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Financial Statement Comparability and Corporate Tax Strategy

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Abstract We investigate whether a firm's financial statement comparability is associated with the firm's tax strategy. We hypothesize that external observers (e.g. press, shareholders, analysts, and tax authorities) can better detect a firm's atypical tax strategy when the firm has high financial statement comparability with its industry peers. Detection and its consequent penalties should restrain firm managers from choosing tax strategies that deviate significantly from those of industry peers. Using firms' uncertain tax benefits (UTBs) as a proxy for tax avoidance, we find that the UTBs of firms with high financial statement comparability move toward their industry peers in subsequent periods. Results suggest that comparability reduces tax aggressiveness for high tax-avoidance firms and enhances tax aggressiveness for low tax-avoidance firms, in comparison with those of industry peers. Overall, these findings indicate a strong within-industry harmonization in tax avoidance for firms with high financial statement comparability.

Keywords: Financial statement comparability; Tax distance; Tax aggressiveness; Undersheltering

1. Introduction

Two sets of theoretical models motivate our hypothesis that firms' financial reporting comparability is associated with their tax strategies. The first set of models proposes that external agents can improve their knowledge about a firm's unique, unreported activities through comparison of peer firms' financial reports (e.g. Cheynel & Levine, 2015; Kim & Verrecchia, 1997). This is because signals from peer firms' financial reports could be complementary as well as substitutive. As such, external agents can interpolate and infer managers' unobserved actions by combination and analysis of peer firms' signals. The second set of models sets forth that external agents' improved knowledge of managers' actions can cause the managers to change their actions in subsequent periods (e.g. Dye, 1990). Despite the salience of these models, sparse research has been done on whether and how peer firms' joint financial reporting quality affects firms' real activities, such as tax avoidance (e.g. Armstrong et al., 2015). We fill this research gap by examining whether comparability is associated with reduction in peer firms' tax distance, that is, the difference between the tax avoidance of a firm and those of its industry peers in the same year.

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Comparability is defined as a characteristic of financial reports that allows users to better identify similarities in, and differences between, economic performances of peer firms [Barth et al., 2008; Financial Accounting Standards Board (FASB), 2006; Simmons, 1967]. For example, any observed difference in the profits of two firms in an industry would more likely reflect their different underlying performances if both firms follow the same inventory-valuation method than if they follow dissimilar inventory-valuation methods [such as last-in-first-out (LIFO) and first-in-first-out (FIFO)]. Comparability can thus better enable an external agent to detect a firm's unusual performance, potentially directing the agent's efforts to investigate it (Barth et al., 2012; Lang et al., 2012). The agent's comparability-enabled learning, in turn, can lower the information asymmetry between manager and external agent beyond what is achievable by a firm's stand-alone financial reporting quality. Comparability-led learning by external agents (e.g. press, shareholders, analysts, and tax authorities) should affect managers' assessments of costs and benefits of tax strategies deviating from those of their industry peers. We expect that comparability is negatively associated with tax distance, defined as the differences between a focal firm's tax avoidance and those of its industry peers in the same year.

Firms treat tax avoidance strategies as risky investment projects, which, on one hand, reduce tax payouts and, on the other hand, increase the potential of reputational harm and monetary penalties (Armstrong et al., 2012; Rego & Wilson, 2012). Managers, therefore, weigh the benefits against costs in choosing an optimal level of tax aggressiveness (Scholes et al., 1990). In doing so, managers seek not to deviate significantly from peer strategies (Armstrong et al., 2019; Boning et al., 2018; Gallemore et al., 2014; Graham et al., 2014; Mills et al., 1998; Rego, 2003). We expect that comparability would alter managers' choice by enhancing the probability-of-detection weighted costs of deviating from peer tax strategies. We thus hypothesize that comparability is associated with firms' both lowered tax aggressiveness and undersheltering with respect to industry peers.

The first part of our hypothesis is based on the idea that comparability increases the likelihood of an Internal Revenue Service (IRS) tax audit. The increased likelihood raises the probability-of-detection weighted regulatory or reputational costs of tax avoidance. The IRS is arguably the most interested agent that monitors a firm's tax aggressiveness. Prior studies show that the IRS relies on financial statements for its investigations in addition to information acquired from corporate tax files (Bozanic et al., 2017). This reliance indicates that financial statements provide incremental information on a firm's tax strategy even to the most knowledgeable external tax agent. Financial reporting comparability is expected to improve the IRS's ability to detect overly aggressive tax strategies. Detection and the associated financial penalties, adverse press coverage, and reputational ramifications could harm firm managers' interests more than those of diversified shareholders. Fearing higher detection risk in high comparability regimes, managers would reduce their tax aggressiveness relative to those of industry peers.

The second part of our hypothesis emanates from the idea that firms with lower levels of tax avoidance, relative to industry peers, would embolden their tax strategies in high comparability regimes. Investors would better detect a firm's undersheltering when its financial statements are comparable. They would then increase the pressure on managers to enhance tax aggressiveness (Khan et al., 2017). Tax department often operates as a profit center, not just as a compliance department (Robinson et al., 2010). Tax directors are often compensated on tax savings relative to peer firms (Slemrod, 2004). Also, managers of firms with relatively lower tax avoidance may be subject to job termination (Chyz & Gaertner, 2017) and face a higher cost of capital (Goh et al., 2016). These factors make managers choose a more aggressive tax strategy that they otherwise would in the normal course of business.

In addition, comparability-led salience of other firms' unusual performance can help an undersheltered firm to identify, investigate, and learn from peer tax strategies. Prior studies show that

firms imitate the tax strategies of their product market leaders (Kubick et al., 2015), learn peers' tax strategies through executive social networks (Brown & Drake, 2014), and reach their optimal level of tax avoidance by benchmarking on peers' strategies (Kim et al., 2019).

Collectively, we hypothesize that comparability would be negatively associated with tax distance, defined as the median of absolute values of differences between a focal firm's uncertain tax benefit (UTB) and those of its peers in the two-digit Standard Industrial Classification (SIC) industry (with UTB scaled by total assets) in the same year. The literature considers several versions of UTB.[1] We use the term 'uncertain tax benefits' because it is most consistent with the theoretical construct we examine. For example, an aggressive firm may not pay any tax on its foreign income, while recognizing that its tax position would be challenged by the IRS. FIN 48 requires that a firm must record a tax expense or an allowance in its financial statements after considering the uncertainty of its tax position. Validity of our measure is supported by prior studies that consider UTB as a proxy for tax aggressiveness (Goh et al., 2016; Guenther et al., 2017; Kubick et al., 2016). We also examine alternative proxies for tax avoidance: effective tax rate (*ETR*) (Gallemore & Labro, 2015), discretionary permanent book-tax differences (*DTAX*) (Frank et al., 2009), abnormal book-tax differences (*DD_BTD*) (Desai & Dharmapala, 2006), and shelter (*SHELTER*) (Wilson, 2009).

We follow De Franco et al. (2011) to measure financial statement comparability, that is, the extent to which two firms' accounting systems similarly reflect the same economic event (measured by a firm's stock return over a fiscal quarter) in their financial statements (measured by that quarter's earnings) using data for the previous 16 quarters. Comparability for a firm is then calculated by the average of its pairwise comparability scores with the same industry firms. We control for industry and year fixed effects throughout all our regression models, so our UTB variables are effectively industry- and year-adjusted.

We control for a range of firm-level factors documented by prior studies that could influence corporate tax policies: firm size, leverage, profitability, growth, research and development (R&D) expenses, asset intensity, cash holdings, foreign income, equity income, tax contingency reserves, stand-alone financial reporting quality, and net operating losses (NOLs). Controlling for profitability and accruals quality ensures that our results reflect discretionary tax policies, not discretionary accounting choices. To isolate the effect of comparability, we control for the product market leader's tax policy (Kubick et al., 2015). We also control for disclosures related to the firm's geographical segment earnings (Hope et al., 2013) and tax contingency reserves (Gupta et al., 2014), the accounting reserve for future tax contingencies that are associated with lower tax avoidance.

Given the possible correlation between proxies for tax aggressiveness and comparability (e.g. firms' idiosyncratic tax policies may render their financial statements less comparable), we investigate the lead-lag relation between tax distance and comparability measures. That is, comparability is measured in the previous year, which itself is based on the previous 12 quarters' data, and tax distance is measured in the current year. Furthermore, we measure comparability at the industry level, which allows us to circumvent any mechanical correlation between a firm's tax aggressiveness and its comparability. We also use changes in variables to address a potential criticism that comparability and tax policies are typically sticky. So, we examine the effect of change in comparability in the previous year on the current year's change in tax distance.

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[1]For example, Compustat calls it uncertain tax position; practice calls it uncertain tax position [e.g., Microsoft 2019 FASB Interpretation No. 48 (FIN 48) disclosure], while Blouin et al. (2007) call it uncertain tax benefits. The general theme is that UTB is a company's own estimate of the uncertainty of exclusions, deductions, credits, and valuations claimed in its filings because they could be challenged and disallowed by the tax authorities (Blouin et al., 2007).

We find that comparability is negatively associated with tax distance in the next period. A one standard deviation increase in comparability is associated with a decrease of 4.58% of the mean tax distance. Results indicate that comparability lowers a firm's deviations from its industry peers, reducing the tax aggressiveness for high tax avoidance firms and enhancing the tax aggressiveness for low tax avoidance firms. These results are stronger in a setting where the IRS audit risk is higher. The evidence supports the notion that comparability improves the IRS's detection of deviations from peer group.

We also exploit a global shock to comparability triggered by the introduction of International Financial Reporting Standards (IFRS) and examine how changes in comparability affect tax distance between industry peers across countries.[2] We treat the mandatory introduction of IFRS as an improvement to comparability (Durocher & Gendron, 2011; Hong, 2013; Hong et al., 2014). The shock also allows us to address concerns related to endogeneity and reverse causality that can affect our results in the U.S. setting. The treatment effect is measured by the percentage increase in uniformity, proxied by the number of domestic and international firms in the industry that become comparable because they follow IFRS (DeFond et al., 2011). The outcome is measured by a new tax distance measure, based on a tax avoidance metric (Atwood et al., 2012). We find that tax distance declines with uniformity. The negative association between uniformity and tax distance is consistent with the idea that comparability reduces tax variation among peer firms.

We make three contributions to the literature. First, we show that firms' financial statement comparability is associated with their tax avoidance. We extend prior studies that examine a range of consequences of comparability (e.g. Chen et al., 2018; De Franco et al., 2011; Gong et al., 2013; Kim et al., 2013) by adding firms' tax strategies to that list. Second, we extend studies that examine the association between stand-alone financial reporting quality and tax avoidance by examining comparability, a peer-level financial reporting attribute. For example, Balakrishnan et al. (2019) find that tax aggressiveness is associated with financial reporting opacity, Francis et al. (2019) find that auditor-provided services, a common proxy for tax planning, is correlated with less accurate analyst forecasts. De Simone (2016) shows that mandatory adoption of IFRS increases income shifting in a global market. Third, we contribute to studies finding that firms react to the tax strategies of peer firms (Armstrong et al., 2019; Bird et al., 2018) by showing that a firm's conformance with its industry peers' tax policies is related to financial statement comparability.

Our study is related to two contemporaneous studies: Majeed and Yan (2019) and Li and Wang (2018), which show a negative association between financial statement comparability and tax avoidance in the Chinese market and the U.S. market, respectively. Our study distinguishes from these two studies in three ways. First, we study tax distance, a bi-directional, peer-level attribute, instead of just a firm's tax avoidance. Second, to improve our identification, we use a lead-and-lag relationship between comparability and tax avoidance, unlike Majeed and Yan (2019) and Li and Wang (2018), which examine the contemporaneous association. Unlike those studies, our study uses UTB, not *ETR*, as the main measure. A contemporaneous association between comparability and tax avoidance, as manifested in *ETR*, could reflect the effect of tax avoidance on comparability, not comparability affecting tax avoidance. Third, we exploit the shock to comparability across countries to strengthen the identification strategy of the impact of comparability upon firms' tax planning activities.

[2]Due to the unavailability of the UTB variables across countries, we use the difference between the firm's tax rate and the country's tax rate as the dependent variable in our IFRS analysis (Atwood et al., 2010).

2. Literature Review and Motivation of Hypothesis

2.1. Financial Reporting Comparability

Comparability implies that a given firm reports economic circumstances in financial statements in a way similar to its peers. Also, different (similar) economic circumstances receive different (similar) accounting treatments in financial statements (Barth et al., 2008; Simmons, 1967). FASB (1980) defines comparability as the quality of information that enables users to identify similarities and differences in financial performance across firms. Researchers further argue that comparability is a different attribute than a firm's stand-alone financial reporting quality and can independently influence the information asymmetry between managers and external investors (Barth et al., 2012; Lang et al., 2012). Some accounting regulations such as the mandatory adoption of IFRS significantly enhances financial reporting comparability by mandating the same accounting standard to all publicly listed firms across countries (e.g. Neel, 2017; Yip & Young, 2012).

The pioneering work by De Franco et al. (2011) shows that comparability enables analysts to not only make more informed inferences about economic similarities and differences across comparable firms but also better grasp how economic events contribute to firm performance. Also, when peer firms provide good benchmarks for each other and their firms' financial reporting is comparable, distinctive firm practices become more salient in the analysis of peer firms' financial reports. This should reduce the efforts that analysts spend in identifying a firm's unique business practice. With this improved knowledge about firms, analysts can more accurately forecast their future performance. Focusing on the debt market, Kim et al. (2013) provide evidence that comparability facilitates more standardized and less judgmental calculations of accounting information for users. They suggest that comparability can be particularly handy to external agents who are informationally disadvantaged, to better learn about a company's performance through standardized financial analysis.

2.2. Comparability and Tax Avoidance

As noted in introduction, we rely on two sets of theories to motivate our hypothesis. The first theory is that signals from peer firms can enhance external agents' understanding of a firm's performance (Dye & Sridhar, 1995). Comparability is one characteristic that can enable external agents to detect a firm's unusual performance, potentially directing agents' efforts to investigate and learn the reasons for that performance. Comparability can thus reduce manager-agent information asymmetry beyond what is achievable by a firm's stand-alone financial reporting quality (Barth et al., 2012; Lang et al., 2012). The second theory is that external agents' improved external knowledge of a manager's atypical activity, and the fear of agents' backlash, can cause the manager to change that activity (e.g. Dye, 1990). Combining the second theory with the first, we expect that if comparability facilitates external agents' detection of a firm's atypical activity that is disapproved by the agents, then the manager would reduce its deviations from the peer firm's strategies. We test this idea in the context of firms' tax strategies.

Firms treat tax avoidance as risky investment projects, which reduce tax payouts but increase the potential of reputational harm and monetary penalties (Armstrong et al., 2012; Rego & Wilson, 2012). Tax reduction is often achieved via investments that provide tax credits or exemptions, transactions that shift corporate resources or income to certain jurisdictions or countries that provide lower marginal tax rates. Tax reduction also involves alterations of the location, timing, and characterization of reported revenues and expenses. We predict that these alterations, to the extent different from industry practice, would become distinctive and salient in the high comparability regime. External agents can then direct their learning efforts to investigate reasons for

these salient, distinctive performances. Financial statement comparability can thus improve comprehension of external agents (such as tax regulators and tax auditors) on firm's tax strategies as well as firm manager's understanding of tax strategies of its industry peers.

Bozanic et al. (2017) show that the IRS uses firms' financial statements in its investigations and enforcement process, indicating that the agency supplements its private information with firms' public financial statements. As such, financial statements thus provide incremental information on a firm's tax strategy even to the most knowledgeable external tax agent. However, the IRS cannot audit all firms' tax returns given its budget constraints. It conducts an automated time series and cross-sectional analysis as an additional tool to identify abnormal patterns and uses a computer-based Discriminant Function System (DIF) score to identify tax evasion and potential offenders (Hoopes et al., 2012; Hunter & Nelson, 1996).[3] The discriminant function model likely uses financial information of peer companies. The efficiency of such models should improve when the inputs for the model estimation, that is, the financial information from peer firms, similarly represent similar events and differently represent different events. DIF score should be higher if a given financial information in a firm's tax returns deviate significantly from its past returns or those of its peer firms in the same income class.

We argue that the accuracy of DIF scores may improve with comparability because, otherwise, DIF deviations could represent differences in accounting instead of differences in real transactions. Hence, comparable financial statements can improve the efficiency of the efforts of a resource-constrained external agent to identify a firm's atypical business practice.[4] The detection and penalization risk for firms with high tax avoidance should thus be greater in high comparability regimes. Anticipating such detection in high comparability regimes, we reason that managers of high tax avoidance firms, relative to industry peers, would reduce their tax aggressiveness in the following periods.

However, comparability can improve the identification of a firm's unique business practices not just for the IRS but also for all external agents, including the firm's competitors. Having identified salient differences in practices, peer firms can then prioritize resources to learn best business practices and imitate innovations from each other (e.g. Badertscher et al., 2013; Chircop et al., 2020). In our study's context, comparability can improve faster learning of peer firms' tax strategies. Prior studies show that firms imitate the tax strategies of their product market leaders (Kubick et al., 2015), learn their peers' tax strategies through an executive social network (Brown & Drake, 2014), and reach their optimal level of tax avoidance by benchmarking on peers firms' strategies (Kim et al., 2019). We argue that learning and imitation should improve in high comparability regimes. Also, comparability might provide a given firm with an additional defense mechanism to justify its tax strategies. For example, De Simone (2016) finds that European firms justify transfer pricing to tax authorities by benchmarking intercompany profit allocations against those of firms using the same accounting standards.[5] We also expect that shareholders would be better able to identify undersheltering relative to peer firms, thereby forcing risk-averse managers to increase tax aggressiveness.

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[3] See, for example, https://www.irs.gov/uac/the-examination-audit-process.

[4] For example, multinational technology firms such as Google and Apple, which generate comparable financial reports, often used a similar tax avoidance technique (e.g. double Irish with a Dutch sandwich structure). Thus, even though this novel tax avoidance technique is highly complex and involves multiple organizations in different jurisdictions, the IRS plausibly can improve its knowledge of such a tax strategy by examining and comparing both companies' tax returns and financial disclosures. See http://www.nytimes.com/interactive/2012/04/28/business/Double-Irish-With-A-Dutch-Sandwich.html?_r = 0.

[5] In contrast, Klassen and Laplante (2012) argue that if information from peer firms is more widely available, the increased availability should constrain the degrees of freedom in transfer pricing. The reason is that a given firm's transfer pricing would have to be consistent with those used by comparable firms, thereby reducing tax evasion.

In sum, we hypothesize that comparability increases the likelihood that a high (low) tax aggressive firm, relative to its industry peers, makes its policies less (more) aggressive in the following period.

H1: Financial statement comparability is negatively associated with the next period's tax distance.

3. Sample Selection, Measurement of Variables, and Descriptive Statistics

3.1. Sample Selection

We obtain financial statement data from Compustat and stock returns data from the Center for Research in Security Prices from 2007 to 2014. We exclude firm-year observations with missing values of total assets and sales (45,070 firm-year observations) and firm-year observations whose values of total assets and sales are less than one million dollars (18,898 firm-year observations). We drop firm-years with negative pre-tax income (29,318 firm-year observations), also required for the validity of ETR-based measure described in Section 3.2.2. We also drop firm-year observations without values of uncertain tax benefits (26,822 firm-year observations), firm-year observations without public listings (5,534 firm-year observations), firm-year observations with missing comparability measures (7,164 firm-year observations), and firm-year observations with missing values of financial reporting quality and other control variables (7,399 firm-year observations). Finally, we exclude firms from the finance and utility industries (573 firm-year observations with SIC 4000–4999 and 6000–6999). Our final sample contains 8,508 firm-years (1,490 distinct firms). The sample attrition is largely caused by the sample selection criteria for the tax and comparability measures, as shown in Table 1.

3.2. Measurement of Variables

The two principal constructs in our study are financial statement comparability and tax distance. The detailed measurements of each variable are described in the Appendix. All continuous variables are winsorized at the top and bottom 1 percentile.

3.2.1. Financial statement comparability

De Franco et al. (2011) measure comparability by the extent to which two firms' accounting systems similarly reflect the same economic event (measured by a firm's stock return over a fiscal

Table 1. Sample selection

This table describes a sample selection of firms examined in this study.

Sample	Firm-years
Compustat data over the period 2007–2014	149,286
Less:	
Firm-years missing total assets and net sales	45,070
Firm-years less than one million dollars in total assets and net sales	18,898
Firm-years with negative pre-tax income	29,318
Firm-years missing uncertain tax benefit tax avoidance measures	26,822
Firm-years without public listing	5,534
Firm-years missing comparability measure	7,164
Firm-years missing financial reporting quality and other control variables	7,399
Firm-years with finance and utility industries	573
Final sample (firm-years, 1,490 unique firms)	8,508

quarter) in their financial statements (measured by that quarter's earnings). This measurement is a three-step process. The first step requires the estimation of firm *i*'s accounting function on a firm-year basis by the association between quarterly earnings and stock returns.

$$Earnings_{q,i,t} = \alpha_{i,t} + \beta_{i,t} \times StockReturn_{q,i,t} + \varepsilon_{q,i,t}, \quad (1)$$

where *Earnings* is the income before extraordinary items for quarter *q* deflated by the market value of equity at the end of the previous quarter and *StockReturn* is the stock return during that quarter. The regression is estimated using data from 16 quarters before year *t*. The estimated coefficients of intercept $\alpha_{i,t}$, and $\beta_{i,t}$ are the two measures of the accounting function on a firm-year basis. The second step requires estimation of accounting functions ($\alpha_{j,t}$, and $\beta_{j,t}$) for firm *j* from the same industry (defined by the two-digit SIC code) in the same year. The third step measures the closeness between firm *i*'s and firm *j*'s accounting function in that year by comparing the actual and the predicted earnings of firm *i* for each of the previous 16 quarters. Predicted earnings are simulated using firm *j*'s accounting function and firm *i*'s stock return. The pairwise comparability score between firm *i*'s and firm *j*'s accounting system at time *t* is the average of the difference between actual and predicted earnings for the previous 16 quarters, multiplied by -1 ($COMPACCT_{i,j}$). This measure shows that comparability is an average of the pairwise measure of a firm's financial reporting compared with its industry peers.

The variable of interest, financial reporting comparability (*COMPACCT*), is measured by three variables ($COMPACCT4_{t-1}$, $COMPACCT10_{t-1}$, and $COMPACCTIND_{t-1}$) and in the year before measurement of tax distance. $COMPACCT4_{t-1}$ and $COMPACCT10_{t-1}$ denote the average of the four and ten highest $COMPACCT_{i,j}$ values for firm *i* at year $t-1$, respectively. $COMPACCTIND_{t-1}$ is the average of $COMPACCT_{i,j}$ for firm *i* for all firms in its Fama and French (1993) industry classification, and $COMPACCTINDMED_{t-1}$ is the median value. These measures are negative values by construction; that is, the more negative the value, the lower the financial statement comparability among peer firms. Despite being negative, on a linear scale, each measure increases in the underlying construct of comparability.

We maintain that comparability would improve an external observer's understanding of a firm's atypical tax strategy, all else held equal. For example, industries with more firms with similar levels and methods of accounting (e.g. LIFO versus FIFO, single line versus double-declining method, and timely versus less timely recognition of losses) should have more comparable financial statements, enhancing the external agencies' ability to identify similarities and differences between firms' tax strategies in that industry.

3.2.2. Tax distance

We measure tax aggressiveness by *UTBTOTAL*, which represents total uncertain tax benefits at the end of the year scaled by lagged total assets. *UTBTOTAL* is measured in the current year. We then construct the tax distance measure (*UTBTOT_DISTANCE*) at the firm-year level by computing the median of the absolute value of all differences in *UTBTOTAL* between a given firm and other firms in a two-digit SIC industry in the same year.[6] Suppose that there are ten firms in an industry ($X_1, X_2, \ldots, X_{10}$) in the two-digit SIC industry classifier. In the first step, we compute the absolute difference of UTB of X_1 with UTBs of the remaining nine firms ($X_2, \ldots, X_{10}$) This gives nine observations for that firm year. In the second step, we compute the median.

[6]We also exploit an alternative tax distance measure (*UTBETR_DISTANCE)* to confirm the robustness of our results, based on *UTBETR*. *UTBETR* captures the portion of total uncertain tax benefits at year-end that impact the effective tax rate (ETR) (measured by Compustat variable TXTUBTXTR, scaled by current assets). We find results qualitatively similar to those reported in Table 3 using *UTBETR_DISTANCE*.

We use *UTB* instead of *ETR* as our main dependent variable because UTB is less likely to be driven by firms' earnings performance. *UTB* suffers from a limitation that the data are available only from 2007. In addition, UTB results from changes in both tax position and discretionary reporting of tax position. We also conduct robustness tests using *ETR*, *CASHETR*, book-tax differences (*BTD*), *SHELTER*, the discretionary permanent book-tax differences (*DTAX*) (Frank et al., 2009; McGuire et al., 2012), and *DD_BTD*, a residual from the regression of the book-tax differences on total accruals estimated with a firm fixed effect model (Desai & Dharmapala, 2006). Detailed measurement of each variable is described in the Appendix.

3.3. Descriptive Statistics

Table 2 reports descriptive statistics for the main variables. The mean and median of *UTBTOT_DISTANCE* are, respectively, 0.0103 and 0.0067. These are positive numbers because they are based on absolute values. The three comparability measures, *COMPACCT*4, *COMPACCT*10, and *COMPACCTIND*, have negative distributions by construction, consistent with De Franco et al. (2011). The mean and median of *DDAQ* are −0.1664 and −0.0215, respectively, indicating that financial reporting transparency is right-skewed. A less negative value of *COMPAACT* means higher financial statement comparability. The descriptive statistics of other control variables are largely consistent with those reported by the literature (Chen et al., 2010; Dyreng et al., 2010; Frank et al., 2009; Law & Mills, 2015; Lisowsky et al., 2013; Manzon & Plesko, 2002; Mills et al., 1998).

Table 2. Descriptive statistics for select variables

This table presents descriptive statistics of select variables. All variables are defined in the Appendix. All continuous variables are winsorized at the top and bottom 1 percentile.

Variable	*N*	Mean	Standard deviation	p25	p50	p75
UTBTOT_DISTANCE	8,508	0.0103	0.0124	0.0042	0.0067	0.0108
$COMPACCT4_{t-1}$	8,508	−0.4895	0.9229	−0.4400	−0.1800	−0.0900
$COMPACCT10_{t-1}$	8,508	−0.7226	1.2495	−0.6800	−0.2900	−0.1400
$COMPACCTIND_{t-1}$	8,508	−3.1592	1.8246	−3.7600	−2.8000	−2.0500
$COMPACCTINDMD_{t-1}$	8,508	−2.0458	1.9642	−2.3900	−1.4100	−0.9800
DDAQ	8,508	−0.1664	0.5030	−0.1293	−0.0215	0.0020
SIZE	8,508	7.4395	1.8672	6.2591	7.4785	8.7122
RDEXP	8,508	0.0377	0.0581	0.0000	0.0128	0.0538
LEV	8,508	0.1704	0.1574	0.0035	0.1516	0.2766
BTM	8,508	0.5142	0.4166	0.2589	0.4199	0.6540
NOL	8,508	0.6331	0.4820	0.0000	1.0000	1.0000
DNOL	8,508	0.0006	0.1053	−0.0034	0.0000	0.0024
ROA	8,508	0.0708	0.0538	0.0339	0.0599	0.0951
PPE	8,508	0.2500	0.2406	0.0836	0.1688	0.3322
FI	8,508	0.0303	0.0402	0.0000	0.0142	0.0515
DEP	8,508	0.0434	0.0274	0.0258	0.0371	0.0531
EQINC	8,508	0.0010	0.0045	0.0000	0.0000	0.0000
MEZZ_FIN	8,508	0.0124	0.0437	0.0000	0.0000	0.0000
AOCI	8,508	0.0158	0.0282	0.0000	0.0015	0.0184
DEFERREDREV	8,508	0.4833	0.4998	0.0000	0.0000	1.0000
STCOMP_EXP	8,508	0.9737	0.1601	1.0000	1.0000	1.0000
M&A	8,508	0.5374	0.4986	0.0000	1.0000	1.0000
CH_UTBTOT_DISTANCE	4,547	−0.0007	0.0067	−0.0016	−0.0003	0.0007
PROB_IRS_AUD	4,215	0.2385	0.0513	0.2245	0.2629	0.2697

4. Tests of Hypothesis

We hypothesize that comparability is negatively associated with tax distance. We begin by examining whether industries with higher comparability have lower variation in measures of tax avoidance. We then use a multivariate regression model to test whether comparability is negatively associated with next-period tax distance at the firm level. We conduct additional tests to address the endogeneity concern, with a change analysis. We also use the mandatory IFRS implementation as an exogenous shock to financial reporting comparability.

4.1. Graphical Evidence

We calculate comparability at the industry and year level by *COMPACCTIND* and by averaging *COMPACCT*4. We calculate the standard deviation of *UTBTOTAL* by industry. We present graphs of the variation in *UTBTOTAL* on the y-axis and the two measures of industry-level comparability on the x-axis in Figures 1 and 2. Industries with fewer than ten observations and with extreme values of comparability and standard deviations of tax avoidance are excluded. The two figures depict an inverse relationship, showing that firms in high comparability industries have

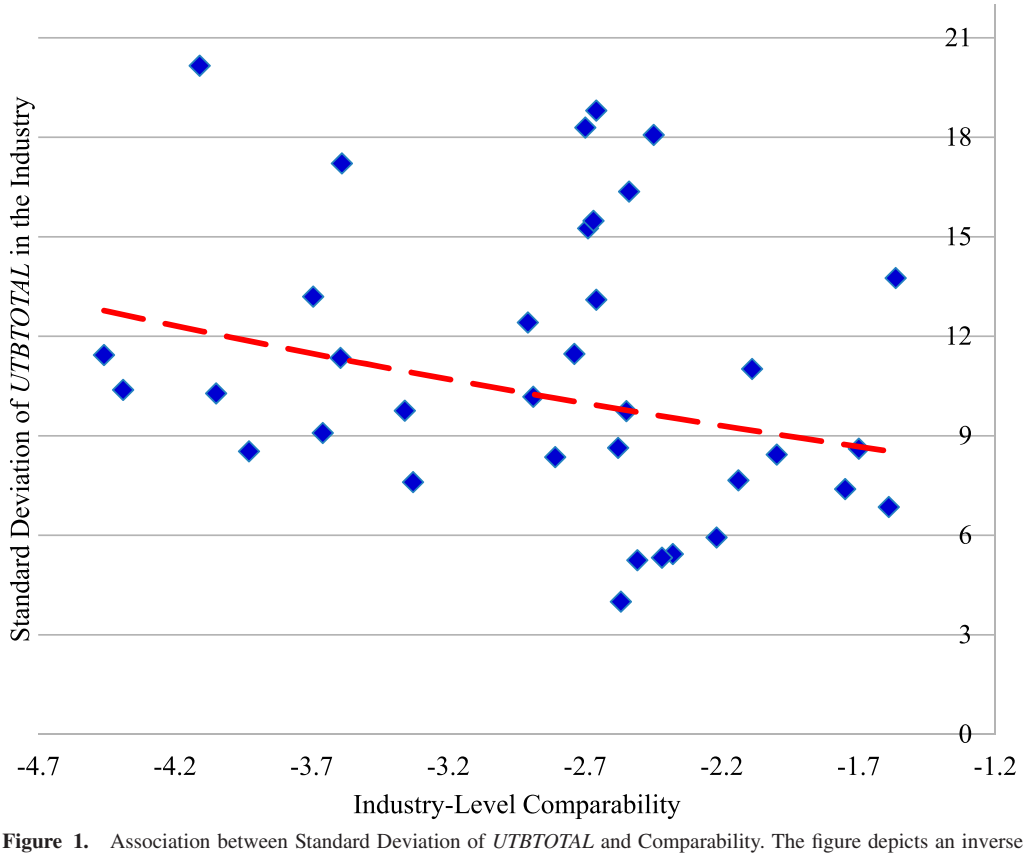

Figure 1. Association between Standard Deviation of *UTBTOTAL* and Comparability. The figure depicts an inverse relationship between an industry's average comparability and standard deviation of tax avoidance, supporting the idea of convergence of tax strategies in a high comparability regime. Tax avoidance is proxied by a measure of alternative tax avoidance (*UTBTOTAL*) and comparability is proxied by *COMPACCTIND*. All variables are defined in the Appendix, and sample firms are described in Table 1. *UTBTOTAL* is multiplied by 1,000 for expositional reasons. Industries with fewer than ten observations and extreme observations are excluded

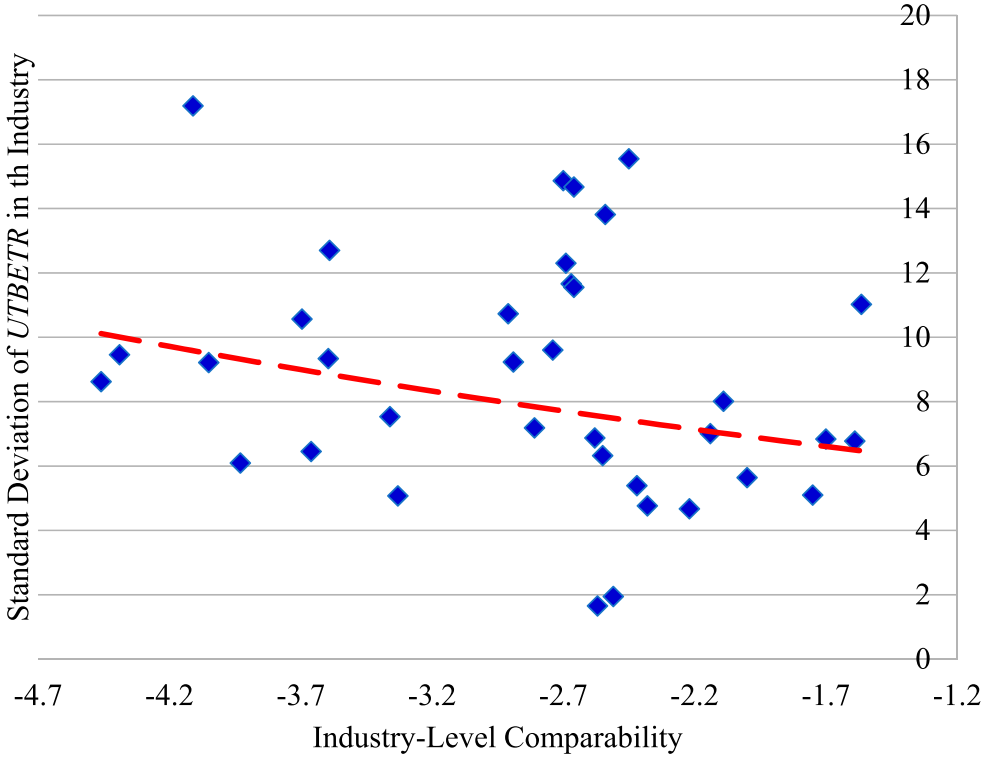

Figure 2. Association between standard deviation of *UTBETR* and comparability. The figure depicts an inverse relationship between an industry's average comparability and standard deviation of tax avoidance, supporting the idea of convergence of tax strategies in a high comparability regime. Tax avoidance is proxied by a measure of alternative tax avoidance (*UTBETR*) and comparability is proxied by *COMPACCTIND*. All variables are defined in the Appendix, and sample firms are described in Table 1. Industries with fewer than ten observations and extreme observations are excluded

lower variation in tax avoidance. These results provide preliminary evidence that comparability is associated with lower variation of tax strategies among industry peers.

4.2. Association Between Comparability and Tax Distance

We estimate the regression

$$TAX\_DISTANCE_t = \beta_0 + (\beta_1 \times COMPACCT_{t-1}) + \left(\sum_s \beta_s \times Controls\right) + \left(\sum_y \beta_y \times Year\_Dummies\right) + \left(\sum_n \beta_n \times Industry\_Dummies\right) + \varepsilon. \quad (2)$$

All variables are measured on a firm-year basis. *TAX_DISTANCE* refers to *UTBTOT_DISTANCE*, measured at the firm-year level. The variable of interest, financial reporting comparability (*COMPACCT*), captured by $COMPACCT4_{t-1}$, $COMPACCT10_{t-1}$, or $COMPACCTIND_{t-1}$, is measured in the year $t-1$ before measuring tax avoidance.

We use a set of control variables that prior studies have found to be associated with firms' tax policies (Chen et al., 2010; Dyreng et al., 2010; Frank et al., 2009; Law & Mills, 2015; Lisowsky

et al., 2013; Manzon & Plesko, 2002; Mills et al., 1998). These control variables, measured in the same year as the tax-avoidance measurement year, are firm size [log of assets (*SIZE*)], research and development investment (*RDEXP*), financial leverage (*LEV*), book-to-market ratio (*BTM*), firm profitability (*ROA*), property, plant, and equipment (*PPE*), foreign income (*FI*), depreciation expense (*DEP*), equity income (*EQINC*), convertible debt and preferred stock (*MEZZ_FIN*), accumulated other comprehensive income (*AOCI*), deferred revenue (*DEFERREDREV*), stock compensation expense (*STCOMP_EXP*), and an indicator for a merger and acquisition (*M&A*). Also, to address the concern that our results could reflect the effects of aggressive financial reporting instead of tax distance (Frank et al., 2009), we control for accrual quality (*DDAQ*; Dechow & Dichev, 2002). Also, we control for levels and changes in net operating loss carryforwards (*NOL* and *DNOL*) that affect firms' current tax payouts. After including year and industry fixed effects, all variables are effectively year- and industry-adjusted.

Table 3 presents the results of Equation (2) using $COMPACCT4_{t-1}$, $COMPACCT10_{t-1}$, or $COMPACCTIND_{t-1}$ as the measure of comparability. The coefficients on comparability are multiplied by 1,000 for expositional reasons. In all models, tax distance measures are negatively and significantly associated with comparability at least at the 5% significance level, showing that firms with higher comparability have lowered tax distance. With *UTBTOT_DISTANCE* as the dependent variable, the coefficients on the three comparability measures $COMPACCT4_{t-1}$, $COMPACCT10_{t-1}$, and $COMPACCTIND_{t-1}$, presented in Columns (1), (3,) and (5), respectively, are -0.5113, -0.3810, and -0.3594 (significant at least at the 5% level). We examine the economic effect of comparability by multiplying the regression coefficient of a comparability measure by its standard deviation. Our results show that a one standard deviation change in $COMPACCT4_{t-1}$ is associated with a reduction of 4.58% of mean value of *UTBTOT_DISTANCE*.[7] The sign and significance of control variables are generally consistent with those reported by prior studies (e.g. Frank et al., 2009). Tax distance increases with risky R&D investments and decreases with foreign income and capital investment.

We also construct tax distance measures using *ETR*, *DTAX, DDBTD*, *DDBTD*, and *SHELTER* as alternative measures of tax avoidance. Untabulated results show that the coefficients on comparability are negative and significant for *COMPACCT*4 (significant at least at the 10% level), corroborating our main results.

4.3. Addressing Endogeneity Concerns

While we measure tax distance and comparability in two different years and measure comparability at the firm and industry level, our results could reflect certain omitted, sticky firm or industry characteristics that can cause spurious lead-lag correlations.[8] To address this endogeneity concern, we estimate Equation (3) with first differences in variables. In Equation (3), the dependent variable is measured in the observation year, and the independent variables are measured one year before the observation year.

$$\Delta UTBTOT\_DISTANCE_{i,t} = \beta_0 + (\beta_1 \times \Delta COMPACCT_{i,t-1}) + \left(\sum_s \beta_s \times \Delta Control_{s,i,t-1}\right)$$

[7]The economic magnitudes are calculated by multiplying the coefficient on *COMPACCT*4 in Column (1) of Table 4 with its standard deviation (-0.5113 × 0.9229 / 1,000), divided by the meian, 0.0103.

[8]To address a potential autocorrelation of tax distance and comparability variables in our design, we estimate an autoregressive model in SAS that corrects the regression coefficients for autocorrelation. Untabulated results are similar to those reported in Table 4, indicating that our main regression results are not likely due to autocorrelation.

Table 3. Association between corporate tax distance and financial statement comparability We examine the association between tax distance and financial statement comparability using ordinary least square regressions. This table presents results using various measures of tax distance as the dependent variable. Comparability is measured by $COMPACCT_{i,j}$ denoting a three-step process. The first step requires estimation of the accounting function on a firm-year basis by the association between quarterly earnings and stock returns. $Earnings_{q,i,t} = \alpha_{i,t} + \beta_{i,t} \times StockReturn_{q,i,t} + \varepsilon_{q,i,t}$, where *Earnings* is the income before extraordinary items for quarter q deflated by the market value of equity at the end of the previous quarter and *StockReturn* is the stock return during that quarter. The regression is estimated using data from 16 quarters before year t for firm i. The second step computes the coefficients $\alpha_{j,t}$ and $\beta_{j,t}$ for firm j in the same industry for the same years. The third step compares the actual and the predicted earnings of firm i for each of the previous 16 quarters with predicted earnings simulated using firm j's accounting function and firm i's stock return. The pairwise comparability score between firm i's and firm j's accounting system at time t is measured by the negative average of the difference between actual and predicted earnings for the previous 16 quarters. $COMPACCT4_{t-1}$ denotes an average of the four highest $COMPACCT_{i,j}$ values for firm i at year $t-1$. $COMPACCT10_{t-1}$ denotes an average of the ten highest $COMPACCT_{i,j}$ values for firm i at year $t-1$. $COMPACCTIND_{t-1}$ denotes an average of $COMPACCT_{i,j}$ for all firms in its industry for firm i at year $t-1$. The coefficients of comparability are multiplied by 1,000 for expositional reasons. All variables are defined in the Appendix, and sample firms are described in Table 1. We report t-statistics in parentheses with standard errors clustered by firm. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level, respectively, on a two-tailed basis. SIC = Standard Industrial Classification.

	Dependent variable is		
	UTBTOT_DISTANCE	*UTBTOT_DISTANCE*	*UTBTOT_DISTANCE*
Variable	(1)	(2)	(3)
$COMPACCT4_{t-1}$	−0.5113		
	(−2.51)**		
$COMPACCT10_{t-1}$		−0.3810	
		(−2.57)**	
$COMPACCTIND_{t-1}$			−0.3594
			(−3.18)***
DDAQ	−0.0002	−0.0002	−0.0002
	(−0.40)	(−0.41)	(−0.41)
SIZE	0.0005	0.0005	0.0005
	(2.62)***	(2.62)***	(2.70)***
RDEXP	0.0548	0.0548	0.0547
	(7.65)***	(7.65)***	(7.63)***
LEV	−0.0032	−0.0032	−0.0033
	(−2.16)**	(−2.18)**	(−2.22)**
BTM	0.0006	0.0006	0.0006
	(1.21)	(1.25)	(1.13)
NOL	0.0004	0.0004	0.0004
	(0.82)	(0.82)	(0.81)
DNOL	0.0002	0.0002	0.0002
	(0.11)	(0.11)	(0.12)
ROA	−0.0016	−0.0016	−0.0018
	(−0.34)	(−0.34)	(−0.39)
PPE	−0.0055	−0.0056	−0.0056
	(−3.75)***	(−3.76)***	(−3.79)***
FI	0.0520	0.0520	0.0517
	(6.34)***	(6.34)***	(6.31)***
DEP	0.0141	0.0143	0.0140
	(1.22)	(1.24)	(1.21)
EQINC	0.0636	0.0637	0.0641
	(1.00)	(1.00)	(1.00)
MEZZ_FIN	−0.0056	−0.0055	−0.0054
	(−1.19)	(−1.18)	(−1.15)

(*Continued*)

Table 3. Continued.

	Dependent variable is		
	UTBTOT_DISTANCE	*UTBTOT_DISTANCE*	*UTBTOT_DISTANCE*
Variable	(1)	(2)	(3)
AOCI	0.0038	0.0039	0.0041
	(0.42)	(0.43)	(0.45)
DEFERREDREV	− 0.0002	− 0.0002	− 0.0002
	(− 0.36)	(− 0.38)	(− 0.39)
STCOMP_EXP	0.0006	0.0006	0.0006
	(0.65)	(0.62)	(0.61)
M&A	− 0.0007	− 0.0007	− 0.0007
	(− 1.79)*	(− 1.79)*	(− 1.77)*
Two-digit SIC industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Number of observations	8,508	8,508	8,508
Adj. *R*-squared	0.207	0.207	0.207

$$+\left(\sum_{t}\beta_t \times Year\_Dummies\right)$$
$$+\left(\sum_{n}\beta_n \times Industry\_Dummies\right)+\varepsilon \tag{3}$$

All control variables are the same as in Equation (2). Δ represents a change from the prior year to the current year. Arguably, β_1 presents the effect of change in comparability on tax distance, all else held constant. Table 4 presents the results of Equation (3). The coefficients on change in comparability are multiplied by 1,000 for expositional reasons. The coefficients on $\Delta COMPACCT$ are negative (significant at least at the 5% level). Overall, our change analysis shows that the negative relation between comparability next-year tax distance is unlikely driven by sticky characteristics.

4.4. The Enhanced Effect of IRS Audits

One of our arguments is that an external agent's comparability-led attention, from the IRS, for example, could have a moderating effect on a tax aggressive firm's strategy. Based on our reasoning, our results should be stronger in settings with higher IRS attention. That is, the comparability effect is expected to be stronger in a setting where IRS audit risk is higher. Higher detection risk exacerbates a tax manager's trade-off of tax avoidance costs (reputation and monetary penalty) and benefits (tax savings), thus inducing the tax manager to move towards industry peers' tax avoidance level. We test this idea, in Equation (4), by using interaction with the probability of an IRS audit (*PROB_IRS_AUD*).

$$TAX\_DISTANCE_{ti,t} = \beta_0 + (\beta_1 \times COMPACCT_{i,t}) + (\beta_2 \times PROB\_IRS\_AUD_{i,t})$$
$$+ (\beta_3 \times COMPACCT_{i,t} \times PROB\_IRS\_AUD_{i,t}) + \left(\sum_{s}\beta_s \times Control_{s,i,t}\right)$$

Table 4. Table 4. Addressing endogeneity concerns about the association between corporate tax distance and accounting comparability using change variables We conduct a change analysis to address the endogeneity concerns in examining the association between corporate tax distance and financial statement comparability. This table presents the association between change in corporate tax avoidance and change in financial statement comparability. The independent variables are measured in the year before the observation year. Comparability is measured by $COMPACCT_{i,j}$ denoting a three-step process. The first step requires estimation of the accounting function on a firm-year basis by the association between quarterly earnings and stock returns. $Earnings_{q,i,t} = \alpha_{i,t} + \beta_{i,t} \times StockReturn_{q,i,t} + \varepsilon_{q,i,t}$, where *Earnings* is the income before extraordinary items for quarter q deflated by the market value of equity at the end of the previous quarter and *StockReturn* is the stock return during that quarter. The regression is estimated using data from 16 quarters before year t for firm i. The second step computes the coefficients $\alpha_{j,t}$ and $\beta_{j,t}$ for firm j in the same industry for the same years. The third step compares the actual and the predicted earnings of firm i for each of the previous 16 quarters with predicted earnings simulated using firm j's accounting function and firm i's stock return. The pairwise comparability score between firm i's and firm j's accounting system at time t is measured by the negative average of the difference between actual and predicted earnings for the previous 16 quarters. $COMPACCT4_{t-1}$ denotes an average of the four highest $COMPACCT_{i,j}$ values for firm i at year $t-1$. $COMPACCT10_{t-1}$ denotes an average of the ten highest $COMPACCT_{i,j}$ values for firm i at year $t-1$. $COMPACCTIND_{t-1}$ denotes an average of $COMPACCT_{i,j}$ for all firms in its industry for firm i at year $t-1$. The coefficients of comparability are multiplied by 1,000 for expositional reasons. All control variables are the same as in Table 3. All variables are defined in the Appendix, and sample firms are described in Table 1. We report t-statistics in parentheses with standard errors clustered by firm. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level, respectively, on a two-tailed basis. SIC = Standard Industrial Classification.

	Dependent variable is		
	CH_UTBTOT_DISTANCE	*CH_UTBTOT_DISTANCE*	*CH_UTBTOT_DISTANCE*
Variable	(1)	(2)	(3)
$CH\_COMPACCT4_{t-1}$	−0.4181 (−10.36)***		
$CH\_COMPACCT10_{t-1}$		−0.3888 (−17.84)***	
$CH\_COMPACCTIND_{t-1}$			−0.1018 (−2.93)***
Firm controls	Yes	Yes	Yes
Two-digit SIC industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Number of observations	4,547	4,547	4,547
Adj. *R*-squared	0.0568	0.0575	0.0559

$$+\left(\sum_{t}\beta_t \times Year\_Dummies\right)+\left(\sum_{n}\beta_n \times Industry\_Dummies\right)+\varepsilon \tag{4}$$

PROB_IRS_AUD represents the ex ante likelihood of an IRS audit for a given firm size and year. It is obtained from the Transactional Records Access Clearinghouse (TRAC) – a nonpartisan research watchdog affiliated with Syracuse University that publicly releases statistics on the performance of many federal agencies according to the government's real data – 'to measure on-the-ground IRS enforcement' (Hoopes et al., 2012, p. 1605).[9] All other variables are the

[9]Data on the probability of an IRS audit for an asset class and year are obtained from TRAC. See https://trac.syr.edu/tracirs/trends/v14/corporations.html.

same as in Equation (3). The coefficient of interest is β_3, which shows the incremental impact of comparability for firms that receive greater IRS attention.

Table 5 reports that the coefficient on the interaction term (β_3) is negative and significant (at the 1% level) across the three proxies for comparability. That is, the association between

Table 5. Association between corporate tax distance and accounting comparability conditional on the probability of an IRS audit We examine the association between corporate tax distance and accounting comparability conditional on the probability of an Internal Revenue Service (IRS) audit (*PROB_IRS_AUD*). *PROB_IRS_AUD* varies across firm sizes and years. Its data are obtained from http://trac.syr.edu/tracirs/trends/v14/corporations.html consistent with Hoopes et al. (2012). All variables are defined in the Appendix, and sample firms are described in Table 1. Comparability is measured by $COMPACCT_{i,j}$ denoting a three-step process. The first step requires estimation of the accounting function on a firm-year basis by the association between quarterly earnings and stock returns. $Earnings_{q,i,t} = \alpha_{i,t} + \beta_{i,t} \times StockReturn_{q,i,t} + \varepsilon_{q,i,t}$, where *Earnings* is the income before extraordinary items for quarter q deflated by the market value of equity at the end of the previous quarter and *StockReturn* is the stock return during that quarter. The regression is estimated using data from 16 quarters before year t for firm i. The second step computes the coefficients $\alpha_{j,t}$ and $\beta_{j,t}$ for firm j in the same industry for the same years. The third step compares the actual and the predicted earnings of firm i for each of the previous 16 quarters with predicted earnings simulated using firm j's accounting function and firm i's stock return. The pairwise comparability score between firm i's and firm j's accounting system at time t is measured by the negative average of the difference between actual and predicted earnings for the previous 16 quarters. $COMPACCT4_{t-1}$ denotes an average of the four highest $COMPACCT_{i,j}$ values for firm i at year $t-1$. $COMPACCT10_{t-1}$ denotes an average of the ten highest $COMPACCT_{i,j}$ values for firm i at year $t-1$. $COMPACCTIND_{t-1}$ denotes an average of $COMPACCT_{i,j}$ for all firms in its industry for firm i at year $t-1$. The coefficients of comparability and its interaction terms are multiplied by 1,000 for expositional reasons. We report t-statistics in parentheses with standard errors clustered by firm. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level, respectively, on a two-tailed basis. SIC = Standard Industrial Classification.

	Dependent variable is		
	UTBTOT_DISTANCE	*UTBTOT_DISTANCE*	*UTBTOT_DISTANCE*
Variable	(1)	(2)	(3)
$COMPACCT4_{t-1}$	0.5814		
	(2.95)***		
PROB_IRS_AUD	−0.0147	−0.0149	−0.0134
	(−3.00)***	(−2.89)***	(−2.69)***
$COMPACCT4_{t-1} \times$ *PROB_IRS_AUD*	−10.1490		
	(−5.30)***		
$COMPACCT10_{t-1}$		0.3801	
		(1.63)	
$COMPACCT10_{t-1} \times$ *PROB_IRS_AUD*		−7.1253	
		(−3.56)***	
$COMPACCTIND_{t-1}$			−0.0588
			(−0.87)
$COMPACCTIND_{t-1} \times$ *PROB_IRS_AUD*			−3.9482
			(−4.25)***
Firm controls	Yes	Yes	Yes
Two-digit SIC industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Number of observations	4,215	4,215	4,215
Adj. *R*-squared	0.182	0.183	0.182

comparability and tax distance becomes more negative when the likelihood of IRS scrutiny is higher. The coefficient on comparability becomes significantly positive or insignificant in all columns, consistent with a view that the heightened IRS scrutiny likelihood is an underlying mechanism through which comparability affects firm tax strategies.

4.5. Controlling for Tax Disclosure Quality

To address the concern that our results are driven by firm disclosure quality, as documented by prior research (see Section 2), we estimate Equation (2) after also controlling for two proxies for disclosures that are associated with tax avoidance. These proxies measure the levels of firm disclosure on geographical segment earnings (*GEO_DISC*; Hope et al., 2013) and disaggregation quality (*DQ*; Chen et al., 2015). The first two variables are indicators that take a value of one if the firm reports those details and zero otherwise. Data for these tests are available only for recent years, which causes sample attrition. As a result, we do not use them as the main tests. *DQ* is a proxy for disclosure quality based on the level of disaggregation of financial data items in firms' financial statements. *DQ* is measured by the count of non-missing Compustat line items and represents the level of detail or fineness of data in firms' financial statements. Additional tests show that, despite controlling for *DQ*, the coefficients on comparability remain negative and significant with the magnitudes of coefficients being higher than in Equation (2) (results not tabulated).

In sum, we find that financial reporting comparability is negatively associated with tax distance, even after controlling for firm disclosure policies. Our results are robust to alternative proxies for tax avoidance. One interpretation of our findings is that comparability improves the ongoing conformance of a firm's tax policy with those of its industry peers, documented by prior studies (Armstrong et al., 2019; Bird et al., 2018). We extend those studies by showing that this conformance is related to financial reporting. Our results are also consistent with the proposition that comparability improves the IRS's understanding and the resultant moderation of an aggressive firm's tax policy (Hoopes et al., 2012) while emboldening tax strategies for tax conservative firms.

4.6. Exogenous Shock to Comparability

We examine mandatory IFRS adoption as an exogenous shock to financial statement comparability around the world (Brochet et al., 2013; DeFond et al., 2011; Hong, 2013; Hong et al., 2014; Wang, 2014). The literature has extensively documented that mandating a single set of accounting standards across many countries enhances financial statement comparability.[10] Motivated by DeFond et al. (2011), we measure improved comparability as an increase in uniformity, defined as a percentage change increase in the number of industry peers using the same accounting standards under the IFRS reporting regime relative to the number of industry peers using a domestic generally accepted accounting principles (GAAP) reporting regime (*ΔUniformity*). We extract financial data from Compustat Global and exclude financial and utility firms (i.e. firms with SIC codes of 4900–4999 and 6000–6999).

We categorize mandatory adopters as firms that use IFRS for the first time on or after 2005. Our sample period consists of the three fiscal years (2002–2004) prior to adoption (the pre-adoption period) and the first three fiscal years (2005–2007) after adoption (the post-adoption period). Our main benchmark sample is local GAAP users in non–IFRS adopting countries that we identify using the propensity score matching (PSM) approach. We construct this benchmark sample by

[10]Improved comparability increases cross-border investment (DeFond et al., 2011), reduces insiders' ability to profit from private information (Brochet et al., 2013), and facilitates information transfer (Yip & Young, 2012).

matching each treatment firm to two control firms with replacement using the PSM approach. We first estimate a logistic regression to calculate the probability of being a mandatory IFRS adopting firm using the full sample of treatment and control firms. Next, we estimate a propensity score for each firm using the predicted probabilities from the logit model and match each treatment firm to two control firms that have the nearest score as the treatment firm in the same industry and in the same year. We use matching with replacement to reduce the propensity score distance between the matched comparison units and the treatment units (Dehejia & Wahba, 2002).[11]

Our proxy for tax distance is measured globally, and is not based on UTB. It is based on the tax avoidance measure that is computed following Atwood et al. (2012); that is, the difference in explicit taxes paid from a country's statutory tax rate. Thus, tax avoidance (*TAXAVOID*) for firm *i* in year *t* is measured as

$$TAXAVOID_{i,t} = \frac{\left[\sum_{t-2}^{t} (PTEBX \times \rho)_{i,t} - \sum_{t-2}^{t} CTP_{i,t}\right]}{\sum_{t-2}^{t} PTEBX_{i,t}}, \tag{5}$$

where *PTEBX* is pre-tax earnings before exceptional items (*pi* – *xi*). *PTEBX* is pre-tax earnings beforeexceptional items (*pi* – *xi*).[12] ρ is home-country statutory corporate income tax rate.[13] *CTP* is current taxes paid (*tx* – change in *txp*).[14]

The higher the value of *TAXAVOID*, the lower the amount of taxes paid relative to taxes payable based on the current statutory tax rate in that country. So, *TAXAVOID* is a direct proxy of tax aggressiveness. We then construct our tax distance measure (*TaxAvoid_Distance*) as the median value of the absolute differences in *TAXAVOID* between a focal firm and the firms whose market capitalization is within the same decile and are in the same two-digit SIC industry classifier across countries.

We categorize the treatment sample into two subgroups, LOW and HIGH, conditional on the sample median of $\Delta Uniformity$. $\Delta Uniformity$ is measured by the natural logarithm of the number of firms using the same GAAP in an industry that a firm can be compared with after the mandatory IFRS adoption, divided by the number of firms in an industry that a firm can be compared with before the mandatory adoption, all minus one (e.g. DeFond et al., 2011). We then run the following baseline model to test for the effect of mandatory IFRS adoption on tax avoidance in these two subgroups, separately:

$$\begin{aligned} TaxAvoid\_Distance_{i,t+1} = {} & \beta_0 + \beta_1 (Mandatory \times Post) + \Sigma \beta_n Z_{it} \\ & + \gamma_{Industry} + \chi_{Country} + \eta_{Year} + \varepsilon, \end{aligned} \tag{6}$$

[11] In comparison to matching without replacement, matching with replacement helps researchers to alleviate bias and resolve the potential problem that the results are exposed to the order in which the treatment units are matched (Dehejia & Wahba, 2002, p. 153). Dehejia and Wahba (2002, p. 154) state:

> When the treatment and comparison units are very different, finding a satisfactory match by matching without replacement can be very problematic. In particular, if there are only a handful of comparison units comparable to the treated units, then once these comparison units have been matched, the remaining treated units will have to be matched to comparison units that are very different. In such settings, matching with replacement is the natural choice.

[12] Item numbers reference the Compustat Global FTP database.

[13] We obtain these statutory rates from a KPMG LLP online summary, PricewaterhouseCoopers LLP's online information, and Coopers & Lybrand LLP's worldwide tax summary guides.

[14] When current tax expense (*txc*) is missing, we replace it with total tax expense less deferred taxes (*txt* − *txdI*) when available. We delete observations when current tax expense (*txc*) is missing and either total tax expense (*txt*) or deferred taxes (*txdI*) is missing. Item names refer to the mnemonics in the Compustat Global FTP database.

where the first indicator variable, *Mandatory,* takes on a value of one if a firm first adopts IFRS in 2005 or afterward, and it applies only to firms domiciled in countries where IFRS is mandatorily adopted in 2005. The second indicator variable, *Post*, takes on a value of one if a firm's fiscal year-end falls into the post-IFRS period starting in 2005. The interaction between *Mandatory* and *Post* captures the incremental tax distance effects for the mandatory adopters following mandatory IFRS adoption. Z_{it} is a vector of controls that are known to affect firm tax strategies, and $\gamma_{Industry}$, $\chi_{Country}$, and η_{Year} are indicator variables for the Fama-French 48 industries, countries, and years, respectively.

The treatment sample contains firms located in countries where IFRS is mandated from 2005 and that adopted IFRS after 2005.[15] Firms that voluntarily adopted IFRS before 2005 are excluded from the treatment sample to avoid a potential endogeneity concern associated with the voluntary adoption and firm tax strategies.[16] Control firms are local GAAP users from countries that are yet to adopt IFRS.

Our control variables are pre-tax return on assets (*PreTaxROA*), firm size (*SIZE*), cash size (*CashSize*), research and development expenditures (*RDEXP*), capital structure (*LEV*), sales growth (*SalesGrowth*), and an indicator variable for multinational operations (*MULTI*) (Atwood et al., 2012). We also include country-level controls to isolate the IFRS effect from other country-level characteristics. When country-level controls are included, country indicators are excluded to avoid the perfect linear correlation between country-level controls and country indicators. The country-level characteristics are the level of required book-tax conformity from Atwood et al. (2010) (*BTaxC*) to control for country-level book-tax conformity on firms' tax planning activities, an indicator for countries with a worldwide approach (*WW*) to differentiate between firms in home countries with a worldwide versus territorial approach to imposing a tax on foreign income, the tax evasion index (*TaxEnf*) to capture perceived tax enforcement, and the statutory corporate tax rate in the home country (*TaxRate*) to control for the impact of tax system characteristics on tax avoidance. We also include the average of variable pay as a percentage of total compensation for firms in the country (*VarComp*) to capture management incentives for tax avoidance (Gaertner, 2014; Hanlon & Heitzman, 2010; Phillips, 2003; Rego & Wilson, 2012) and the cross-sectional earnings volatility (*Earnvol*) to control for differences in the cross-sectional variance in pre-tax earnings. Finally, we use indicator variables for the country's economic development and legal origin (*LegalFactor*).[17]

Panel A of Table 6 presents the sample distribution for variables in our regression model. The median level of *TAXAVOID* is 7.98% of pre-tax earnings. Our descriptive statistics of *TAXAVOID* are largely consistent with those reported by Atwood et al. (2012). We also report that 23.93% of our sample observations have multinational operations.

Table 6, Panel B, reports the estimation results of the logit model (1), using the same set of control variables as in Equation (6). The model reasonably predicts the introduction of IFRS across firms and countries. The proportion of concordant pairs is over 90%, and the proportion of discordant pairs is under 10%. IFRS is more likely to be adopted by firms that have smaller size, higher sales growth, multinational operations, and lower profits. These findings indicate

[15]Note that certain type of firms are exempted from adopting IFRS in countries where IFRS is mandated in 2005. For example, European Union (EU) firms that are listed in domestic exchanges rather than in the EU stock exchange are exempted from mandatory IFRS adoption (Pownall & Wieczynska, 2018). We designate as mandatory IFRS adopters firms whose accounting standard (ACCTSTD) variable has a value of DI from 2005 and onward in the Compustat Global data file.

[16]We exclude 297 voluntary adopters, which constitute 1,388 firm-year observations.

[17]Atwood et al. (2010) include a variable for legal investor protection from La Porta et al. (1998) that incorporates legal origin and other variables. We use legal origin because it is a commonly used variable that captures the underlying fundamental legal structure of a country. The results are qualitatively similar if we use the Atwood et al. (2010) measure.

Table 6. Effect of mandatory IFRS implementation on tax distance around the world. We consider mandatory International Financial Reporting Standards (IFRS) adoption as an exogenous shock to comparability. This table presents results on whether the tax distance effects around the IFRS mandate are more significant for mandatory adopters that experience increased comparability of accounting information following mandatory IFRS adoption. Panel A reports the sample distribution for Δ*Uniformity*, which captures the change in the uniformity of accounting standards across industries and countries (DeFond et al., 2011). We use firms that adopt IFRS, located in countries with mandatory IFRS adoption, as the treatment sample, and the firms with local generally accepted accounting principles (GAAP) located in countries that do not adopt IFRS during our sample period as the control sample. Panel A presents descriptive statistics. Panel B presents the results of the propensity score matching approach. We perform this procedure by first estimating a logit regression to model the probability of being a mandatory IFRS adopter (*MandatoryAdopter*) using the sample of treatment firms and the benchmark sample of local GAAP users in non–IFRS adopting countries. We perform this estimation by using all of the firm- and country-level control variables in Equation (1), as well as industry and year fixed effects as our predictors. We then compute the propensity score for each firm using the predicted probabilities from the logistic regression model. We match-pair a treatment firm with a control firm per the Fama and French 48 industry classifier and year using nearest-neighbor matching without replacement. χ^2-statistics (in parentheses) are based on robust standard errors clustered by country. Panel C presents the results of the regressions. All variables are defined in the Appendix, and sample firms are described in Table 1. We report *t*-statistics in parentheses with standard errors clustered by firm. *, **, and *** denote significance at the 0.10, 0.05, and 0.01 level, respectively, on a two-tailed basis. SIC = Standard Industrial Classification.

Panel A: Descriptive statistics

Variable	Mean	Q1	Median	Q3	Standard deviation Std.
TaxAvoid_Distance	0.0570	0.0260	0.0581	0.0773	0.0615
ΔUniformity	0.0972	0.0000	0.0000	0.0000	0.3198
Firm-level controls					
PreTaxROA	0.0040	− 0.0125	0.0422	0.0960	0.2011
SIZE	11.7739	10.4553	11.7611	13.0521	1.9969
CashSize	0.2240	0.0580	0.1302	0.2705	0.2888
R&D	0.0186	0.0000	0.0000	0.0114	0.0530
Lev	0.0979	0.0033	0.0531	0.1495	0.1204
SalesGrowth	0.1986	0.0313	0.1111	0.2341	0.3741
MULTI	0.1055	0.0000	0.0000	0.0000	0.3072
Country-level controls					
BTaxC	0.0119	0.0094	0.0104	0.0143	0.0053
WW	0.8252	1.0000	1.0000	1.0000	0.3798
TaxEnf	4.2318	4.3400	4.4100	4.5800	0.6345
TaxRate	0.3151	0.2800	0.3000	0.3500	0.0627
VarComp	0.3228	0.2200	0.3000	0.3600	0.1182
Earnvol	0.6242	0.5196	0.6448	0.7391	0.1773
Factor	4.0792	3.6818	3.6818	4.5172	1.0761

Panel B: Procedure to develop propensity score to identify matched sample

Variable Dependent variable is *MandatoryAdopter*	
PreTaxROA	− 2.2428
χ2 *p*-value	(< 0.0001)
SIZE	− 0.2829
χ^2*p*-value	(< 0.0001)
CashSize	0.0153
χ^2*p*-value	(0.7584)
R&D	− 1.4534
χ^2*p*-value	(< 0.0001)
Lev	− 1.1929

(*Continued*)

Table 6. Continued.

Panel B: Procedure to develop propensity score to identify matched sample

Variable Dependent variable is *MandatoryAdopter*	
χ^2 *p*-value	(< 0.0001)
SalesGrowth	0.5271
χ^2 *p*-value	(< 0.0001)
MULTI	0.6388
χ^2 *p*-value	(< 0.0001)
BTaxC	− 34.1061
χ^2 *p*-value	(< 0.0001)
WW	− 2.1518
χ^2 *p*-value	(< 0.0001)
TaxEnf	− 0.1384
χ^2 *p*-value	(< 0.0001)
TaxRate	− 0.5641
χ^2 *p*-value	(0.0511)
VarComp	− 1.7023
χ^2 *p*-value	(< 0.0001)
Earnvol	6.1952
χ^2 *p*-value	(< 0.0001)
LegalFactor	0.1852
χ^2 *p*-value	(< 0.0001)
Two-digit SIC industry fixed effects	Yes
Year fixed effects	Yes
Number of observations	34,561
Pseudo R^2	0.47
Percent concordant	93.3
Percent discordant	6.7

Panel C: Regression

	ΔUniformity is		
	LOW		HIGH
Variable	(1)		(2)
Mandatory × *Post*	0.0520***		− 0.0290***
	(16.57)		(− 5.86)
Difference in Coefficient on *Mandatory* × *Post (1)– (2)*		0.081***[5.49]	
Firm-level controls			
PreTaxROA	− 0.1314***		− 0.0983***
	(− 18.83)		(− 10.03)
SIZE	− 0.0131***		− 0.0062***
	(− 24.88)		(− 18.47)
CashSize	0.0135***		0.0163***
	(3.85)		(5.17)
R&D	− 0.0747***		− 0.0775***
	(− 4.88)		(− 4.45)
Lev	0.0313***		− 0.0298***
	(2.78)		(− 4.36)
SalesGrowth	0.0005		− 0.0166***
	(0.18)		(− 5.15)
MULTI	0.0028**		0.0000
	(2.12)		(0.03)
Country-level controls			
BTaxC	− 1.5316***		− 0.5383***
	(− 5.08)		(− 3.25)

(*Continued*)

Table 6. Continued.

Panel C: Regression		
	ΔUniformity is	
	LOW	HIGH
Variable	(1)	(2)
WW	0.0319***	− 0.0087***
	(10.33)	(− 4.27)
TaxEnf	− 0.0201***	− 0.0107***
	(− 18.29)	(− 12.62)
TaxRate	− 0.0876***	− 0.1803***
	(− 3.66)	(− 13.71)
VarComp	− 0.0958***	− 0.0096
	(− 9.16)	(− 1.43)
Earnvol	0.0037	0.0446***
	(0.65)	(7.09)
LegalFactor	− 0.0001	− 0.0030***
	(− 0.06)	(− 5.16)
Year fixed effects	Yes	Yes
Two-digit SIC industry fixed effects	Yes	Yes
Country fixed effects	No	No
Number of observations	9,344	6,750
Adj. *R*-squared	0.3944	0.2786

that, in general, the adoption of the global accounting standard appears to be driven by a demand by firms to increase their informational transparency and comparability and mitigate external capital market financial frictions in a global market. Also, the global accounting standards are more likely to be adopted by countries with relatively weak tax institutional characteristics, that is, those without laws that require book-tax conformity, territorial versus worldwide approach, and the ex ante weaker tax enforcement. Such countries may use the global accounting standard mandate as a substitute for their weak tax institutional mechanisms.

Table 6, Panel B, summarizes the results of the propensity score matching procedure, and Panel C provides the results of Equation (6). Our main interest is the coefficient (β_1) on *Mandatory* × *Post*. β_1 represents the incremental effect of an increase in corporate tax distance for the treatment firms relative to the control firms. Table 6 shows that β_1 is negative and significant (p-value < 0.01) only in the subsample that experiences a large increase in uniformity. The difference of β_1 is statistically significant (p-value < 0.01) between LOW and HIGH subgroups. This result is consistent with the increased uniformity of accounting after mandatory IFRS adoption having an incremental negative effect on corporate tax distance across countries, on average. These results indicate that more uniformity in, and thus the improved comparability of, financial statements decreases tax distance. These results mitigate the endogeneity concerns about the negative relation between comparability and tax distance from Equation (3).

5. Conclusion

We examine and find that financial statement comparability could, in some instances, affect firms' tax planning activities. Our study is based on the idea that comparability reduces the information acquisition costs for external agents, thereby improving the agents' knowledge about a

firm's atypical tax planning activities. This improved knowledge, in turn, could alter the costs and benefits of tax avoidance. The changed cost–benefit profile of tax avoidance could induce tax managers to change their tax strategies that are perceived negatively by external agents. Consistent with this idea, our results indicate that comparability moves firms' UTBs toward those of industry peers and, thus, promotes greater harmonization of tax strategies among industry peers.

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Appendix A: Measurement of Variables

Key Variables

UTBTOTAL = Total uncertain tax benefits at the end of the year scaled by lagged total assets. (Source: Compustat North America)
UTBETR = Amount of total uncertain tax benefits at year-end that would impact the effective tax rate scaled by lagged total assets (Source: Compustat North America)
UTBTOT_DISTANCE = Median value of the absolute difference of UTBTOTAL of the given firm relative to other firms in the same two-digit SIC industry group in the same year.
$COMPACCT_{i,j}$ = Three-step process measurement. The first step requires estimation of the accounting function on a firm-year basis by the association between quarterly earnings and stock returns.

$$Earnings_{q,i,t} = \alpha_{i,t} + \beta_{i,t} \times StockReturn_{q,i,t} + \varepsilon_{q,i,t},$$

where *Earnings* is the income before extraordinary items for quarter q deflated by the market value of equity at the end of the previous quarter and *StockReturn* is the stock return during that quarter. The regression is estimated using data from 16 quarters before year t for firm i. The estimated coefficients of intercept $\alpha_{i,t}$ and $\beta_{i,t}$ are the two measures of the accounting function on a firm-year basis. The second step requires estimation of accounting functions of the peer firms (defined by industry at the two-digit SIC level). The coefficients $\alpha_{j,t}$ and $\beta_{j,t}$ for firm j in the same industry are calculated for the same years. The third step measures the closeness between firm i's and firm j's accounting function in that year by comparing the actual and the predicted earnings of firm i for each of the previous 16 quarters with predicted earnings simulated using firm j's accounting function and firm i's stock return. The pairwise comparability score between firm i's and firm j's accounting system at time t is measured by the negative average of the difference between actual and predicted earnings for the previous 16 quarters. (Source: Compustat North America)
*COMPACCT*4 = Average of the four highest $COMPACCT_{i,j}$ values for firm i at year $t-1$.

*COMPACCT*10 = Average of the ten highest $COMPACCT_{i,j}$ values for firm *i* at year *t* – 1.
COMPACCTIND = Mean value of $COMPACCT_{i,j}$ for all firms in its industry for firm *i* at year *t* – 1.

$$TAXAVOID_{i,t} = \frac{\left[\sum_{t-2}^{t} (PTEBX \times \rho)_{i,t} - \sum_{t-2}^{t} CTP_{i,t}\right]}{\sum_{t-2}^{t} PTEBX_{i,t}},$$

where *PTEBX* is pre-tax earnings before exceptional items (*pi* – *xi*), ρ is home-country statutory corporate income tax rate, and *CTP* is current taxes paid (*txc* – the change in *txp*). (Source: Compustat Global)
TAX_DISTANCE = Median value of the absolute difference of *TAXAVOID* relative to other firms in a two-digit SIC industry classifier in the same year.

Other Variables

SIZE = Natural logarithm of firm's total assets (*at*) at the end of year *t*. (Source: Compustat North America)
RDEXP = Firm's research and development expense (*xrd*) at year *t* divided by total assets at the end of year *t*. (Source: Compustat North America)
LEV = Firm's long-term debt (*dltt*) divided by total assets at the end of year *t*. (Source: Compustat North America)
BTM = Natural log of firm's book value of common equity (*ceq*) divided by its market value of common equity (*csho* × *prcc_f*), both measured at the end of year *t*. (Source: Compustat North America)
NOL = Indicator variable equal to one if there is a tax loss carryforward during year *t* and zero otherwise. (Source: Compustat North America)
ΔNOL = Change in tax loss carryforward from the previous year to the current year scaled by total assets the beginning of the current year. (Source: Compustat North America)
ROA = Income before extraordinary items (*ib*) divided by total assets at the end of year *t*. (Source: Compustat North America)
PPE = Property, plant, and equipment (*ppegt*) divided by total assets at the end of year *t*. (Source: Compustat North America)
FI = Pre-tax foreign income for year *t* (*pifo*) scaled by total assets at the end of year *t*. (Source: Compustat North America)
DEP = Depreciation and amortization expense for year *t* divided by total assets at the end of year *t*. (Source: Compustat North America)
EQINC = Equity income for year *t* (*esub*) scaled by total assets at the end of year *t*. (Source: Compustat North America)
MEZZ_FIN = Convertible debt and preferred stock (*DCPSTK*) divided by total assets (*AT*) at the end of year *t*. (Source: Compustat North America)
AOCI = Absolute of accumulated other comprehensive income (*AOCI*) divided by total assets (*AT*) at the end of year *t*. (Source: Compustat North America)
DEFERREDREV = Indicator that equals one if deferred revenue (*DRC* + *DRLT*) is nonzero and zero otherwise. (Source: Compustat North America)
STCOMP_EXP = Indicator that equals one if stock compensation expense (*STKCO*) is nonzero and zero otherwise. (Source: Compustat North America)
M&A = Indicator that equals one if firm *j* is involved in a merger and acquisition in year *t* and zero otherwise. (Source: SDC Platinum)

DDAQ = Standard deviation of the firm-level residuals from the Dechow and Dichev (2002) model as modified by McNichols (2002) over five years and multiplied by negative one. The model is a regression of working capital accruals on lagged, current, and future cash flows plus the change in revenue and property, plant, and equipment. All variables are scaled by average total assets. (Source: Compustat North America)
PROB_IRS_AUD = Number of face-to-face corporate audits completed in IRS fiscal year *t* in an asset class, divided by total number of 1120s filed in calendar year *t* – 1 in that asset class.
CashSize = Cash and short-term investments divided by total assets at the end of year *t*. (Source: Compustat North America)
SalesGrowth = Percentage change in sales in a given year *t*. (Source: Compustat North America)
PreTaxROA = Pre-tax income before exceptional items (*pi* – *xi*) divided by lagged total assets (*at*). (Source: Compustat Global)
MULTI = Indicator variable that equals zero if foreign income taxes are missing or are zero and one otherwise. (Source: Compustat Global)
BTaxC = Level of book-tax conformity from Atwood et al. (2010).
WW = Dummy variable that takes on the value of one for firms in home countries with a worldwide approach and zero for firms in home countries with a territorial approach.
TaxEnf = Managers' perceptions of the strength of tax enforcement in the country, from the 1996 Global Competitiveness Report
TaxRate = Statutory corporate tax rate in the home country. (Sources: a KPMG LLP online summary, PricewaterhouseCoopers LLP's online information, and Coopers & Lybrand LLP's worldwide tax summary guides)
VarComp = Country average of managers' variable pay as a percentage of management compensation.
Earnvol = Scaled descending decile rank of cross-sectional pre-tax earnings volatility by country-year.
LegalFactor = Institutional factors (*Factor*) using the results of a factor analysis of the country's legal tradition (common law versus code law), strength of investor rights, and ownership concentration as developed by La Porta et al. (1998).
ΔUniformity = Natural logarithm of percent change in the number of firms using the same GAAP in an industry that a firm can be compared with after the mandatory IFRS adoption (e.g. DeFond et al., 2011).