THE IMPACT OF TAX HAVEN USE ON TAX ACCRUAL QUALITY

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Abstract

A firm's decision to utilize subsidiaries in tax haven jurisdictions is often a complexity increasing, discretionary, tax planning choice. Adding to the tax haven debate, this study examines the relationship between tax haven use and tax accrual quality—i.e., the degree of mapping between cash tax payments and tax expense (Choudhary et al., 2016). While tax haven use is not found to directly impact tax accrual quality, all tax havens are not created equal. Based on signaling theory, firms could use tax accrual quality to signal their intentions to external stakeholders when the subsidiary jurisdiction is a low-quality information environment. Using the Financial Secrecy Index (FSI) to capture the information environment quality of a firm's subsidiaries, I find a positive association between tax haven use and tax accrual quality. That is, tax haven use can assist in decreasing the level of managerial tax accrual estimation error being made despite the fact that tax haven activities are associated with additional complexity.

Keywords: Tax Havens, Subsidiaries, Tax Accrual Quality, Information Environment, Management Estimation Error, Jurisdictions.

1. INTRODUCTION

Financial reporting for income taxes is an area of increasing concern for U.S. investors, standard-setters, and regulators. Investors generally perceive that accounting for income taxes under the United States' generally accepted accounting principles (GAAP) is complex and often opaque, potentially reducing the informativeness of these disclosures, particularly in respect of the analysis of the cash effects of income taxes (Financial Accounting Foundation [FAF], 2012, 2013; Graham et al., 2012; Linebaugh et al., 2013). In response to this widely held perception, the Financial Accounting Standards Board (FASB) has renewed its focus on clarifying the calculation and disclosure of income taxes for U.S. firms (FASB, 2016).[2] Similarly, the Securities and Exchange Commission (SEC) has focused on improving and enhancing the disclosures related to income taxes in corporate filings, as shown by the increasing frequency at which tax-related comment letters are issued to U.S. firms (Kubick et al., 2016; Whalen & Usvyatsky, 2014).[3] Thus, the United States provides an important institutional setting for the examination of financial accounting for income taxes.

The informativeness of tax expense disclosures could be reduced through certain corporate activities. Specifically, anecdotal and academic evidence suggests that a corporation's presence

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[2] Accounting Standards Update (ASU) 740 updates add new tax disclosures and promote greater disaggregation for some existing disclosures, including unrecognized tax benefits, valuation allowance changes, and carryforwards (FASB, 2016).

[3] In 2017, approximately 10 percent of SEC comment letters related to a tax issue, resulting in tax being the seventh most frequently commented area (EY, 2017).

in foreign tax haven jurisdictions is generally associated with increased tax aggressiveness, opportunities for tax-related earnings management, and reduced financial reporting and geographical disclosure transparency (see, for example, Akamah et al., 2018; Dyreng et al., 2012; Dyreng & Lindsey, 2009).[4] The use of tax haven subsidiaries inserts an additional layer of complexity into financial reporting for income taxes via increased secrecy, reduced information sharing with regulators and tax authorities in other countries, greater long-term tax strategy uncertainty, and potentially fewer shareholder protections, regulations, and enforcement activities (e.g., Fan, 2008; Krull, 2004; Thomas, 1999). Importantly, the use of tax subsidiaries can affect tax-related financial reporting through the tax accrual via deferred tax activities that alter the computation of taxes payable versus income tax expense. In contrast to overall financial reporting quality, tax accrual quality—i.e., the degree of mapping between a firm's income tax expense and cash tax payments (Choudhary et al., 2016)—focuses exclusively on tax reporting.[5] The use of tax havens can spur companies to make more decisions regarding the reinvestment of earnings in particular jurisdictions, tax-motivated transfer pricing, income shifting, multi-jurisdictional tax information agreements, and tax reserves than firms with foreign operations that do not use tax havens. Accordingly, in this study, I investigate the following research question: How does subsidiary tax haven use by firms impact tax accrual quality?

While the working capital accrual quality and earnings metrics provide a holistic view, the tax accrual quality specifically isolates the effect of the use of tax havens on the informativeness of existing tax disclosures. My focus on the tax accrual, via income tax expense, is motivated by the fact that higher tax accrual quality serves as a positive signal to the market about a firm's ability to properly estimate its tax obligation and, therefore, provides information beyond overall profitability data (Choudhary et al., 2016). Despite the inherent complexity involved in accounting for income taxes, the extant research shows that income tax expense disclosures provide information on the persistence and growth of current and future earnings, future tax payments, and the extent of earnings management through the tax accrual, incremental to the information contained in pre-tax income (e.g., Ayers et al., 2009; Beardsley et al., 2020; Hanlon, 2005; Hanlon & Heitzman, 2010).

A U.S. firm's use of tax haven subsidiaries could impact the degree of management estimation error in its tax accrual. The use of tax havens not only allows businesses to reduce explicit taxes (Hanlon & Heitzman, 2010), but enables tax haven subsidiaries to change the likelihood that

[4] Tax havens are most often countries outside those in which a firm normally operates, and are characterised by their low tax rates and heightened secrecy laws (Tax Justice Network, 2010-2022). They typically have small populations, few natural resources that can be used for production and sales, and little to entice firms to operate within them beyond the financial opportunities that they provide (Akamah et al., 2018). A list of haven jurisdictions is located in the appendix. While no exact amount of tax haven holdings is available, experts estimate that there is between $21 and $32 trillion of wealth located in tax haven jurisdictions (Clarke-Billings, 2016). At the corporate level, Apple has reported that $181 billion in cash is held by foreign subsidiaries versus about $16 billion held in the United States (Fernández Campbell, 2016).

[5] Although utilizing working capital accrual quality as a measure of overall transparency provides some evidence that tax planning via tax havens yields tax savings while simultaneously increasing financial and organizational complexity, it does not specifically address the tax account (Balakrishnan et al., 2019). After controlling for size and volatility of pre-tax earnings, the correlation between working capital accrual quality and tax accrual quality is 0.14, indicating that the two measures are not equivalent. Additionally, working capital accruals are expected to reverse within a year, whereas some of the estimation error in the tax accrual is expected to reverse over the long term. Tax accrual quality is not highly correlated with tax avoidance, tax risk, and tax-related earnings management proxies (Choudhary et al., 2016). Results found using the above constructs are not guaranteed to hold when tax accrual quality is also measured.

tax payments will be made. Managers could intentionally or unintentionally affect the precision of tax expense estimation when there is greater reliance on tax haven jurisdictions among all disclosed subsidiaries.

Although foreign earnings tend to be more persistent than domestic earnings, tax haven use could introduce regulation, uncertainty, and potential tax planning opportunities that could directly affect the tax accrual. Specifically, Schmal et al. (2021) note that firms report higher income tax expenses after being implicated in a tax haven data leak, suggesting that the use of havens provides an opportunity for greater tax planning when under a firm's managers' control and when this activity will not cause reputational concerns. The authors suggest that less readable tax footnotes following a leak could be attributable to a deflection of attention from operations in critical tax havens (Schmal et al., 2021). Thus, without taking each tax haven jurisdiction's information environment into consideration, greater haven use could either increase estimation error, as it results in greater compliance costs and uncertainty, or reduce estimation error, as it provides greater tax planning opportunities.

Although the perception exists that tax havens can act as "treasure islands" (Peretti, 2016), it is unlikely that all of these jurisdictions do so. According to the signaling theory (see Spence, 1973), the quality of the overall informational environment of the subsidiary could create an incentive for managers to strategically signal their intentions when subsidiaries are located in tax haven jurisdictions associated with reduced transparency. For instance, Dyreng et al. (2012) note that tax haven subsidiaries in strong information environments constrain some tax-related earnings management. Lewellen (2016) notes that when a firm based in the United States incorporates in a tax haven, financial reporting transparency can improve if that firm's primary corporate operations are located in a strong information environment jurisdiction with regulations that promote greater transparency.[6] Firms could use tax accrual quality as a mechanism by which to signal their strategic intent when using tax haven subsidiaries in particular jurisdictions. By increasing the certainty that tax positions will be upheld and confirming whether any tax payments are due, firms can signal that their foreign subsidiary operations have positive intentions, despite the fact that they use tax havens.

To investigate whether firms' tax haven use is associated with tax accrual quality, I utilize a sample of 14,259 U.S. domiciled firm-year observations from 1999-2014 obtained by merging Exhibit 21 Significant Subsidiary Disclosures[7] and Compustat data (Dyreng & Lindsey, 2009). When considering only the impact of tax haven subsidiary use, I do not find evidence that their use is associated with tax accrual quality. However, subsidiary information environment quality could have a moderating effect on the relationship between tax haven use and tax accrual quality. Utilizing financial secrecy (the extent of cross-border refusal to share financial information with legitimate regulatory and judicial entities) as a proxy for subsidiary information environment quality, I find a positive association between tax haven use, financial secrecy, and tax accrual quality. That is, firms with greater tax haven use and operations in

[6] Financial reporting transparency is measured by the author through overall accrual quality, earnings informativeness, and analyst forecast accuracy.

[7] U.S. public firms must report all significant subsidiaries in Exhibit 21 when filing a 10-K annual report with the SEC. 10-K filings contain annual audited financial statements, notes, and management's discussion. A significant subsidiary is one that has more than ten percent of total assets, earns at least ten percent of total net income, or is the parent of other subsidiaries that together could be considered significant. If the subsidiaries are continuing the same line of work as the parent company, the specific subsidiaries do not have to be identified and the number of foreign subsidiaries will suffice (17 CFR 229.601).

jurisdictions with higher financial secrecy report higher tax accrual quality despite the additional uncertainty created by participating in tax haven activities.

An examination of the conditional model effects provides further evidence that there is higher tax accrual quality—and greater informativeness of the tax expense disclosure—with greater tax haven use after considering subsidiaries' information environments. U.S. domiciled firms do appear to use tax accrual quality as a mechanism for signaling discretion over foreign subsidiary operations and have the ability to estimate tax implications with greater certainty, leading to more precise mapping between cash tax payments and the tax accrual. Subsequent analyses further suggest that the incentive to provide a signal to external stakeholders about tax haven use depends on auditor involvement, the extent of tax planning, and how the information environment quality is captured.

This study contributes to the tax haven literature by showing that the use of tax haven subsidiaries can provide additional tax-related information to external stakeholders, contributing to a firm's overall financial reporting quality and the utility of existing disclosures. Results suggest that managers are incentivized to provide additional tax accrual information when tax haven subsidiaries are in jurisdictions with less transparency. Further, the study contributes to the signaling theory literature by examining the distinct decision to disclose significant foreign subsidiaries and the discretionary choice to form, maintain, and disclose tax haven subsidiaries. The information content of the tax expense depends on the overall quality of the information environment of the subsidiary. Distinct from a firm's overall financial reporting quality, tax accrual quality attempts to isolate the specific effect of tax haven subsidiaries on tax expense disclosure and, in particular, management estimation error. This study also acts as a natural extension to Choudhary et al. (2016) by examining how tax havens affect tax accrual quality in a different way to non-haven foreign operations.

In addition to examining tax haven use through a tax minimization lens, this study provides evidence of the way in which firms' financial reporting is affected. The results provide timely evidence to investors, tax fairness campaigners, and other interested stakeholders of the role that tax haven subsidiaries and their information environments play in tax reporting quality. In particular, this study provides guidance on the FASB's continued project: updating ASC 740. While there have been recent legislative changes in the United States—as part of the Tax Cuts and Jobs Act of 2017—that increase complexities for firms when reporting tax information to the Internal Revenue Service and create uncertainties about foreign operations, tax reporting quality does not necessarily suffer due to foreign haven operations. In light of renewed attention towards low-taxed intangible assets and base erosion, this study also provides greater context to the larger discussion surrounding country-by-country reporting. Although the FASB has backed away from incorporating such disclosures as part of firms' annual reports, country-by-country reporting still provides the IRS with an opportunity to gather additional information about the extent of firm subsidiaries' operations globally. The focus of the current study provides initial evidence of how tax haven jurisdiction use can impact U.S. firms' financial reporting. However, it may not be possible to generalize the use of foreign subsidiaries disclosures to other jurisdictions.

The remainder of the paper is as follows: Section 2 develops hypotheses, while Section 3 describes the research design. Section 4 discusses results and Section 5 concludes.

2. PRIOR RESEARCH AND HYPOTHESES

Tax Haven Use

Tax haven jurisdictions incrementally add to the complexity and uncertainty faced by a firm. It is necessary for firms to consider regulations, compliance activities, and long-term tax strategies and, simultaneously, to determine how to treat tax haven-related transactions (Krull, 2004). While the use of tax havens can increase firm value, operating in tax haven jurisdictions could also create additional risk and lead to managerial opportunism (Desai & Dharmapala, 2006). Tax sheltering firms engaging in the most aggressive tax strategies do tend to have more foreign operations and tax haven subsidiaries than non-sheltering firms (Lisowsky, 2010; Wilson, 2009). Additionally, Dyreng and Lindsey (2009) note that the use of tax haven subsidiaries is associated with a 1.5 percentage point reduction in the global tax burden and a reduction of $64 billion in current tax expense over a 12-year period. Changing regulatory costs likely increase the appeal of using tax haven jurisdictions and the degree of profit shifting out of the United States (Klassen & Laplante, 2012).

Similarly, research suggests that firms' tax haven use is associated with lower quality geographical earnings disclosures and, ultimately, reduced reporting transparency in respect of global operations and true investment risk (e.g., Hope et al., 2013). Firms that disclose fewer geographical segments tend to have lower foreign earnings prices than firms with increased segment disclosures. This is consistent with findings that geographical disclosures improve transparency and investors' monitoring capabilities (Hope et al., 2008). Tax shaming incidents in the media reinforce the link between tax havens and immoral, secretive activities (Barford & Holt, 2013). U.S. institutional investors, such as the California Public Employees' Retirement System (known as CalPERS), have even threatened to divest and block the stock and bond purchases of firms that use foreign tax havens (Hanlon & Slemrod, 2009). Negative public perceptions about tax haven use potentially impact the quality of tax disclosures related to tax haven subsidiaries (O'Donovan et al., 2019).

Whether tax haven subsidiaries impact financial reporting transparency or income tax expense disclosure is unknown. While two studies—Lewellen (2016) and Lewellen et al. (2021)—examine strategic parent entity incorporation in tax havens, they do not examine the characteristics of the tax havens themselves. Moreover, these studies find that the decision to incorporate in a tax haven is associated with greater financial transparency if the firm actually operates in a different jurisdiction with a strong information environment.[8] The financial reporting decision to locate a firm's legal parent entity in a tax haven shifts the focus away from recurring, operating firm activities, which are often conducted through the creation and use of subsidiaries in multiple jurisdictions. Examining the placement and disclosure of subsidiaries, which could be located in tax haven jurisdictions, can provide incremental knowledge about the tax implications of a firm's operations. Transparent disclosures about the location of a firm's operations could facilitate an assessment of its income tax expense relative to its tax-related payments, especially if tax havens are used. As the intricacies of the income tax expense disclosure are not captured through overall financial reporting quality, examining

[8] Lewellen (2016) measures transparency through accrual quality, earnings informativeness, and analyst forecast accuracy, while Lewellen et al. (2021) focus on the cost of capital premium resulting from haven incorporation. Lewellen et al. (2021) find that the equity capital premium is reduced for operations located in a strong information environment jurisdiction.

the relationship between tax haven subsidiaries and the informativeness of the tax expense disclosure can provide incremental information about the impact of foreign tax haven use.

Tax Accrual Quality

Tax accrual quality—the degree of mapping between a firm's income tax expense and cash tax payments (Choudhary et al., 2016)—specifically targets the oft opaque income tax expense disclosure located in firms' 10-K annual filings. Although tax haven subsidiaries are associated with tax minimization and less financial reporting transparency, there is not an automatic link between the quality of a firm's tax accrual and tax haven operations. A firm could choose to engage in aggressive tax planning, including tax haven-facilitated income shifting, yet still provide a precise estimate of its tax accrual as it maps into past, present, and future cash tax payments. Choudhary et al. (2016) explain that permanent book tax differences do not affect tax accrual quality because the total income tax expense and cash income taxes paid are the same for these amounts. Rather, temporary book tax differences affect tax accrual quality. Choudhary et al. (2016) describe tax accrual quality as being comprised of two components: management estimation error and GAAP-induced mismapping. A large portion of management estimation error in the tax accrual is caused by the idiosyncratic complexities of the tax account, as tax practices are often tailored to suit a firm's unique circumstances. The application of technical U.S. GAAP standards and knowledge to the financial reporting of income taxes can result in GAAP-induced mismapping. While GAAP-induced mismapping applies across firms, estimation error is contingent on the specific decisions made by a firm. Thus, the current study focuses on the estimation error component of tax accrual quality.

Tax expense estimation error is costly because it decreases earnings informativeness (Choudhary et al., 2022). Additional estimation errors relating to tax haven use can further decrease the utility of existing tax disclosures. When there is a higher degree of precision between financial reporting for income taxes and tax-related cash payments, the tax accrual provides information that is incremental to pre-tax financial income. Ayers et al. (2009) note that there is an inverse relationship between the extent of a firm's tax planning and the incremental information content of estimated taxable income over book income, suggesting that there is a need to examine the impact of tax haven subsidiaries on tax accrual quality in order to better understand their impact on tax reporting.

Tax haven subsidiaries could impact management estimation error—whether intentional or unintentional—in several ways: through the designation of reinvested earnings, tax-motivated transfer pricing and income shifting, multi-jurisdictional tax information agreements, and the designation of tax reserves. Greater tax haven use could exacerbate the effect that such subsidiaries have on tax accrual estimation error. Without taking each tax haven jurisdiction's information environment into consideration, greater haven use could either increase estimation error as a result of the higher compliance costs and greater uncertainty involved, or reduce estimation error as a result of the greater tax planning opportunities that would be provided.

First, reinvested earnings can affect the estimation of the extent of deferred tax activities. Profits from tax havens can be designated as permanently reinvested and, if so, are subject to lower U.S. taxation rates, even following the introduction of the Tax Cuts and Jobs Act of 2017. While permanent book tax differences do not affect tax accrual quality, the designation of permanently reinvested earnings reduces the extent of temporary book tax differences that could create uncertainties between tax expense and cash tax payments. Reinvested earnings

provide greater certainty as to the tax treatment of those earnings (e.g., Krull, 2004). Any amount of haven earnings not deemed to be permanently reinvested would increase the total income tax expense and the income taxes payable but would not necessarily increase the cash payments, which could affect tax accrual quality. As such, greater haven use could either result in greater certainty coming from reinvesting earnings, or greater potential tax payments if the income is eventually subject to the full U.S. corporate tax rate. More (less) reinvested earnings could thus increase (decrease) tax accrual quality by reducing (increasing) temporary book tax differences.

Second, greater tax haven use could spur greater tax-motivated transfer pricing. Taylor et al. (2015) find that tax haven use is positively associated with transfer pricing aggressiveness. As a tax planning opportunity, tax-motivated transfer pricing enables firms to obtain a tax benefit and, at the same time, increases international tax enforcement challenges related to international tax enforcement efforts. The downward management of tax payments by means of the allocation of profits and losses among firm entities located in different tax jurisdictions through transfer prices could increase or decrease tax accrual estimation error (Hanlon & Heitzman, 2010). Reallocating taxable income (such as service fees, royalties, and dividends) or expenses (such as research and development, intangible asset, and advertising costs) that are well founded, or less likely to be questioned by regulators and tax authorities, could increase tax accrual quality. In particular, the greater certainty gained in relation to tax-motivated transfer pricing when there is economic substance behind each transaction could be reflected in the relationship between tax expense and tax payments.

However, if tax-motivated transfer pricing is a part of a riskier tax strategy, there could be additional uncertainty about the merit of such actions. Greater uncertainty relating to transfer pricing activities could increase complexity when estimating the income tax accrual and increase overall risk.

Third, tax haven use can have implications for multi-jurisdictional tax information agreements. Further consideration of legislation in multiple jurisdictions, potential legal implications, and whether additional taxes will be owed could directly impact tax accrual estimation. By operating in additional jurisdictions, firms could renew attention to the question of which tax authorities have access to underlying tax haven information. The existence of agreements to share information between different jurisdictions could cause concerns to arise about transparency in relation to tax haven use and discourage firms from relying heavily on tax haven operations (Bennedsen & Zeume, 2016; Schmal et al., 2021).

Reputational concerns surrounding the spread of the tax repercussions of operating in haven jurisdictions could cause greater uncertainty and result in tax planning opportunities being reined in. While tax planning opportunities are expected to persist in these jurisdictions (see, for example, Schmal et al., 2021), less aggressive opportunities provide a better understanding of deferred tax implications. As a result, there could be greater estimation precision between the tax accrual and cash tax payments if managers are aware that tax haven operation information will be shared with multiple tax authorities.

Fourth, greater haven use could result in changes being made to the assessment and recording of tax reserves. Although the accrual may not reverse in the short term, tax accrual quality captures management estimation error over the long term. A firm could recognize a tax accrual for income shifted into a tax haven subsidiary by creating a deferred tax liability or a reserve

for an uncertain tax position given the strategy used to shift income (Gleason & Mills, 2011; Krull, 2004). While the creation of a deferred tax liability or an increase in reserves could affect financial reporting for income taxes, it also increases uncertainty when determining whether any cash tax payments will occur. Uncertainty surrounding the eventual settling of a tax position and any inquiries made by various tax authorities further exacerbate the difficulty in assessing the probability of tax payments being required. However, the secrecy provided by haven jurisdictions could reduce the likelihood that a tax position will eventually be questioned by a tax authority, reducing future tax payments and mitigating the impact of reserves on the financial accounting of income taxes. In turn, tax reserves relating to haven use could benefit or hinder the estimation of the tax accrual in the current period.

The decision to use and maintain subsidiaries in tax haven jurisdictions extends beyond pure tax or financial reporting purposes. Due to the uniqueness of tax accrual quality, tax haven subsidiaries could impact the tax expense disclosure positively or negatively. Tax haven subsidiaries could enable more precise estimations between cash tax payments and tax expense to be made. Greater precision could come from greater tax position certainty or greater management discretion over tax planning activities. As tax haven operations are not required to operate in a multinational environment, managers have greater discretion with regard to the extent to which their firm operates in such jurisdictions and the extent to which they use haven-related tax planning (Dyreng & Lindsey, 2009; Holzer, 2013). Precise tax accrual estimates could indicate that tax haven use does not hinder a firm's ability to estimate its tax obligation, despite the fact that the use of havens can cause reduced geographical transparency and, potentially, provide more tax planning opportunities (Akamah et al., 2018; Dyreng et al., 2012). Conversely, greater haven use could result in additional uncertainty about the tax outcomes of haven operations, leading to greater estimation error. Lower tax accrual quality would support the preexisting perception that the additional complexity afforded by tax havens could be harmful to a firm and its stakeholders, who rely on existing tax disclosures. Hence, the first hypothesis posits that tax haven use is associated with tax accrual quality.

H1: Tax haven use is associated with tax accrual quality.

Certain tax havens, such as the Cayman Islands, actively attempt to disassociate corporate activities within their borders from tax evasion (Peretti, 2016). These jurisdictions claim that they are not actually tax havens and that there are legitimate reasons for operations to have a presence there, such as to facilitate international trade (Peretti, 2016). Furthermore, some tax havens and foreign subsidiaries have more stringent laws and financial regulations than other jurisdictions, so tax-related activities that take place within them have more definitive outcomes. Financial reporting and tax disclosure requirements differ across jurisdictions, with some jurisdictions requiring firms to make additional disclosures in order to provide evidence of the legitimacy of their operations and the extent of any tax-motivated transfer pricing taking place. Jurisdictions with stronger information environments—such as those that use common law, have stable governments, grant investor rights, and/or are conducive to ownership concentration—can limit managerial decisions and some private gains (Atwood, Drake, & Myers, 2010; Blaylock et al., 2012). Stronger information environments across subsidiary jurisdictions could impact the creation of reserves in respect of uncertain tax positions, affect discretion when determining a deferred tax liability, and reduce estimation error in relation to a firm's tax expense. Dyreng et al. (2012) note that tax haven subsidiaries located in jurisdictions with weak information environments facilitate increased levels of earnings management.

Thus, the overall information environment of a firm's subsidiaries could incentivize managers to communicate additional tax information with external stakeholders through tax accrual quality. Signaling theory notes that not all agents share the same information and that some agents (e.g., managers) have more information about a firm's future prospects than others (Spence, 1973). Managers can use additional privileged information to provide signals to stakeholders about a firm's future prospects. Multiple subsidiaries can be created and operated in a variety of jurisdictions. While GAAP-induced mismapping is expected to persist, the extent of tax accrual estimation error for firms that use tax haven operations more extensively is more likely to be affected by information environment quality than it is for firms with foreign operations in non-tax haven jurisdictions.

Since the use of tax havens creates more incremental uncertainty than the use of other foreign operations, managers can signal their strategic intentions about tax haven operations when the quality of the information environments of subsidiary jurisdictions is poorer. If subsidiaries are located in high transparency jurisdictions, tax accrual quality would likely be guided by existing rules and disclosures. However, in jurisdictions with less transparency, managers have greater insight into the operations than external stakeholders. The provision of higher quality tax accrual information through smaller estimation error can signal that there is an underlying business purpose for a firm's tax haven operations. Furthermore, higher tax accrual quality signals that tax haven operations in reduced transparency operations do not adversely affect a firm's financial reporting quality.

Firms could, therefore, use tax accruals to enable their shareholders to gain a better understanding of the tax implications of using havens and to produce more precise tax estimates. Greater reliance on tax haven operations could allow a firm to create a long-term strategy where its managers are able to better estimate income tax expense and predict with greater certainty whether tax payments will be made. The idiosyncratic nature of subsidiaries is likely to impact the tax accrual in a different way than it impacts firm-level financial reporting quality. Therefore, I expect that the managers' incentive to signal higher quality tax information depends on the quality of the subsidiary information environment. As such, information environment quality is expected to act as a moderating factor between tax haven use and tax accrual quality. The second hypothesis states:

> **H2:** Subsidiary information environment quality impacts the association between tax haven use and tax accrual quality.

3. RESEARCH DESIGN

Sample Selection

Sample selection began with the universe of observations and Compustat data was used to estimate Model 1 (70,700 firm-years). 50,763 firm-year observations generate TaxAQ values from 1999 through 2014 after requiring at least five years of consecutive data and 20 observations per industry-year. The sample begins in 1999 to ensure that all changes due to the implementation of SFAS 109 (Accounting for Income Taxes)[9] are consistently applied and ends prior to the implementation of the Tax Cuts and Jobs Act of 2017, which could impact

[9] Issued by the FASB, SFAS 109 establishes the financial accounting and reporting of the impact of income taxes, including current and deferred tax liabilities and assets.

firms' use of tax havens and add tax reporting complexities, such as issues relating to the change in the statutory corporate income tax. Furthermore, the sample period ends prior to the Panama Papers tax data leak that took place on April 3, 2016 in order to ensure that firms have the same reporting incentives for haven subsidiaries. The examination of Exhibit 21 significant subsidiaries necessitated a focus on firms that file 10-K reports with the SEC (i.e., firms domiciled in the United States). The requirement for no missing values for Exhibit 21 data and control variables resulted in a final sample of 14,259 observations (2,543 unique multinational firms).[10] Table 1 provides additional details about the sample selection criteria.

Table 1: Sample Selection

	TaxAQ
Universe of firm-year observations with tax accrual quality determinant variables between 1999 and 2014	70,700
Less: Observations with fewer than five years of consecutive data and at least 20 observations per industry-year	(19,937)
	50,763
Less: Firm-year observations with missing Exhibit 21 data (only U.S. domiciled firms are retained)	(27,310)
	23,453

Research Design

To examine the association between firms' tax haven operations and tax accrual quality, I use Exhibit 21 Significant Subsidiary Disclosures from 1999 to 2014, which provide data on firms' significant subsidiary operations and confirm whether the jurisdictions within which these operations are based are considered to be tax havens.[11] Tax accrual ($TaxACC_{jt}$) is measured as the difference between total income tax expense and income-related cash outflows using the statement-of-cash-flows approach. Cash tax payments (CTP) from *t*-1 through *t*+1 and current period changes in long-term deferred tax assets and losses (ΔDTA_LT_{jt} and ΔDTL_LT_{jt}) are included in Model 1, with all variables scaled by total assets (Choudhary et al., 2016; Choudhary et al., 2021). $TaxAQ_{jt}$ is then calculated as the standard deviation of firm *j*'s residuals from *t*-4 through *t* using Fama-French 48 industry-year regressions, multiplied by negative one, such that a larger number indicates higher quality. A minimum of 20 observations per industry-year is required.[12]

[10] Results are qualitatively similar if utilities and financial firms are removed from the sample.

[11] While Exhibit 21 Significant Subsidiary Disclosures are public as part of Form 10-K, the disclosures are not easily compiled. Dyreng and Lindsey (2009) leverage a text search program to identify more subsidiaries in distinct countries for a larger range of corporations than would be possible if the data were collected by hand. I thank the authors for making this data available. Firms must have at least one foreign (non-U.S.) subsidiary to be included in this dataset. The designation of a jurisdiction as a tax haven occurs when a jurisdiction appears on at least two of four tax haven lists (Akamah et al., 2018). The full list of tax haven jurisdictions can be found in the appendix.

[12] The tax accrual quality (TaxAQjt) measure requires tax accrual information from *t*-4 through *t* and, as a result, needs input information from *t*-5 through *t*+1. Therefore, the initial Compustat sample extends five years prior to the Exhibit 21 data. A firm must have a minimum of five years of data to calculate rolling windows of $TaxAQ_{jt}$.

$$TaxACC_{jt} = \beta 0 + \beta_1 CTP_{jt-1} + \beta_2 CTP_{jt} + \beta_3 CTP_{jt+1} + \beta_4 \Delta DTL\_LT_{jt} + \beta_5 \Delta DTA\_LT_{jt} + \varepsilon_{jt} \quad (1)$$

Given partial observability in the setting (e.g., Phillips, 2003), I use a two-stage Heckman approach to control for the strategic decision to have and disclose a haven subsidiary. Model 2 presents the first stage model of the strategic disclosure decision. HIGH_SUB is a dichotomous variable set equal to one for firm-years with an above industry median amount of Exhibit 21 subsidiaries and to zero for below median amounts. HIGH_SUB captures whether a firm is willing to disclose a greater number of subsidiaries, regardless of whether these subsidiaries are located in tax haven jurisdictions. If firms have a greater number of disclosed subsidiaries, there is greater strategic subsidiary disclosure and there could be a greater willingness to disclose haven use. Based on Dyreng and Lindsey (2009) and Dyreng et al. (2020), the decision to have and disclose subsidiaries is driven by firm size (SIZE), payment of taxes on foreign operations (FOREIGN), profitability (LEV, ROA, NOL), ownership of intangible assets (INTANG), capital intensity (PPE), and industry differences (IND). Fitted values from the first stage regression are used to calculate the Inverse Mills Ratio (IMR_{jt}), which is then included in each second stage model.[13]

$$HIGH\_SUB_{jt} = \beta_0 + \beta_1 SIZE_{jt} + \beta_2 FOREIGNjt + \beta_3 LEV_{jt} + \beta_4 ROA_{jt} + \beta_5 NOL_{jt} + \beta_6 INTANG_{jt} + \beta_7 PPE_{jt} + \beta_8 k\Lambda IND_{jt} + \varepsilon_{jt} \quad (2)$$

I then estimate a second stage ordinary least squares (OLS) regression with $TaxAQ_{jt}$ as the primary dependent measure and tax haven use ($HAVEN_{jt}$) as the primary independent variable of interest. I use the percentage of tax haven countries to total unique countries (HAVEN%) and the percentage of tax haven subsidiaries (HAVENINT) as measures of tax haven use (Dyreng & Lindsey, 2009).

Industry and year fixed effects are also included (Balakrishnan et al., 2019). All continuous variables are winsorized at the 1st and 99th percentiles and are mean centered. The standard error is corrected.[14]

$$TaxAQ_{jt} = \beta_0 + \beta_1 HAVEN_{jt} + \beta_2 SIZE_{jt} + \beta_3 FOREIGN_{jt} + \beta_4 TAX\_LOSS_{jt} + \beta_5 PTBI\_VOL_{jt} + \beta_6 AQ_{jt} + \beta_7 BIG4_{jt} + \beta_8 MTB_{jt} + \beta_9 LEV_{jt} + \beta_{10} ROA_{jt} + \beta_{11} NOL_{jt} + \beta_{12} SUBMAT_{jt} + \beta_{13} INTANG_{jt} + \beta_{14} RDjt + \beta_{15} ADV_{jt} + \beta_{16} PPE_{jt} + \beta_{17} ESO\_INDUSTRY_{jt} + \beta_{18} DISC\&EXTRA_{jt} + \beta_{19} IMR_{jt} + \varepsilon_{jt} \quad (3)$$

I include control variables based on the extant tax research. First, factors that are associated with tax accrual quality, as noted by Choudhary et al. (2016, 2022), including working capital accrual quality, employee stock options, and discontinued and extraordinary items. Based on Francis et al. (2005), working capital accrual quality (AQ) is measured in a similar way to TaxAQ, and maps past, present, and future working capital accruals into cash flows from operations. AQ is included to control for overall financial reporting quality and to further differentiate any additional informational value of TaxAQ. AQ is expected to be positively associated with TaxAQ. Following Choudhary et al. (2016), I control for GAAP-induced

[13] Results are robust to the removal of IMR in the second stage model.
[14] The standard error is corrected through the HECKIT option of PROC QLIM procedure in SAS.

mismapping between book and tax reporting, using the presence of employee stock options (ESO_INDUSTRY), and discontinued and extraordinary items (DISC&EXTRA). Therefore, TaxAQ captures management estimation error, both intentional and unintentional, when mapping cash tax payments to the tax accrual.

I also include four firm characteristic variables identified by Choudhary et al. (2016) that are associated with increased complexity when applying tax-related GAAP: firm size (SIZE), taxable foreign operations (FOREIGN), the presence of a tax loss (TAX_LOSS), and pre-tax earnings volatility (PTBI_VOL). Balakrishnan et al. (2019) note that factors associated with tax planning could affect a firm's decision to use tax haven subsidiaries. Thus, the current study takes a similar approach and proxies for tax planning opportunities through the presence of a Big 4 auditor (BIG4), firm growth (MTB), net operating loss (NOL), leverage (LEV), and return on assets (ROA). Hope et al. (2013) find that the decision to use a tax haven can also be influenced by the amount of intangible assets held by a firm (INTANG), as well as research and development (RD) costs, property, plant and equipment (PPE) expenses, and advertising (ADV) spend. I further control for the materiality of subsidiaries presented (SUBMAT) and the Inverse Mills Ratio from Model 2 (IMR).

I then test the association between subsidiary information environment quality and the HAVEN measures. The Financial Secrecy Index (FSI) developed by the Tax Justice Network—a prominent organization that campaigns for tax fairness—provides static indices for 92 unique countries, including most tax haven jurisdictions and the United States (Tax Justice Network, 2016). The index quantifies the size of the jurisdiction with regard to the provision of offshore financial services and comprises 15 criteria relating to the transparency of beneficial ownership, corporate regulation, tax and financial regulation efficiency, and international standards and cooperation.[15] Higher indices are synonymous with higher financial secrecy within the jurisdiction. Firm-year information environment quality is measured as the average FSI score for all unique subsidiary jurisdictions. That is, the FSI captures the information environment quality of all of a firm's subsidiaries. All continuous variables are mean centered.

$$\begin{aligned} TaxAQ_{jt} = {} & \beta_0 + \beta_1 HAVEN_{jt} + \beta_2 FSI_{jt} + \beta_3 HAVEN_{jt}*FSI_{jt} + \beta_4 SIZE_{jt} + \\ & \beta_5 FOREIGN_{jt} + \beta_6 TAX\_LOSS_{jt} + \beta_7 PTBI\_VOL_{jt} + \beta_8 AQ_{jt} + \beta_9 BIG4_{jt} + \\ & \beta_{10} MTB_{jt} + \beta_{11} LEV_{jt} + \beta_{12} ROA_{jt} + \beta_{13} NOL_{jt} + \beta_{14} SUBMAT_{jt} + \beta_{15} INTANG_{jt} + \\ & \beta_{16} RD_{jt} + \beta_{17} ADV_{jt} + \beta_{18} PPE_{jt} + \beta_{19} ESO\_INDUSTRY_{jt} + \beta_{20} DISC\&EXTRA_{jt} + \\ & \beta_{21} IMR_{jt} + \varepsilon_{jt} \end{aligned} \quad (4)$$

[15] Developed by a team of economists, accountants, and journalists at the Tax Justice Network, the Financial Secrecy Index has a specific focus on tax haven jurisdictions and offshore financial services. The index is politically neutral and specifically isolates the effect of *financial* regulations and secrecy laws, rather than *overall* jurisdiction laws and regulations, on firm activities. While previous index iterations have been developed (in 2009, 2011, and 2013), these cannot be directly compared due to methodological differences. However, the secrecy criteria used in the development of the index have not significantly changed and many of the top FSI jurisdictions are well known tax havens, alleviating some concerns. Furthermore, tax haven secrecy is sticky, with few significant changes having taken place during the last decade despite the fact that the subject has attracted increasing media and political attention. As the setting could also be affected by the 2008 financial crisis, in an untabulated analysis, I drop all observations in 2008 and 2009. The results are robust.

4. RESULTS

Descriptive Statistics

Table 2, Panel A presents descriptive statistics for Model 4 variables. On average, 19.9 percent of all disclosed subsidiary jurisdictions are located in tax havens (HAVEN%) and 18.9 percent of all subsidiaries are in tax havens (HAVENINT). Since firms may have foreign operations without paying or reporting tax payments on foreign income, as evidenced by only 68.8 percent of firms reporting foreign tax payments, the inclusion of FOREIGN in the first stage model alleviates concerns about multinational firms' aggressive tax planning and/or transfer pricing activities. Firms are also more likely than not to have a tax loss (TAX_LOSS) and to use a Big 4 auditor (BIG4).[16]

In Panel B, I present the FSI scores and the rule of law—an alternative subsidiary information quality measure—average scores for each jurisdiction. Tax haven jurisdictions are shown separately from non-tax haven jurisdictions. I find that tax haven jurisdictions have a higher average FSI score than non-tax haven jurisdictions (t=2.159) while there is no jurisdictional difference utilizing average rule-of-law scores, i.e., a high FSI does not automatically correspond with weaker rule of law. Panel C presents Spearman correlations. FSI score is weakly positively associated with the HAVEN variables and is negatively correlated with TaxAQ. This is consistent with increased secrecy resulting in lower reporting quality.

Table 2: Descriptive Analyses

This table provides summary statistics relating to key characteristics of the firm-year observations in the 1999 to 2014 sample. Tax accrual quality (TaxAQ) is presented along with two measures of tax haven use: the percentage of subsidiary countries that are tax haven jurisdictions (HAVEN%) and the percentage of all subsidiaries that are located in tax haven jurisdictions (HAVENINT). Details of the variable definitions are provided in the Appendix. All continuous variables are winsorized at the 1% and 99% levels. Bolded correlation coefficients are statistically significant at the 5% level.

Panel A: Descriptive Statistics

Variable	N	Mean	25th Pctl	Median	75th Pctl	Std Dev
TaxAQ	14,259	-0.016	-0.021	-0.012	-0.007	0.012
HAVEN%	14,259	0.199	0.000	0.167	0.286	0.230
HAVENINT	14,259	0.189	0.000	0.127	0.263	0.238
FSI	14,259	362.289	230.933	309.030	431.140	218.026
RULE_OF_LAW	13,033	1.029	0.705	1.062	1.456	0.529
SIZE	14,259	6.402	5.057	6.378	7.742	2.103
TAX_LOSS	14,259	0.213	0.000	0.000	0.000	0.409
PTBI_VOL	14,259	0.112	0.026	0.054	0.112	0.206
FOREIGN	14,259	0.688	0.000	1.000	1.000	0.463
AQ	14,259	-0.065	-0.077	-0.046	-0.029	0.066
ROA	14,259	0.031	-0.016	0.0573	0.121	0.190
MTB	14,259	2.528	1.160	1.929	3.185	3.551
LEV	14,259	0.217	0.019	0.183	0.331	0.216
BIG4	14,259	0.803	1.000	1.000	1.000	0.398
INTANG	14,259	0.228	0.400	0.153	0.341	0.243

[16] 80 percent of firms use a Big 4 auditor. In the main analyses, BIG4 is consistently negatively associated with the TaxAQ suggesting that using a Big 4 auditor does not necessarily result in more precise tax accrual estimates.

RD	14,259	0.046	0.000	0.009	0.066	0.076
ADV	14,259	0.012	0.000	0.000	0.007	0.031
NOL	14,259	0.482	0.000	0.000	1.000	0.500
PPE	14,259	0.501	0.192	0.373	0.689	0.522
SUBMAT	14,259	2.231	1.333	1.857	2.579	1.485
ESO_INDUSTRY	14,259	0.589	0.000	1.000	1.000	0.492
DISC&EXTRA	14,259	0.029	0.000	0.000	0.000	0.168
CASH_ETR	10,797	0.251	0.100	0.223	0.335	0.211

Panel B: Jurisdictions' Information Environment Quality

	Financial Secrecy Index	**Rule of Law (Average)**
Mean		
Tax haven jurisdictions	281.61	0.74
Non-tax haven jurisdictions	193.73	0.84
t-stat.	2.159 (p<0.05)	-0.599
Tax Haven Jurisdictions		
Switzerland	1,466.1	1.87
Hong Kong	1,259.4	1.43
Singapore	1,147.1	1.63
Cayman Islands	1,013.1	1.09
Luxembourg	816.9	1.81
Lebanon	760.2	-0.53
Bahrain	471.3	0.47
Macao	420.1	0.65
Panama	415.6	-0.15
Marshall Islands	405.5	-0.07
Jersey	354.0	1.74
Guernsey	339.3	
British Virgin Islands	307.6	
Barbados	298.3	1.18
Mauritius	297.0	0.94
Bahamas	273.0	1.00
Malta	260.9	1.37
Uruguay	255.5	0.57
Isle of Man	228.5	
Liberia	218.2	-1.35
Bermuda	217.7	1.01
Cyprus	213.9	1.02
Liechtenstein	202.3	1.47
Ireland	187.4	1.66
Vanuatu	142.8	0.17
U.S. Virgin Islands	118.2	0.89
Samoa	117.5	0.81
Gibraltar	109.3	
Aruba	99.5	1.14
Latvia	92.7	0.59
Belize	92.4	-0.27
Botswana	90.5	-0.43
Anguilla	89.3	1.25
St. Vincent & the Grenadines	79.6	0.76
Antigua & Barbuda	79.5	0.84
Costa Rica	74.9	0.51

St. Kitts & Nevis	68.4	0.66
Curaçao (Dutch Antilles)	67.8	0.88
Seychelles	60.8	0.19
Monaco	53.6	0.89
St. Lucia	51.6	0.71
Brunei	47.4	0.56
Grenada	42.1	0.18
San Marino	33.2	0.89
Andorra	27.3	1.28
Dominica	21.3	0.65
Cook Islands	17.8	0.09
Montserrat	10.8	
Non-Tax Haven Jurisdictions		
United States of America	1254.7	1.56
Germany	701.8	1.66
United Arab Emirates (Dubai)	440.7	0.57
Japan	418.3	1.33
United Kingdom	380.2	1.69
Malaysia (Labuan)	338.7	0.51
Turkey	320.9	0.03
China	312.1	-0.41
Austria	295.3	1.86
Brazil	263.6	-0.26
Canada	251.7	1.75
Russia	243.2	-0.86
France	241.9	1.42
Belgium	181.2	1.33
Guatemala	177.1	-1.07
Israel	173.7	0.96
Netherlands	168.3	1.78
Chile	166.6	1.28
Saudi Arabia	163.8	0.18
Australia	148.0	1.76
India	148.0	0.06
Philippines	146.0	-0.42
Ghana	139.1	-0.06
Korea	124.2	0.91
Mexico	117.0	-0.52
Norway	110.6	1.93
New Zealand	109.3	1.87
Sweden	100.8	1.89
Italy	98.6	0.51
South Africa	90.8	0.09
Spain	77.4	1.15
Turks & Caicos	72.4	
Iceland	67.1	1.78
Slovakia	60.1	0.42
Macedonia	59.5	-0.36
Poland	57.3	0.61
Estonia	52.9	0.98
Portugal (Madeira)	52.5	1.12
Czech Republic	44.2	0.90

Denmark	38.2	1.92
Hungary	37.3	0.77
Greece	37.2	0.67
Slovenia	22.4	0.98
Finland	19.4	1.96

Table 2: Descriptive Analyses (cont.)

Panel C: Pearson\Spearman Correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	TaxAQ	-	-0.00	-0.00	**-0.04**	**0.13**	**-0.11**	**-0.33**	**-0.04**	**0.19**	0.00	0.00	**0.14**	-0.00	**0.07**	**-0.09**	**-0.05**	-0.01	**0.09**	**0.07**	**-0.09**	**-0.03**
2	HAVENINT	-0.00	-	**0.94**	**0.31**	**0.22**	0.00	**-0.03**	**0.11**	**0.09**	**0.07**	**0.06**	-0.00	**0.12**	-0.01	**0.03**	0.01	-0.01	0.00	**0.11**	-0.01	0.00
3	HAVEN%	-0.01	**0.94**	-	**0.34**	**0.20**	0.01	**-0.04**	**0.08**	**0.07**	**0.05**	**0.04**	0.02	**0.11**	0.01	-0.01	0.01	-0.01	0.01	**0.14**	-0.01	-0.00
4	FSI	**-0.07**	**0.31**	**0.33**	-	**-0.14**	0.01	**0.11**	0.00	**-0.06**	**-0.05**	**-0.02**	**-0.12**	**-0.06**	-0.01	**0.16**	**0.05**	0.01	**-0.14**	**-0.04**	**0.13**	-0.02
5	SIZE	**0.18**	**0.09**	**0.09**	**-0.19**	-	**-0.10**	**-0.44**	**0.24**	**0.41**	**0.26**	**0.17**	**0.32**	**0.48**	**0.26**	**-0.26**	**-0.05**	0.02	**0.17**	**0.42**	**-0.22**	0.02
6	TAX_LOSS	**-0.11**	**0.02**	**0.02**	**0.02**	**-0.09**	-	**0.17**	**-0.25**	**-0.10**	**-0.24**	**-0.14**	**0.03**	**-0.05**	**-0.11**	0.01	**-0.06**	-0.00	**0.05**	**-0.03**	-0.01	**0.05**
7	PTBI_VOL	**-0.15**	-0.01	-0.01	**0.08**	**-0.35**	**0.09**	-	**-0.13**	**-0.40**	**-0.35**	**-0.10**	**-0.14**	**-0.21**	**-0.21**	**0.25**	**0.03**	**0.07**	**-0.12**	**-0.18**	**0.11**	**0.03**
8	FOREIGN	**0.02**	**-0.04**	**-0.05**	**-0.09**	**0.25**	**-0.25**	**-0.17**	-	**0.16**	**0.19**	**0.14**	**-0.09**	**0.18**	**0.15**	**0.14**	**0.05**	**0.05**	**-0.06**	**0.20**	**0.10**	**-0.03**
9	AQ	**0.16**	**0.03**	**0.02**	**-0.09**	**0.33**	**-0.06**	**-0.41**	**0.18**	-	**0.19**	**0.09**	**0.07**	**0.22**	**0.18**	**-0.06**	0.02	**-0.10**	**0.16**	**0.12**	0.00	**-0.04**
10	ROA	**0.03**	**0.02**	**0.02**	**-0.08**	**0.34**	**-0.17**	**-0.49**	**0.23**	**0.28**	-	**0.40**	**-0.16**	**0.17**	**0.12**	**-0.08**	**0.03**	**-0.10**	**0.06**	**0.07**	**-0.06**	**-0.07**
11	MTB	-0.01	0.02	0.01	**-0.04**	**0.09**	**-0.05**	**-0.09**	**0.07**	**0.05**	**0.19**	-	**-0.12**	**0.14**	**0.13**	**0.19**	**0.08**	-0.00	**-0.03**	0.01	**0.03**	**-0.05**
12	LEV	**0.10**	-0.02	0.00	**-0.06**	**0.17**	**0.03**	**0.12**	**-0.13**	**-0.08**	**-0.21**	**-0.13**	-	**0.10**	**0.17**	**-0.32**	**-0.07**	**0.04**	**0.26**	**0.18**	**-0.25**	**0.03**
13	BIG4	**0.04**	**0.04**	**0.05**	**-0.13**	**0.48**	**-0.05**	**-0.22**	**0.18**	**0.21**	**0.21**	**0.07**	**0.04**	-	**0.11**	**-0.07**	**-0.11**	**-0.04**	**0.10**	**0.17**	**-0.05**	-0.00
14	INTANG	**0.07**	**-0.06**	**-0.04**	**-0.04**	**0.20**	**-0.09**	**-0.07**	**0.09**	**0.01**	**0.07**	**0.04**	**0.13**	**0.07**	-	-0.01	**0.13**	**0.08**	**-0.31**	**0.14**	**0.08**	**-0.03**
15	RD	**-0.08**	0.00	**-0.02**	**0.08**	**-0.32**	**0.02**	**0.27**	**0.02**	**-0.13**	**-0.30**	**0.11**	**-0.17**	**-0.11**	**-0.03**	-	**0.11**	**0.08**	**-0.21**	**-0.19**	**0.38**	**-0.03**
16	ADV	**-0.05**	0.01	0.01	0.01	-0.00	**-0.04**	**0.04**	-0.00	**-0.04**	0.01	**0.07**	-0.01	**-0.05**	**0.10**	-0.01	-	**0.03**	**-0.18**	**-0.07**	**0.03**	-0.01
17	NOL	**-0.02**	**-0.04**	**-0.03**	-0.01	-0.00	-0.00	**0.06**	**0.05**	**-0.03**	**-0.10**	-0.01	**0.04**	**-0.04**	**0.07**	**0.07**	0.01	-	**-0.05**	**0.05**	**0.05**	0.00
18	PPE	**0.08**	0.01	0.00	**-0.08**	**0.09**	**0.04**	**0.04**	**-0.09**	**0.05**	**-0.05**	**-0.05**	**0.22**	**0.04**	**-0.20**	**-0.09**	**-0.09**	**-0.02**	-	**0.08**	**-0.20**	**-0.02**
19	SUBMAT	**0.10**	**-0.04**	-0.00	**-0.08**	**0.37**	**-0.02**	**-0.08**	**0.11**	**0.05**	**0.07**	-0.01	**0.13**	**0.12**	**0.10**	**-0.20**	**-0.02**	**0.03**	**0.05**	-	**-0.12**	**0.03**
20	ESO_INDUSTRY	**-0.10**	**-0.04**	**-0.02**	**0.07**	**-0.23**	-0.01	**0.03**	**0.10**	**0.04**	**-0.04**	0.00	**-0.21**	**-0.05**	**0.06**	**0.26**	**-0.06**	**0.05**	**-0.20**	**-0.16**	-	**-0.04**
21	DISC&EXTRA	**-0.04**	0.00	-0.00	-0.01	**0.02**	**0.05**	0.01	**-0.03**	**-0.05**	**-0.05**	**-0.03**	**0.03**	-0.00	**-0.02**	**-0.02**	-0.00	0.00	-0.01	**0.04**	**-0.04**	-

Main Analyses

In Table 3, I test the association between tax accrual quality and tax haven use. Panel A presents the results of the first stage model. I find that firm size (SIZE) and the presence of foreign tax payments (FOREIGN) are both positively associated with the likelihood of having and disclosing a higher than industry median number of subsidiaries on Exhibit 21. Conversely, firms with greater intangible assets (INTANG) are less likely to report having more subsidiaries. The results suggest that the model increases observability in the current setting.

In Panel B, the second stage Model 3 results indicate that neither HAVEN% nor HAVENINT are significantly related to TaxAQ. Without taking subsidiary information environment quality into consideration, the use and disclosure of tax haven subsidiaries does not appear to impact the degree to which cash tax payments map into income tax expense. That is, having and disclosing the use of tax havens does not appear to affect tax reporting quality.[17] Columns 3

[17] In an untabulated analysis, a median FSI split is used to partition the sample in order to further examine the relationship between the two HAVEN main effects and tax accrual quality. In the below median FSI sample, there is no significant relationship between each HAVEN measure and TaxAQ, although the relationship is negative in nature. However, in the above median FSI sample, there is a positive and significant relationship between haven use and tax accrual quality (HAVEN%, t=1.61; HAVENINT, t=2.56). The additional results provide greater confidence in the underlying relationship between tax haven use and tax accrual quality.

and 4 test the effect of HAVEN on TaxAQ when FSI scores are considered.[18] Columns 5 and 6 use prior year haven use ($HAVEN_{t-1}$), as there could be a time variant impact on the income tax expense. Since all continuous variables are mean centered, HAVEN reflects the impact of tax haven use on tax accrual quality when there is an average value of subsidiary financial secrecy. HAVEN% and HAVENINT are not associated with TaxAQ at the mean value of the FSI score. Thus, the use of tax havens is not associated with tax accrual when the subsidiary information environment quality is held constant. However, the interaction term between HAVEN and FSI reflects a positive association with TaxAQ. The results provide support for the second hypothesis, which predicts that the association between tax haven subsidiary use and tax accrual quality depends on subsidiary information environments. I find that as the FSI scores increase for firm-years with greater tax haven use, there is greater mapping between the current period tax accrual and associated cash tax payments. When considering prior year tax haven subsidiary use, the results are consistent, providing further support for the underlying theory of the relationship between strategic subsidiary choice and income tax expense. The results suggest that managers signal additional tax accrual information when operating in jurisdictions with greater financial secrecy.

Table 3: Tax Accrual Quality and Tax Haven Use

This table tests the relationship between tax haven use and tax accrual quality (TaxAQ) without considering the information environment of the subsidiaries presented on Exhibit 21. Panel A presents the first stage Heckman model results, representing the strategic decision to have and disclose a haven subsidiary.

HIGH_SUB is a dichotomous variable set equal to one for firm-years with an above industry median amount of Exhibit 21 subsidiaries and to 0 for below median amounts. Panel B presents the second stage ordinary least squares (OLS) model. GAAP-induced complexity is controlled for by the presence of stock options (ESO_INDUSTRY) and discretionary and extraordinary items (DISC&EXTRA). Haven use is measured using both the percentage of tax haven jurisdictions (HAVEN%) and the percentage of tax haven subsidiaries (HAVENINT). Current and prior year (*t*-1) haven use is shown. All continuous variables are mean centered. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively (two-tailed). Industry and year fixed effects are included but not reported.

Panel A: First Stage Heckman Model

	[1] Y=HIGH_SUB	
Variables	Coeff.	t-stat.
Intercept	-2.8332***	*-28.85*
SIZE	0.3537***	*44.45*
FOREIGN	0.7941***	*27.18*
LEV	0.2475***	*3.79*
ROA	-0.1389*	*-1.78*
NOL	0.1376***	*5.71*
INTANG	-0.1708***	*-3.09*
PPE	-0.1634***	*-4.22*
Industry Fixed Effects	Y	
Adjusted R^2	0.229	
N	14,259	

[18] Removing ESO_INDUSTRY and DISC&EXTRA from Tables 4 and 5 results in qualitatively similar conclusions. Removing these two measures captures tax accrual quality due to financial standard complexity and management estimation error. However, isolating management estimation error provides greater detail about the role of tax havens.

Table 3: Tax Accrual Quality and Tax Haven Use (cont.)

Panel B: Second Stage Models

	[1] Y=TaxAQ		[2] Y=TaxAQ		[3] Y=TaxAQ		[4] Y=TaxAQ		[5] Y=TaxAQ		[6] Y=TaxAQ	
Variables	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
HAVEN%	0.0652	*0.73*			-0.1159	*-1.12*						
HAVENINT			0.1147	*1.40*			-0.0147	*-0.16*				
$HAVEN\%_{t-1}$									-0.0648	*-0.66*		
$HAVENINT_{t-1}$											0.0199	*0.23*
FSI					0.0003**	*2.31*	0.0002	*2.14*	0.0002**	*1.81*	0.0002**	*1.65*
HAVEN*FSI					0.0010**	*2.30*	0.0011**	*2.51*				
$HAVEN_{t-1}$*FSI									0.0010**	*2.05*	0.0009**	*2.10*
SIZE	0.1933***	*5.26*	0.1925***	*5.23*	0.2044***	*5.53*	0.2038***	*5.51*	0.2489***	*6.03*	0.2474***	*5.99*
FOREIGN	0.3783***	*3.80*	0.3786***	*3.80*	0.3932***	*3.94*	0.3985***	*3.99*	0.4700***	*4.26*	0.4714***	*4.27*
TAX_LOSS	-0.1498***	*-4.69*	-0.1519***	*-4.75*	-0.1481***	*-4.64*	-0.1498***	*-4.69*	-0.1640***	*-4.90*	-0.1666***	*-4.97*
PTBI_VOL	-1.2139***	*-14.21*	-1.2182***	*-14.25*	-1.2082***	*-14.20*	-1.2090***	*-14.20*	-1.3146***	*-14.05*	-1.3161***	*-14.05*
AQ	2.9791***	*12.16*	2.9721***	*12.13*	3.0270***	*12.34*	3.0219***	*12.31*	3.0021***	*10.94*	2.9997***	*10.93*
BIG4	-0.0932**	*-2.18*	-0.0919**	*-2.15*	-0.0868**	*-2.04*	-0.0858**	*-2.02*	-0.0678	*-1.58*	-0.0663	*-1.54*
MTB	0.0035	*0.96*	0.0034	*0.94*	0.0037	*1.00*	0.0037	*1.01*	-0.0001	*-0.03*	-0.0001	*-0.02*
LEV	0.3104***	*3.86*	0.3096***	*3.85*	0.3329***	*4.11*	0.3268***	*4.04*	0.3646***	*4.14*	0.3576***	*4.07*
ROA	-0.4761***	*-4.50*	-0.4776***	*-4.51*	-0.4702***	*-4.43*	-0.4723***	*-4.45*	-0.3962***	*-3.34*	-0.4009***	*-3.38*
NOL	0.0467	*1.53*	0.0474	*1.55*	0.0499	*1.62*	0.0480	*1.56*	0.0856**	*2.39*	0.0837**	*2.34*
SUBMAT	0.0215***	*2.63*	0.0223***	*2.72*	0.0202**	*2.47*	0.0210**	*2.56*	0.0094	*1.06*	0.01	*1.13*
INTANG	0.2210***	*3.44*	0.2252***	*3.51*	0.2120***	*3.29*	0.2133***	*3.30*	0.2472***	*3.33*	0.2494***	*3.35*
RD	-0.8847***	*-3.94*	-0.8907***	*-3.97*	-0.9025***	*-4.01*	-0.8907***	*-3.97*	-0.8022***	*-3.37*	-0.7972***	*-3.35*
ADV	-1.3248***	*-3.05*	-1.3102***	*-3.02*	-1.3068***	*-3.01*	-1.2805***	*-2.95*	-1.5005***	*-3.26*	-1.4761***	*-3.21*
PPE	0.0689	*1.39*	0.0675	*1.36*	0.0772	*1.55*	0.0774	*1.55*	0.0355	*0.63*	0.036	*0.63*
ESO_INDUSTRY	-0.1906**	*-2.33*	-0.1944**	*-2.37*	-0.1760**	*-2.15*	-0.1772**	*-2.16*	-0.1749**	*-2.03*	-0.1773**	*-2.05*
DISC&EXTRA	-0.1831***	*-2.72*	-0.1840***	*-2.73*	-0.1794***	*-2.67*	-0.1809***	*-2.69*	-0.0966	*-1.37*	-0.0974	*-1.39*
IMR	0.8963***	*4.90*	0.8977***	*4.90*	0.9231***	*5.03*	0.9282***	*5.06*	1.0850***	*5.64*	1.0839***	*5.64*
Industry FE	Y		Y		Y		Y		Y		Y	
Year FE	Y		Y		Y		Y		Y		Y	
Adjusted R^2	0.176		0.176		0.177		0.177		0.182		0.182	
N	14,259		14,259		14,259		14,259		13,302		13,302	

Table 3: Tax Accrual Quality and Tax Haven Use (cont.)

Panel C: Propensity Matched Sample

	[1] Y=TaxAQ		[2] Y=TaxAQ		
Variables	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.
HAVEN%	0.1424	*1.21*	-0.007	*-0.05*	
HAVENINT					0.2309
FSI			0.0003**	*2.08*	
HAVEN*FSI			0.0010**	*2.12*	
Control Variables	Y		Y		
IMR	Y		Y		
Industry & Year FE	Y		Y		
Adjusted R^2	0.185		0.186		
N	8,035		8,035		

As it is possible that the impact of tax haven subsidiaries on tax accrual quality is driven by systematic differences between firms with and without disclosed tax haven subsidiaries, I also use propensity score matching. Specifically, I use one-to-one propensity score matching without replacement to match similar firms with and without disclosed tax haven subsidiaries (Shipman et al., 2017). Using Model 5, propensity score matching results in a sample of 8,035 firm-year observations, comprised of 4,010 without a haven subsidiary and 4,025 with a haven subsidiary. HAVENPRES is an indicator variable set equal to 1 if a firm has a disclosed tax haven subsidiary and to 0 otherwise. The balance comparison shows that, between the groups of firms with and without disclosed tax haven subsidiaries, the means of the control variables are not statistically different, with the exception of firm size. Firms with tax haven subsidiaries are larger than firms without haven subsidiaries.

$$HAVENPRES_{jt} = \beta_0 + \beta_1 SIZE_{jt} + \beta_2 FOREIGN_{jt} + \beta_3 TAX\_LOSS_{jt} + \beta_4 PTBI\_VOL_{jt} + \beta_5 AQ_{jt} + \beta_6 BIG4_{jt} + \beta_7 MTB_{jt} + \beta_8 LEV_{jt} + \beta_9 ROA_{jt} + \beta_{10} NOL_{jt} + \beta_{11} SUBMAT_{jt} + \beta_{12} INTANG_{jt} + \beta_{13} RD_{jt} + \beta_{14} ADV_{jt} + \beta_{15} PPE_{jt} + \beta_{16} ESO\_INDUSTRY_{jt} + \beta_{17} DISC\&EXTRA_{jt} + \beta_{18k} \Lambda IND_{jt} + \beta_{19k} \Lambda YEAR_{jt} + \varepsilon_{jt} \quad (5)$$

Table 3, Panel C presents the propensity score matching results. In columns 1 and 3, there is some evidence of a positive and significant association between tax haven use and tax accrual quality (HAVENINT, t=1.99). Furthermore, there continues to be a robust relationship between haven use, FSI score, and tax accrual quality. Specifically, HAVEN%*FSI is positively associated with TaxAQ (t=2.12) and HAVENINT*FSI is positively associated with TaxAQ (t=2.20). Collectively, the propensity score matched sample provides additional assurances about the robustness of the relationship between tax haven subsidiary use and tax accrual quality.

Since both HAVEN and FSI are continuous measures, the interaction effect could reflect a "less negative" TaxAQ rather than an improvement in tax accrual quality. Therefore, I further test the conditional effect of HAVEN on TaxAQ. Following Burks, Randolph, and Seida (2019), I present the conditional effect plot of the impact of HAVEN on TaxAQ at different FSI score levels in Figure 1. At each different FSI score level, the interaction effect reflects an improvement in TaxAQ, providing additional support for the second hypothesis. I also present

the conditional slope plot indicating the conditional slope (β_1HAVEN + β_3HAVEN*FSI) and confidence intervals for the regression coefficient estimate on HAVEN conditional on the level of FSI score. The conditional slope plot indicates that there is a positive conditional slope, within 95 percent confidence intervals, across the entire range of FSI values. As such, as the FSI score increases, there is a greater conditional slope for the relationship between HAVEN and TaxAQ. The results suggest that the use and disclosure of tax havens could prompt managers to pay greater attention to tax reporting, resulting in strategic signaling to external stakeholders. That is, the tax accrual could reflect the attention that a firm pays to tax haven-related activities.

Additional Analyses

Rule of law as an alternative measure of subsidiary information environment

As the utilization of the FSI scores could bias the classification of a subsidiary's jurisdictional information environment quality, I also use rule of law as an alternative proxy for subsidiaries' information environments. Rule of law captures perceptions that the rules of society are followed and of the quality of institutions, such as contract enforcement, property rights, the police, and the courts, as well as the likelihood of incidences of crime and violence occurring (Dyreng et al., 2012). Rule of law would, in turn, directly affect a firm's financial reporting and the disclosures that the firm makes with regard to its tax haven activities. These differences are objectively captured by the World Bank Governance Indicator dataset at the country-year level, and go beyond differentiating between common law and civil law jurisdictions. Rule of law (RULE_OF_LAW) captures four broad World Bank objectives: democracy promotion, economic development and good governance, human rights and social development, and law enforcement. An average rule of law score for all unique subsidiary jurisdictions is computed for each firm-year.[19] RULE_OF_LAW is updated annually and covers 214 countries. FSI and RULE_OF_LAW are modestly correlated, with a Spearman correlation coefficient of 0.36 ($p<0.05$, untabulated).

In Table 4, Panel A, I examine the relationship between tax haven use and TaxAQ when RULE_OF_LAW is included to capture overall subsidiary information environment quality.

[19] Rule of law is presented as an estimate in units of a standard normal distribution ranging from approximately –2.5 to 2.5, with higher rule of law noted by a higher estimate. High rule of law represents greater democratic protections and greater law enforcement, including the creation of additional civil protections and greater human rights. Low rule of law captures weaker law enforcement, greater allowance of secretive activities, and fewer democratic and social protections. Since the measure is comprised of a variety of individual factors, rule of law goes beyond designating a jurisdiction as being a common law or civil law jurisdiction. For example, both Canada and the Cayman Islands are common law jurisdictions but, in 2014, Canada had a rule-of-law estimate of 1.9 while the Cayman Islands had an estimate of 0.6. Therefore, Canada has a higher rule-of-law score than the Cayman Islands.

Fig. 1: Conditional Effects

Fig. 1a: Plot of Conditional Effects

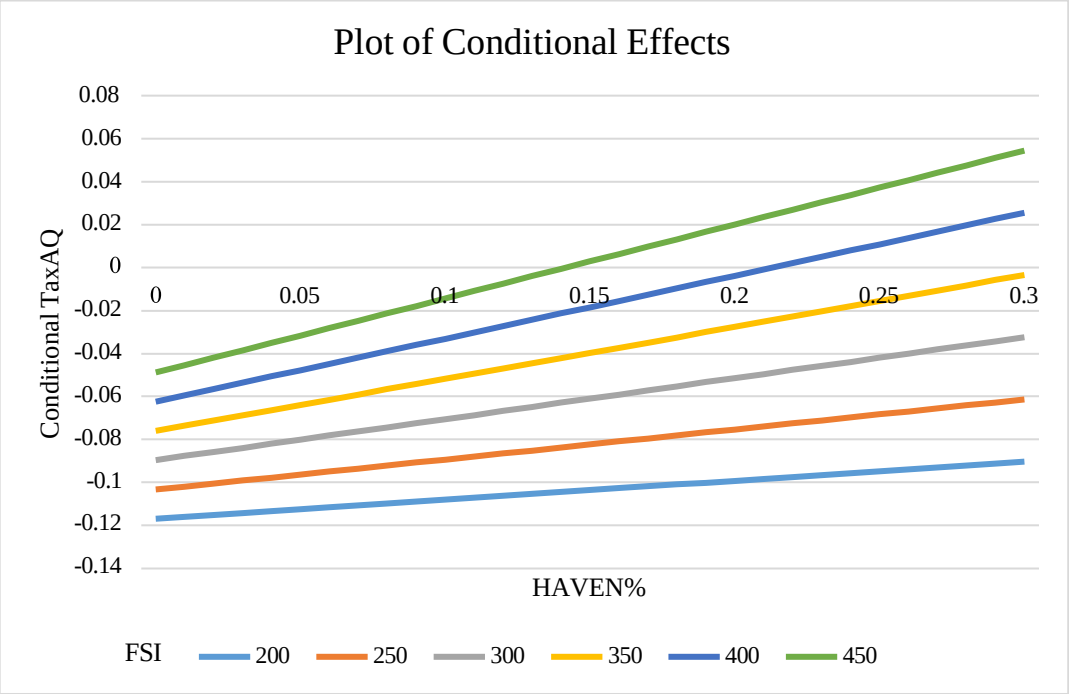
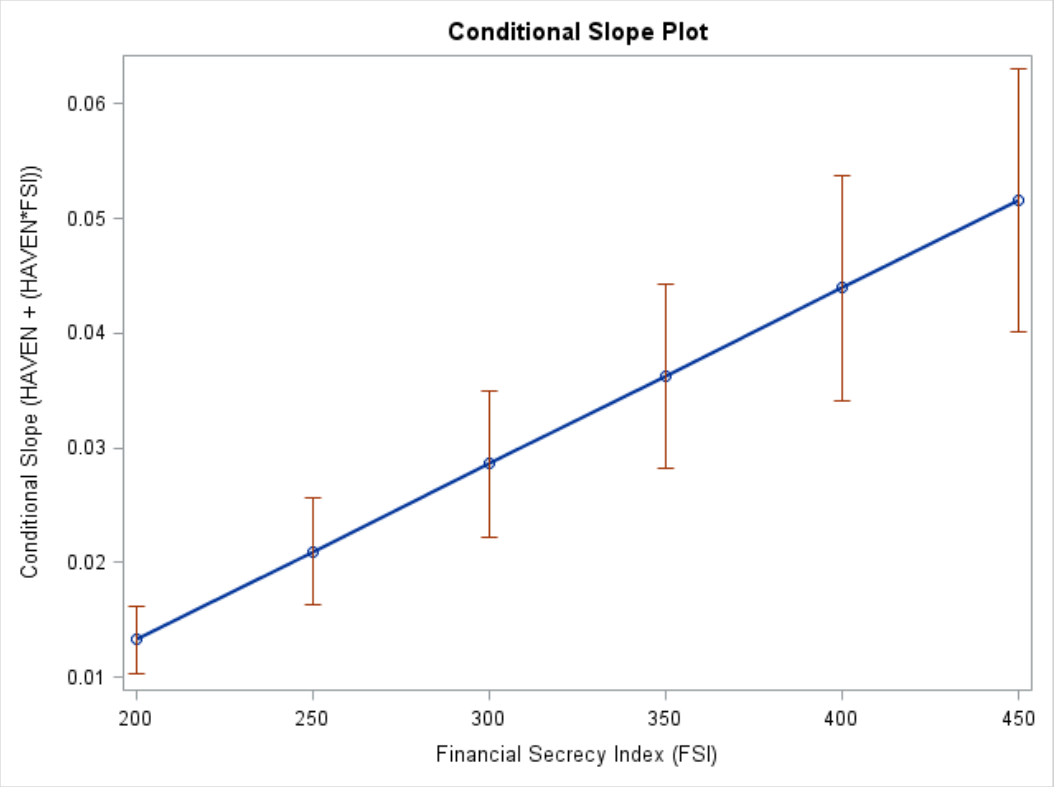


Fig. 1b: Conditional Slope Plot



Although neither HAVEN measure is associated with TaxAQ at the mean level of RULE_OF_LAW, I find that the interaction terms HAVEN%*RULE_OF_LAW and HAVENINT*RULE_OF_LAW are positively associated with TaxAQ. The existence of a positive relationship suggests that, as there is greater tax haven use and subsidiaries are located in a higher rule-of-law jurisdiction, there is a smaller tax accrual estimation error and higher quality tax reporting. The results conform with, and expand upon, those of Dyreng et al. (2012), who find that having subsidiaries in tax havens in high rule-of-law jurisdictions constricts foreign earnings management, which results in higher quality financial reporting. While RULE_OF_LAW focuses on societal expectations, FSI focuses only on the attributes of financial secrecy that would be directly faced by firms with haven operations and could increase managers' incentives to provide additional information about the tax accrual.[20]

Table 4: Additional Analyses

This table shows the results of testing the relationship between tax haven use and tax accrual quality (TaxAQ) in several different situations. In Panel A, subsidiary information environment (RULE_OF_LAW) is measured by the average rule of law in each subsidiary jurisdiction. Panel B examines the presence of auditor-provided tax services (APTS). Panel C uses the extent of foreign income (FOREIGN_INC) as a measure of foreign involvement. Panel D utilizes an industry-year median split of current cash effective tax rates (CASH_ETR). HIGH_CETR=1 reflects a higher than industry-year, cash effective, tax rate. All continuous variables are mean centered. The symbols *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level respectively (two-tailed). Industry and year fixed effects are included but not reported.

Panel A: Rule of Law

	[1] Y=TaxAQ		[2] Y=TaxAQ	
Variables	Coeff.	t-stat.	Coeff.	t-stat.
HAVEN%	0.0748	*0.80*		
HAVENINT			0.1200	*1.41*
RULE_OF_LAW	-0.0675*	*-1.95*	-0.0636*	*-1.83*
HAVEN*RULE_OF_LAW	0.4271**	*2.26*	0.4092**	*2.26*
Control Variables	Y		Y	
IMR	Y		Y	
Industry & Year FE	Y		Y	
Adjusted R^2	0.166		0.167	
N	13,033		13,033	

Panel B: Auditor-Provided Tax Services

	[1] APTS=1		[2] APTS=1		[3] APTS=0		[4] APTS=0	
Variables	Coeff.	t-stat.	Coeff.	t-stat.	C	t-stat.	Coeff.	t-stat.
HAVEN%	-0.4158***	*-3.45*			0.4	*2.34*		
HAVENINT			-0.2186**	*-2.10*			0.3711**	*1.97*
FSI	0.0006***	*4.63*	0.0005***	*4.00*	-0.	*-1.68*	-0.0003	*-1.13*
HAVEN*FSI	0.0008*	*1.59*	0.0010**	*1.95*	0.(	*1.56*	0.0012*	*1.32*
Control Variables	Y		Y				Y	
IMR	Y		Y				Y	
Industry & Year FE	Y		Y				Y	
Adjusted R^2	0.190		0.190				0.163	
N	9,264		9,264				4,995	

[20] In an untabulated analysis, I partition the sample between high and low rule-of-law firm-years using a median split. The association between tax haven use, financial secrecy, and tax accrual quality exists only when there is low average rule of law. That is, the positive association between HAVEN*FSI is significant only when there is low rule of law among firm subsidiary activities. The results suggest that when a firm's subsidiary is located in a lower rule-of-law environment, it provides managers with a greater incentive to signal higher quality tax accrual information to external stakeholders where there is lower existing transparency.

Panel C: Extent of Foreign Income

	[1] Y=TaxAQ		[2] Y=TaxAQ		[3] Y=TaxAQ		[4] Y=TaxAQ	
Variables	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
HAVEN%	-0.1081	*-1.04*			0.0976	*1.04*		
HAVENINT			-0.0067	*-0.07*			0.1356	*1.58*
FSI	0.0003**	*2.41*	0.0002**	*2.24*				
RULE_OF_LAW					-0.0696**	*-2.00*	-0.0651***	*-1.87*
HAVEN*FSI	0.0010**	*2.18*	0.0010***	*2.38*				
HAVEN*RULE_OF_LAW					0.4221**	*2.20*	0.4179**	*2.30*
FOREIGN_INC	-0.0002	*-0.18*	-0.0002	*-0.19*	-0.0002	*-0.18*	-0.0002	*-0.18*
Control Variables	Y		Y		Y		Y	
IMR	Y		Y		Y		Y	
Industry & Year FE	Y		Y		Y		Y	
Adjusted R^2	0.177		0.177		0.165		0.165	
N	14,259		14,259		14,259		14,259	

Panel D: Extent of Tax Planning

	[1] HIGH_CETR=1		[2] HIGH_CETR=1		[3] HIGH_CETR=0		[4] HIGH_CETR=0	
Variables	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
HAVEN%	0.0656	*0.46*			-0.2108	*-1.46*		
HAVENINT			0.0129	*0.10*			0.0033	*0.03*
FSI	0.0002	*1.11*	0.0002	*1.49*	0.0004**	*2.55*	0.0003**	*2.11*
HAVEN*FSI	0.0010*	*1.42*	0.0006	*0.94*	0.0010**	*1.67*	0.0011**	*1.98*
Control Variables	Y		Y		Y		Y	
IMR	Y		Y		Y		Y	
Industry & Year FE	Y		Y		Y		Y	
Adjusted R^2	0.199		0.198		0.176		0.176	
N	5,358		5,358		8,901		8,901	

Auditor-provided tax services (APTS)

One possible explanation for some of the variation in the above results is auditor involvement. In particular, the use of APTS could impact the extent to which a firm's tax haven operations can be understood and promote higher tax reporting quality. APTS can create a knowledge spillover between audit and tax functions such that the auditor has a broader understanding of a client (e.g., Gleason & Mills, 2011; Kinney et al., 2004; Robinson, 2008). In turn, when an auditor has greater knowledge of a client, it could foster a more precise tax accrual. In Panel B, I partition the sample into firm-years where ATPS were utilized (APTS=1) and where they were not (APTS=0). At the mean-centered value of FSI, I find that when the auditor provides tax services, there is a significantly negative association between tax haven use and tax accrual quality, providing additional evidence of the overall impact of tax havens. I also note a weak positive association between the interaction terms HAVEN%*FSI and HAVENINT*FSI, and TaxAQ. When the auditor does not provide tax services, tax haven use is positively associated with tax accrual quality, both with and without taking the effect of subsidiary information environment quality into consideration. The results suggest that although auditor involvement can facilitate higher quality tax reporting, it is not a clear influencing factor for the impact of tax haven use on tax accrual quality.

Extent of foreign income

As an alternative measure of foreign operations, I replace FOREIGN with the ratio of pre-tax foreign income to total income (FOREIGN_INC) in Panel C. Utilizing a continuous measure of the extent of foreign operations engenders additional confidence that firms' foreign operations are controlled for in the model, including their potential impact on management tax accrual estimation error. Columns 1 and 2 examine the relationship between HAVEN, FSI, and TaxAQ using FOREIGN_INC as a control variable. While FOREIGN_INC is not significant, I continue to find a positive interaction term between HAVEN and FSI. Likewise, in columns 3 and 4, I continue to find a positive interaction term between HAVEN and RULE_OF_LAW. The results suggest that the association between a firm's use of tax haven subsidiaries, information environment quality, and tax accrual quality is not contingent on how foreign operations are captured.

Extent of tax planning

In Panel D, I partition the sample on the extent of tax planning utilizing an industry-year median split of current cash effective tax rates (CAH_ETR). Overall, firm-years in the sample have a median cash effective tax rate of 22.3 percent. Firm-years with greater tax planning could have a different relationship with tax haven subsidiaries than other firm-years. Although Models 3 and 4 contain control variables for the availability of tax planning opportunities, directly testing the role of tax planning can provide more direct evidence of the relationship. Columns 1 and 2 examine the relationship between HAVEN, FSI, and TaxAQ for firm-years with above median cash effective rates. No significant association exists between tax haven use and overall subsidiary information environment quality when there are high effective rates. Conversely, in columns 3 and 4, the previously noted positive association between HAVEN*FSI and TaxAQ is seen for firm-years with below median cash effective tax rates. The results indicate that tax haven use and information environment quality play larger roles when firms engage in more tax planning, possibly reflecting the opportunities afforded by tax haven jurisdictions.

5. CONCLUSION

This study examines the association between firms' use of subsidiaries in tax haven jurisdictions and tax accrual quality, a measure of tax reporting quality. While haven-based subsidiaries provide secrecy and potential tax payment savings for firms, it is unknown whether their use affects tax reporting quality. Increasing regulatory focus on financial reporting for income taxes prompts greater attention to the information provided by the tax accrual in firms' annual reports. While tax haven use could increase uncertainty in relation to the extent and timing of taxable foreign earnings, the additional discretion could allow management to reduce estimation error in certain situations and improve tax accrual quality. Based on signaling theory, I predict and find that managers communicate additional tax accrual information to external stakeholders through higher tax accrual quality when their firms have subsidiaries in tax haven jurisdictions with higher financial secrecy. That is, not all tax haven jurisdictions impact financial reporting in the same way.

The findings contribute to the tax haven literature by providing initial evidence that strategically choosing where to have subsidiary operations could impact tax-related financial reporting. While the literature primarily focuses on the tax aggressiveness implications of tax havens and the direct impact on tax disclosures, this study provides evidence of how the tax accrual itself could also be affected. Although haven subsidiaries can be used to minimize a firm's tax burden, this intent does not necessarily impair tax reporting quality. Furthermore, tax accrual quality can be utilized as a signaling mechanism. Policymakers and regulators can benefit from gaining a greater understanding about how havens are used by U.S. firms. The recent increase in incidents of tax shaming and heightened regulatory interest in devising a global minimum tax rate underscore the importance of first understanding the impact of havens. Imposing new international regulations surrounding disclosure on a country-by-country basis could further improve transparency, although stricter global taxation could result in additional tax accrual mapping estimation error.

As in all studies, limitations exist that provide opportunities for future research. First, this study only examines U.S. firms in order to access Exhibit 21 Significant Subsidiary Disclosures. As such, the results may not generalize directly to disclosure regimes in other jurisdictions. Future research could examine whether different financial reporting regulations affect the implications of tax haven subsidiaries.

Second, the sample period is curtailed by recent developments in U.S. tax law and international tax data leaks. Future research could explore international settings that are not subject to changes affecting the determination of income tax expense and cash tax payments. Future studies could also explore whether the disclosure of country-by-country reporting information has impacted the relationship between tax haven use and tax accrual quality. If firms must disclose financial information on a per-jurisdiction basis, there could be greater transparency about the mapping between income tax expense and tax payments.

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APPENDIX

Variable Definitions

Variable	Definition
Tax Accrual Quality	
CTP_{jt}	Cash taxes paid related to income taxes ($TXPD_{jt}$), scaled by total assets (AT_{jt}).
ΔDTA_LT_{jt}	Change in the long-term portion of the deferred tax asset ($TXDBA_{jt}$ - $TXDBA_{jt-1}$), scaled by total assets (AT_{jt}). SFAS 109 permits firms to net short-term DTAs/DTLs and long-term DTAs/DTLs and, in practice, many firms do, so missing values of $TXDB_{jt}$ are set equal to net DTA/DTL ($TXNDB_{jt}$) less short-term DTL ($TXDBCL_{jt}$) less short-term DTA ($TXDBCA_{jt}$), with missing values of $TXDBCL_{jt}$ ($TXDBCA_{jt}$) reset to zero when $TXDBCA_{jt}$ ($TXDBCL_{jt}$) is not missing. If $TXDBA_{jt}$ is missing and $TXDB_{jt}$ is not missing, $TXDBA_{jt}$ is reset to zero, as in Choudhary et al. (2016).
ΔDTL_LT_{jt}	Change in the long-term portion of the deferred tax liability ($TXDB_{jt}$ - $TXDB_{jt-1}$), scaled by total assets (AT_{jt}). SFAS 109 permits firms to net short-term DTAs/DTLs and long-term DTAs/DTLs and, in practice, many firms net their short-term net DTA/DTL and long-term DTA/DTL, so missing values of $TXDB_{jt}$ are set equal to net DTA/DTL ($TXNDB_{jt}$) less short-term DTL ($TXDBCL_{jt}$) less short-term DTA ($TXDBCA_{jt}$), with missing values of $TXDBCL_{jt}$ ($TXDBCA_{jt}$) reset to zero when $TXDBCA_{jt}$ ($TXDBCL_{jt}$) is not missing. If $TXDB_{jt}$ is missing and $TXDBA_{jt}$ is not missing, $TXDB_{jt}$ is reset to zero, as in Choudhary et al. (2016).
$TaxACC_{jt}$	Total tax accrual, defined as $TTE_{jt} - CTP_{jt}$.
$TaxAQ_{jt}$	Standard deviation of firm *j*'s residuals from Fama-French 48 industry year. estimates of Model 1 ($TaxACC_t = \beta_0 + \beta_1 CTP_{t-1} + \beta_2 CTP_t + \beta_3 CTP_{t+1} + \beta_4 \Delta DTL\_LT_t + \beta_5 \Delta DTA\_LT_t + \varepsilon_t$) from year *t*-4 to *t*, multiplied by -1 so larger values indicate better tax accrual quality. A minimum of 20 observations per industry year is required to estimate TaxAQ.
TTE_{jt}	Total tax expense (TXT_{jt}) scaled by total assets (AT_{jt}).
Firm Characteristics Related to Tax Accrual Quality	
PTBI_VOL	Standard deviation of pre-tax book income ($PTBI_t$) scaled by total assets (AT_{jt}), measured from years *t*-4 through *t*.
TAX_LOSS	1 (0 otherwise) if current tax expense (TXC_{jt}) is less than zero.
FOREIGN	1 (0 otherwise) if a firm reports nonzero foreign tax expense ($TXFO_{jt}$).
ESO_INDUSTRY	1 (0 otherwise) if a firm operates in an industry with potentially large tax deductions from the exercise of options (defined as industry Standard Industrial Codes 30-39 and 70-89).
DISC&EXTRA	1 (0 otherwise) if a firm reports a large discretionary/extraordinary item [defined as discontinued and extraordinary items from the statement of cash flows ($XIDOC_{jt}$) > 1% of revenue ($REVT_{jt}$)].
SIZE	Natural log of total assets (AT_{jt}).
Tax Haven Use	
HAVEN%	Percentage of foreign countries classified in Exhibit 21 as tax havens. Tax haven locations, as designated in Dyreng and Lindsey (2009), include: Andorra, Anguilla, Antigua and Barbuda, Aruba, Bahamas, Bahrain, Barbados, Belize, Bermuda, British Virgin Islands, Brunei, Botswana, Cape Verde, Cayman Islands, Cook Islands, Costa Rica, Cyprus, Dominica, Gibraltar, Grenada, Guernsey and Alderney, Hong Kong, Ireland, Isle Of Man, Jersey, St. Kitts and Nevis, Latvia, Lebanon, Liberia, Liechtenstein, Luxembourg, Macau, Maldives, Malta, Marshall Islands, Mauritius, Monaco, Montserrat, Nauru, Netherlands Antilles (or Dutch Antilles), Niue, Palau, Panama, Samoa, San Marino, Seychelles, Singapore, St. Lucia, St. Vincent and the Grenadines, Switzerland, United States of America. Virgin Islands, Uruguay, and Vanuatu.

HAVENINT	Percentage of all disclosed subsidiaries that are in countries classified in Exhibit 21 as tax havens
Information Environment Quality	
FSI	The Tax Justice Network has developed the Financial Secrecy Index for 92 countries including both tax haven and other countries (Tax Justice Network, 2016). The index comprises 15 different criteria relating to the transparency of: beneficial ownership (banking secrecy, trust and foundations register, recorded company ownership); corporate regulation (public company ownership, public company accounts, country-by-country reporting); efficiency of tax and financial regulation (fit for information exchange, efficiency of tax administration, avoids promoting tax evasion, harmful legal vehicles); and international standards and cooperation (anti-money laundering, automatic information exchange, bilateral treaties, international transparency commitments, international judicial cooperation). The higher the index, the more financial secrecy exists within a jurisdiction and this, in turn, weakens the information environment. An average score is calculated per firm-year.
RULE_OF_LAW	Rule of law captures perceptions of the extent to which agents have confidence in, and abide by, the rules of society and, in particular, of the quality of institutions, such as contract enforcement, property rights, the police, and the courts, as well as the likelihood of incidences of crime and violence occurring. See the World Bank (n.d.) for a full listing of factors utilized. An average rule-of-law score is calculated per firm-year. Higher rule of law is represented by a higher ratio.
Control Variables	
BIG4	1 (0 otherwise) if the firm is audited by a top four accounting firm (AU).
MTB	Ratio of market value (PRCC_F × CSHO) to book value (CEQ).
NOL	1 (0 otherwise) if the tax loss carryforward (TLCF) is negative at the beginning of the year.
ROA	Pre-tax book income (PTBI) divided by lagged total assets (AT_{jt-1}).
LEV	Total debt divided by total assets [$(DLTT_{jt}+DLC_{jt})/AT_{jt}$].
ADV	Advertising expense (XAD) divided by lagged total revenue (REVT).
RD	Research and development expense (XRD) divided by lagged total assets (AT).
INTANG	Intangible assets (INTAN) divided by lagged total assets (AT).
PPE	Property, plant, and equipment divided by lagged total assets (AT).
SUBMAT	Number of foreign subsidiaries divided by number of countries listed in Exhibit 21.
AQ	Standard deviation of firm *j*'s residuals from Fama-French 48 industry year estimates of $\Delta WC_t = \alpha + \beta_1 CFO_{t-1} + \beta_2 CFO_t + \beta_3 CFO_{t+1} + \beta_4 \Delta REV_t + \beta_5 PPE_t + \varepsilon_t$ from year *t*-4 to *t*, multiplied by -1, so larger values indicate better working capital accruals quality. Following Francis et al. (2005), ΔWC_t is the change in working capital accruals [Δ current assets (ACT_t - ACT_{t-1}) – Δ current liabilities (LCT_t - LCT_{t-1}) – Δ cash (CHE_t - CHE_{t-1}) + Δ current portion of long-term debt (DLC_t - DLC_{t-1})]. CFO_t is cash flows from operations ($OANCF_t$), ΔREV_t is Δ revenue ($REVT_t$ – $REVT_{t-1}$), and PPE_t is gross plant, property, and equipment ($PPEGT_t$). All variables are scaled by average total assets ((AT_t + AT_{t-1}) ÷ 2). A minimum of 20 observations per industry year is required to estimate AQ.
IMR	Inverse Mills Ratio (Heckman, 1979) added to second stage models from the following first stage model representing the strategic decision to have and disclose a haven subsidiary: $HIGH\_SUB_{jt} = \beta_0 + \beta_1 SIZE_{jt} + \beta_2 FOREIGN_{jt} + \beta_3 LEV_{jt} + \beta_4 ROA_{jt} + \beta_5 NOL_{jt} + \beta_6 INTANG_{jt} + \beta_7 PPE_{jt} + \beta_8 kSIND_{jt} + \varepsilon_{jt}$. HIGH_SUB is a dichotomous variable set equal to 1 (0 otherwise) if a firm discloses a higher than industry median amount of subsidiaries on Exhibit 21.