.48)
UK Distance	-0.02***	0.01	0.06**	-0.13***	0.72***	0.59**	0.46	1.18***	-0.01	0.01	-0.04	-0.03**
	(0.00)	(0.67)	(0.03)	(0.00)	(0.00)	(0.03)	(0.17)	(0.00)	(0.13)	(0.53)	(0.17)	(0.01)
UK Intensity	0.05	0.30**	0.10	-0.03	0.35	-0.91	3.75	-2.31	-0.07	-0.15	-0.30	-0.05
	(0.26)	(0.02)	(0.72)	(0.93)	(0.87)	(0.73)	(0.21)	(0.50)	(0.26)	(0.34)	(0.28)	(0.69)
Industry FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	1,122	1,122	1,122	1,122	1,122	1,067	758	711	1,122	1,067	758	711
R^2	0.06	0.03	0.03	0.04	0.08	0.06	0.09	0.10	0.03	0.04	0.03	0.03

Notes: Table 4 presents OLS regression results with different textual characteristics (*Word Count*, *Similarity* and *Uncertainty*) as dependent variables. Textual characteristics of a firm's overall tax strategy report and the *Tax Planning*, *Level of Risk* and *Voluntary Disclosure* category are examined separately, as displayed at the top of each column. If a firm does not report information in a specific category, *Word Count* is set to zero. *Similarity* depicts the highest level of percentage point similarity between a firm's report to another report in our sample by using the open-source software WCopyFind. *Uncertainty* is computed as the ratio of uncertainty words over the total number of words per report. Our list of uncertainty words is based on that in Loughran and McDonald (2011), however slightly modified with respect to our setting. In all regressions, we employ industry fixed effects. All estimation results are based on robust standard errors. P-values are shown in parentheses. ***, **, * indicate statistical significance at the level of 1%, 5%, and 10%, respectively.

3.6 Effects on Tax Avoidance

3.6.1 Research Methodology

In accordance with H2, we investigate whether the U.K. tax strategy disclosure regulation is useful in curbing tax avoidance. Using a Difference-in-Differences [DiD] design, we examine the relative change in ETRs between U.K. firms subject to the disclosure regulation and several unaffected control groups after the effectiveness of the U.K. FA 2016. We deploy the following OLS regression model:

$$\begin{aligned} ETR_{it} = {} & \beta_0 + \beta_1 Treated_i \; x \; Post_t + \beta_2 Size_{it} + \beta_3 RoA_{it} + \beta_4 Leverage_{it} \\ & + \beta_5 Capital\ Intensity_{it} + \beta_6 R\&D_{it} + \beta_7 Sales\ Growth_{it} \\ & + \beta_8 Intangibles_{it} + Year\ FE + Firm\ FE + u_{it} \end{aligned} \quad (2)$$

The dependent variable is the one-year GAAP ETR of firm *i* in year *t*. In this setup, we do not average the ETR over a five-year period because we perform a DiD approach across a pre- and post-period using panel data. The variable *Treated* is an indicator which is set to one for U.K. firms whose turnover and/or balance sheet total are above the legal thresholds.[47] We exclude firms that are subject to the CbC reporting requirement which was also introduced in 2016, i.e., we limit our sample to firms with a global turnover of less than €750 million. Depending on the specification, *Treated* is set to zero for firms that are not subject to the disclosure regulation, i.e., U.K. firms that are below the legal thresholds.

In order to improve causal inference, the identification of a treatment (control) group which is definitely affected (unaffected) by the disclosure regulation is of primary importance (Leuz and Wysocki, 2016). In all our tests, we ensure that treatment firms have published a tax strategy report and firms in the control group have not voluntarily published a report. Another crucial requirement for the validity of a DiD is the construction of a comparable control group

[47] In this analysis, we limit the sample to U.K. based firms only because we expect no or only minor effects on tax avoidance for non-U.K. based firms. See Panel B of Table 2 for descriptive statistics of the U.K. sample.

(St. Clair and Cook, 2015; Leuz and Wysocki, 2016). To find suitable counterfactuals, our control group consists of firms with at least £50 million in total assets.[48] We then rank the firms with respect to their turnover in the year 2015, the last year that is unaffected by the U.K. FA 2016, and keep 50 firms that are directly below the legal threshold as control firms. Correspondingly, we construct our treatment group, i.e., those 50 U.K. firms that are directly above the turnover threshold.

The variable *Post* is an indicator equal to one for years after the effectiveness of the U.K. FA 2016, i.e., years from 2017 to 2019, and equal to zero for years from 2011 to 2015. By choosing this sample period, we avoid distortive effects due to the financial crisis and the global virus pandemic. Because it is unclear to assign the year 2016 to either the pre- or post-period, we exclude this year from our analysis. The coefficient of interest is β_1 that estimates the effect of the disclosure regulation on firms' ETRs in the post-regulation period. Based on H2, we expect the coefficient to be positive.

In all our regressions, we include year fixed effects in order to control for annual trends in tax avoidance and business cycle effects. Consequently, we do not include *Post* as separate variable in our regression model. Furthermore, we include firm fixed effects in most of our specifications in order to eliminate time-invariant heterogeneity between the firms. In these specifications, we do not include *Treated* as a separate regressor.[49] Finally, we control for several firm characteristics that have been shown to be associated with corporate tax avoidance (Gupta and Newberry, 1997; Plesko, 2003; Rego, 2003). All financial variables are winsorized at the 1st and 99th percentiles. A definition of employed variables can be found in Table A1 in the Appendix.

[48] In contrast to the studies of Xia (2020) and Bilicka et al. (2021), we require a rather high minimum threshold to ensure that control firms are large enough to serve as comparable counterfactuals. We further exclude funds and trusts in virtue of different taxation.

[49] Note that we use industry and pair fixed effects instead of firm fixed effects in some of our specifications. In these, we include the variable *Treated* in the regression model.

In order to address concerns that treatment and control firms are systematically different, we perform several matching and reweighting techniques in most of our specifications. We apply PSM approaches to identify adequate matching partners for U.K. disclosing firms. The underlying idea behind PSM is to take into account confounding factors that explain systematic differences between disclosing firms and control firms and to cope with a potential self-selection bias (Rosenbaum and Rubin, 1983; Caliendo and Kopeinig, 2008; Shipman, Swanquist and Whited, 2017). Matching on a set of firm characteristics, we seek treatment and control firms that are as similar as possible.

PSM requires a two-step approach (Rosenbaum and Rubin, 1983): In the first step, we estimate a probit model including a vector of relevant firm characteristics to predict the propensity score (Table 5). The score denotes the probability of becoming a tax strategy disclosing firm. In the probit model, we include the financial variables of equation (2) except *Size* because by definition treatment and control firms structurally differ regarding their size. The PSM is performed in the year 2015, one year prior to the enactment of the U.K. FA 2016.

Table 5: Probit Regression for PSM – Indicators of Tax Strategy Disclosing Firm

	(1)
VARIABLES	**Tax Strategy Disclosing Firm**
RoA	1.511***
	(0.000)
Leverage	1.260***
	(0.000)
Capital Intensity	-0.597***
	(0.000)
R&D	-4.072***
	(0.001)
Sales Growth	-0.540***
	(0.000)
Intangibles	-0.376**
	(0.024)
Observations	1,561
Pseudo R^2	0.043

Notes: Table 5 presents the probit regression result used for the prediction of the propensity scores for PSM. The dependent variable is an indicator variable which is set to one for U.K. firms that are subject to the disclosure regulation and have published a tax strategy report. P-values are shown in parentheses. ***, ** and * show significance at the level of 1%, 5% and 10%, respectively.

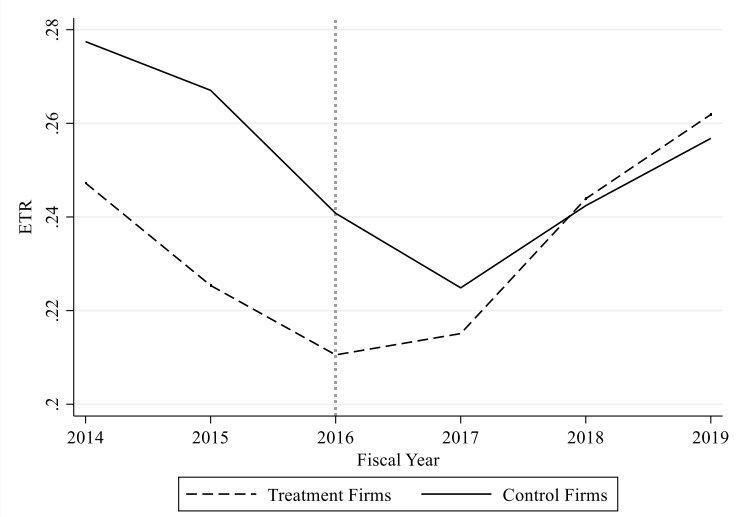
In the second step, we perform a one to one nearest neighbor matching algorithm. Using the propensity scores derived from the first step, we attempt to match each tax strategy disclosing firm to one unaffected firm. We set the caliper, the maximum deviation between the propensity scores of treated and matched control firms, to 0.03 (Austin, 2011; Lunt, 2014). Out of 63 treatment firms, we can match 41 firms to corresponding control firms.[50]

3.6.2 Empirical Results

In this section, we present results regarding the effectiveness of the U.K. tax strategy disclosure regulation to reduce tax avoidance. First, in order to validate if the treatment and control group exhibit a parallel trend in their level of tax avoidance prior to the effectiveness of the disclosure regulation, we compare the ETRs of both groups over time in Figure 4. The two lines illustrate systematic differences in the level of ETRs prior to the regulation. However, the trend is parallel. On average, disclosing firms have an ETR that is three to four percentage points lower relative to control firms in the pre-regulation period. This notable systematic disparity diminishes after the effectiveness of the regulation. For years from 2018 onwards, treatment firms even exhibit a higher ETR relative to their unaffected peers.

[50] The matching quality is presented in Table A2 in the Appendix. The overall standardized mean bias is reduced from 15.2 percent before the matching to 2.8 percent after the matching. We reach an overall good matching quality.

Figure 4: Parallel Trend of ETRs of Tax Strategy Disclosing Firms and Control Firms



Notes: Figure 4 shows ETR developments of treatment firms (U.K. based firms that are subject to the regulation and have published a U.K. tax strategy report) and control firms (U.K. based firms that are below the prescribed thresholds and have not voluntarily disclosed a report) over a period from 2014 to 2019. The vertical dotted line represents the effectiveness of the U.K. FA 2016.

In Table 6, we present regression results based on equation (2). Column (1) shows results of a not matched sample approach based on 50 tax strategy disclosing firms directly ranked above the legal turnover threshold and 50 control firms directly ranked below the threshold. Columns (2) to (4) correspond to the one to one nearest neighbor PSM as described in Section 3.6.1 with altering fixed effects. For reasons of robustness, we also test an alternative matching prerequisite by setting the caliper to 0.02 (Columns (5) to (7)). Throughout all specifications, the coefficient of the interaction of *Treated* and *Post* is positive and significant. The point estimates suggest that U.K. firms subject to the disclosure regulation experienced a significant increase in their ETRs between 3.5 and 6.0 percentage points relative to unaffected firms.[51] The results confirm H2 and show that the U.K. tax strategy disclosure regulation deters corporate tax avoidance.

[51] With regard to the economic magnitude, we acknowledge that the point estimates are fairly high and should be interpreted with caution.

Table 6: Effects of the Tax Strategy Disclosure Regulation on Tax Avoidance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				ETR			
	Not matched	1:1 NN Matching					
VARIABLES	sample	Caliper: 0.03			Caliper: 0.02		
Treated			0.002	-0.010		0.005	-0.003
			(0.935)	(0.630)		(0.826)	(0.861)
*Treated*Post*	0.060**	0.056**	0.049**	0.047**	0.039*	0.041*	0.035*
	(0.022)	(0.015)	(0.039)	(0.031)	(0.075)	(0.090)	(0.098)
Size	-0.049**	-0.030*	-0.020**	-0.018*	-0.038**	-0.018*	-0.019*
	(0.035)	(0.062)	(0.041)	(0.073)	(0.023)	(0.061)	(0.065)
RoA	-0.852***	-0.826***	-0.437***	-0.488***	-0.753***	-0.376***	-0.459***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.004	-0.188	-0.003	-0.128	-0.161	0.009	-0.133
	(0.965)	(0.104)	(0.976)	(0.200)	(0.175)	(0.927)	(0.210)
Capital Intensity	0.058	-0.012	-0.030	0.077	0.014	-0.045	0.072
	(0.657)	(0.931)	(0.571)	(0.223)	(0.924)	(0.395)	(0.271)
R&D	0.663**	0.313	-0.338*	0.053	0.258	-0.471**	0.032
	(0.011)	(0.122)	(0.055)	(0.791)	(0.208)	(0.014)	(0.881)
Sales Growth	-0.093***	-0.049	-0.072	-0.075*	-0.095**	-0.106**	-0.115***
	(0.000)	(0.318)	(0.121)	(0.095)	(0.035)	(0.037)	(0.009)
Intangibles	0.191**	0.073	0.018	-0.009	0.104	0.009	0.005
	(0.035)	(0.355)	(0.683)	(0.866)	(0.256)	(0.857)	(0.932)
Year FE	✓	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓			✓		
Industry FE			✓			✓	
Pair FE				✓			✓
Observations	589	494	494	494	458	458	458
R^2	0.526	0.458	0.146	0.345	0.482	0.157	0.372

Notes: Table 6 presents OLS regression results of equation (2). In all columns, the dependent variable is *ETR*. *Treated* is an indicator equal to one if the U.K. firm is subject to the U.K. tax strategy disclosure regulation and has published a tax strategy report, and zero if the U.K. firm is below the prescribed thresholds and has not voluntarily published a report. *Post* is an indicator equal to one for years after the effectiveness of the U.K. FA 2016, i.e., years from 2017 to 2019, and equal to zero for years from 2011 to 2015. In Column (1), we keep 50 treatment firms that have a turnover directly above the legal threshold and 50 control firms that have a turnover directly below the legal threshold. In Columns (2) to (4), we perform a one to one nearest neighbor PSM with a maximum difference in propensity score between a treatment and a control firm of 0.03 (caliper). In Columns (5) to (7), we set the caliper to 0.02. All estimation results are based on robust standard errors. P-values are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

3.6.3 Robustness Tests

In order to alleviate concerns that the employed matching technique is a key driver for the results found in Table 6, we perform alternative matching algorithms. Columns (1) and (2) of Table 7 show regression results based on a one to three nearest neighbor matched sample. We attempt to match up to three control firms to each disclosing firm. In Columns (3) and (4),

we also perform a one to five nearest neighbor matching. The coefficients for the interaction term are positive and significant and thus, statistically unchanged relative to those in Table 6.

Moreover, we employ two multivariate reweighting techniques which improve the covariate balance between the treatment and control group. In Column (5) of Table 7, we use an entropy-balanced sample. All observations are balanced based on the employed firm characteristics in the pre-regulation year 2015. The balancing constraint is set to the second moment so that the overall mean and variance of the reweighted control group match the treatment group (Hainmueller, 2012). Lastly, in Column (6) we present estimation results when inverse probability weights [IPWs] are used. The IPWs are calculated following the weighting strategy by Stuart et al. (2014).[52] Both reweighting techniques yield similar results. The coefficients of the interaction term are positive and statistically significant. Overall, the results found in Section 3.6.2 are not driven by the deployed matching algorithm.

Table 7: Alternative Matching Algorithms and Multivariate Reweighting Techniques

	(1)	(2)	(3)	(4)	(5)	(6)
			ETR			
VARIABLES	1:3 NN Matching		1:5 NN Matching		Entropy Balancing	Inverse Prob. Weighting
Treated		-0.003		-0.006		
		(0.895)		(0.757)		
*Treated*Post*	0.060**	0.051**	0.062***	0.052**	0.048**	0.038*
	(0.013)	(0.032)	(0.007)	(0.023)	(0.045)	(0.079)
Controls	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Firm FE	✓		✓		✓	✓
Industry FE		✓		✓		
Observations	673	673	734	734	1,177	1,456
R^2	0.395	0.127	0.388	0.127	0.597	0.715

Notes: Table 7 presents OLS regression results of equation (2) with alternative matching algorithms and reweighting techniques. In all columns, the dependent variable is *ETR*. *Treated* is an indicator equal to one if the U.K. firm is subject to the U.K. tax strategy disclosure regulation and has published a tax strategy report, and zero if the U.K. firm is below the prescribed thresholds and has not voluntarily published a report. *Post* is an indicator equal to one for years after the effectiveness of the U.K. FA 2016, i.e., years from 2017 to 2019, and equal to zero for years from 2011 to 2015. Columns (1) and (2) are based on a one to three nearest neighbor PSM and Columns (3) and (4) are based on a one to five nearest neighbor PSM. The PSM is performed with a maximum difference in propensity score of 0.03 (caliper). In Columns (5) and (6), we deploy entropy balancing and inverse probability weights to improve the covariate balance between the treatment and control groups. All estimation results are based on robust standard errors. P-values are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

[52] The weights are generated in a way that each of the four groups (pre treatment, post treatment, pre control, post control) is similar to the treatment group in the pre-period with respect to the employed firm characteristics.

Furthermore, we acknowledge that the change in ETRs of the treatment group might be caused by factors other than the disclosure regulation. These factors may not apply to the matched non-disclosing U.K. firms, such as anti-tax avoidance measures like the OECD's BEPS action plan. Therefore, we use a European sample, again applying PSM to generate a control group of matched European firms exceeding the disclosure thresholds. Hence, we compare ETRs of U.K. firms subject to the disclosure regulation with matched European firms.[53] Table 8 contains the corresponding results. In Columns (1) to (3), the regressions are based a one to one nearest neighbor matching as described in Section 3.6.1. For confounding factors in the probit regression, we utilize the financial variables of equation (2) including *Size* because treatment firms and the European control firms do not systematically differ in their size. Notably, the results presented in these columns remain economically and statistically unchanged relative to the previous results.

To rule out that other U.K.-specific economic developments such as the Brexit cause the increase in ETRs for treated U.K. firms relative to European peers, we perform a European pseudo-treatment analysis. If U.K.-specific developments other than the disclosure regulation explain the increase in U.K. firms' ETRs, we would expect a similar effect when we compare U.K. firms *below* the tax strategy disclosure threshold with comparable European firms. Therefore, in the following specification, *Treated* is an indicator equal to one if a U.K. firm has a balance sheet total and turnover below the prescribed legal thresholds and has not voluntarily disclosed a report (pseudo-treated). We match the pseudo-treatment firms to comparable European firms. The coefficients of the interaction term are statistically insignificant (Columns (4) to (6)). This non-finding supports our assumption that only U.K. firms being subject to the

[53] For the matched control group, we use the Compustat Global database and identify European firms that have a turnover exceeding £200 million and/or a balance sheet total above £2 billion and have not published a U.K. tax strategy report. Moreover, we exclude firms with global turnover of more than €750 million (CbC reporting firms). We restrict the matched control group to firms based in countries most frequently represented in the European sample (France, Germany, Italy, Norway, Poland, Sweden and Switzerland).

disclosure regulation exhibit higher ETRs in the post-regulation period. In summary, our robustness tests support the findings from our prior analysis.

Table 8: European Sample Approach

	(1)	(2)	(3)	(4)	(5)	(6)
			ETR			
VARIABLES	Treatment Sample			Pseudo-Treatment Sample		
Treated		-0.077***	-0.071***		-0.011	-0.010
		(0.000)	(0.000)		(0.385)	(0.464)
*Treated*Post*	0.060***	0.065***	0.065***	0.002	0.016	0.008
	(0.005)	(0.009)	(0.006)	(0.920)	(0.417)	(0.658)
Controls	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Firm FE	✓			✓		
Industry FE		✓			✓	
Pair FE			✓			✓
Observations	564	564	564	1,243	1,243	1,243
R^2	0.514	0.172	0.343	0.513	0.150	0.329

Notes: Table 8 presents OLS regression results of equation (2) with a European sample. In all columns, the dependent variable is *ETR*. In Columns (1) to (3), *Treated* is an indicator equal to one if the U.K. firm is subject to the U.K. tax strategy disclosure regulation and has published a tax strategy report, and zero for matched European firms that have not published a report. In Columns (4) to (6), we present a pseudo-treatment analysis. In this specification, *Treated* is an indicator that is set equal to one if a U.K. firm is below the prescribed thresholds and has not voluntarily published a report, and zero for matched European firms that are also below the thresholds and have not published a report. *Post* is an indicator equal to one for years after the effectiveness of the U.K. FA 2016, i.e., years from 2017 to 2019, and equal to zero for years from 2011 to 2015. In all columns, we perform a one to one nearest neighbor PSM. The matching is based on the probit regression as presented in Table 5, however, also including the variable *Size*. All estimation results are based on robust standard errors. P-values are reported in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

3.7 Conclusion

For financial years starting after 15 September 2016, large U.K.-based firms and MNEs with economic presence in the U.K. have to publish a report concerning their tax strategy. The report presents information with regard to specific tax-related categories. The U.K. regulation aims at improving transparency towards HMRC, consumers and other stakeholders and at curbing tax avoidance.

In this study, we analyze the determinants and effects of the U.K. tax strategy reports. First, we find that firms engaging in tax avoidance tend to omit certain categories within their reports. Additionally, these firms provide less information with regard to tax planning and voluntary disclosures and use more uncertainty words. In summary, tax-avoiding firms exhibit poor (less transparent) tax strategy reports. In the second part of our study, using DiD

approaches and matching and reweighting techniques, we find a significant increase in ETRs for firms subject to the regulation. Conducting a series of additional tests, we ensure robustness.

Our results could be of interest for policymakers worldwide. We demonstrate that textual characteristics of a tax strategy report and the degree of compliance with the law allow for inferences on firms' tax behavior and are thus useful for recipients. Firms' prior tax avoidance is found to be negatively associated with the level of tax transparency. Moreover, our finding on the effects of the disclosure regulation suggests that qualitative tax disclosures are an adequate instrument to curb corporate tax avoidance. We are the first to demonstrate that the regulation has a real economic effect by limiting tax avoidance.

Our study is subject to some limitations. First, textual measures like length, similarity and linguistic uncertainty do not necessarily capture the explicit content of a report and its categories. We acknowledge that more content-related insights could be useful to further examine the informativeness of tax strategy reports. Second, we are unable to clearly figure out how tax transparency impacts corporate tax avoidance. While we find a significant decline in affected firms' tax avoidance, we cannot disentangle the mechanisms that drive our findings. Lastly, we primarily focus on a change of firms' tax avoidance behavior. Further aspects and spill-over effects of the disclosure regulation are not analyzed in this paper. Other net benefits or costs that the regulation has on affected firms are worth to study.

Appendix

Table A1: Variable Definitions

Variable		Definition
Disclosure Characteristics		
No. of Categories	=	Count variable that counts the number of categories in a tax strategy report taking values between one and five.
All Categories	=	Indicator variable which is set to one if a firm reports in all four required categories and in the voluntary category in its tax strategy report, and zero otherwise.
Tax Planning	=	Indicator variable which is set to one if a firm reports on its attitude towards tax planning in its tax strategy, and zero otherwise.
Level of Risk	=	Indicator variable which is set to one if a firm reports on its level of accepted risk in its tax strategy, and zero otherwise.
Voluntary Disclosure	=	Indicator variable which is set to one if a firm has integrated a voluntary category in its tax strategy report, and zero otherwise.
Word Count	=	Natural log of total number of words in a tax strategy report cleaned by removing punctuations, tokenizing and removing stopwords.
Similarity	=	Highest percentage point similarity of the same sequence of words of a firm's tax strategy report to another report in the sample. This variable is computed by using the open-source software WCopyFind (available at: https://plagiarism.bloomfieldmedia.com/software/wcopyfind/).
Uncertainty	=	Number of uncertainty words divided by total number of words in a report that are included in the Master Dictionary file. Our list of uncertainty words and the Master Dictionary file are based on Loughran and McDonald (2011) and can be retrieved on McDonald's website (https://sraf.nd.edu). Examples for uncertainty words are 'assume', 'doubt', 'perhaps', and 'uncertain'. We modify the list with respect to our specific setting, i.e., we delete the words 'intangible' and 'risk' and add 'expect', 'expectation', 'expected', 'expects', 'likeliness', 'likely', 'occasional', 'potential', 'potentially', 'soon', 'unsure', 'whenever' and 'whether'.
Firm Characteristics		
ETR	=	Total income tax expense (txt) divided by pre-tax income (pi).
ETR5	=	Five-year sum of total income tax expense (txt) over years *t-4* to *t* divided by the five-year sum of pre-tax income (pi) over years *t-4* to *t*.
Tax Haven	=	Number of a firm's subsidiaries incorporated in a tax haven country scaled by the firm's total number of subsidiaries using the ownership database of Bureau van Dijk Amadeus database. Tax haven countries are categorized following Dyreng and Lindsey (2009). A list of all tax haven countries can be found on Dyreng's website (https://sites.google.com/site/scottdyreng/Home/data-and-code/EX21-Dataset).

Table A1: Variable Definitions (continued)

Size	=	Natural log of total assets (at).
Leverage	=	Long-term-debt (dltt) scaled by total assets (at).
MtB	=	Market-to-Book ratio, calculated as natural log of market value of equity to book value of equity. Data is retrieved from Refinitiv's Eikon database.
RoA	=	Return on assets, calculated as pre-tax income (pi) divided by total assets (at).
B2C	=	Indicator variable which is set to one if a firm is in a business-to-consumer sector following Srinivasan et al. (2011).
Big4	=	Indicator variable which is set to one if a firm is audited by a Big Four firm (Deloitte, EY, KPMG or PwC) in a given year. Data is retrieved from Refinitiv's Eikon database.
UK Distance	=	Natural log of the geographic distance (in kilometers) of a firm's headquarter country to the U.K. Geographic data is retrieved from The World Bank's World Development Indicators database.
UK Intensity	=	The ratio of a firm's aggregated sales of all U.K.-based subsidiaries to the worldwide consolidated sales. Sales of U.K.-based subsidiaries are retrieved from the Bureau van Dijk Amadeus database.
Capital Intensity	=	Property, plant, and equipment (ppent) scaled by total assets (at).
R&D	=	Research and development expense (xrd) scaled by total assets (at).
Sales Growth	=	Sales (sale) growth from year *t–1* to year *t*, scaled by year *t–1* sales.
Intangibles	=	Intangible assets (intan) divided by total assets (at).

Table A2: One to One Nearest Neighbor Matching Quality

Nearest Neighbor 1:1		Mean		Bias	Bias Reduction	t-test	
		Treated	Control	(in %)	(in %)	t	p>t
RoA	Unmatched	0.1131	0.0931	21.5		1.44	0.152
	Matched	0.1080	0.1050	3.2	85.2	0.16	0.871
Leverage	Unmatched	0.1506	0.1218	16.0		1.09	0.278
	Matched	0.0868	0.0914	-2.6	84.0	-0.19	0.853
Capital Intensity	Unmatched	0.2233	0.2529	-12.1		-0.76	0.447
	Matched	0.2214	0.2122	3.8	69.0	0.18	0.857
R&D	Unmatched	0.0091	0.0136	-18.8		-1.19	0.237
	Matched	0.0136	0.0140	-1.7	91.2	-0.07	0.946
Sales Growth	Unmatched	0.0243	0.1097	-22.7		-1.31	0.193
	Matched	0.0352	0.0380	-0.8	96.7	-0.09	0.925
Intangibles	Unmatched	0.2656	0.2658	-0.1		-0.01	0.994
	Matched	0.2572	0.2444	5.0	-4,316.5	0.23	0.82

Notes: Table A2 shows the matching quality in terms of relevant matching characteristics between treatment firms (tax strategy disclosing firms) and control firms (firms below the prescribed thresholds) before and after the matching. The matched control group is determined by the propensity score in 2015, a year which is unaffected by the U.K. FA 2016. Moreover, we require a matching partner from the same industry. Results are formed on a one to one nearest neighbor matching requiring a difference in propensity scores of less than 0.03 (caliper). Variables are defined in Table A1.

Table A3: Examples of Tax Strategy Reports

Example 1

Marshalls plc, Nov 2017 – FTSE 250 constituent

Tax Policy Statement
Marshalls aims to pay its fair share of tax and to do so within the spirit of the law. Marshalls believes it is fair to mitigate the company's tax in a fair way using generally available reliefs, but without using aggressive tax avoidance schemes.

The Board of Marshalls has set out that Marshalls;
• will pay the right amount of tax in accordance with relevant statute and case law.
• will pay tax and make all returns on a timely basis, across all taxes.
• aims to have a good working relationship with HMRC and will liaise with the Group's CRM (Customer Relationship Manager) when relevant.
• will not use aggressive tax planning or enter into complicated tax avoidance schemes.
• will not use *Tax Haven*s or inappropriately shift profits between tax jurisdictions.

The Board will review this policy annually to ensure that it is complied with.
Jack Clarke
Group Finance Director
3 November 2017

Example 2

Hays plc, Jun 2018 – FTSE 250 constituent

Hays plc – Our Approach to Tax – Year Ended 30 June 2018
This document, and our UK Tax Strategy described below, has been approved and adopted by the Hays plc Board. Our Tax Strategy will be kept under review and revised as appropriate from time to time.
Our UK business (Hays UK) matches thousands of the right candidates to the right jobs in around 20 different industry sectors (specialisms).
Hays UK operates across commercial, public service, not-for-profit, executive and international channels. Our expert recruitment teams in the UK are ably supported by finance, human resources, information technology, marketing, legal and compliance functions.
For a full list of UK registered Hays plc subsidiaries, please refer to the latest Hays plc Annual Report & Financial Statements, which is freely available on the Hays plc website.

Risk Management and Governance in Relation to Taxation
The Group Chief Financial Officer ("CFO") is responsible for oversight of the Hays plc group's tax risk, which includes Hays UK, and reports to the Hays plc Board on tax and finance issues throughout the financial year. The Group Head of Tax & Treasury is responsible for the day-to-day activities of the Hays in-house tax team and reports to the Group CFO. Hays UK has a multifaceted risk profile due to the size and complexity of this business, the recent increase in relevant changes to UK tax legislation that directly or indirectly affects the recruitment sector, and geographical aspects due to its ownership of or relationship with other Hays' subsidiary companies around the world.

Business Size
Due to the size of the business operating in the UK, the volume and frequency of transactions entered into during the course of the year represent an inherent risk through "process failure" or incorrect interpretation of relevant legislation.
To mitigate the risk of process failure, Hays' strong internal IT infrastructure allows for the deployment of our own internal training across both front office and back office employees. The internal training programmes are robust, yet flexible enough to ensure swift deployment of any changes deemed necessary by the business.
The Hays plc Board and senior management within the business encourage "Whistleblowing", using an independently operated and confidential call facility, which serves as an effective means of minimising any activities that might be in breach of any laws or Hays policies.
To mitigate the risk of the incorrect interpretation of relevant legislation, we employ an in-house tax team based in the UK, who utilise industry leading tax compliance and training software, which are automatically updated to comply with any changes in legislation. Where there is any uncertainty of the correct tax treatment over changes in either the legislation or the Government's interpretation of such legislation, external tax or legal advice is usually sought. In addition, where the complexity or nature of the transaction under review represents a significant risk to the business, external advice is also usually sought.

Table A3: Examples of Tax Strategy Reports (continued)

Changes in UK Tax Legislation
Through interactions with HM Revenue & Customs ("HMRC") and maintaining up-to-date knowledge on changes to tax rules, Hays is able to ensure that HMRC's interpretation of both the letter of the law and the intention of the law is understood throughout the Hays UK business.
Where there remains any doubt because of high levels of complexity, the Hays UK business will seek clarity from HMRC in a real time exchange.

Geographical Influence
The taxation of cross-border, intercompany transactions has been a recent focus of various governmental and international organisations. Hays undertakes its intercompany transactions on an arm's length basis in compliance with UK legislation and OECD principles.
In addition, Hays uses robust transfer pricing documentation covering all of the Group's material intercompany transactions in line with the OECD's transfer pricing documentation requirements that undergo external review and analysis to ensure that the tax risks are mitigated.

Approach to Tax Planning
Hays plc operates as a commercial business and will pursue the best possible economic return for our shareholders. However, in making economic decisions, Hays plc operates a set of Business Principles that have regard to the impact of these decisions on other stakeholders, including both the wider society and the environment in which we operate.
Hays plc recognises that success flows from the trust it enjoys with its stakeholders, including governmental and regulatory bodies and the communities in which we operate. Hays plc's Business Principles, which can be found on our website, extend beyond our legal obligations and establish our relationship with society and are integral to building our reputation both in the UK and across the world as a responsible and trusted business partner.
The Hays UK business therefore manages its tax strategy in such a manner as to ensure the payment of the correct amount of tax in the appropriate tax jurisdiction and at the right time. This involves claiming all the appropriate reliefs and incentives where available. As mentioned, where there is a degree of uncertainty over the interpretation or application of a particular aspect of tax law, Hays UK will usually seek external advice from leading third party providers.
Hays UK does not pursue aggressive tax planning arrangements, which we define as arrangements that are not driven by a valid commercial outcome or transactions that lack material economic substance. However, we intend to remain competitive by seeking to mitigate tax costs by reviewing commercially motivated activities, whilst having full regard to our reputation in the market and to our wider corporate responsibilities.

The level of Tax Risk that the Hays UK business is prepared to accept
From time to time issues may arise that could potentially expose Hays UK to tax risk. Where this occurs, these issues will be managed on a case by case basis. The Hays plc Board's attitude to tax risk is primarily determined through discussions with the Group CFO, the Non-Executive Directors and understanding accepted market practices contained in advice received from leading external advisors.
For completeness, the Hays plc Board is not influenced to any degree by any external stakeholders over its tax strategy and is under no pressure to deviate from this strategy.

Approach to dealing with HMRC
Hays plc adopts a proactive and transparent approach when dealing with HMRC and aims to meet all filing and correspondence deadlines. The business maintains a constant dialogue with its HMRC Customer Relationship Manager and voluntarily reports all significant issues that impact the tax payable by the business. Where possible the business will seek to secure agreement with the relevant tax authorities over the appropriate tax treatment.
Where HMRC have interpreted the legislation in a different manner to that of the Hays UK business and its external advisors, the business works with HMRC to reach a timely agreement on the particular issue.

Group Tax Strategy
Hays plc is firm in its belief that tax matters. As a business we understand that tax helps to fund vital public services and infrastructure, and when paid fairly it ensures a level playing field for businesses, whether large or small.
Whilst this document has been prepared to meet Hays plc's UK obligations under the Finance Act 2016, Schedule 19 in respect of all the UK companies within the Hays plc group, the Hays plc Board adopts the same approach to tax across the whole of the Hays plc group.

References

Akamah, H., Hope, O.-K., & Thomas, W. B. (2018). Tax havens and disclosure aggregation. *Journal of International Business Studies*, 49(1), 49-69.

Austin, P. C. (2011). Optimal caliper widths for propensity-score matching when estimating differences in means and differences in proportions in observational studies. *Pharmaceutical Statistics*, 10(2), 150-161.

Austin, C. R., & Wilson, R. J. (2017). An examination of reputational costs and tax avoidance: evidence from firms with valuable consumer brands. *Journal of the American Taxation Association*, 39(1), 67-93.

Balakrishnan, K., Blouin, J., & Guay, W. (2019). Tax aggressiveness and corporate transparency. *The Accounting Review*, 94(1), 54-69.

Barford, V., & Holt, G. (2013). Google, Amazon, Starbucks: The rise of 'tax shaming'. Available at: https://www.bbc.com/news/magazine-20560359.

Belnap, A. (2019). Brass necks and boilerplate: How US multinationals treat UK requirements for tax strategy disclosure. *Working paper*.

Bergh, D. D., Connelly, B. L., Ketchen, D. J., & Shannon, L. M. (2014). Signalling theory and equilibrium in strategic management research: An assessment and a research agenda. *Journal of Management Studies*, 51(8), 1334-1360.

Beuselinck, C., Blanco, B., Dhole, S., & Lobo, G. J. (2018). Financial statement readability and tax aggressiveness. *Working Paper*.

Bilicka, K., Casi-Eberhard, E., Seregni, C., & Stage, B. M. B. (2021). Qualitative information disclosure: Is mandating additional tax information disclosure always useful? *CESifo Working Paper No. 2021-9030.*

Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys*, 22(1), 31-72.

Campbell, J. L., Chen, H., Dhaliwal, D. S., Lu, H., & Steele, L. B. (2014). The information content of mandatory risk factor disclosures in corporate filings. *Review of Accounting Studies*, 19(1), 396-455.

Chen, S., Schuchard, K., & Stomberg, B. (2019). Media coverage of corporate taxes. *The Accounting Review*, 94(5), 83-116.

Christensen, J., & Murphy, R. (2004). The social irresponsibility of corporate tax avoidance: taking CSR to the bottom line. *Development*, 47(3), 37-44.

Christians, A. (2013). Tax activists and the global movement for development through transparency. Tax, Law and Development. Edward Elgar Publishing, 288-315.

Deegan, C. (2002). Introduction - The legitimising effect of social and environmental disclosures - a theoretical foundation. *Accounting, Auditing & Accountability Journal*, 15, 282-311.

Dyreng, S. D., Hanlon, M., & Maydew, E. L. (2008). Long-run corporate tax avoidance. *The Accounting Review*, 83(1), 61-82.

Dyreng, S. D., Hoopes, J. L., Langetieg, P., & Wilde, J. H. (2020). Strategic subsidiary disclosure. *Journal of Accounting Research*, 58(3), 643-692.

Dyreng, S. D., Hoopes, J. L., & Wilde, J. H. (2016). Public pressure and corporate tax behavior. *Journal of Accounting Research*, 54(1), 147-186.

Dyreng, S. D., & Lindsey, B. P. (2009). Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries on U.S. multinational firms' tax rates. *Journal of Accounting Research*, 47(5), 1283-1316.

European Commission (2015). A fair and efficient corporate tax system in the European Union: 5 key areas for action. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52015DC0302&from=EN.

Evers, M. T., Meier, I., & Spengel, C. (2016). Country-by-country reporting: Tension between transparency and tax planning. *ZEW Discussion Paper*, No. 17-008.

Fair Tax Mark (2020). The new 'Lockdown mindset': More Brits call for greater accountability for businesses on tax avoidance and social responsibility. Available at: https://fairtaxmark.net/the-new-lockdown-mindset-more-brits-call-for-greater-accountability-for-businesses-on-tax-avoidance-and-social-responsibility/.

Forstater, M. (2016). Publishing corporate tax strategies. Available at: https://www.taxjournal.com/articles/publishing-corporate-tax-strategies-04082016.

Freedman, J., Loomer, G., & Vella, J. (2009). Corporate tax risk and tax avoidance: New approaches. *British Tax Review*, Issue 1, 74-116.

Freedman, J., & Vella, J. (2016). Section 161 and Schedule 19: large businesses: tax strategies and sanctions for persistently unco-operative behaviour: further commentary. *British Tax Review*, Issue 5, 653-663.

Gallemore, J., Maydew, E. L., & Thornock, J. R. (2014). The reputational costs of tax avoidance. *Contemporary Accounting Research*, 31(4), 1103-1133.

Graham, J. R., Hanlon, M., Shevlin, T., & Shroff, N. (2014). Incentives for tax planning and avoidance: Evidence from the field. *The Accounting Review*, 89(3), 991-1023.

Gribnau, H. J., & Jallai, A.-G. (2017). Good tax governance: A matter of moral responsibility and transparency. *Nordic Tax Journal*, Issue 1, 70-88.

Gupta, S., Mills, L. F., & Towery, E. (2014). The effect of mandatory financial statement disclosures of tax uncertainty on tax reporting and collections: The case of FIN 48 and multistate tax avoidance. *The Journal of the American Taxation Association*, 36(2), 203-229.

Gupta, S., & Newberry, K. (1997). Determinants of the variability in corporate effective tax rates: Evidence from longitudinal data. *Journal of Accounting and Public Policy*, 16(1), 1-34.

Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, 20(1), 25-46.

Hanlon, M., & Slemrod, J. (2009). What does tax aggressiveness signal? Evidence from stock price reactions to news about tax shelter involvement. *Journal of Public Economics*, 93(1-2), 126-141.

Hasegawa, M., Hoopes, J., Ishida, R., & Slemrod, J. (2013). The effect of public disclosure on reported taxable income: Evidence from individuals and corporations in Japan. *National Tax Journal*, 66(3), 571-608.

Henry, E., Massel, N., & Towery, E. (2016). Increased tax disclosure and corporate tax avoidance. *National Tax Journal*, 69(4), 809-830.

Hermalin, B. E. (2001). Economics & corporate culture. *Working Paper*.

HMRC (2015a). Policy paper - Tax administration: large businesses transparency strategy. Available at: https://www.gov.uk/government/publications/tax-administration-large-businesses-transparency-strategy/tax-administration-large-businesses-transparency-strategy#policy-objective.

HMRC (2015b). Exploring large business tax strategy behaviour. TNS BMRB final report – HMRC research report 363. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/444898/HMRC_Research_Report_363_-_Exploring_Large_Business_Tax_Behaviours.pdf.

HMRC (2015c). Improving large business tax compliance. Available at: https://www.gov.uk/government/consultations/improving-large-business-tax-compliance.

Hoi, C. K., Wu, Q., & Zhang, H. (2013). Is corporate social responsibility (CSR) associated with tax avoidance? *The Accounting Review*, 88(6), 2025-2059.

Honaker, K., & Sharma, D. S. (2017). Does Schedule UTP have uniform long-run effects on corporate tax planning? *The Journal of the American Taxation Association*, 39(2), 63-79.

Hoopes, J. L., Robinson, L., & Slemrod, J. (2018). Public tax-return disclosure. *Journal of Accounting and Economics*, 66(1), 142-162.

Hope, O.-K., Ma, M., & Thomas, W. B. (2013). Tax avoidance and geographic earnings disclosure. *Journal of Accounting and Economics*, 56(2-3), 170-189.

Inger, K. K., Meckfessel, M. D., Zhou, M., & Fan, W. (2018). An examination of the impact of tax avoidance on the readability of tax footnotes. *The Journal of the American Taxation Association*, 40(1), 1-29.

Joshi, P. (2020). Does private country-by-country reporting deter tax avoidance and income shifting? Evidence from BEPS action item 13. *Journal of Accounting Research*, 58(2), 333-381.

Kao, W. C. (2019). The relation between tax avoidance and voluntary disclosures of taxation in United Kingdom. *Working Paper*.

Kreps, D. M. (1990). Corporate culture and economic theory. Perspectives on positive political economy. *Cambridge University Press*, 90-142.

Kubick, T. R., Lynch, D. P., Mayberry, M. A., & Omer, T. C. (2016). The effects of regulatory scrutiny on tax avoidance: An examination of SEC comment letters. *The Accounting Review*, 91(6), 1751-1780.

Kvaal E., & Nobes, C. (2013). International variations in tax disclosures. *Accounting in Europe*, 10(2), 241-273.

Law, K., & Mills, L. F. (2015). Taxes and financial constraints. *Journal of Accounting Research*, 53(4), 777-819.

Lee, D. (2020). Corporate social responsibility of U.S.-listed firms headquartered in tax havens. *Strategic Management Journal*, 41(9), 1547-1571.

Leuz, C., & Wysocki, P. D. (2016). The economics of disclosure and financial reporting regulation: Evidence and suggestions for future research. *Journal of Accounting Research*, 54(2), 525-622.

Li, F. (2008). Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics*, 45(2-3), 221-247.

Loughran, T., & McDonald, B. (2011). When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *The Journal of Finance*, 66(1), 35-65.

Lunt, M. (2014). Selecting an appropriate caliper can be essential for achieving good balance with propensity score matching. *American Journal of Epidemiology*, 179(2), 226-235.

Mathews, M. R. (1997). Twenty-five years of social and environmental accounting. Is there a silver jubilee to celebrate? *Accounting, Auditing & Accountability Journal*, 10, 481-531.

Middleton, A., & Muttonen, J. (2020). Multinational enterprises and transparent tax reporting. *Routledge Studies in Accounting*.

Müller, R., Spengel, C., & Vay, H. (2020). On the determinants and effects of corporate tax transparency: Review of an emerging literature. *ZEW Discussion Paper*, No. 20-063.

Oats, L., & Tuck, P. (2019). Corporate tax avoidance. *Accounting and Business Research*, 49(5), 565-583.

Overesch, M., & Wolff, H. (2021). Financial transparency to the rescue: Effects of public country-by-country reporting in the EU banking sector on tax avoidance. *Contemporary Accounting Research*, 38(3), 1616-1642.

Plesko, G. (2003). An evaluation of alternative measures of corporate tax rates. *Journal of Accounting and Economics*, 35(2), 201-226.

PwC (2015). Global tax transparency and risk management - the landscape prompts changes to operations, strategy and budgets. Available at: https://www.pwc.com/gx/en/tax/publications/assets/pwc-global-tax-transparency-and-risk-management-september-2015.pdf.

PwC (2016). Tax transparency and country-by-country reporting: BEPS and beyond. Available at: https://www.pwc.com/gx/en/tax/publications/assets/tax-transparency-and-country-by-country-reporting.pdf.

Rego, S. O. (2003). Tax-avoidance activities of U.S. multinational corporations. *Contemporary Accounting Research*, 20(4), 805-833.

Robinson, L. A., & Schmidt, A. P. (2013). Firm and investor responses to uncertain tax benefit disclosure requirements. *The Journal of the American Taxation Association*, 35(2), 85-120.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1), 41-55.

Seely, A. (2019). Tax avoidance and tax evasion. Briefing paper Number 7984.

Shipman, J. E., Swanquist, Q. T., & Whited, R. L. (2017). Propensity score matching in accounting research. *The Accounting Review*, 92(1), 213-244.

Shocker, A., & Sethi, S. (1973). An approach to incorporating societal preferences in developing corporate social action. *California Management Review*, 15(4), 97-105.

Spence, M. (1973). Competitive and optimal responses to signals: An analysis of efficiency and distribution. *Journal of Economic Theory*, 7, 296-332.

Srinivasan, R., Lilien, G. L., & Sridhar, S. (2011). Should firms spend more on research and development and advertising during recessions? *Journal of Marketing*, 75(3), 49-65.

St. Clair, T., & Cook, T. D. (2015). Difference-in-Difference methods in public finance. *National Tax Journal*, 68(2), 319-338.

Stuart, E. A., Huskamp, H. A., Duckworth, K., Simmons, J., Song, Z., Chernew, M., & Barry, C. L. (2014). Using propensity scores in difference-in-differences models to estimate the effects of a policy change. *Health Services & Outcomes Research Methodology*, 14(4), 166-182.

Tetlock, P. C. (2007). Giving content to investor sentiment: The role of media in the stock market. *The Journal of Finance*, 62(3), 1139-1168.

Xia, J. (2020). Qualitative disclosure as a tax enforcement mechanism: Evidence from the U.K. tax strategy disclosure requirement. *Working Paper*.

Chapter 4

The Effects of the U.S. Tax Reform on Investments in Low-Tax Jurisdictions – Evidence from Cross-Border M&As

The Effects of the U.S. Tax Reform on Investments in Low-Tax Jurisdictions – Evidence from Cross-Border M&As

Mathias Dunker
Department of Business Taxation, University of Cologne, dunker@wiso.uni-koeln.de

Michael Overesch
Department of Business Taxation, University of Cologne, overesch@wiso.uni-koeln.de

Max Pflitsch
Department of Business Taxation, University of Cologne, pflitsch@wiso.uni-koeln.de

Abstract:

This paper examines the effects of the U.S. tax reform of 2017, commonly known as the 'Tax Cuts and Jobs Act' [TCJA] on cross-border M&As of U.S. acquirers. The TCJA replaced the U.S. worldwide tax system by a territorial system, albeit with one important exception: the 'Global Intangible Low-Taxed Income' [GILTI] provision. Our results suggest that the outbound acquisition pattern changed significantly for those U.S. acquirers that are affected by the new GILTI provision. GILTI-affected firms acquire targets in low-tax countries and tax havens significantly less often after the TCJA. We also provide weak evidence that U.S. firms not affected by the GILTI regime acquire more often targets in low-tax countries and tax havens.

Keywords: Cross-Border M&As, U.S. Tax Reform, International Taxation, Global Intangible Low-Taxed Income

JEL Classifications: G34, H26, H32

Chapter 4

Tables

Figures

4.1 Introduction

This paper examines effects of the 'Tax Cuts and Jobs Act of 2017' [TCJA] on U.S. firms' cross-border merger and acquisition [M&A] decisions. We scrutinize how the shift to a territorial tax system and the 'Global Intangible Low-Taxed Income' [GILTI] provision affect cross-border acquisitions of U.S. firms. The GILTI regime aims at deterring tax avoidance via low-tax jurisdictions. In particular, we investigate how the pattern of U.S. acquisitions in low-tax versus high-tax countries is affected. Our results suggest that the outbound acquisition pattern changed significantly for those U.S. acquirers that are affected by the new GILTI provision.

Undoubtedly, the TCJA is the most significant tax reform in the U.S. for decades. For example, the TCJA reduced the U.S. corporate tax rate significantly from 35 percent to 21 percent and changed the existing worldwide tax system into a territorial one. Due to the abolition of the worldwide tax systems, foreign profits can be repatriated without additional home-country taxes. Thus, one might expect an increase of U.S. cross-border M&As in low-tax countries because U.S. firms can benefit from higher after-tax income earned in low-tax countries without additional taxes upon repatriation. However, the TCJA also instituted the GILTI provision as an important exception to the territorial tax system. This provision aims to deter tax avoidance through investments in low-tax jurisdictions. The GILTI provision results in additional taxes on certain foreign excess returns. Therefore, we expect GILTI-affected firms to be less likely to acquire targets in low-tax jurisdictions.

Prior literature has shown that both, the corporate tax rate and the tax system, i.e., worldwide versus territorial tax system, affect M&A decisions (Barrios, Huizinga, Laeven and Nicodème, 2012; Arulampalam, Devereux and Liberini, 2019; Soled, 2008). In particular, previous studies have documented that the former U.S. tax system distorted M&A decisions (Bird, Edwards and Shevlin, 2017; Feld et al., 2016; Harris and O'Brien, 2018; Huizinga and Voget, 2009). The worldwide tax system prior to the TCJA incentivized U.S. firms to

accumulate cash abroad rather than repatriate foreign profits (Graham, Hanlon and Shevlin, 2010). Correspondingly, the U.S. international tax system was often associated with inefficient investment decisions (Hanlon, Lester and Verdi, 2015; Edwards, Kravet and Wilson, 2016; Harford, Wang and Zhang, 2017).

We examine potential effects of the U.S. tax reform and, in particular, of the GILTI provision on the pattern of U.S. cross-border M&As. Therefore, we distinguish between GILTI-affected and non-GILTI-affected U.S. firms. We consider two different measures to classify GILTI-affected firms. For both measures, we find strong evidence that the GILTI regime deters investments in low-tax jurisdictions of U.S. acquirers. In addition, we find weak evidence for changes in cross-border M&A activities of U.S. firms that are unaffected by the GILTI provision. More precisely, our results suggest that unaffected firms invest more often in low-tax countries after the TCJA. This finding is in accordance with incentives for U.S. firms to invest in low-tax countries due to the adoption of a territorial tax system. However, the effect is not robust across all of our specifications.

Two contemporaneous papers are closely related to our study. Atwood, Downes, Henley and Mathis (2020) investigate whether the TCJA affects domestic and foreign investments differently. They find that after the TCJA, not only the number of foreign acquisitions but also the number of domestic acquisitions decreased on average. Amberger and Robinson (2020) analyze the overall effect of the TCJA on cross-border M&A decisions of U.S. firms. They find a reduced probability that a foreign target is acquired by a U.S. firm after the TCJA, particularly in low-growth and low-tax countries. We add to this literature and focus specifically on the new GILTI regime. Our results suggest that only GILTI-affected firms decrease their number of acquisitions in low-tax countries. Moreover, we find weak evidence that U.S. firms not affected by the GILTI regime acquire more often targets in low-tax and tax haven countries.

Our study makes several contributions. First, we document how the cross-border acquisition behavior of U.S. firms is affected by the TCJA. More precisely, we show that the

GILTI regime prevents firms from investing in low-tax countries. There is an ongoing international debate across OECD countries how to curb profit shifting. In particular, investments in low-tax or tax haven countries are often motivated by tax considerations. Our finding that the GILTI anti-avoidance rule effectively deters investments in low-tax jurisdictions adds to this debate. Furthermore, evaluating the GILTI-related effects is of particular importance because the Biden administration is considering to expand and enhance the GILTI regime significantly.[54] Additionally, cross-border M&A flows are an important channel affecting both the U.S. and foreign economies. Our findings suggest that a specific provision in the tax code could have significant effects on M&A decisions. Therefore, future research concerning M&As could consider tax provisions in more detail. Lastly, we add to the growing literature examining one of the largest tax reforms in western countries for decades (Koutney and Mills, 2018; Slemrod, 2018; Hanlon, Hoopes and Slemrod, 2019; Carrizosa, Gaertner and Lynch, 2020; Gaertner, Hoopes and Williams, 2020).

The remainder of the paper is structured as follows. Section 4.2 briefly reviews the TCJA provisions likely affecting the M&A market and derives our hypotheses. Section 4.3 discusses the sample selection, explorative results, and the empirical approach. Section 4.4 presents empirical results and Section 4.5 concludes.

4.2 The U.S. Tax Reform and its Potential Effects on M&A

The TCJA includes several provisions potentially affecting cross-border investments of U.S. acquirers. First, the TCJA reduced the corporate tax rate considerably from 35 percent to 21 percent. This implies that U.S. firms have more after-tax income and thus, more funds available to pursue cross-border investments. However, it is unclear whether the reduction of

[54] 'The Made In America Tax Plan' suggests an increase of the GILTI tax to 21 percent and additionally changes the calculation to a country-by-country basis (https://home.treasury.gov/system/files/136/MadeInAmerica TaxPlan_Report.pdf).

the corporate tax rate ultimately affects the decision to acquire targets in high- or low-tax countries.

More importantly, the TCJA changed the U.S. tax system from a worldwide tax system to a territorial one.[55] Under a territorial tax system, a multinational enterprise [MNE] can repatriate foreign profits without any additional taxes imposed by the home country. Thus, the foreign tax rate becomes particularly important and investments in low-tax countries are more attractive relative to foreign investments under a worldwide tax system. Prior to the TCJA, however, U.S. firms could avoid U.S. repatriation taxes by permanently reinvesting their foreign earnings. Therefore, it remains an empirical question whether the change to the territorial tax system increased the attractiveness of M&As in low-tax jurisdictions. As our null hypothesis, we state that the shift to a territorial tax system has an effect on the cross-border acquisition decision:

H1: After the TCJA, U.S. firms become more likely to acquire targets in low-tax countries than in high-tax countries.

Besides other provisions affecting international taxation, the GILTI provision is most prominently discussed.[56] The GILTI regime constitutes an important exception to the territorial tax system. The GILTI provision states that 50 percent of the income of a U.S. controlled foreign corporation, net of interest payments, might be subject to U.S. taxation if it exceeds a certain return on its 'qualified business asset investment' [QBAI]. However, this rule applies only if the foreign tax rate is less than 13.125 percent until 2025 or less than 16.4 percent from

[55] The TCJA also contains a one-time transition tax on foreign earnings. However, given that this tax applies to past earnings, we do not believe that it significantly alters future M&A decisions of the firms.

[56] We acknowledge that the TCJA contained multiple other provisions affecting taxation nationally and internationally, the most discussed of which are 'Foreign Derived Intangible Income' [FDII] and the 'Base Erosion and Anti Abuse Tax' [BEAT]. We cannot rule out that these or other provisions also affect cross-border M&As of U.S. firms. However, we expect that the GILTI provision has the strongest effect on the decision to invest in either a high-tax or low-tax country because GILTI taxes directly depend on the aggregated level of a U.S. MNE's foreign taxation.

2026 onwards.[57] Importantly, the GILTI regime generally applies to the aggregated income of all foreign affiliates of a U.S. firm.[58] Thus, if a U.S. firm already reports a low foreign tax rate, income from additional foreign low-taxed operations can be subject to GILTI taxes. U.S. acquirers might therefore refrain from investing in low-tax countries if the new investment generates profits subject to the GILTI provision. Accordingly, we state the following hypothesis:

H2: U.S. firms subject to the GILTI provision are less likely to acquire targets in low-tax countries following the TCJA.

4.3 Data

4.3.1 Sample Selection and Explorative Results

Our initial sample contains all cross-border acquisitions available in Refinitiv's SDC Database, announced between 2010 and 2019. We chose this sample period to avoid distortive effects associated with the financial crisis or the virus pandemic from 2020 onward. We limit the sample to deals in which an acquirer seeks a majority stake in the target and exclude internal restructurings. We eliminate firms from financial and utility industries and those lacking sufficient data on control variables in Compustat. Moreover, we exclude deals with U.S. targets.[59] We also require a minimum of ten deals per target country to ensure an active M&A market. Finally, we restrict our sample to target countries that do not switch between the low-tax and high-tax group during the sample period.[60] Our final sample consists of 8,598 cross-

[57] Lyon and McBride (2018) argue that the GILTI regime may at least partly offset the benefits of the territorial tax system. Therefore, the new tax system is often referred to as a quasi-territorial tax system.
[58] Note that the after-tax earnings (excluding subpart F income) are aggregated across all foreign subsidiaries of a U.S. MNE and reduced by ten percent of all foreign subsidiaries' QBAI only if the after-tax earnings are positive.
[59] Excluding deals with U.S. targets is in line with prior literature (Amberger and Robinson, 2020). The results are robust if we include U.S. targets for non-U.S. acquirers.
[60] We exclude these target countries from our sample to avoid distortive effects. A change of assignment to a low-tax or high-tax country due to a change of the statutory tax rate in the investigation period might have a significant, though only mechanical, effect on the share of M&A flows between low-tax and high-tax countries.

border deals ('Global Sample'). Of these, 873 deals have a U.S. acquirer ('U.S. Sample').[61] We consider the U.S. Sample as our baseline sample for the first part of our empirical analysis.[62] Table 1 illustrates the sample selection process.

Table 1: Sample Selection

Description	No. of Deals
All cross-border M&A deals with non-missing deal value of U.S. and non-U.S. acquirers announced between 2010 and 2019 (Source: SDC Platinum). Deals with U.S. targets are excluded.	45,860
Less: M&A deals in which the acquirer does not or will not hold a majority stake in the target and deals that are declared as internal restructurings.	(11,005)
Less: M&A deals of acquirers not included in Compustat.	(16,918)
Less: M&A deals of firms from the financial and utility industries.	(3,808)
Less: M&A deals with missing financial data. Also requiring at least 10 deals per target country and eliminating target countries that switch between a low-tax and high-tax group during the sample period.	(5,531)
Global Sample	**8,598**
U.S. Sample	**873**

Notes: Table 1 shows our sample selection process. We obtain deal-level data from Refinitiv's SDC Platinum and acquirer-level and target-level financial statement data from Compustat.

To study potential effects of the GILTI regime on M&A activities, we need to identify firms that are likely affected by the new provision. We employ two different strategies to determine whether a firm is GILTI-affected. As described in Section 4.2, the GILTI regime only applies if the consolidated foreign tax rate of a U.S. firm is below 16.4 percent (13.125 percent until 2025). Accordingly, we consider a firm as affected by the GILTI provision when it has a foreign effective tax rate [FETR] below the GILTI threshold of 16.4 percent. We use the FETR in the fiscal year prior to the deal to alleviate concerns regarding reverse causality, i.e., that the deal itself affects the FETR.

In an additional analysis, we classify firms by considering the potential GILTI tax base. The GILTI tax due is based on excess returns defined as follows (see Dharmapala, 2018):

[61] Henceforth, the term U.S. acquirer applies to acquisitions where the acquirer or its global ultimate owner is from the U.S.
[62] We again require at least 10 M&A deals in target countries.

*GILTI = Foreign Pre-Tax Income – Foreign Taxes – 0.1*QBAI*. QBAI is defined as the basis in foreign depreciable physical assets. Due to limited data availability, we have to approximate potential excess returns using consolidated acquirer level data. We argue that firms exhibiting large excess returns in their consolidated accounts are also likely to have large foreign excess returns. More precisely, we substitute foreign pre-tax income with consolidated pre-tax income, foreign taxes with total taxes, and QBAI with consolidated property, plant and equipment.[63] We scale the excess return with lagged total assets and consider those firms as GILTI-affected if their excess return is in the upper quantile of our sample. We chose this conservative cutoff for two reasons. First, we aim to classify only those firms as GILTI-affected that are *significantly* affected. For instance, the GILTI taxes for firms with low excess returns would be very low and are unlikely to affect foreign acquisition decisions. Second, our measure is based on consolidated data. Accordingly, we consider only firms with very large *consolidated* excess returns because they are more likely to exhibit positive *foreign* excess returns, too.[64]

Figure 1 shows the results of an explorative analysis of U.S. cross-border M&As around the TCJA. We plot the average annual deal value of U.S. cross-border acquisitions. First, we split the sample across targets into high-tax and low-tax countries using the annual median statutory tax rate.[65] Panel A shows that the average annual deal value of U.S. cross-border acquisitions increased from $22.71 billion to $28.63 billion after the TCJA. However, the amount invested in low-tax countries decreased from $6.75 billion to $6.01 billion in the period following the TCJA. Panel B shows how investments in low-tax countries differ depending on whether firms are GILTI-affected using the FETR. The graph displays heterogeneity across

[63] Results are qualitatively unchanged if we consider an alternative QBAI approximation, computed as total assets net of current assets and intangibles (untabulated).

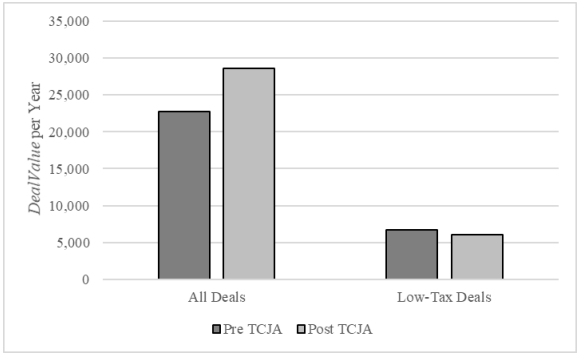
[64] Utilizing different cutoffs, for instance zero, might result in larger classification bias. That is, firms with consolidated excess returns just above zero might have negative foreign excess returns and are thus not affected by GILTI. However, untabulated results are robust when we consider either the zero or a median cutoff for the excess returns.

[65] More precisely, we compute the annual median treating each country as one observation. Computing the median annually across all observations would prevent us from analyzing changes in the low-tax versus high-tax shares across periods.

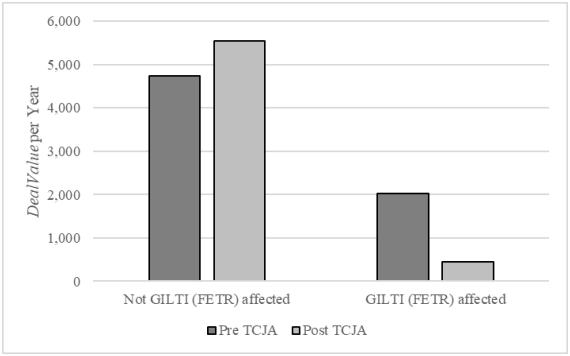
GILTI- and non-GILTI-affected firms. For unaffected firms, the annual value of M&A deals in low-tax countries increased after the TCJA. By contrast, considering firms that are subject to the GILTI provision, the annual deal value in low-tax countries decreased considerably following the TCJA. For instance, Panel B suggests a decline of 77 percent, from $2.02 billion to $455 million. Moreover, Panel C considers our alternative GILTI measure based on excess returns. We likewise observe an increase of investments in low-tax countries for non-affected firms. Firms that are affected by GILTI reduce their investments in low-tax countries post TCJA.

Figure 1: Annual Cross-Border M&A Deal Value pre and post TCJA

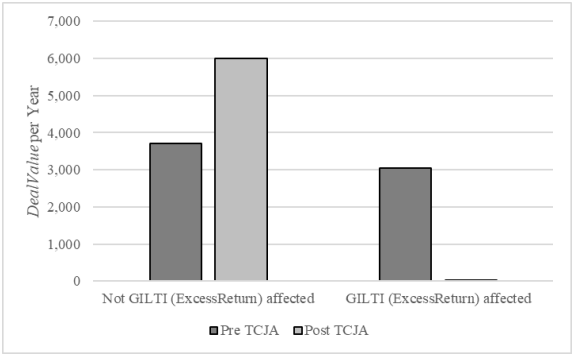
Panel A: Annual *DealValue*



Panel B: Annual *DealValue* by GILTI (FETR) Affected Firms in Low-Tax Countries



Panel C: Annual DealValue by GILTI (ExcessReturn) Affected Firms in Low-Tax Countries



Notes: Figure 1 plots the average annual deal value (in million U.S. Dollar) in the pre- and post-TCJA-period for all U.S. cross-border M&A deals and U.S. cross-border M&A deals in low-tax countries (Panel A). Low-tax countries are defined as having a below median statutory tax rate, computed annually across countries. In Panel B, we split the low-tax sample depending on whether an acquirer is GILTI-affected. We define a firm to be GILTI-affected if the FETR is below 16.4 percent, where FETR is defined as Compustat items foreign income taxes (*txfo*) divided by foreign pre-tax income (*pifo*) for positive values of txfo and pifo. FETR is winsorized at values 0 and 1. In Panel C, we consider the alternative approximation of GILTI-affected firms based on excess returns of the acquirer. An acquirer is assumed to be affected if its excess return is in the upper quantile of our sample. Excess return is defined as the difference of pre-tax income (*pi*) and total tax expense (*txt*) less 10 percent of property, plant and equipment (*ppent*), scaled by lagged total assets (*at*).

4.3.2 Empirical Approach

Acquisitions in Low-Tax Countries

We examine potential effects of the U.S. tax reform on the pattern of U.S. cross-border M&As. Therefore, we model the investment decision of a U.S. acquirer to either invest in a low-tax or high-tax country. As dependent variable, we use the dummy variable *LowTaxCountry*. We classify a country as a *LowTaxCountry* when its statutory tax rate is below the median.[66] We examine the probability that the target country of an M&A deal is a low-tax country. Therefore, we estimate a logit model based on the following equation (firm and time indices omitted):

$$\begin{aligned} LowTaxCountry = {} & \alpha_0 + \alpha_1\, PostTCJA + \alpha_2\, X + \alpha_3\, PostTCJA{*}X + \alpha_4\, Year \\ & + \alpha_5\, DealValue + \alpha_6\, Size + \alpha_7\, SalesGrowth + \alpha_8\, Leverage \\ & + \alpha_9\, WorkingCapital + \alpha_{10}\, RoA + \alpha_{11}\, CashRatio + \alpha_{12}\, Intangibles \\ & + \alpha_{13}\, CapitalIntensity + Industry\ FE + u \end{aligned} \quad (1)$$

We mark M&A deals that were announced after the TCJA came into force with an indicator variable *PostTCJA*. That is, *PostTCJA* equals one if the deal is announced in 2018 or 2019. If we consider only M&A deals of U.S. firms ('U.S. Sample'), coefficient α_1 in equation (1) depicts whether U.S. acquirers are more or less likely to invest in low-tax countries in the aftermath of the TCJA. In line with H1, we expect α_1 to be positive.

In addition, we include the dummy variable *X* that indicates if the acquirer is likely subject to the GILTI provision. An acquirer is assumed to fall within the GILTI regime if its FETR is below a certain threshold or if its excess return is in the upper quantile as described above. The interaction coefficient α_3 depicts whether GILTI-affected firms are more or less

[66] The median is computed annually across countries. We compute the median based on a sample where each country is represented as one observation. Computing the median annually across all observations would prevent us from analyzing changes in the low-tax versus high-tax share across periods.

likely to acquire targets in low-tax countries following the TCJA. In accordance with H2, we expect α_3 to be negative.

Our set of control variables follows prior literature (Amberger and Robinson, 2020; Atwood et al., 2020). We control for firm characteristics of acquiring firms that could have an impact on M&A activities. Moreover, we consider the deal value as a proxy for target size. All financial variables are based on the year prior to the announcement date.[67] Furthermore, we control for acquirer industry fixed effects and include a time trend in the regressions. Descriptive statistics for employed variables are presented in Table 2.

Table 2: Descriptive Statistics

Panel A: U.S. Sample

Variable	N	Mean	Std. Dev.	Q1	Median	Q3
CorpTaxRate	873	27.83	5.79	26.00	29.72	31.00
TaxHaven	873	0.12	0.32	0.00	0.00	0.00
FETR	873	0.28	0.21	0.16	0.25	0.34
ExcessReturn	873	0.04	0.06	0.01	0.04	0.08
DealValue	873	3.48	2.45	2.15	3.73	5.20
Size	873	8.04	1.79	6.82	8.04	9.23
SalesGrowth	873	0.11	0.27	-0.01	0.07	0.18
Leverage	873	0.23	0.19	0.08	0.20	0.35
WorkingCapital	873	0.07	0.16	-0.01	0.07	0.16
RoA	873	0.09	0.09	0.04	0.08	0.13
CashRatio	873	0.15	0.14	0.06	0.11	0.19
Intangibles	873	0.34	0.26	0.12	0.29	0.49
CapitalIntensity	873	0.20	0.19	0.07	0.14	0.26

Panel B: Global Sample

Variable	N	Mean	Std. Dev.	Q1	Median	Q3
CorpTaxRate	8,598	26.09	7.13	25.00	26.00	30.00
TaxHaven	8,598	0.16	0.36	0.00	0.00	0.00
USAcquirer	8,598	0.12	0.32	0.00	0.00	0.00
ExcessReturn	8,598	-0.01	0.19	-0.02	0.02	0.06
DealValue	8,598	1.59	3.33	-0.19	1.94	3.87
Size	8,598	6.93	2.48	5.28	6.99	8.69
SalesGrowth	8,598	0.17	0.57	-0.05	0.07	0.23
Leverage	8,598	0.17	0.19	0.01	0.13	0.26
WorkingCapital	8,598	0.00	0.22	-0.08	0.01	0.10
RoA	8,598	0.04	0.23	0.02	0.07	0.12
CashRatio	8,598	0.18	0.23	0.06	0.11	0.22
Intangibles	8,598	0.22	0.28	0.02	0.11	0.35
CapitalIntensity	8,598	0.28	0.26	0.08	0.21	0.41

Notes: Table 2 presents descriptive statistics for the U.S. Sample (Panel A) and the Global Sample (Panel B). All financial variables are based on the year prior to the announcement date of an M&A deal. Variables are defined in Table A1 in the Appendix.

[67] All continuous variables are winsorized at the 1st and 99th percentiles. A description of all variables employed can be found in Table A1 in the Appendix.

In additional specifications, we also include cross-border M&A deals of non-U.S. acquirers ('Global Sample'). This allows controlling for potential global trends. For instance, global initiatives in combating harmful tax avoidance schemes, such as the OECD's 'Base Erosion and Profit Shifting' initiative, could have influenced M&A activities. Particularly, the preference to invest in low-tax countries could be affected as well. In these specifications, we define *X* equal to one for U.S. acquirers (equal to zero for acquirers outside the U.S.). To examine how the GILTI regime affects the probability of an acquisition in a low-tax country, we separately estimate this equation for GILTI and non-GILTI-affected U.S. firms. According to the above-discussed H2, we expect α_3 to be negative for the GILTI-affected U.S. firms, i.e., GILTI-affected U.S. firms are less likely to acquire targets in low-tax countries compared to international peers. For the set of non-GILTI-affected firms we expect α_3 to be positive (H1).

M&A Market Share of U.S. Acquirers

In a second analysis, we investigate whether the share of U.S. acquisitions in the global M&A market has changed after the TCJA. Therefore, we consider all cross-border M&A deals in our sample. As dependent variable, we use a dummy variable *USAcquirer* that equals one if the acquirer is from the U.S. We examine whether the likelihood that the acquiring firm of a cross-border M&A deal is from the U.S. has changed after the introduction of the TCJA. We estimate the following logit model:

$$\begin{aligned} USAcquirer = {} & \beta_0 + \beta_1\, PostTCJA + \beta_2\, Year + \beta_3\, DealValue + \beta_4\, Size + \beta_5 SalesGrowth \\ & + \beta_6\, Leverage + \beta_7\, WorkingCapital + \beta_8\, RoA + \beta_9\, CashRatio \\ & + \beta_{10}\, Intangibles + \beta_{11}\, CapitalIntensity + Industry\ FE + u \end{aligned} \tag{2}$$

β_1 indicates whether the likelihood that a cross-border deal has a U.S. acquirer has changed after the TCJA. Utilizing sample splits, we also investigate how this likelihood regarding low-tax and high-tax countries has changed after the TCJA. Moreover, we consider

subsamples of U.S. firms that are likely affected by the GILTI regime and those that are not. Particularly, we expect β_1 to be negative (positive) for the subsample of GILTI-affected (non-GILTI-affected) U.S. firms investing in low-tax jurisdictions.

4.4 Empirical Results

4.4.1 U.S. M&As in Low-Tax versus High-Tax Countries

In this section, we present our empirical results. Table 3 presents the results corresponding to the logit regression of equation (1).[68] In Column (1), we analyze how the overall number of U.S. outbound acquisitions changed following the TCJA. The coefficient of *PostTCJA* is insignificant. This result suggests that the probability of acquisitions in low-tax versus high-tax countries does not significantly differ between the pre- and post-TCJA-period.

[68] Results are robust if we consider probit estimations instead of the logit model (untabulated).

Table 3: GILTI Regime and Investments in Low-Tax Countries – *FETR* Cutoff

Dependent Variable	(1)	(2)	(3)	(4)	(5)
	LowTaxCountry				
	U.S. Sample		*Global Sample*		
X=	Low *FETR*		*USAcquirer*	*USAcquirer* & Low *FETR*	*USAcquirer* & High *FETR*
PostTCJA	0.26	0.55***	0.01	0.00	0.02
	(0.17)	(0.00)	(0.92)	(0.99)	(0.86)
X		0.11	-0.40	-0.27	-0.44
		(0.68)	(0.16)	(0.49)	(0.11)
*X*PostTCJA*		-1.26***	0.08	-1.24**	0.39
		(0.00)	(0.74)	(0.01)	(0.16)
Year	-0.01	-0.02	0.01	0.02	0.01
	(0.69)	(0.66)	(0.59)	(0.53)	(0.64)
DealValue	-0.02	-0.03	0.01	0.01	0.01
	(0.91)	(0.85)	(0.89)	(0.84)	(0.89)
Size	0.15*	0.15*	-0.06	-0.07	-0.06
	(0.07)	(0.09)	(0.15)	(0.11)	(0.13)
SalesGrowth	0.59*	0.58*	-0.03	-0.04	-0.04
	(0.09)	(0.10)	(0.64)	(0.52)	(0.56)
Leverage	0.48	0.69	0.33	0.32	0.37*
	(0.47)	(0.32)	(0.14)	(0.19)	(0.09)
WorkingCapital	0.57	0.56	-0.31*	-0.35**	-0.33*
	(0.51)	(0.53)	(0.07)	(0.04)	(0.06)
RoA	-1.56	-1.34	0.51***	0.57***	0.55***
	(0.24)	(0.28)	(0.00)	(0.00)	(0.00)
CashRatio	0.30	0.22	0.01	0.01	0.01
	(0.72)	(0.78)	(0.98)	(0.98)	(0.96)
Intangibles	-0.85	-0.88	-0.51	-0.55	-0.52
	(0.28)	(0.27)	(0.22)	(0.21)	(0.22)
CapitalIntensity	-1.78	-1.94*	-0.16	-0.14	-0.17
	(0.11)	(0.09)	(0.48)	(0.55)	(0.47)
Industry FE	✓	✓	✓	✓	✓
Observations	873	873	8,598	7,860	8,328
Pseudo R^2	0.040	0.047	0.012	0.012	0.012

Notes: Table 3 presents logit regression results of equation (1). Columns (1) and (2) are based on the U.S. Sample, containing U.S. acquirers only, *X* is set equal to one if the *FETR* is below 16.4 percent. In Columns (3) to (5), the sample additionally comprises cross-border acquisitions of acquirers located outside the U.S. For these Columns, *X* is set equal to one if the acquirer is from the U.S. In Column (4), we omit U.S. acquirers with *FETR* > 16.4 percent, whereas in Column (5), we omit acquirers with *FETR* < 16.4 percent. In all regressions, we employ robust standard errors clustered at the target-country level. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Variables are defined in Table A1 in the Appendix.

However, this could be due to offsetting effects. That is, GILTI-affected firms might invest less in low-tax countries, while unaffected U.S. firms could increase their investments in low-tax countries, as described in Section 4.2. In Column (2), we therefore include the variable

X, indicating those firms affected by the GILTI regime. We approximate GILTI-affected firms using the FETR (see Section 4.3.1). The interaction between *X* and *PostTCJA* is negative and highly significant.[69] This finding suggests that GILTI-affected firms invest less often in low-tax countries after the TCJA, confirming H2. Moreover, the positive effect of the *PostTCJA* variable indicates that the U.S. firms unaffected by the new GILTI regime are even more likely to acquire targets in low-tax countries after the TCJA.[70] This finding is in accordance with H1.

The analysis thus far is based solely on the U.S. Sample. In Columns (3) to (5) of Table 3, we consider our Global Sample of cross-border M&A deals to control for global trends.[71] We set *X* equal to one if the acquirer is a U.S. firm, and zero otherwise. The interaction effect of *X* and *PostTCJA* is insignificant. However, the insignificant result might be associated with offsetting effects of different TCJA provisions.

We therefore differentiate again between U.S. firms that are subject to the GILTI regime and U.S. firms that are not. In Column (4), we keep only those U.S. firms that are affected by GILTI and in Column (5) those that are not. The negative and significant interaction effect in Column (4) suggests a reduced likelihood of acquisitions in low-tax countries for GILTI-affected U.S. firms compared to their international peers. This strengthens our findings based on the U.S. Sample (Column (2)). However, when considering U.S. firms not subject to the GILTI regime, the interaction effect is insignificant (Column (5)). The latter result does not confirm our finding that unaffected U.S. firms invest more in low-tax countries after the TCJA.

In Table 4, we present additional results considering the alternative approximation of GILTI-affected firms based on excess returns of the acquirer (see Section 4.3.1). The main

[69] Ai and Norton (2003) show that the sign of the interaction coefficient can differ from the marginal effect. However, Puhani (2012) demonstrates that the sign of the marginal effect does not differ in the case of a dummy interaction. Henceforth, since it is not possible to interpret corresponding coefficient magnitudes, we focus on the sign and significance of the respective coefficients.

[70] The finding for the interaction between *X* and *PostTCJA* remains statistically unchanged if we consider year fixed effects instead of a time trend (untabulated). Using a time trend, however, allows us to interpret the *PostTCJA* coefficient.

[71] To alleviate concerns that our results are driven by systematic differences across U.S. and non-U.S. firms, we show that all results carry over if we perform a Propensity Score Matching [PSM] before the main regressions as part of our robustness tests.

findings of Table 3 carry over. GILTI-affected firms acquire significantly less often targets in low-tax countries (Columns (1) and (2)). Analogous to Column (1) in Table 3, we find that firms not affected by GILTI acquire significantly more targets in low-tax countries after the TCJA when we consider the sample of U.S. firms only. However, this finding is not confirmed if we consider the Global Sample (Column (3)).

Table 4: GILTI Regime and Investments in Low-Tax Countries – *ExcessReturn* Cutoff

Dependent Variable	(1)	(2)	(3)
	LowTaxCountry		
	U.S. Sample	*Global Sample*	
X=	High *ExcessReturn*	*USAcquirer* & High *ExcessReturn*	*USAcquirer* & Low *ExcessReturn*
PostTCJA	0.48**	0.25	-0.08
	(0.05)	(0.19)	(0.59)
X	0.06	-0.17	-0.47*
	(0.83)	(0.59)	(0.10)
*X*PostTCJA*	-1.13*	-0.72**	0.40
	(0.08)	(0.03)	(0.19)
Year	-0.01	-0.01	0.02
	(0.70)	(0.73)	(0.36)
DealValue	-0.03	-0.00	0.01
	(0.87)	(1.00)	(0.87)
Size	0.15*	-0.09*	-0.05
	(0.09)	(0.08)	(0.22)
SalesGrowth	0.57	-0.21	0.01
	(0.10)	(0.19)	(0.86)
Leverage	0.59	-0.16	0.43
	(0.38)	(0.69)	(0.11)
WorkingCapital	0.53	-0.19	-0.37*
	(0.56)	(0.55)	(0.08)
RoA	-1.14	0.40	0.49**
	(0.50)	(0.53)	(0.02)
CashRatio	0.20	0.28	-0.06
	(0.80)	(0.41)	(0.81)
Intangibles	-0.89	-0.13	-0.60
	(0.25)	(0.75)	(0.18)
CapitalIntensity	-1.89*	0.61	-0.29
	(0.09)	(0.12)	(0.27)
Industry FE	✓	✓	✓
Observations	873	2,149	6,449
Pseudo R^2	0.045	0.027	0.013

Notes: Table 4 presents logit regression results of equation (1). Column (1) is based on the U.S. Sample, containing U.S. acquirers only, *X* is set equal to one if the *ExcessReturn* is in the upper quantile of our sample. In Columns (2) and (3), the sample additionally comprises cross-border acquisitions of acquirers located outside the U.S. For these Columns, *X* is set equal to one if the acquirer is from the U.S. In Column (2), we omit U.S. acquirers with *ExcessReturn* below the upper quantile, whereas in Column (3), we omit acquirers with *ExcessReturn* above the upper quantile. In all regressions, we employ robust standard errors clustered at the target-country level. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Variables are defined in Table A1 in the Appendix.

In sum, GILTI-affected U.S. firms exhibit a significantly reduced probability to invest in low-tax jurisdictions following the TCJA. This result is robust when controlling for the acquisition pattern of non-U.S. acquirers and for different GILTI approximations. By contrast, the evidence is less conclusive for U.S. firms not affected by the GILTI regime. If we examine a sample comprising U.S. firms only, these firms acquire significantly more often targets in low-tax jurisdictions after the TCJA. However, the result is insignificant when including worldwide M&A deals ('Global Sample').

4.4.2 M&A Market Share of U.S. Acquirers after the TCJA

In the second part of our analysis, we investigate whether the share of acquisitions of U.S. firms in international M&As has changed following the TCJA. Put differently, we scrutinize whether U.S. firms are more or less likely to acquire foreign targets compared to acquirers from other countries after the TCJA. We again differentiate between acquisitions in low-tax and high-tax countries.

Table 5 shows the regression results of equation (2). The dependent variable *USAcquirer* is set equal to one if the acquirer is from the U.S., and zero otherwise. In Column (1), we consider all cross-border deals, in Column (2), we consider only deals in high-tax countries, and in Column (3), we consider only deals in low-tax countries. The *PostTCJA* coefficient indicates how the share of U.S. acquirers has changed after the TCJA. We do not find any significant effect. Thus, our results suggest that the likelihood that a deal has a U.S acquirer has not significantly changed after the TCJA.

Table 5: Cross-Border M&As – Market Share of U.S. Acquirers post TCJA – *FETR* Cutoff

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent Variable	**Total *USAcquirer***			**GILTI *USAcquirer***			**Non-GILTI *USAcquirer***		
	Overall	High-Tax	Low-Tax	Overall	High-Tax	Low-Tax	Overall	High-Tax	Low-Tax
PostTCJA	-0.11	-0.13	0.02	-0.08	0.11	-1.44**	-0.15	-0.24	0.32
	(0.46)	(0.48)	(0.92)	(0.75)	(0.70)	(0.03)	(0.34)	(0.15)	(0.31)
Year	-0.04**	-0.04*	-0.04	-0.06*	-0.07*	-0.02	-0.03	-0.03	-0.05
	(0.04)	(0.07)	(0.34)	(0.06)	(0.08)	(0.84)	(0.14)	(0.21)	(0.28)
DealValue	0.17***	0.17***	0.14***	0.11*	0.11*	0.12	0.19***	0.19***	0.16***
	(0.00)	(0.00)	(0.00)	(0.05)	(0.08)	(0.16)	(0.00)	(0.00)	(0.00)
Size	0.22***	0.18***	0.39***	0.25***	0.21***	0.43***	0.21***	0.17***	0.38***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
SalesGrowth	-0.78***	-0.88***	-0.40	-0.57**	-0.71**	0.02	-0.86***	-0.94***	-0.56*
	(0.00)	(0.00)	(0.18)	(0.01)	(0.03)	(0.94)	(0.00)	(0.00)	(0.10)
Leverage	2.33***	2.49***	1.93***	2.21***	2.68***	0.30	2.19***	2.24***	2.36***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.78)	(0.00)	(0.00)	(0.00)
WorkingCapital	3.54***	3.24***	4.87***	2.82***	2.44***	4.84***	3.78***	3.54***	4.83***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RoA	2.00***	2.40***	0.80	2.92***	3.38**	1.46	1.63**	1.99***	0.81
	(0.00)	(0.00)	(0.44)	(0.01)	(0.02)	(0.11)	(0.01)	(0.01)	(0.58)
CashRatio	-0.19	-0.13	-0.27	0.26	0.36	0.21	-0.59	-0.57	-0.51
	(0.56)	(0.74)	(0.51)	(0.46)	(0.39)	(0.62)	(0.11)	(0.21)	(0.32)
Intangibles	1.10***	1.04***	1.10**	0.75**	0.69*	1.11*	1.21***	1.17***	1.02**
	(0.00)	(0.00)	(0.02)	(0.02)	(0.06)	(0.09)	(0.00)	(0.00)	(0.04)
CapitalIntensity	-1.41***	-1.24***	-2.78***	-1.45**	-1.36**	-1.51	-1.47***	-1.24***	-3.38***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.02)	(0.38)	(0.00)	(0.00)	(0.00)
Industry FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	8,598	6,488	2,110	7,631	5,736	1,822	8,328	6,265	2,063
Pseudo R^2	0.206	0.194	0.282	0.189	0.186	0.256	0.203	0.192	0.282

Notes: Table 5 reports logit regression results of equation (2). The dependent variable is an indicator variable equal to one if the acquirer is U.S. resident, and zero otherwise. In Column (1), we consider the full sample of U.S.-based acquirers. In Column (2), we keep only deals in high-tax target countries, whereas in Column (3), we keep deals in low-tax target countries. A target country is indicated as high-tax (low-tax) if the country's statutory tax rate is above (below) the median, computed annually across countries. The Columns (4) to (6) contain regression results analogously to Columns (1) to (3), however, only including U.S. acquirers that are GILTI-affected based on the *FETR* cutoff of 16.4 percent. The Columns (7) to (9) contain regression results analogously to Columns (1) to (3), however only including U.S. acquirers that are *not* GILTI-affected. In all regressions, we employ robust standard errors clustered at the target-country level. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Variables are defined in Table A1 in the Appendix.

In additional specifications, we again differentiate between GILTI-affected (Columns (4) to (6)) and non-GILTI-affected U.S. acquirers (Columns (7) to (9)). For acquisitions in low-tax countries, we find a significant decline in the probability that the acquirer is a GILTI-affected U.S. firm (Column (6)). However, the probability is not significantly different for acquisitions in high-tax countries (Column (5)). Considering U.S. firms not subject to the GILTI regime in Columns (7) to (9), we do not find any significant effect.

Table 6 presents regression results analogous to Table 5. Here, we again consider our alternative classification of GILTI-affected firms using excess returns (see Section 4.3.1). In Columns (1) to (3), we compare M&A deals of GILTI-affected U.S. acquirers with non-U.S. acquirers, and in Columns (4) to (6), we compare M&A deals of *non*-GILTI-affected U.S. acquirers with non-U.S. acquirers. The result of Column (3) strengthens our previous finding that GILTI-affected firms exhibit a reduced likelihood to be the acquirer in low-tax countries following the TCJA. Analogous to Table 5, the *PostTCJA* coefficients for *non*-GILTI-affected firms are insignificant.

Table 6: Cross-Border M&As – Market Share of U.S. Acquirers post TCJA – *ExcessReturn* Cutoff

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	**GILTI *USAcquirer***			**Non-GILTI *USAcquirer***		
	Overall	High-Tax	Low-Tax	Overall	High-Tax	Low-Tax
PostTCJA	-0.15	0.03	-1.02*	-0.18	-0.27	0.11
	(0.48)	(0.91)	(0.06)	(0.39)	(0.24)	(0.79)
Year	-0.08**	-0.08**	-0.07	-0.01	-0.01	0.00
	(0.02)	(0.03)	(0.22)	(0.79)	(0.82)	(0.96)
DealValue	0.15***	0.16**	0.12**	0.17***	0.17***	0.16***
	(0.00)	(0.01)	(0.05)	(0.00)	(0.00)	(0.00)
Size	0.33***	0.28***	0.58***	0.22***	0.19***	0.32***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
SalesGrowth	-1.14***	-1.32***	-0.36	-0.67***	-0.70***	-0.51*
	(0.00)	(0.00)	(0.48)	(0.00)	(0.00)	(0.07)
Leverage	2.00***	2.30***	1.37	2.30***	2.41***	2.49***
	(0.00)	(0.00)	(0.21)	(0.00)	(0.00)	(0.00)
WorkingCapital	3.42***	3.06***	6.23***	3.70***	3.57***	4.12***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RoA	10.76***	11.49***	9.83***	-1.02**	-0.85	-1.27**
	(0.00)	(0.00)	(0.00)	(0.04)	(0.16)	(0.04)
CashRatio	-0.74*	-0.58	-1.14*	-1.13***	-1.21***	-0.79**
	(0.07)	(0.23)	(0.06)	(0.00)	(0.00)	(0.04)
Intangibles	0.82**	0.89**	0.24	1.16***	1.08***	1.05**
	(0.02)	(0.02)	(0.80)	(0.00)	(0.00)	(0.01)
CapitalIntensity	-3.88***	-4.08***	-3.87***	-0.65	-0.34	-3.20***
	(0.00)	(0.00)	(0.00)	(0.11)	(0.37)	(0.01)
Industry FE	✓	✓	✓	✓	✓	✓
Observations	7,962	5,966	1,403	8,226	6,181	2,045
Pseudo R^2	0.299	0.297	0.351	0.187	0.176	0.252

Notes: Table 6 reports logit regression results of equation (2). The dependent variable is an indicator variable equal to one if the acquirer is U.S. resident, and zero otherwise. In Column (1), we consider the sample of U.S.-based acquirers that are GILTI-affected based on the *ExcessReturn* cutoff at the upper quantile. In Column (2), we keep only deals in high-tax target countries, whereas in Column (3), we keep only deals in low-tax target countries. A target country is indicated as high-tax (low-tax) if the country's statutory tax rate is above (below) the median, computed annually across countries. The Columns (4) to (6) contain regression results analogously to Columns (1) to (3), however, only including U.S. acquirers that are *not* GILTI-affected. In all regressions, we employ robust standard errors clustered at the target-country level. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Variables are defined in Table A1 in the Appendix.

4.4.3 Robustness Tests

We provide several robustness tests for our main result in Tables 7 and 8. First, we show that our results regarding the acquisition patterns in Table 3 carry over if we consider the

alternative FETR threshold of 13.125 percent (see Panel A of Table 7).[72] The interaction coefficient of *X* and *PostTCJA* in Columns (2) and (4) is negative and statistically significant.

Table 7: Robustness Tests for Specification 1

	(1)	(2)	(3)	(4)	(5)
	U.S. Sample		Global Sample		
X=	Low *FETR*		*USAcquirer*	*USAcquirer* & Low *FETR*	*USAcquirer* & High *FETR*
***Panel A**: Investments in Low-Tax Countries - Alternative FETR Cutoff at 13.125%*					
PostTCJA	0.26	0.42***	0.01	-0.00	0.02
	(0.17)	(0.01)	(0.92)	(0.99)	(0.84)
X		0.05	-0.40	-0.31	-0.42
		(0.75)	(0.16)	(0.43)	(0.12)
*X*PostTCJA*		-0.96**	0.08	-0.90*	0.26
		(0.03)	(0.74)	(0.07)	(0.29)
***Panel B**:Investments in Tax Havens*					
PostTCJA	0.39**	0.52***	-0.05	-0.08	-0.05
	(0.03)	(0.00)	(0.75)	(0.63)	(0.75)
X		-0.09	-0.47	-0.26	-0.54
		(0.67)	(0.15)	(0.56)	(0.11)
*X*PostTCJA*		-1.27*	0.02	-1.89***	0.36
		(0.09)	(0.95)	(0.01)	(0.34)
***Panel C**: Investments in Low-Tax Countries - PSM Sample*					
PostTCJA			0.41	0.36	0.53*
			(0.17)	(0.25)	(0.08)
X			-0.22	-0.11	-0.24
			(0.38)	(0.78)	(0.32)
*X*PostTCJA*			-0.12	-1.38***	0.19
			(0.64)	(0.00)	(0.52)
Controls	✓	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓	✓
Panel A					
Observations	873	873	8,598	7,786	8,402
Pseudo R^2	0.040	0.043	0.012	0.011	0.012
Panel B					
Observations	873	873	8,598	7,860	8,328
Pseudo R^2	0.075	0.079	0.049	0.051	0.049
Panel C					
Observations			1,738	1,025	1,477
Pseudo R^2			0.022	0.030	0.029

Notes: Table 7 presents robustness tests for the logit regression results of equation (1). Panel A repeats the regressions of Table 3 with an alternative GILTI cutoff. We set the variable *X* equal to one if the *FETR* is below 13.125 percent. In Panel B, we replace the dependent variable *LowTaxCountry* by the variable *TaxHaven* and employ the *FETR* cutoff at 16.4 percent for building the variable *X*. Panel C presents regression results based on the Global Sample with an employed PSM to reshape the sample. In the first step of the PSM, we apply a probit regression including all control variables of equation (1). In the second step, we perform a one to one nearest neighbor matching algorithm (with replacement, caliper set to 0.02). Again, we employ the *FETR* cutoff at 16.4 percent for building the variable *X*. In all panels, we include the control variables of equation (1) and industry fixed effects. We employ robust standard errors clustered at the target-country level. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Variables are defined in Table A1 in the Appendix.

[72] For years until 2026, the relevant threshold is 13.125 percent.

In Panel B of Table 7, we replace the dependent variable *LowTaxCountry* by the indicator variable *TaxHaven*. *TaxHaven* is set equal to one if the target country is identified as a tax haven by Dyreng and Lindsey (2009). The results for the interaction term in Columns (2) and (4) suggest that U.S. acquirers also invest significantly less often in tax haven countries if they are subject to the GILTI regime.

To alleviate concerns that our results are driven by structural differences between U.S. and non-U.S. firms, we perform Propensity Score Matching [PSM], a commonly used matching technique to improve covariate balance in Panel C. PSM is a feasible technique to identify an adequate control group regarding various firm characteristics and is based on a two-step approach (Rosenbaum and Rubin, 1983; Shipman, Swanquist and Whited, 2017). In the first step, we apply a probit regression model including a vector with all control variables of equation (1). In the second step, we perform a one to one nearest neighbor matching algorithm (with replacement). Using the propensity scores derived from the first step, we attempt to match each deal with a U.S. acquirer to a deal of a non-U.S. acquirer. Therefore, we set the caliper, the maximum deviation between the propensity scores of U.S. cross-border deals and matched non-U.S. cross-border deals, to 0.02 (Lunt, 2014; Shipman et al., 2017). Panel C of Table 7 shows results for the Global Sample, employing PSM to reshape the sample. We provide evidence that the results of our baseline analysis carry over if we conduct PSM in advance of the regressions (Column (4)).[73]

Table 8 provides additional robustness tests regarding the development of the probability that a deal has a U.S. acquirer (Table 5). In Panel A of Table 8, we change the FETR threshold to 13.125 percent, in Panel B, we use the *TaxHaven* dummy variable as dependent variable instead of the *LowTaxCountry* variable, and in Panel C, we again perform the PSM as

[73] If we consider the alternative GILTI threshold using excess returns, the results of Table 4 remain qualitatively unchanged when changing the dependent variable to *TaxHaven* or performing PSM (untabulated). We also build an alternative excess return variable where QBAI is approximated by *Total Assets – Current Assets – Intangible Assets.* Again, we confirm robustness of our results.

described above. Considering the *PostTCJA* variable for GILTI-affected U.S. acquirers in contrast to non-U.S. acquirers (Column (6)), throughout all panels, we find negative and significant coefficients. Accordingly, this confirms robustness of the results of Table 5.[74]

[74] We also consider the excess return for the GILTI approximation in this setting. Our baseline results remain unchanged (untabulated).

Table 8: Robustness Tests for Specification 2

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Total *USAcquirer*			**GILTI *USAcquirer***			**Non-GILTI *USAcquirer***		
	Overall	High-Tax	Low-Tax	Overall	High-Tax	Low-Tax	Overall	High-Tax	Low-Tax
***Panel A**: Market Share of U.S. Acquirers in High-Tax and Low-Tax Countries – Alternative FETR Cutoff at 13.125%*									
PostTCJA				0.13	0.32	-1.32*	-0.17	-0.24	0.22
				(0.67)	(0.31)	(0.09)	(0.26)	(0.16)	(0.41)
***Panel B**: Market Share of U.S. Acquirers in Tax Havens and non-Tax Havens*									
PostTCJA	-0.11	-0.16	0.19	-0.08	0.03	-2.15**	-0.15	-0.24	0.51
	(0.46)	(0.33)	(0.52)	(0.75)	(0.91)	(0.01)	(0.34)	(0.12)	(0.17)
***Panel C**: Market Share of U.S. Acquirers in High-Tax and Low-Tax Countries – PSM Matched Sample*									
PostTCJA	-0.18	-0.11	-0.06	-0.21	0.03	-1.90**	-0.16	-0.16	0.30
	(0.37)	(0.66)	(0.88)	(0.51)	(0.93)	(0.04)	(0.41)	(0.53)	(0.55)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Industry FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Panel A									
Observations				7,557	5,675	1,730	8,402	6,326	2,076
Pseudo R^2				0.182	0.179	0.277	0.206	0.194	0.283
Panel B									
Observations	8,598	7,266	1,332	7,631	6,411	1,139	8,328	7,027	1,301
Pseudo R^2	0.206	0.196	0.331	0.189	0.181	0.367	0.203	0.195	0.317
Panel C									
Observations	1,738	1,399	339	1,017	806	210	1,477	1,184	293
Pseudo R^2	0.012	0.009	0.106	0.064	0.065	0.175	0.024	0.021	0.125

Notes: Table 8 presents robustness tests for the logit regression results of equation (2). Panel A repeats the regressions of Table 5 with an alternative GILTI cutoff. We set the variable *X* equal to one if the *FETR* is below 13.125 percent. In Panel B, we replace the dependent variable *LowTaxCountry* by the variable *TaxHaven* and employ the *FETR* cutoff at 16.4 percent for building the variable *X*. Panel C presents regression results based on the Global Sample with an employed PSM to reshape the sample. In the first step of the PSM, we apply a probit regression including all control variables of equation (2). In the second step, we perform a one to one nearest neighbor matching algorithm (with replacement, caliper set to 0.02). Again, we employ the *FETR* cutoff at 16.4 percent for building the variable *X*. In all panels, we include the control variables of equation (2) and industry fixed effects. We employ robust standard errors clustered at the target-country level. P-values are shown in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively. Variables are defined in Table A1 in the Appendix.

4.5 Conclusion

Analyzing one of the most far-reaching tax reforms in decades, we investigate how the U.S. tax reform of 2017 affects the cross-border M&A decisions of firms. The TCJA considerably altered the international taxation of U.S. firms. Notably, the tax system has been changed to a territorial tax system, albeit with an important exception referred to as GILTI.

Our empirical results suggest that the GILTI provision significantly affected the cross-border investments of U.S. firms. That is, GILTI-affected firms invest significantly less often in low-tax countries and tax havens. However, we find mixed evidence for U.S. firms that are not affected by the GILTI regime. Based on a set comprised of only U.S. firms, we find evidence that these firms increased investments in low-tax countries. However, we find only weak evidence for this effect when augmenting our dataset with cross-border deals of acquirers from outside the U.S. Overall, our results suggest that specific provisions in the corporate tax code may impact M&A decisions significantly.

Appendix

Table A1: Variable Definitions

Variable		Definition	Source
CorpTaxRate	=	The statutory corporate income tax rate in the target country in the year prior to the deal.	KPMG Corporate Tax Rates Table and the Tax Foundation
DealValue	=	The natural log of the deal value.	SDC Platinum
LowTaxCountry	=	An indicator variable which is set to one if the target country has a statutory corporate income tax rate below the median, computed annually across countries, and zero otherwise.	KPMG Corporate Tax Rates Table and the Tax Foundation
PostTCJA	=	An indicator variable equal to one for deal announcements after 2017, and zero otherwise.	SDC Platinum
TaxHaven	=	An indicator variable which is set to one if the target country is a tax haven country following Dyreng and Lindsey (2009). A list of all tax haven countries can be found on Dyreng's website (https://sites.google.com/site/scottdyreng/Home/data-and-code/EX21-Dataset).	Dyreng and Lindsey (2009)
USAcquirer	=	An indicator variable which is set to one if the ultimate owner of the firm that acquires a foreign target is located in the U.S. or the acquirer of a foreign target is located in the U.S., and zero otherwise.	SDC Platinum
FETR	=	Foreign effective tax rate of an acquirer, defined as foreign income taxes (txfo) divided by foreign pre-tax income (pifo) in year *t–1* and winsorized at values 0 and 1. Note that the FETR can only be computed for firms from Compustat North America.	Compustat
ExcessReturn	=	Excess return of an acquirer, defined as the difference of pre-tax income (pi) and total tax expense (txt) less 10 percent of property, plant and equipment (ppent), scaled by lagged total assets (at) at the end of year *t–1*.	Compustat
Year	=	Announcement year of a deal which runs from 2010 to 2019.	SDC Platinum
Control Variables			
CapitalIntensity	=	Net value of property, plant and equipment (ppent), scaled by lagged total assets (at) at the end of year *t–1*.	Compustat
CashRatio	=	Cash (ch), scaled by lagged total assets (at) at the end of year *t–1*.	Compustat
Intangibles	=	Intangible assets (intan), scaled by lagged total assets (at) at the end of year *t–1*.	Compustat
Leverage	=	Long-term debt (dltt), scaled by lagged total assets (at) at the end of year *t–1*.	Compustat
RoA	=	Return on Assets, defined as pre-tax income (pi) divided by lagged total assets (at) at the end of year *t–1*.	Compustat

Table A1: Variable Definitions (continued)

SalesGrowth	=	Sales (sale) growth from year *t–2* to year *t–1*, scaled by year *t–2* sales.	Compustat
Size	=	The natural log of total assets (at) at the end of year *t–1*.	Compustat
WorkingCapital	=	Current assets (act), less current liabilities (lct), less cash and cash equivalents (che), scaled by lagged total assets (at) at the end of year *t–1*.	Compustat

References

Ai, C., & Norton, E. C. (2003). Interaction terms in logit and probit models. *Economics letters*, 80(1), 123-129.

Amberger, H., & Robinson, L. (2020). The Effect of the 2017 US Tax Reform on US Acquisitions of Foreign Firms. *Working paper*.

Arulampalam, W., Devereux, M. P., & Liberini, F. (2019). Taxes and the location of targets. *Journal of Public Economics*, 176, 161-178.

Atwood, T. J., Downes, J., Henley, J., & Mathis, M. (2020). The Impact of US Tax Reform on US Firm Acquisitions of Domestic and Foreign Targets. *Working paper*.

Barrios, S., Huizinga, H., Laeven, L., & Nicodème, G. (2012). International taxation and multinational firm location decisions. *Journal of Public Economics*, 96(11-12), 946-958.

Bird, A., Edwards, A., & Shevlin, T. (2017). Does US foreign earnings lockout advantage foreign acquirers? *Journal of Accounting and Economics*, 64(1), 150-166.

Carrizosa, R., Gaertner, F. B., & Lynch, D. (2020). Debt and taxes? The effect of TCJA interest limitations on capital structure. *Working paper*.

Dharmapala, D. (2018). The consequences of the Tax Cut and Jobs Act's international provisions: Lessons from existing research. *National Tax Journal*, 71(4), 707-728.

Dyreng, S. D., & Lindsey, B. P. (2009). Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries on US multinational firms' tax rates. *Journal of Accounting Research*, 47(5), 1283-1316.

Edwards, A., Kravet, T., & Wilson, R. (2016). Trapped cash and the profitability of foreign acquisitions. *Contemporary Accounting Research*, 33(1), 44-77.

Feld, L. P., Ruf, M., Scheuering, U., Schreiber, U., & Voget, J. (2016). Repatriation taxes and outbound M&As. *Journal of Public Economics*, 139, 13-27.

Hanlon, M., Hoopes, J. L., & Slemrod, J. (2019). Tax reform made me do it! *Tax Policy and the Economy*, 33(1), 33-80.

Hanlon, M., Lester, R., & Verdi, R. (2015). The effect of repatriation tax costs on US multinational investment. *Journal of Financial Economics*, 116(1), 179-196.

Harford, J., Wang, C., & Zhang, K. (2017). Foreign cash: Taxes, internal capital markets, and agency problems. *The Review of Financial Studies*, 30(5), 1490-1538.

Harris, J., & O'Brien, W. (2018). US worldwide taxation and domestic mergers and acquisitions. *Journal of Accounting and Economics*, 66(2-3), 419-438.

Huizinga, H. P., & Voget, J. (2009). International taxation and the direction and volume of cross-border M&As. *The Journal of Finance*, 64(3), 1217-1249.

Gaertner, F. B., Hoopes, J. L., & Williams, B. M. (2020). Making only America great? Non-US market reactions to US tax reform. *Management Science*, 66(2), 687-697.

Graham, J. R., Hanlon, M., & Shevlin, T. (2010). Barriers to mobility: The lockout effect of US taxation of worldwide corporate profits. *National Tax Journal*, 63(4), 1111-1144.

Koutney, C. Q., & Mills, L. F. (2018). The immediate impact of tax reform on corporate earnings: Investor expectations and reactions. *Working paper*.

Lunt, M. (2014). Selecting an appropriate caliper can be essential for achieving good balance with propensity score matching. *American journal of epidemiology*, 179(2), 226-235.

Lyon, A. B., & McBride, W. A. (2018). Assessing US Global Tax Competitiveness after Tax Reform. *National Tax Journal*, 71(4), 751-788.

Puhani, P. A. (2012). The treatment effect, the cross difference, and the interaction term in nonlinear "difference-in-differences" models. *Economics Letters*, 115(1), 85-87.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika*, 70(1), 41-55.

Shipman, J. E., Swanquist, Q. T., & Whited, R. L. (2017). Propensity score matching in accounting research. *The Accounting Review*, 92(1), 213-244.

Slemrod, J. (2018). Tax reform and tax experts. *The Journal of the American Taxation Association*, 40(2), 83-88.

Soled, J. A. (2008). How Do Tax and Financial Reporting Policies Affect Cross-Border Mergers and Acquisitions? *The Journal of the American Taxation Association*, 30(2), 149-150.

Chapter 5

The Review of Trade Tax Assessment Notices – Evidence from the Field

The Review of Trade Tax Assessment Notices – Evidence from the Field

Mathias Dunker
Department of Business Taxation, University of Cologne, dunker@wiso.uni-koeln.de

Abstract:

For a German tax-resident firm, the comprehensive taxation procedure regarding trade tax may result in a large number of annual tax assessment notices, all of which should be individually reviewed. In view of lacking reform efforts by German municipalities, a digitization of trade tax assessment notice reviews may help to enhance the review process and lead to an increased efficiency. For determining the potential of time and cost savings as well as the relevance of a digitized review process, I conduct semi-structured interviews with employees of a large tax consulting firm in Düsseldorf, Germany. The interview results indicate that the current review process of trade tax assessment notices is neither quantitatively nor qualitatively a relevant process within the context of corporate tax declaration. Nonetheless, the results suggest that a digitally supported review of tax assessment notices is a promising approach to streamline the review process.

Keywords: Digitization, Trade Tax, Tax Assessment Notice, Interviews

JEL Classification: O3, H25, H32

Acknowledgments: I thank a large tax consulting firm in Düsseldorf, Germany, for the opportunity to provide insights into a current and interesting process in tax consultancy. In particular, I appreciate the professional and friendly cooperation with two employees of the tax technology department, who assisted me in preparing and conducting the interviews. I am very grateful for making the contact to the tax consulting firm, helpful comments and valuable suggestions to my doctoral supervisor, Michael Overesch. Lastly, I also thank several employees of the firm who agreed to be available as interviewees.

Chapter 5

Tables

5.1 Introduction and the Taxation Procedure of German Trade Tax

This study examines the potential and relevance of a digitization of the trade tax assessment notice review, an iterative process within the tax declaration function.[75] Due to the complex and comprehensive taxation procedure concerning German trade tax, I expect the review of trade tax assessment notices to be a time-consuming and thus, costly process for a firm and its tax advisors, respectively. A digitization of trade tax assessment notice reviews could be a promising approach to streamline the review process. In order to obtain information on the potential of time and cost savings and thus, on the relevance of a digitally supported assessment notice review, I conduct semi-structured interviews with employees of a big tax consulting firm in Düsseldorf, Germany (hereinafter referred to as 'the tax consulting firm').

Tax compliance with regard to German trade tax often leads to high administrative costs for firms and their advisors. Not least, this is due to the structure of the taxation procedure. The taxation procedure for trade tax is divided into multiple steps: The base amount procedure (*Messbetragsverfahren*), the apportionment procedure (*Zerlegungsverfahren*), the tax assessment procedure (*Steuerfestsetzungsverfahren*), the tax collection procedure (*Steuererhebungsverfahren*), and the prepayment procedure (*Vorauszahlungsverfahren*). The local tax office (*Finanzamt*) is responsible for the first two procedural steps; for the three last-mentioned steps, however, in most of the German federal states the municipalities are responsible (cf. Gewerbesteuer-Richtlinien and -Hinweise, 2009, no. 1.2).[76]

Based on the trade tax return filed by the taxpayer or its advisors, the local tax office determines the trade tax base amount (*Gewerbesteuermessbetrag*) for the tax assessment period (*Erhebungszeitraum*). The base amount is then announced in the trade tax base amount assessment notice (*Gewerbesteuermessbescheid*) to the taxpayer or its advisors and

[75] The tax function of a firm can broadly be divided into the 'tax planning' function and 'tax declaration' function (see Section 5.2).
[76] In the federal city states of Berlin, Hamburg and Bremen, the local tax offices are responsible for the entire taxation procedure.

simultaneously conveyed to the competent municipality. A municipality is involved in the taxation procedure if the firm has a permanent establishment on the grounds of that municipality (Sec. 2 (1) Trade Tax Act, TTA). Subsequently, depending on the base amount and the individual municipal rate (*Hebesatz*), the municipality announces the trade tax by issuing a trade tax assessment notice (*Gewerbesteuerbescheid*) to the taxpayer or its advisors (Sec. 16 TTA). If the firm maintains permanent establishments in several municipalities in Germany, an apportionment of the trade tax base amount to each municipality involved is required (Sec. 28 (1) TTA). That is, the local tax office issues the base amount on a pro rata basis to the municipalities. The base amount is apportioned by aggregated wages and salaries (Sec. 29 TTA).[77] Then, each involved municipality issues a separate trade tax assessment notice to the taxpayer or its advisors in accordance to the share of apportionment.

Additionally, each competent municipality annually issues a trade tax prepayment assessment notice (*Gewerbesteuervorauszahlungsbescheid*) for the current assessment period. Adjusted trade tax prepayment assessment notices may also be issued due to new information obtained in tax audits or due to a taxpayer's application to amend trade tax prepayments. Moreover, the municipality is entitled to issue interest assessment notices (*Zinsbescheid*). Consequently, the number of issued assessment notices can be considerably high, particularly for firms with physical presence in several municipalities in Germany.

Hence, the review of trade tax assessment notices, which is at the discretion of the taxpayer, is presumably a time-consuming and therefore costly process. Commonly, as part of contractual agreements, the review of tax assessment notices is delegated to the taxpayer's tax advisors. The review is to be done with business prudence and thus, likewise time-consuming for the advisors. In addition, a media disruption caused by written assessment notices instead of electronic ones impedes the review process of trade tax assessment notices. This entails the

[77] The share of apportionment is the ratio of total wages and salaries paid to employees of permanent establishments in the individual municipality to total wages and salaries paid to employees of all German based permanent establishments of the firm.

risk of transmission errors within the taxation procedure. Lastly, most municipalities deploy their own heterogeneous written format of trade tax assessment notices, again exacerbating the review process.[78]

In the last two decades, proposals for an extensive reform or even an abolition of German trade tax have repeatedly been part of the legislative agenda and several reform efforts have been initiated to reorganize the municipal finance (Deutscher Bundestag, 2003; Gemeindefinanzkommission, 2011). However, an extensive reform failed several times due to oppositions of the municipalities.[79] To this regard, I interviewed representatives of the German Association of Towns and Municipalities (*Deutscher Städte- und Gemeindebund*) on current reform efforts regarding trade tax. Though, in the short and medium term, no reform or even digitization efforts regarding the taxation procedure are apparent (cf. Drüen, 2020, with further references).

As a result, it is up to the firms and their advisors to deal with the aforementioned adversities of the taxation procedure. Digitizing the recognition and review process of trade tax assessment notices, for instance using Optical Character Recognition [OCR], might be a way to reduce the expenditure of time on manual reviewing. Moreover, the detection rate of errors in assessment notices could be increased. Taken together, digitization could be a promising approach to optimize the review process.

The interview responses of employees of the tax consulting firm suggest that the review of trade tax assessment notices in the status quo is not an extensive process within tax consultancy. First, clients of the tax consulting firm that receive a large amount of trade tax assessment notices each fiscal year usually review the assessment notices themselves. Second,

[78] Beside shortcomings regarding the taxation procedure, constitutional and fiscal concerns exist with regard to German trade tax, strongly requiring a legislative reform. The German trade tax system leads to substantial differences in the 'tax power' of municipalities, tends to 'overtax' commercial activities, is very sensitive to economic trends and causes distortions of competition both within Germany and abroad (Deutscher Bundestag (1968), p. 42-43; Deutscher Bundestag (1983), p. 194-195 and Deutscher Bundestag (2003)).

[79] Particularly, municipalities are not willing to lose their sovereignty to set the municipal rate and thus, to influence their trade tax revenue.

relative to trade tax *base amount* assessment notices issued by local tax offices, trade tax assessment notices are rarely incorrect in terms of tax calculation. Accordingly, the interview results indicate that the review of trade tax assessment notices neither is a quantitatively nor a qualitatively significant process in the tax consulting firm.

Nonetheless, the interviewees' responses suggest that a digitally supported review of trade tax assessment notices can be a promising approach to optimize the review process. For the digitization to be successfully implemented in the review process, the detection rate of errors has to be increased and, specifically, time savings for the employees entrusted with the review have to be achieved. The interviewees stated that if the process optimization via digitization effectively leads to time savings, additional clients could be allured concerning the review of assessment notices. Moreover, employees in the tax consulting firm can be entrusted with other activities, for example in the advisory regarding tax planning.

My study contributes to the literature concerning the German trade tax system. The taxation procedure has widely been criticized for being too complex, particularly in comparison to international taxation of multinational entities (Keen, 2002; Hoppe, Rechbauer and Sturm, 2019). An abolition of German trade tax and a reorganization of the municipalities' finances are still demanded (Wollmershäuser et al., 2017; Hentze, 2021; FDP, 2021). My results suggest that the decentralized trade tax collection of the municipalities leads to inefficiencies in the review process of trade tax assessment notices. In particular, trade tax assessment notices are disclosed at very different point in times by different municipalities. Due to a rather short period of objection (within one month since disclosure), the review of individual trade tax assessment notices is a very timely manner. Accordingly, the interviewees state that economies of scale are hardly to achieve. Hence, my results support a reorganization of the taxation procedure.

Moreover, I contribute to the current topic of the digitization of tax consultancy services. In a widely discussed study, Frey and Osborne (2017) find that – out of 702 jobs – the 'tax preparer' is among the top ten jobs endangered by digitization. An antipathy of employees in

tax consultancy toward digitization might be the result. In contrast, I find that the employees' acceptance of tax technologies to optimize review processes in a large tax consulting firm is very high. Evidently, fears of being superfluous do not exist.

The remainder of the study is organized as follows. Section 5.2 delivers an overview of the transformation of the tax function. Section 5.3 describes my study design. In Sections 5.4 and 5.5, I present the interviewees' summarized responses and results on two separated sets of theses. Section 5.6 concludes.

5.2 The Transformation of the Tax Function

The digitization[80] of the economic world will significantly impact and reshape the tax function of a firm (Dobell, 2017; Peck, 2018; EY, 2020). Likewise, tax consultancy will face substantial challenges and restructurings. For example, there is wide consensus in the literature from tax consulting firms that routine activities of the tax function such as reviewing of invoices for VAT, filing of income tax returns or VAT returns, or the preparation of filings regarding transfer pricing will widely be automated (PwC, 2016; KPMG, 2018). The transformation of the tax function is and will be based on technological developments in fields such as artificial intelligence, machine learning, blockchain, robotic process automation, or augmented and virtual reality applications (WTS, 2017; PwC, 2017; KPMG, 2018).[81]

The tax function of a firm can broadly be categorized into the areas of 'tax planning' and 'tax declaration'. The digitization will affect the two areas to a different degree. Tax planning on the one hand can be characterized, among other things, as a creative activity. In this field, different economic and legal scenarios for a firm have to be prepared and simulated to achieve a tax-favored outcome. Due to permanently changing tax-related parameters and conditions, adjustments regarding the firm structure or financing channels should be taken into

[80] In the context of this study, digitization is defined as the automation of processes with support of information technology.
[81] An explanation of the different tax technology tools and their individual applications within the tax function is beyond the scope of this study.

account by the firm and its advisors. The tax planning function is characterized by only a few routine activities and will remain a creative function. Therefore, most of this function cannot not be automated. Nonetheless, new software applications for mapping and monitoring the firm structure and predictive analytics will partially facilitate the tax planning function (WTS, 2017).

On the other hand, the tax declaration function is characterized by significantly more routine activities. It essentially includes tasks that take place on a regular basis in a similar form and that are not subject to major changes over time. Tax declaration activities contain, among other things, the preparation of the balance sheet for tax purposes, filing of tax returns or review of tax assessment notices. For these activities, information gathering, consolidation and processing is of particular importance. The tax declaration function can widely be digitized (Hinerasky and Kurschildgen, 2016; Mayr and Meyer-Pries, 2017). From a technical point of view, a uniform and integrated solution to improve tax declaration processes is feasible (Eismayr and Kirsch, 2016). In practice, however, the digitization of the tax declaration function often fails due to different software solutions associated with a media disruption within the firm, but also between the firm and the tax administration. In the status quo, high efforts for the firms and their advisors to digitize the tax declaration function are inevitable.

Besides requirements and difficulties concerning the technical implementation, employees within the tax department of a firm or in tax consultancy have to be actively involved in the process of the digital transformation. In addition to training courses and sensitization, the employees' acceptance to digitize the tax function is essential. In this regard, Frey and Osborne (2017) investigate how substitutable current jobs are to computerization. Out of 702 identified jobs, the authors find that the 'tax preparer' is among the top ten jobs endangered by digitization.[82] As a result, employees in tax consultancy could be hostile to digitization, given that their jobs may be superseded by digital, non-human-based processes.

[82] Note that a 'tax preparer' cannot be equated with 'tax advisor' (see https://www.irs.gov/tax-professionals/understanding-tax-return-preparer-credentials-and-qualifications).

5.3 Study Design

In order to gather information on the potential and relevance of a digitally supported review of trade tax assessment notices, I conduct semi-structured interviews. A semi-structured interview is the most common form of all qualitative research methods (Alvesson and Deetz, 2000) and allows the interviewer to individually respond to the interviewees' answers, thereby eliciting more elaborate responses. Questions are prepared, formulated and scheduled in advance (DiCicco-Bloom and Crabtree, 2006). However, depending on the course of the interview, additional questions might be asked spontaneously in order to be able to specifically determine qualitative findings. Semi-structured interviews allow the interviewer to modify the style, pace and ordering of questions to elicit the most completed responses from the interviewees. It proves to be particularly valuable if the interviewer is to understand how the interviewees perceive the social and economic world (Qu and Dumay, 2011).

A total of nine employees of the tax consulting firm in Düsseldorf were selected as interview participants. The interviewed employees are from different hierarchy levels (Director, Manager, Consultant) and different tax departments in order to obtain a comprehensive picture regarding experience, expertise and overview of the review process of trade tax assessment notices. The interviews lasted between 30 and 60 minutes.

The interviews are divided into two parts:

1) Current Process of Reviewing Trade Tax Assessment Notices (Section 5.4)

2) Relevance of Trade Tax Assessment Notice Reviews (Section 5.5)

The interview results are based on eleven theses (six theses on the Current Process and five on the Relevance).[83] The theses were developed in advance of conducting the interviews

[83] In total, each interview consists of 27 questions. A comprehensive overview of questions and summarized responses can be found in the Appendix.

and were evaluated and proved by using the interviewees' answers. Where possible, minimum and maximum values and the median are presented.

5.4 Answers on the 'Current Process of Reviewing Trade Tax Assessment Notices'

1. *Reviewing trade tax assessment notices is a time-consuming process within the tax declaration function due to the large number of issued trade tax assessment notices.*

Depending on the tax department of the tax consulting firm, the amount of trade tax assessment notices to be annually reviewed varies between 20 (minimum) and 700 (maximum). On average, between 50 and 100 trade tax assessment notices are annually reviewed in a tax department. The average time to review amounts to 30 minutes per assessment notice (see Thesis no. 2). Thus, the annual time spent on reviewing trade tax assessment notices per tax department varies between 25 and 50 hours. Hence, the expenditure of time for reviewing trade tax assessment notices per tax department is not an extensive process within the tax declaration function. All interviewees stated that reviewing trade tax *base amount* assessment notices takes much more time. Not least, this is due to a very low number of errors within trade tax assessment notices (see Thesis no. 6). Legal misjudgments, different interpretations of the law by tax authorities or adjustments as a result of new facts usually influence the trade tax base amount procedure. Accordingly, in most cases, only the trade tax base amount assessment notice can be contested (*Anfechtung*, see Sec. 351 (2) German Fiscal Code, GFC).

2. *The time required to review a single trade tax assessment notice is on average less than one hour.*

The interviewees' answers show that reviewing a single trade tax assessment notice takes around 30 minutes. The answers range from a minimum of 15 to a maximum of 45 minutes per assessment notice. The time to review depends on several factors. For example, it depends on whether the trade tax assessment notice has been issued for the current assessment period or whether the assessment notice has been altered due to a tax audit. Furthermore, the

interviewees reported that the time to review is extended if the actual trade tax burden or refund is high, or if prepayments or interest payments are included in the assessment notice. As a consequence, the digitization of the review process will lead to an improvement if the manual time to review for the employees is significantly reduced to less than 30 minutes.

3. *The review of prepayment assessment notices and interest assessment notices issued as part of the trade tax assessment is a complex and costly process.*

According to the interviewees' responses, the costs for reviewing trade tax prepayments depend on whether the prepayments are based on the previous assessment year or whether they are adjusted as a result of tax audits or new information. The review process is more time-consuming if prepayments are adjusted during the fiscal year and if the fiscal year deviates from the calendar year. Pursuant to the interviewees, the review time strongly varies (between two minutes and two hours). In particular, it is time-consuming to compare prepayments already remitted to the tax office with the correct amount of prepayments still to be paid when prepayments have been adjusted within the current fiscal year.

The responses on interest assessment notices as part of the trade tax assessment lead to heterogeneous results. Most interviewed employees (7 out of 9) see an increased effort to review. In particular, reviewing interest assessment notices that adjust previous assessment notices is complex and time-consuming. Moreover, the majority of interviewees (6 out of 9) stated that they formally lodge an objection (*Einspruch*) against each interest assessment notice. This is due to the unconstitutionality of the current level of the tax-based interest rate of 6 percent p.a. (Sec. 238 GFC).[84]

[84] Very recently, on 8th July 2021 the German Federal Constitutional Court (*Bundesverfassungsgericht*) declared the current level of the tax-based interest rate unconstitutional (BVerfG, 2021, 1 BvR 2237/14, 1 BvR 2422/17).

4. *The average time required to review a single trade tax assessment notice decreases with increasing number of trade tax assessment notices for the same client in the same assessment year.*

In principle, the interviewees' responses demonstrate that there are no economies of scale when reviewing several trade tax assessment notices for the same client. That is, for the time to review a single trade tax assessment notice, it is irrelevant if several trade tax assessment notices are issued for the client in the same assessment year. Each assessment notice has to be reviewed separately and an average of 30 minutes for reviewing is spent (see Thesis no. 2). For the same assessment year, the competent municipalities issue trade tax assessment notices at very different point in times. Accordingly, the review process for these assessment notices extends to several months. An objection against a tax assessment notice, however, has to be lodged within one month of disclosure (Sec. 355 GFC). Thus, the review of tax assessment notices is a timely manner. Three interviewees stated that minor economies of scale exist in terms of communicating with clients who annually receive a large number of trade tax assessment notices.

5. *Usually, consultants review trade tax assessment notices.*

According to the interviewees' responses, consultants and senior consultants (lower hierarchy levels) normally review trade tax assessment notices (on average 80 percent of cases), whereas managers and senior managers are entrusted in only rare cases (on average 20 percent of cases). Depending on the tax department and the client, the share of consultants and senior consultants ranges from 70 percent (minimum) to 95 percent (maximum). Commonly, the top management (partners and directors) is not entrusted with the review of assessment notices.

6. *Very few trade tax assessment notices are incorrect with respect to calculation.*

The interviewees reported that very few trade tax assessment notices are incorrect in terms of calculation. As a rule, less than one percent are incorrect.[85] The municipal process for issuing trade tax assessment notices is generally automated. Hardly any transmission error with respect to the base amount or the share of apportionment occurs. Accordingly, it is extremely rare that an obligation against the trade tax assessment notice will be lodged due to errors in calculation. Obligations are generally lodged against the trade tax *base amount* assessment notice due to diverging interpretations of the law by the taxpayer and the tax administration or due to calculation errors. Obligations lodged against trade tax assessment notices generally rely on legal circumstances (e.g. unconstitutionality of the tax-based interest rate). With regard to calculation errors, digitizing the review process of trade tax assessment notices only leads to an improvement if all errors are detected.

Taking together, the interviewees' answers suggest that the review of trade tax assessment notices is a very formal and rather unprofitable process within the tax declaration function. Correspondingly, if a digitally supported review of trade tax assessment notices leads to a significant reduction of manual review time, employees in tax consulting firms can be entrusted with creative and possibly more profitable activities.

5.5 Answers on the 'Relevance of Trade Tax Assessment Notice Reviews'

1. *The majority of served clients maintains at least ten permanent establishments in different municipalities in Germany.*

The interviewees responded that 80 percent up to 100 percent of served clients maintain between one and ten permanent establishments in different municipalities in Germany.[86] Most of the interviewees (7 out of 9) even stated that a representative client maintains on average between one and two permanent establishments in Germany. However, some of the largest

[85] However, depending on the municipality that issues the assessment notices, some of the interviewees (3 out of 9) stated that trade tax assessment notices are incorrect in 10 percent up to 30 percent of cases.
[86] Between 20 and 300 different clients are served by an individual tax department of the tax consulting firm.

clients of a specific tax department have more than 50 permanent establishments in Germany (4 out of 9).

2. *On average, a representative client receives more than ten trade tax assessment notices per fiscal year.*

The interviewees' statements show that a representative client receives an average of one up to five trade tax assessment notices per fiscal year (mean value of 4).[87] Based on the results of Thesis no. 1, this is due to the low number of permanent establishments. However, some interviewees reported that few clients receive more than 50 trade tax assessment notices within a fiscal year (see Thesis no. 1). Nonetheless, the overall responses show that trade tax assessment notice reviews represent a manageable and only minor process within the tax declaration function.

3. *In particular, clients served by large tax consulting firms maintain a large number of permanent establishments in different municipalities in Germany leading to a large amount of trade tax assessment notices to be reviewed.*

Pursuant to the interviewees' responses, the thesis can be refuted. Large domestic firms and, specifically, those with an own tax department normally review trade tax assessment notices themselves. Conversely, small and medium-sized firms as well as inbound firms not having domestic tax expertise delegate the review process to external providers.

This finding is of high relevance for the importance of a digitally supported review process. If the review process can be optimized leading to a significant reduction in manual review time and thus, to lower review costs, clients with a substantial number of permanent establishments in different municipalities in Germany might be willing to delegate the review

[87] There are several factors influencing the number of issued trade tax assessment notices. Besides the number of permanent establishments in different municipalities, changes regarding the trade tax base amount due to tax audits or new information affect the number of assessment notices as well.

process to the tax consulting firm. Moreover, the tax consulting firm might license or sell the software tool to its clients.

4. *The employees surveyed rate the importance of reviewing trade tax assessment notices to be low within the tax declaration function.*

The answers provide heterogeneous results. On average, most employees surveyed gave a medium importance to the review process (mean of 4.1 on a seven-point Likert scale). The medium relevance of the review is attributed to the low error rate of the assessment notices (see Thesis no. 6 of Section 5.4). The interviewees stated that the preparation and filing of tax returns is much more important in the context of tax declaration. Though, the relevance of the review increases when tax assessment notices are checked that are becoming final (*bestandskräftig*). A tax assessment notice becomes final if the period to lodge an objection expires (generally within one month of disclosure) and the tax assessment notice is not 'subject to review' (*Vorbehalt der Nachprüfung*, Sec. 164 (2) GFC). Final tax assessment notices can only be cancelled or amended if a strict norm of correction (e.g. Sec. 172 et seqq. GFC) is applicable. Therefore, the relevance of review increases when the assessment notice becomes final.

5. *The demand for digitizing the review process of trade tax assessment notices is rated high and the employees have a positive attitude toward digitization in the field of tax declaration.*

For most of the interviewees, the demand for a digitization of trade tax assessment notice reviews is rated high (mean of 5.7 on a seven-point Likert scale). The interviewees expect an increase in efficiency when a software tool is implemented in the review process. Presumably, some employees can be entrusted with other tasks and new clients could possibly be allured.

All employees surveyed are extremely positive toward a digitization of trade tax assessment notice reviews (mean of 6.8 on a seven-point Likert scale). A prerequisite for full acceptance, however, is a high functionality of the implemented software tool. The software

application needs to result in a simplification and reduction of the manual review process. In order to achieve this goal, the software must be sufficiently piloted.

Finally, all employees identified a high demand to digitize other processes within the tax declaration function. For example, software tools that facilitate the correct documentation of tax prepayments, that analyze income statements in terms of trade tax additions (Sec. 8 TTA) and deductions (Sec. 9 TTA), or that proactively recognize information within electronic balance sheets (*E-Bilanz*) are rated highly relevant.

5.6 Conclusion

The demand for a fundamental reformation of the German trade tax regime has been repeatedly on the political agenda in the past. Besides constitutional and fiscal concerns, the complex and long-winded trade tax procedure is widely criticized. Several reform proposals failed due to oppositions of the municipalities. Currently, a major trade tax reform seems to be unlikely. As a consequence, it is up to the firms and their advisors to deal with the adversities of the taxation procedure. Among other things, the trade tax system impedes the review of trade tax assessment notices which is performed by the firm or its tax advisors. Accordingly, a digitization of trade tax assessment notice reviews might be a promising approach to enhance the review process.

In this study, I evaluate answers of employees of a large tax consulting firm concerning the current review process of trade tax assessment notices. I conduct semi-structured interviews in order to determine the extent and relevance of the review process and to obtain information on potential time and cost savings when digitizing this process. The interviewees' responses indicate that reviewing trade tax assessment notices is not an overly extensive and thus, not time-consuming process within the tax declaration function. In particular, firms receiving a large number of tax assessment notices each fiscal year usually review the assessment notices themselves. Moreover, relative to trade tax *base amount* assessment notices issued by local tax

offices, trade tax assessment notices are extremely rarely incorrect in terms of calculation. Consequently, the interview results suggest that the review of trade tax assessment notices neither represents a quantitatively nor a qualitatively significant process in tax consulting.

Nonetheless, a digitally supported review of trade tax assessment notices can be a promising approach to streamline the review process. For this, some challenges have to be overcome. First, although the error rate in the assessment notices is very low, the detection rate has to be increased, and second, the time spent for the entrusted employee must be significantly reduced when reviewing the digitally pre-reviewed assessment notices. Therefore, the software has to be fairly piloted and tested.

The interview results also indicate that if a process optimization is successful, additional clients can be allured in terms of reviewing the trade tax assessment notices. Moreover, employees can be entrusted with more demanding and profitable task, for instance in the tax planning function. The employees' acceptance of a digitally supported review does not hinder a successful implementation and integration of the software tool into the review process. For this study, however, it must be taken into account that the results are solely based on interviews of nine employees and do not necessarily reflect a complete cross-section of the tax declaration function in the tax consulting firm.

Appendix

Table A1: Summary of Interview Responses

Panel A: Current Process of Reviewing Trade Tax Assessment Notices

	Questions	Summarized Responses
a)	*How many trade tax assessment notices (incl. trade tax prepayment assessment notices and interest assessment notices) does your tax department review annually?*	Between 20 and 700 assessment notices with respect to trade tax (depending on the tax department).
b)	*What are the individual steps of the review process of trade tax assessment notices?*	This depends on whether the tax consulting firm has power of attorney (*Empfangsvollmacht*) to receive the assessment notices. If the power of attorney exists, the steps are as follows: Inbox of assessment notice → Forwarding to responsible partner/group secretary → Notification of due date to lodge an objection in the secretariat by stamping the assessment notice + entry in electronic calendar for due dates → Forwarding to authorized and entrusted manager → Forwarding to the consultant who actually reviews the assessment notice; the review is conducted by using the reference files of the apportionment assessment notice and trade tax base amount assessment notice issued by the local tax office, occasionally using DATEV calculations → Assessment notice is scanned and electronically stored in the DMS (Document Management System) → E-mail to client incl. the scanned assessment notice with additional information regarding tax payments, prepayments, due date → due date is unsubscribed in the secretariat.
c)	*What is the average time required to review a trade tax assessment notice?*	The average time to review ranges from 15 to 45 minutes (trade tax assessment notice issued due to current assessment period) → As a rule: 30 minutes. If the assessment notice is issued due to tax audits leading to final assessment notices: Review time increases.
d)	*What is the average time required to review a trade tax prepayment assessment notice?*	Overall, the time required for reviewing trade tax prepayment assessment notices is very low (depending on whether a trade tax prepayment assessment notice is issued separately or included in the trade tax assessment notice, and whether it is issued on the basis of the current assessment period or a tax audit). The time required to review ranges from two to 30 minutes. If the municipality adjusts trade tax prepayment assessment notices without referring to the trade tax base amount assessment notice: The time required to review may be up to two hours.
e)	*Why is the review for specific trade tax prepayments a complex and time-consuming process?*	The review time for trade tax prepayments depends on whether prepayments are issued on the basis of the previous assessment year or whether prepayments are adjusted on the basis of tax audits or new findings. The review is time-consuming if prepayments are adjusted during the fiscal year or if the fiscal year deviates from the calendar year. The documentation of prepayments and diverging prepayment adjustments is especially time-consuming.

f) What is the average time taken to review an interest assessment notice as part of the trade tax assessment?	Overall, no valid time specification is possible. However, there is on average a higher expenditure of time for the review relative to the trade tax assessment notice. The review time depends on the tax department: Partially difficult reviews. However: Increased expenditure of time due to objections because of the unconstitutionality of the current tax-based interest rate.
g) What is the time required to review a single trade tax assessment notice of a client, with 1 - 10, 11 - 20, 21 - 50 and > 50 permanent establishments in different municipalities in Germany/Are there economies of scale when reviewing a large number of trade tax assessment notices for the same client?	There are no/almost no economies of scale. Each trade tax assessment notice has to be reviewed separately. Trade tax assessment notices from different municipalities are not issued at the same point in time. Trade tax assessments extends over three to six months. The period to lodge an objection against tax assessment notices is relatively short (objection has to be lodged within one month of disclosure, Sec. 355 GFC).
h) What is the time required to review all trade tax assessment notices of a client, with 1 - 10, 11 - 20, 21 - 50 and > 50 permanent establishments in different municipalities in Germany/Are there economies of scale when reviewing a large number of trade tax assessment notices for the same client?	The overall expenditure of time in a fiscal year is hardly to determine. The review time for an individual assessment notice remains the same, regardless of the amount of trade tax assessment notices. There are no/almost no economies of scale. Reasoning: Generally, trade tax assessment notices are send to the tax consulting firm or its clients at very different points in time during the fiscal year. Time savings exist for e-mail correspondence with the clients.
i) Which employees are generally involved in reviewing trade tax assessment notices (in percent)?	This depends on the structure of the specific tax department. The extent of a manager's review increases in case of erroneous assessment notices or if the trade tax burden or credit is relatively high. Partner/Director: 0% Senior Manager/Manager: 5 – 30% Senior Consultant/Consultant: 70 – 95% Trainee/Working Student: occasionally
j) On average, how many trade tax assessment notices to be reviewed by your tax department are incorrect?	Very few trade tax assessment notices are incorrect (most interviewees declared an error ratio of less than 1%). Trade tax collection by municipalities is automated (hardly any transmission error occurs when applying the trade tax base amount or the share of apportionment). However: Two interviewees declared an error ratio of 20% to 30% of all reviewed trade tax assessment notices within their tax department (incorrect calculation of interest payments or incorrectly applied share of apportionment).
k) How often do you lodge an objection against trade tax, prepayment or interest assessment notices (in percent)?	In very rare cases (less than 1%) an objection is lodged. Lodging an objection depends on the significance of the detected error within the assessment notice. But: An objection against interest assessment notices is typically lodged if no note of preliminary statement (*Vorläufigkeitsvermerk*) regarding the level of tax-based interest rate is included in the assessment notice.
l) What is the most common source of error in a trade tax assessment notice?	The calculations of prepayments or interest payments are a potential source of errors (partially due to divergent fiscal years). Rarely occurring: Incorrectly applied share of apportionment or trade tax base amounts.

Panel B: Relevance of Trade Tax Assessment Notice Reviews

	Questions		Summarized Responses
a)	*How many clients with*		
	1 - 10	→	80 - 100%
	11 - 20	→	Few
	21 - 50	→	Few
	> 50	→	Very few
	permanent establishments in different municipalities in Germany are served by your tax department regarding tax declaration (in percent)?		On average, a representative client of the tax consulting firm has between one and two permanent establishments in different municipalities in Germany. Overall, between 20 and 300 clients are served per tax department at the tax consulting firm.
b)	*How many permanent establishments in different municipalities in Germany does your client with most permanent establishments have?*		This strongly depends on the tax department of the tax consulting firm: The client with most permanent establishments maintains between 7 and more than 200 permanent establishments in different municipalities in Germany.
c)	*How many trade tax assessment notices does a representative client receive on average per year?*		This depends on how many permanent establishments are maintained by the client and whether a tax audit has been carried out: On average, one to five trade tax assessment notices per client per year (mean value of 4).
d)	*How often are prepayments included in trade tax assessment notices?*		This strongly depends on the competent municipality. Prepayment assessments are often included in the trade tax assessment notices. Separate prepayment assessment notices are generally issued due to tax audits.
e)	*How many separate trade tax prepayment notices does a client receive on average per year?*		No valid answer possible. See answer on d).
f)	*How many interest assessment notices issued by municipalities as part of the trade tax assessment does a client receive on average per year?*		Relative to trade tax assessment notices: Significantly less interest assessment notices are issued. Interest assessment notices are issued depending on whether a tax audit has been carried out or whether the period of interest accrual has started.
g)	*For how many clients does your tax department of the tax consulting firm review trade tax assessment notices and how many of your clients review the assessments themselves?*		Depending on the tax department: For 90 up to 100% of the clients (7 out of 9 interviewees), the tax department of the tax consulting firm reviews the assessment notices. However, some tax departments only review assessment notices of approximately 60% of their clients.
h)	*Which characteristics of the client determine whether the client usually reviews trade tax assessment notices itself?*		Clients with an own tax department and large domestic clients (with various permanent establishments in different municipalities in Germany) usually review their tax assessment notices themselves.
i)	*On a scale from 1 (rather unimportant) to 7 (very important): How important is the review of trade tax assessment notices relative to general trade tax consultancy?*		Depending on what is meant by trade tax consultancy: In relation to a broader meaning: 1. In relation to tax compliance: 3 – 7 (however, depending on whether the trade tax assessment notice is preliminary or final).

j)	*How large is the percentage of trade tax assessment notice reviews relative to the entire trade tax consultancy?*	This depends on the tax department and on what is meant by trade tax consultancy: 1 to 30% (1% relative to a broader meaning and 30% (maximum) in relation to tax compliance).
k)	*Does any form of digitization in terms of reviewing trade tax assessment notices currently take place in your tax department?*	Currently, there is no specific digitization with respect to the review process. So far, tax assessment notices are scanned and archived in the DMS.
l)	*On a scale from 1 (very low) to 7 (very high): How do you evaluate the demand for an automation and digitization of the review of trade tax assessment notices?*	Overall high: Mean value of 5.7.
m)	*On a scale from 1 (very low) to 7 (very high): How do you evaluate the demand for an automation and digitization of the review of trade tax assessment notices by your clients?*	Overall medium high: Mean value of 3.9. For the clients, a correct and low priced review is important. When the fees charged decrease due to the new software: Higher priority for a digitization by the clients.
n)	*On a scale from 1 (very negative) to 7 (very positive): How do you rate an automation and digitization of reviewing trade tax assessment notices?*	Very high: Mean value of 6.8 (given that a digitally supported review process is functional and leads to a simplification; adequate piloting in advance as additional prerequisite).
o)	*Which other processes regarding trade tax declaration are time-consuming and should or might be automated or digitized?*	A selection of the most common answers is presented: - Workflow process in general: Scanning of tax assessment notices should be consistently outsourced to the secretariat. - Digitizing the review processes concerning other tax assessment notices. - Internal analysis and examination of electronic balance sheets (*E-Bilanz*) concerning plausibility checks. Proactively recognizing insights/information regarding tax. - Simplified and correct documentation of tax prepayments (especially after tax audits). - Developing and implementing a software tool that analyzes the income statement in terms of trade tax additions (Sec. 8 TTA) and deductions (Sec. 9 TTA). - Developing and implementing a software tool to calculate interest payments, particularly after tax audits, considering the respective period of interest accrual. - Digitizing the determination of aggregated wages and salaries to calculate the share of apportionment.

References

Alvesson, M., & Deetz, S. (2000). Doing critical management research. Sage. Thousand Oaks, CA.

Bundesverfassungsgericht (BVerfG) (2021). Beschluss vom 08. Juli 2021 - 1 BvR 2237/14, 1 BvR 2422/17.

Deutscher Bundestag (1968). Entwurf eines Gesetzes zur Änderung und Ergänzung des Grundgesetzes (Finanzreformgesetz). Drucksache V/2861.

Deutscher Bundestag (1983). Jahresgutachten 1983/84 des Sachverständigenrates zur Begutachtung der gesamtwirtschaftlichen Entwicklung. Drucksache 10/669.

Deutscher Bundestag (2003). Entwurf eines Gesetzes zur Reform der Gewerbesteuer. Drucksache 15/1517.

DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interview. *Medical Education*, 40(4), 314-321.

Dobell, J. (2017). The future of tax technology is now. *International Tax Review*, 28, 41-42.

Drüen, K. D. (2020). Commentary on Sec. 1 TTA. *Blümich – EStG – KStG – GewStG – Einkommensteuergesetz – Körperschaftsteuergesetz – Gewerbesteuergesetz*. 155th supplement. Verlag Franz Vahlen. München.

Eismayr, R., & Kirsch, A. (2016). Digitalisierung in der Steuerberatung: Globale Entwicklungen bei der Automation von Besteuerungsprozessen. *Der Betrieb*, 69(47), 40-44.

Ernst & Young (EY) (2020). The intelligent tax function. 2020 Global Tax Technology and Transformation Survey highlights. Available at: https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/tax/tax-pdfs/ey-the-intelligent-tax-function-2020-global-ttt-survey-highlights.pdf.

FDP (2021). Gewerbesteuer abschaffen, Finanzierung der Kommunen auf neue Grundlage stellen. Available at: https://www.fdp.de/forderung/gewerbesteuer-abschaffen-finanzierung-der-kommunen-auf-neue-grundlage-stellen.

Frey, C. B., & Osborne, M. A. (2017). The future of employment: How susceptible are jobs to computerisation? *Technological forecasting and social change*, 114, 254-280.

Gemeindefinanzkommission (2011). Ausgangslage und Ergebnisse. https://web.archive.org/web/20150407232737/http:/www.bundesfinanzministerium.de/Content/DE/Monatsberichte/Standardartikel_Migration/2011/08/analysen-und-berichte/b02-gemeindefinanzkommission/Gemeindefinanzkommission.html?view=renderPrint.

Gewerbesteuer-Richtlinien und -Hinweise (2009). Allgemeine Verwaltungsvorschrift zur Anwendung des Gewerbesteuerrechts. BStBl. I 2010 Sondernummer 1 S. 2.

Hentze, T. (2021). Reformen gefordert. Experte fordert: Gewerbesteuer abschaffen. Available at: https://kommunal.de/krise-reformanstoss-Gewerbesteuer.

Hinerasky, A., & Kurschildgen, M. (2016). Digitalisierung in der Steuerberatung: Künstliche Intelligenz und Blockchain – neue Technologien in der Besteuerungspraxis. *Der Betrieb*, 69(47), 35-39.

Hoppe, T., Rechbauer, M., & Sturm, S. (2019). Steuerkomplexität im Vergleich zwischen Deutschland und Österreich – Eine Analyse des Status quo. *Arqus Discussion Paper No. 240*.

Keen, M. (2002). The German tax reform of 2000. *International Tax and Public Finance*, 9(5), 603-621.

KPMG (2018). Transforming the tax function through technology. A practical guide to 2020. Available at: https://assets.kpmg/content/dam/kpmg/xx/pdf/2018/04/transforming-the-tax-function-final.pdf.

Mayr, R., & Meyer-Pries, L. (2017). Digitalisierung in der Steuerberatungskanzlei - Ausblicke und Einschätzungen. *Die Steuerberatung*, 14(5), 210-222.

Peck, G. (2018). Embracing tax technology: The full perspective. *International Tax Review*, 29, 31-33.

PwC (2016). The tax function of the future. Building the business case for change. Available at: https://www.pwc.com/gx/en/tax/publications/assets/tfof-building-the-case-for-change.pdf.

PwC (2017). Spotlight: Robotic Process Automation (RPA). What tax needs to know now. Available at: https://www.pwc.com/gx/en/tax/publications/assets/pwc-tax-function-of-the-future-focus-on-today-robotics-process-automation.pdf.

Qu, S. Q., & Dumay, J. (2011). The qualitative research interview. *Qualitative Research in Accounting & Management*, 8(3), 238-264.

Wollmershäuser, T., Delrio, S., Fuest, C., Göttert, M., Grimme, C., Krolage, C., Lautenbacher, S., Lehmann, R., Nierhaus, W., Peichl, A., Reif, M., Šauer, R., Schröter, F., Schuler, T., Stöckli, M., Wohlrabe, K., Wolf, A., & Zeiner, C. (2017). ifo Konjunkturprognose 2017–2019: Deutsche Wirtschaft auf dem Weg in die Hochkonjunktur. Available at: https://www.ifo.de/publikationen/2017/aufsatz-zeitschrift/ifo-konjunkturprognose-2017-2019-deutsche-wirtschaft-auf-dem.

WTS (2017). Künstliche Intelligenz im Steuerbereich. Digitalisierung und Potentiale. Available at: https://www.wts.com/wts.de/insights/kuenstliche-intelligenz/wts-flyer_ki_a5_web_einzel_ final. pdf.

Chapter 6

Concluding Remarks

6 Concluding Remarks

This thesis expands the understanding of firm responses on current tax regulations such as tax transparency requirements and anti-tax avoidance measures. In particular, the thesis provides knowledge on the effects and determinants of qualitative tax disclosures of firms and the effectiveness of tools in the fight against tax avoidance. In addition, the thesis aims at a better knowledge of how tax consulting firms react to environmental tax influences, like the taxation procedure, and reveals the demand and the prerequisites of a transformation of the tax function. The four independent essays of the thesis provide novel insights into current topics in tax research that might be of particular interest for policymakers in order to combat global tax avoidance and, more broadly, to enhance tax legislation.

Chapter 2 addresses the research question of what qualitative and voluntary tax disclosures effectively signal and if these disclosures can be attributed to an amendment of tax affairs or if managers only provide boilerplate information. For this purpose, we seek annual reports of large European firms for information on tax risks and find a remarkable increase of tax risk disclosures since 2005. Based on this disclosure phenomenon, we find significantly lower effective tax rates [ETRs] and ETR volatilities for firms that initially provide information on tax risks relative to firms that abstain from any tax risk disclosure. Our results suggest that tax risk disclosures signal a more refined tax management and a professionalized approach towards tax risks. Thus, we conjecture that firms clearly take advantage of the leeway when disclosing specific information on taxes in annual reports.

Chapter 3 examines the determinants and effects of qualitative and public tax strategy disclosures. For financial years ending December 31, 2017, large U.K. based firms and certain multinational enterprises [MNEs] are obliged to publicly disclose information about their tax strategy by reference to U.K. taxation, including their attitude towards tax planning. Empirical results suggest that tax-avoiding firms provide poor tax strategies by deliberately omitting information on tax planning or tax risks. This result confirms prior literature finding that

managers systematically avoid disclosures of unpleasant tax information. Moreover, we find a significant increase in ETRs of affected firms after the regulation came into effect relative to unaffected peers. We reason that qualitative and publicly available information about firms' tax strategies can serve as an adequate instrument for policymakers to effectively deter tax avoidance.

Chapter 4 provides insights into the effects of the U.S. tax reform of 2017 on cross-border M&As. In particular, we scrutinize if and how the shift to a territorial tax system and the implementation of an anti-abuse measure, denoted as GILTI provision, affect cross-border acquisition patterns of U.S. firms. Empirical results demonstrate a reduced probability for GILTI-affected U.S. firms to invest in low-tax and tax haven countries following the TCJA. Our finding that the GILTI anti-abuse provision effectively deters investments in low-tax jurisdictions is of particular importance because the U.S. administration under Joe Biden is considering to expand the GILTI regime significantly.

Chapter 5 studies a current process within a tax consulting firm and aims at gaining knowledge on the relevance and potentials to digitize this process. I conduct interviews with employees of a large tax consulting firm and find out that the review process of trade tax assessment notices is not an overly time-consuming and extensive process within the tax declaration function, despite the long-winded and complex taxation procedure. Nonetheless, my results suggest that a digitally supported review of tax assessment notices is a promising approach to streamline the review process. In a broader sense, the interview results also indicate that there is considerable need for a reform of the German trade tax procedure.

In conclusion, the thesis addresses current and important developments in the field of corporate taxation. In light of extremely high indebtedness of governments around the world due to the COVID-19 pandemic, efforts to combat global tax avoidance and to raise public revenues are very high on the political agenda. Among other legislative initiatives, enhancing transparency around a firm's tax affairs is found to be a promising approach to curb tax

avoidance and strengthen public trust in firms paying their ‘fair share of taxes’. However, the analyses of this thesis also provide evidence of firms exploiting the legislative leeway when providing tax-related information to the public. Therefore, my research advocates more legal requirements about what information should effectively be disclosed. Additionally, the thesis contributes to firm responses on an anti-abuse measure embedded in the U.S. tax reform of 2017 and provides insights into a current review process in tax consultancy.

CURRICULUM VITAE

Mathias Dunker

Personal Data

Date of Birth	23rd September 1991
Place of Birth	Bergisch Gladbach
Citizenship	German

Education

Since 10/2016	**University of Cologne (Germany)** PhD Student and Research Assistant at the Chair of Business Taxation, Prof. Dr. Michael Overesch
10/2014 – 08/2016	**University of Cologne (Germany)** Business Administration (Master of Science)
10/2011 – 07/2014	**University of Cologne (Germany)** Business Administration (Bachelor of Science)
09/2002 – 07/2011	**Albertus-Magnus-Gymnasium Bensberg, Bergisch Gladbach (Germany)** Allgemeine Hochschulreife (A-Levels)

Cologne, October 2021