The Effect of Income Shifting on the Information Environment: Evidence from Two-Stage Least Squares and SFAS 131

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Abstract: We examine whether tax-motivated income shifting by U.S. multinational corporations affects their external information environments. Using a new firm-year measure of income shifting and a two-stage least squares approach, we find income shifting increases information asymmetry, private information gathering, and information uncertainty. Cross-sectional tests reveal that the effect of shifting on the information environment is more pronounced for firms with large differences between foreign and domestic earnings growth. Using SFAS 131 to improve identification and establish evidence consistent with a causal relation between income shifting and the information environment, we demonstrate that the negative impact of income shifting on the information environment is concentrated in firms that stopped disclosing geographic earnings. Overall, our study provides evidence that significant information environment consequences are associated with tax-motivated income shifting.

Keywords: tax-motivated income shifting; information asymmetry; private information gathering; information uncertainty

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1. Introduction

We examine the relation between firms' tax-motivated income shifting and their information environment. Following prior research, we refer to a firm's information environment as a construct that includes "corporate reporting, private information acquisition, and information dissemination" (e.g., Lang, Lins, and Miller 2003; Bushman, Piotroski, and Smith 2004).[1] Firms with multinational operations use transfer pricing, cost sharing agreements, and other means to allocate internal resources and to facilitate the shifting of income to low-tax jurisdictions. Tax-motivated income shifting, however, makes identifying the true location of earnings more difficult for outside investors.[2] Prior research documents that identifying the true location of earnings is important for valuation purposes, because of differences in expected growth rates, earnings persistence, and risk between foreign and domestic earnings (Bodnar and Weintrop 1997; Thomas 1999; and Nessa, Shevlin, and Wilson 2015). Thomas (1999) suggests poor disclosures may inhibit investors' understanding of the valuation implications of foreign earnings. Further, firms face costs when disclosing information about tax-motivated income shifting, because such disclosure provides taxing authorities with information to detect aggressive tax avoidance. Indeed, Hope, Ma, and Thomas (2013) find that firms with lower worldwide effective tax rates were more likely to discontinue the disclosure of geographic earnings after the implementation of SFAS 131. Hence, we predict that tax-motivated income shifting negatively affects firms' external information environments in the form of greater information asymmetry, increased information uncertainty, and more private information gathering.

Prior research and the business press motivate our examination of the relation between income shifting and the information environment. Prior research finds multinational firms engage in significant and increasing tax-motivated income shifting (Klassen and Laplante 2012). The significant and increasing

[1] In our study, variation in information asymmetry among investors, information asymmetry between managers and investors, information uncertainty among analysts, and private information gathering reflect the variation in the information environment (e.g., Beyer, Cohen, Lys, and Walther 2010; Armstrong, Balakrishnan, and Cohen 2012).
[2] The jurisdiction where firms report income for tax purposes is not necessarily the jurisdiction where the income is earned. We view the "true location" of income as being based on where the economic earnings activities took place. Income shifting, then, is the extent to which income is reported elsewhere due to lower tax rates.

magnitude of shifted income, the efforts to veil such income shifting from public disclosure, and the importance for investors to correctly identify the true source of earnings suggest significant information costs to income shifting. In the business press, the Financial Transparency Coalition (FTC), a watchdog group, argues for country-by-country financial reporting to mitigate the harmful effects of income shifting, because such reporting "would arm potential investors with information they can use to make sure a company [is not] distorting its bottom line or taking excessive risks" (FTC 2016). Despite widespread interest in income shifting and claims that income shifting is harming the information environment, prior research has not examined how income shifting affects the information environment.

We predicate our study on theories from public economics linking the informativeness of public information to informed trading (e.g., Grossman and Stiglitz 1980; Verrecchia 1982; Diamond 1985). These studies predict that the level of informed trading is negatively related to the informativeness of firms' public disclosure. We argue that income shifting reduces the informativeness of firms' disclosures about foreign and domestic earnings. Prior research suggests that investors value unshifted domestic earnings differentially from unshifted foreign income based on the relative persistence of each source of earnings (Bodnar and Weintrop 1997; Nessa et al. 2015). When a portion of domestic (foreign) income is reported as foreign (domestic), we predict uninformed (i.e., outsider) shareholders will face greater uncertainty regarding firm value. We expect income shifting to have less of an effect on insiders, who have private information on the true source of earnings. As such, we predict greater information asymmetry between informed and uninformed investors.[3] Finally, we predict that uninformed shareholders will engage in private information gathering to offset their informational disadvantage.

We develop a firm-year measure of income shifting and employ several empirical strategies to examine the relation between income shifting and the information environment. Because income shifting and the information environment are likely endogenously related, our first approach uses a simultaneous

[3] Collins, Kemsley, and Lang (1998) provide evidence that investors, on average, at least partially recognize the effect of income shifting on firm value. Even if investors understand the amount of shifting that occurs on average, however, it is unclear whether investors will understand the amount of shifting that occurs at any given firm. Insofar as investors can ascertain the extent of shifting at a sufficiently low cost, we will fail to find support for a relation between tax-motivated income shifting and firms' information environments.

system of equations to model the relation between income shifting and firms' information environments.[4] Consistent with our expectations, we find evidence that income shifting negatively affects the information environment. We document that income shifting is positively associated with the adverse selection component of the bid-ask spread and abnormal insider trading profitability, which measure the information asymmetry aspect of the information environment (Armstrong, Core, Taylor, and Verrecchia 2011; Huddart and Ke 2007). We estimate that the average cost to traders of higher adverse selection components of bid-ask spreads is $22.05 million to $34.96 million for a one standard deviation increase in our income shifting variables, which represents 0.86 to 1.36 percent of market capitalization of firms in our sample. Consistent with tax-motivated income shifting leading to more private information gathering, we find income shifting is positively related to idiosyncratic return volatility (Ang, Hodrick, Xing, and Zhang 2006; 2009). We also document a positive association between tax-motivated income shifting and information uncertainty, as measured by analyst forecast dispersion (Armstrong, Balakrishnan, and Cohen 2012). We find little evidence that the external information environment affects income shifting. Overall, our findings suggest that income shifting activities affect the external information environment, but that the converse relation is not necessarily the case.

We conduct cross-sectional tests to examine whether the link between income shifting and the information environment is pronounced in a setting where distinguishing the true location of earnings is especially important. We expect the relation of interest to be stronger for firms with significant differences in growth rates between their foreign and domestic earnings. If the growth of foreign and domestic earnings is similar for a given firm, then identifying the amount of shifted income will be less important for investors. As this difference grows, however, the importance of identifying the amount of shifted income increases. Consistent with expectations, we find the associations between income shifting and information asymmetry, information uncertainty, and private information gathering costs are more pronounced for firms with large differences in the growth rates of foreign earnings and domestic earnings.

[4] Similar to Rego and Wilson (2012), we use two-stage lease squares to estimate our simultaneous system of equations, where proxies for tax-motivated income shifting and the information environment are the endogenous, dependent variables. See Section 3 for more details.

Our second empirical approach exploits the adoption of Statement of Financial Accounting Standards No. 131 (SFAS 131) to provide evidence consistent with a causal relation between income shifting and the information environment. Prior to the implementation of SFAS 131, U.S. firms were required to disclose geographic earnings. After the implementation, geographic earnings disclosures became voluntary for firms that defined and evaluated operating segments by groups of similar products or services. Because most firms define operating segments by product or service line, most firms discontinued geographic segment disclosures (Herrmann and Thomas 2000). To the extent that geographic earnings disclosures are useful for investors to identify the true source of earnings, we expect the adverse information environment effect of income shifting will be more pronounced when firms stop disclosing geographic earnings. Consistent with this expectation, we find that income shifting negatively affects the information environment only in the post-SFAS 131 period and is concentrated among firms that suspend geographic earnings disclosure.

To further mitigate concerns that unobserved time invariant firm characteristics drive our results, we examine changes in our information environment measures around the initiation of operations in tax haven countries. In Form 10-K Exhibit 21, firms list the countries in which they have significant subsidiaries, and therefore, Exhibit 21 provides investors with a low-cost mechanism to determine whether a firm is likely to be engaged in tax-motivated income shifting to a tax haven. Consistent with our main results, we find the initiation of significant operations in tax haven jurisdictions is associated with higher information asymmetry, idiosyncratic return volatility, and analyst forecast dispersion. Additionally, we provide evidence that managers at income-shifting firms are significantly more likely to initiate earnings and sales forecast guidance, and we find evidence that guidance mitigates the effect of income shifting on the information environment.

We acknowledge that the determinants of a multinational firm's operations and tax positions are complex and controlling for all the observable and unobservable factors that influence both our information environment measures and firms' tax strategies is challenging. In addition to including an inventory of control variables in our analyses, we also use a bevy of empirical strategies to identify the

effects of income shifting on firms' information environments including: simultaneous system of equations, the adoption of SFAS 131, and the initiation of operations in tax haven countries. Given the complexity of and the interrelation between the underlying constructs, however, we cannot conclusively dismiss all possible alternative explanations. Therefore, our results should be interpreted with these limitations in mind.

Our study contributes to the literature in three important ways. First, we answer the call from Hanlon and Heitzman (2010, p. 146) to examine the non-tax costs that investors bear when firms engage in tax avoidance activities. We provide evidence that income shifting, an important and growing phenomenon (Clausing 2009; Klassen and Laplante 2012), affects information asymmetry between managers and external equity shareholders, the extent of private information gathering, and information uncertainty. The increased adverse selection component of the bid-ask spread and information gathering costs impose a significant cost on those investors who would like to buy or sell the stock of firms engaged in income shifting. Specifically, information asymmetry increases trading frictions as investors price protect against potential losses from trading with better informed market participants (Bhattacharya and Spiegel 1991; Verrecchia 2001). We do not claim, however, that the aggregate costs of tax-motivated income shifting outweigh the aggregate benefits of the increased after-tax cash flows from such shifting for investors that already hold the stock of income shifters. Nonetheless, these costs are important for managers to consider in evaluating whether the marginal costs of shifting additional income will exceed the marginal tax benefits. Our results complement and extend Donohoe and Knechel (2014), who find tax aggressiveness influences audit pricing.

Second, our results provide new insight into why firms appear to underutilize available tax planning opportunities. Prior research establishes that although the savings from tax avoidance activities such as income shifting appear substantial, firms do not fully avail themselves of tax planning opportunities (Weisbach 2002; Hanlon and Heitzman 2010). This supposed failure to fully utilize tax planning opportunities is puzzling in the case of income shifting. The costs of some tax planning strategies are straightforward, though potentially difficult to document. Tax-favored assets bear a lower

pretax rate of return than tax-disfavored assets. Complex tax shelters are costly to implement, have a high likelihood of being challenged by tax authorities, and may result in substantial penalties and interest (Wilson 2009). By contrast, income shifting exploits gaps between the tax laws of two or more jurisdictions and involves tax-favored transfer prices, which are difficult for taxing authorities to argue against if documented and established within the letter of the law. Hence, it is less clear whether income shifting generates similar nontax costs (e.g., implicit taxes, detection risk, and financial reporting tradeoffs) to other tax avoidance strategies. We document new evidence that tax-motivated income shifting produces significant external information environment costs.

Third, we develop a firm-year measure of income shifting that incorporates both firms' incentives to shift income (Klassen and Laplante 2012) and evidence of shifted income (Collins, Kemsley, and Lang 1998). Our measure is calculated using publicly available data and, therefore, does not require hand collection or use of proprietary IRS tax return data. Our measure should be useful to researchers interested in studying the incentives and determinants of tax-motivated income shifting, the consequences of tax-motivated income shifting, and the relation between such income shifting and firm or managerial behavior.

The remainder of the paper is organized as follows. In the next section, we develop our hypotheses. We describe our sample and our empirical approach in Section 3 and discuss our results in Section 4. Section 5 provides tests of robustness, and Section 6 concludes.

2. Hypothesis Development

Two features of the U.S. tax system create an incentive for multinational corporations (MNCs) to shift income from the U.S. into foreign jurisdictions. First, the U.S. taxes the worldwide income of U.S. MNCs, but the U.S. defers taxation of foreign earnings until firms repatriate those earnings. The U.S. tax due upon repatriation is roughly equivalent to the difference between the U.S. statutory tax rate and firms' average foreign tax rate. Second, the U.S. statutory tax rate exceeds the statutory tax rates of most foreign

countries.[5] Hence, to the extent that U.S. MNCs shift income out of the U.S. and into foreign jurisdictions, they defer incremental U.S. taxation on such earnings until repatriation. U.S. regulators and politicians argue that U.S. MNCs utilize transfer pricing to shift income out of the U.S. and into countries with low statutory tax rates. According to Senator Carl Levin, "… too many corporations are using tax trickery to send their profits overseas and avoid paying their fair share in the United States" (Browning 2008). Such claims are consistent with firms responding to incentives and engaging in tax-motivated income shifting.

Prior theoretical and empirical work provides a framework for predicting how tax-motivated income shifting will affect firms' information environments. Theoretical research suggests that the existence of informed and uninformed traders leads to high transaction costs, thin markets, and lower market liquidity (e.g., Grossman and Stiglitz 1980; Kyle 1985). Prior theoretical and empirical research demonstrates, however, that disclosure can reduce information asymmetry and increase market liquidity (Diamond and Verrecchia 1991; Kim and Verrecchia 1991; Lang and Lundholm 1993; Welker 1995). Disclosing information about tax-motivated income shifting can reduce information asymmetry because disclosure helps investors identify the true location of earnings. Identifying the true location of earnings is important, because foreign earnings have differential growth and persistence relative to domestic earnings, and investors attach a valuation premium to foreign earnings relative to domestic earnings (Bodnar and Weintrop 1997; Nessa et al. 2015). Managers, however, do not always fully disclose information they possess (e.g., Dye 1985; Jung and Kwon 1988; Verrecchia 1983). In our setting, we believe that disclosing information about tax-motivated income shifting is unlikely because such disclosure provides taxing authorities with a roadmap to detect aggressive tax avoidance. This belief is supported by Hope et al. (2013), who find managers of firms engaged in higher amounts of tax avoidance are less likely to provide disclosures on the source of geographic earnings. With limited disclosure about tax-motivated income shifting, it is more difficult for uninformed investors to disentangle the true source

[5] Since 2013, the U.S. has the highest corporate tax rate among OECD countries (see Part C, Table II.1, of the OECD Tax Database, available at *http://www.oecd.org/tax/tax-policy/tax-database.htm*).

of earnings and to differentiate the growth and persistence implications between foreign and domestic earnings.[6] Therefore, we posit that tax-motivated income shifting is associated with higher information asymmetry and more private information gathering.

Recent anecdotal evidence provides additional support for our predictions. Whitehouse (2011) notes that regulators have expressed concerns that foreign earnings are not transparent to investors: "Companies that keep offshore earnings abroad to avoid high U.S. tax rates have a lot of explaining to do to satisfy not just tax authorities, but also the Securities and Exchange Commission." The report mentions that Microsoft and Google have faced queries from the SEC staff about providing additional disclosures to investors about the overseas earnings. Whitehouse (2011) notes, "The [SEC] also is asking companies to quantify amounts attributable to countries with very low tax rates." Concerns over poor disclosures related to the source and validity of foreign earnings suggest investors would incur significant information gathering costs in identifying the true source of geographic earnings for income shifting firms.

We expect tax-motivated income shifting will also be associated with higher information uncertainty. Following Zhang (2006, p. 567), we view information uncertainty as "ambiguity with respect to the implications of new information for a firm's value".[7] In Zhang's (2006, p. 569) conceptual framework, an "observed signal (s) is characterized as a firm's fundamental value (v) plus a noise term (e) – that is $s = v + e$". The variance of the signal measures information uncertainty. In our setting, tax-motivated income shifting increases the variance of the signal because income shifting masks the true geographic source of a firm's earnings. Masking the true source of earnings, in turn, makes forecasting future cash flows from foreign operations more difficult for outside investors. This forecasting is important because investors likely have differing expectations regarding the growth and persistence of foreign earnings relative to domestic earnings. A counter argument is that information uncertainty will be lower for firms with tax-motivated income shifting, because managers will provide disclosures to offset

[6] We use true source of earnings to refer to the location where the economic sales occur.

[7] Information asymmetry and information uncertainty are closely related constructs. Information asymmetry implies that some party has more information than another party, while information uncertainty captures uncertainty generally. In this paper, our overarching construct is a firm's information environment, and therefore, we do not attempt to empirically disentangle these two related constructs.

the uncertainty that arises from income-shifting behavior. Although voluntary disclosure may help mitigate the effects of income shifting on the information environment, however, it is unlikely that voluntary disclosure would result in income shifting firms having less information uncertainty than non-shifting firms. An additional concern is that prior literature treats shifted foreign (domestic) earnings the same as actual foreign (domestic) earnings when documenting differences in persistence and growth (e.g., Bodnar and Weintrop 1997, Thomas 1999). This limitation works against prior research finding differences in average growth and persistence between foreign and domestic earnings. Similarly, if the distinction between the sources of earnings is trivial to investors, we should not find support for our predictions. We state our first hypothesis, in the alternative form, as follows:

H1: Tax-motivated income shifting is associated with a poorer information environment.

Next, we examine a cross-sectional setting where we expect tax-motivated income shifting has a stronger effect on firms' information environments. The underlying mechanism through which tax-motivated income shifting affects firms' information environments is that income shifting masks the true sources of reported earnings and hence, affects investors' projection and valuation of future earnings. Investors place a valuation premium on foreign earnings relative to domestic earnings, because investors expect more growth, on average, from foreign operations (Bodnar and Weintrop 1997). If the growth of foreign and domestic earnings is similar for a given firm, then identifying the amount of shifted income will be less important for investors. For firms with large differences between foreign and domestic earnings growth, however, the importance of identifying the amount of shifted income increases. Therefore, we posit that the effect of tax-motivated income shifting on firms' information environments is stronger for firms with large differences in the growth rates of foreign earnings and domestic earnings. This discussion leads to our second hypothesis:

H2: The association between tax-motivated income shifting and the information environment is more pronounced for firms with large differences between foreign and domestic earnings growth.

Prior to SFAS 131, U.S. MNCs were required to disclose geographic earnings, geographic sales and geographic assets. We expect the combination of these geographic disclosures would be useful to

investors in identifying and quantifying income shifting. In fact, Collins et al. (1998) examine a sample of U.S. manufacturing firms from 1984 to 1992 (prior to SFAS 131) and find evidence that investors recognize the effect of income shifting in making their valuation. SFAS 131 affords firms the option to disclose segments on the basis of how they organize their operations. After adoption of SFAS 131, most firms chose to report product- or service-lines segments and to omit geographic segment disclosures. We expect, as a result of this shift in disclosure following SFAS 131, the ability of investors to identify and quantify income shifting would decrease for firms that discontinue geographic segment disclosures. This leads to our final hypothesis:

> **H3:** The association between tax-motivated income shifting and the information environment is exacerbated for firms that stopped disclosing geographic earnings data following the adoption of SFAS 131.

3. Sample and Empirical Methods

3.1 Sample Selection

We limit our data collection to fiscal years beginning after December 15, 1992, which is the effective date of adoption of SFAS 109. In our primary analyses, we use a measure of tax-motivated income shifting based on Collins et al. (1998) and Klassen and Laplante (2012). This income shifting measure uses five years of Compustat data to determine the foreign tax rate-based incentive to shift (i.e., excess limit versus excess credit position). Aside from these measures of the long-run foreign tax-rate based incentive to shift income, all remaining variables are measured using a three-year accumulation period. With a three-year accumulation period, our estimation sample period extends from 1995 through 2012. In our SFAS 131 analysis, we restrict our sample period from three years before through three years after the adoption of SFAS 131.

We include all publicly-traded, U.S.-based multinational corporations with necessary, non-missing data to compute the respective information environment, income shifting, and control variables. In addition to requiring non-missing data to compute each variable, we also require that firm-years have positive values for beginning total assets, ending total assets, and the five-year sum of pretax domestic

income and of pretax foreign income.[8] We exclude REITs and publicly traded partnerships from our analysis because they are typically not subject to taxation at the entity level. Consistent with prior research, we also exclude public utilities (GICS 5510) and financial services firms (GICS 4010-4040) because of differing incentives to avoid taxes.[9]

We summarize our sample selection process in Table 1. Sample size variation across each test is primarily attributable to the data requirements for each of our four dependent variables. For the adverse selection component of the bid-ask spread and idiosyncratic return volatility tests, our data collection period covers three years of data from Trades and Automated Quotes (TAQ) and CRSP—two prior periods and one contemporaneous period. To be included, we require at least 32 months (670 trading days) of data for the adverse selection component of the bid-ask spread (idiosyncratic return volatility).[10] For insider profits, we obtain insider trading data from Thomson Reuters and require stock return data from CRSP to calculate abnormal returns.

We use quarterly analyst forecast data provided by I/B/E/S to calculate analyst forecast dispersion. Except for the fourth fiscal quarter, in which we use contemporaneous annual accounting data, we pair interim quarterly forecast dispersion estimates with annual variables from the most recently ended fiscal year.[11] To prevent concerns that outliers influence our results, we winsorize all continuous variables at the 1 and 99 percent levels each fiscal year, except for sample standard deviation-based metrics which are winsorized at the 99 percent level as they are bounded from below at zero (Hribar and Nichols 2007). We do not winsorize industry-size-adjusted GAAP ETRs, because unadjusted ETRs are set to lie in the [0, 1] interval (Balakrishnan, Blouin, and Guay 2012; Armstrong, Blouin, Jagolinzer, and Larcker 2015).

[8] Our treatment of loss firms is comparable to prior research by Collins et al. (1998) and Klassen and Laplante (2012). Collins et al. (1998, p. 216) "exclude observations with negative pretax domestic or foreign income," and Klassen and Laplante (2012, p. 1262) "exclude firm years with negative five-year summed pretax domestic or foreign income (loss firms) because their income shifting incentives are more difficult to reliably estimate."

[9] We use 4-digit GICS (or GICS groups) as our industry definition. The classifications have the advantage of being revenue stream-based rather than product-based (e.g., SIC and NAICS schemes). Historical GICS are broadly available from 1985 through the present, which covers our entire sample period. Results are robust to using 2-digit SIC, 3-digit NAICS, and Fama-French 48 industries to estimate industry membership fixed effects (untabulated).

[10] For each three-year period, there are 36 trading months and approximately 753 trading days. Hence, 32 trading months and 670 trading days represent roughly equivalent fractions of the respective totals.

[11] Our results are qualitatively unchanged throughout when we (i) limit the analyses to the final quarter of each firm-year, (ii) include fiscal quarter fixed effects, or (iii) include calendar quarter fixed effects.

3.2 Variable Measurement

Tax-Motivated Income Shifting Measures

Prior research measures the tax incentive to shift income as the foreign tax rate faced by the firm less the U.S. statutory tax rate (τ_{US}) (e.g., Collins et al. 1998; Mills and Newberry 2004).[12] Specifically, Collins et al. (1998) calculate the foreign tax rate differential as:

$$FTR_{i,t} = TE_{f,i,t}/PTI_{f,i,t} - \tau_{US,t}, \quad (1)$$

where $TE_{f,i,t}$ is the tax expense reported for all foreign jurisdictions by firm i in period t (TXFO plus TXDFO), $PTI_{f,i,t}$ is the pretax income reported for all foreign jurisdictions by firm i in period t (PIFO), and $\tau_{US,t}$ is the top U.S. federal statutory corporate tax rate faced by corporations in period t. The U.S. statutory tax rate is used as a proxy for the tax rate the firm would face on those earnings if they were sourced to the U.S. We follow Collins et al. (1998) and subtract the U.S. statutory tax rate rather than the U.S. effective tax rate because the U.S. statutory tax rate is not confounded by taxes that are paid on repatriated foreign earnings. The effective tax rate is a useful measure of the firm's tax burden, but is influenced by changes in tax accruals and permanent adjustments that are unrelated to a firm's incentive to shift earnings abroad. We use the firm's average foreign tax rate which provides a measure of a firm's blend of unobservable foreign tax rates. Mills and Newberry (2004) note that a firm's average foreign tax rate reflects the firm's foreign operations in both high and low tax jurisdictions and the difference between the average foreign tax rate and the U.S. statutory tax rate is an indication of a firm's incentive to shift earnings conditional on the current structure of operations.

U.S. MNCs facing U.S. tax rates in excess of foreign tax rates (i.e., $FTR_{i,t} < 0$) have an incentive to shift income from the U.S. to foreign jurisdictions with low tax rates. Although such shifting will ultimately result in incremental U.S. tax upon repatriation, the temporary tax savings may yield

[12] Our sample extends from 1995 to 2012, and as such, we use 35 percent as the U.S. statutory rate. Beginning in 1993, the U.S. statutory rate for corporations with taxable income of at least $18,333,333 became 35 percent (https://www.irs.gov/pub/irs-soi/02corate.pdf). Although statutory rates other than 35 percent exist for corporations with taxable income below $18,333,333, the statutory rates for lower levels of income rarely apply to the MNCs in our sample. The MNCs in our sample are profitable (only 5.2 percent of firm-years report a loss) and have a mean market capitalization of $2.6 billion.

substantial tax benefits depending on the length of the deferral period. Alternatively, U.S. MNCs facing foreign tax rates that exceed the U.S. tax rate (i.e., $FTR_{i,t} > 0$) are more likely to face foreign tax credit limitations. In such instances, a firm would not receive the full credit against U.S. tax for foreign taxes paid. Because of the limitation on the foreign tax credit against U.S. taxes, the marginal dollar of foreign earnings is taxed once at the higher foreign rate, which creates an incentive to shift earnings into the U.S. where it will instead be taxed once at the lower domestic rate.

Klassen and Laplante (2012) note the annual *FTR* measure exhibits considerable variation over time, and the authors argue the underlying incentive to shift income should be stable across periods. Moreover, year-to-year variation in *FTR* could result from the application of accounting for income taxes (ASC 740; formerly SFAS 109) rules as opposed to actual variation in the economic incentives to shift income. To mitigate the possibility that year-to-year variation in *FTR* does not reflect economically meaningful variation in the incentive to shift income, we follow the approach of Klassen and Laplante (2012) and compute the long-run average of *FTR* (*FTR_AVE*):

$$FTR\_AVE_{i,t} = \Sigma_{m=0}^{4} TE_{f,i,t-m} / \Sigma_{m=0}^{4} PTI_{f,i,t-m} - 1/5 \times \Sigma_{m=0}^{4} \tau_{US,t-m}, \quad (2)$$

where the variables are computed as defined above. This proxy uses data from five years, and hence, is more likely to capture stable incentives to shift income by averaging out year-to-year fluctuations. When *FTR_AVE* is negative (positive), the firm faces a long-run incentive to shift income out of (into) the U.S.

Next, we proxy for the incidence of income shifting. We identify firm-year observations suspected of shifting income by adapting the methodology of Collins et al. (1998).[13] Specifically, for each sample year *t*, we estimate the following equation, requiring at least one contemporaneous and five lagged

[13] Collins et al. (1998) examine the association between *FTR* and foreign profit margins by interacting *FTR* with two indicator variables for whether they expect foreign tax credit limitations to be binding. Specifically, they set the variable *FTCBIND* to one if *FTR* is greater than zero, and zero otherwise. They set *NONBIND* to one if *FTR* is less than or equal to zero, and zero otherwise. If the effect of income shifting dominates implicit taxes, the authors expect that the coefficients on the interaction terms (*FTCBIND* * *FTR*) and (*NONBIND* * *FTR*) will be negative. Our analysis in equation (3) differs because we do not have these indicator variables interacted with *FTR*. Instead, we require *FTR_AVE* to be non-zero and the coefficient on α_{3i} to be negative in order to classify a firm as an income shifter. We do this to construct a firm-year level measure of income shifting for our information environment tests.

observations (t through t–5) per firm to limit potential bias in the firm-specific estimators (e.g., α_{2i} and α_{3i}):

$$FRoS_{i,t} = \alpha_1 RoS_{i,t} + \Sigma_i \alpha_{2i} Firm_i + \Sigma_i \alpha_{3i} Firm_i \times FTR\_AVE_{i,t} + \eta_{i,t}, \quad (3)$$

where $FRoS_{i,t}$ is the foreign return on sales calculated as foreign pretax income (PIFO) divided by total foreign sales (from the Compustat Segments File), $RoS_{i,t}$ is the worldwide return on sales calculated as worldwide pretax income (PI) divided by total sales (SALE), $Firm_i$ is an indicator variable for each firm i, and $FTR\_AVE_{i,t}$ is as defined above. The outcome of these regressions is a firm-specific coefficient (α_{3i}) for each year.

In equation (3), a negative α_{3i} indicates an association between lower (higher) foreign tax rates and higher (lower) unexplained foreign profit margins. Moreover, a negative α_{3i} is consistent with firms with low average foreign tax rates shifting profits from the U.S. to foreign jurisdictions. Shifting profits to foreign jurisdictions allows firms to maximize the extent to which profits are taxed at lower foreign tax rates. The result of this tax-motivated income shifting is higher unexplained foreign profit margins. Combining this evidence with a negative $FTR\_AVE_{i,t}$, which suggests a tax-based incentive to shift income outbound exists, we infer that tax-motivated outbound income shifting has occurred for firm i in year t. Similarly, a negative α_{3i} is also consistent with firms with high average foreign tax rates shifting profits from foreign jurisdictions to the U.S., which allows firms to maximize the extent to which profits are taxed at lower U.S. tax rates. In this case, tax-motivated income shifting results in lower unexplained foreign profit margins. Combining this evidence with a positive $FTR\_AVE_{i,t}$, which suggests a tax-based incentive to shift income inbound exists, we infer that tax-motivated inbound income shifting has occurred for firm i in year t.[14]

Because we lack differential predictions for the effects of outbound versus inbound income shifting on firms' information environments, we construct our tax-motivated income shifting variables to

[14] We conduct sensitivity analyses requiring that each α_{3i} is statistically significantly less than zero at the five-percent and 10-percent levels to be treated as evidence of income shifting (i.e., no evidence of shifting if insignificant or significantly positive). Each of these sensitivity checks (untabulated) produces qualitatively similar results to our reported results.

include both forms of income shifting. Specifically, we use the annual firm-specific coefficient (α_{3i}) to capture tax-motivated income shifting (*SHIFT_AVE*$_{i,t}$) if (i) α_{3i} from the equation (3) estimated in year *t* is negative and (2) *FTR_AVE*$_{i,t}$ is not equal to zero.[15] If either condition is failed, we classify the firm as not engaging in tax-motivated income shifting and set *SHIFT_AVE*$_{i,t}$ α_{3i} to zero. We multiply α_{3i} by negative one so that higher values of *SHIFT_AVE*$_{i,t}$ reflect greater income shifting.

For our second measure, we follow Klassen and Laplante (2012) to address potential measurement error in the incentive to shift income by using instrumental variables. As discussed above, the annual variation in foreign tax rates that is unrelated to the incentive to shift income creates measurement error in *FTR*. We are interested in estimating the persistent portion of foreign tax expense that relates to the underlying incentives to shift income. Thus, we employ the lagged values of *FTR* as instruments for this unobservable persistent incentive, and we estimate the following first-stage regression:

$$FTR_{i,t} = \beta_0 + \Sigma_{k=1}^{3}\beta_k FTR_{i,t-k} + \beta_4 RoS_{i,t} + \sum \beta_{5j} IND_{i,t} + \sum \beta_{6t} YEAR_{i,t} + \upsilon_{i,t} \quad (4)$$

where *RoS*$_{i,t}$, worldwide return on sales, controls for cross-sectional variation in firms' overall profitability. We also control for industry fixed effects at the four-digit GICS level and for fiscal year fixed effects.[16] The fitted values from this regression, *FTR_IV*$_{i,t}$, proxy for the persistent incentive to shift income. When *FTR_IV* is negative (positive), there exists an incentive to shift income out of (into) the U.S. We re-estimate equation (3) substituting *FTR_IV* for *FTR_AVE*. If the annual firm-specific coefficient on *FTR_IV* (α_{3i}) is negative, we view this as evidence that unexpected foreign profitability is associated with the tax rate incentive to shift. Again, we multiply the annual firm-specific coefficient on *FTR_IV* by negative one to measure tax-motivated income shifting (*SHIFT_IV*$_{i,t}$) if the coefficient estimate from the modified equation (3) is negative and the fitted-value from equation (4) (*FTR_IV*$_{i,t}$) is

[15] We exclude the *FTR_AVE* main effect, because it is a linear combination of the firm-specific *FTR_AVE* interactions.

[16] As in Klassen and Laplante (2012), we originally include a fourth lagged value of *FTR* and the ratio of foreign sales divided by worldwide sales as instruments, but based on *t*-statistics and an over-identifying restrictions test, we eliminate these two instruments and retain the more parsimonious equation (4).

not equal to zero.[17] We validate our income shifting measures and discuss the validation test results in Section 4 of the paper.

Measuring Information Environment Consequences

We examine the effect of tax-motivated income shifting on three aspects of the information environment: (1) information asymmetry; (2) private information gathering; and (3) information uncertainty. We measure information asymmetry using the adverse selection component of the bid-ask spread (*LAMBDA*). We estimate *LAMBDA* following Madhavan, Richardson, and Roomans (1997) as described in Armstrong et al. (2011) to take into account cross-sectional differences in firm size. To estimate *LAMBDA*, we gather intraday trade and quote data from the TAQ database. We match trades and quotes using the Lee and Ready (1991) algorithm with a five second lag to infer the direction of the trade (i.e., buy or sell). After trades are classified as either buyer- or seller-initiated, we estimate the following firm-specific regression using all transactions available during the month:

$$\Delta p_t / p_{t-1} = \psi_1 \Delta D_t + \lambda (D_t - \rho D_{t-1}) + u_t, \quad (5)$$

where p_t is the transaction price, D_t is the sign of trade (+1 if buy and -1 if sell), and ρ is the AR(1) coefficient for D_t. We require at least ten trades to estimate the regression. The fitted value λ in the above model is our monthly measure of the adverse selection component of bid-ask spreads. Finally, we average monthly values for firm *i* over years *t* to *t*-2 ($LAMBDA_{i,t}$). To facilitate interpretation, we multiply by 100.

In addition to *LAMBDA*, we use insider trading profits (*INS_PROFIT*) to capture the information asymmetry between managers and outside investors. For each insider trade, we calculate the insider trading profitability by calculating the excess return from the Carhart (1997) model that includes the Fama and French (1993) factors plus a momentum factor, and we estimate parameters over a window from 250 to 50 days prior to the trade, and multiplying by the dollar size of the trade (in millions). Following Huddart and Ke (2007), trade values are signed positive for purchases and negative for sales.

[17] In addition to our semi-continuous measures, we also create two indicator variables of our income shifting measures: (1) *D(SHIFT_AVE)* equal one if *SHIFT_AVE* is positive, and zero otherwise; (2) *D(SHIFT_IV)* equal one if *SHIFT_IV* is positive, and zero otherwise. We continue to find strong results (untabulated) supporting our hypothesis when we use these indicator variables of income shifting.

Thus, when insider trading profit is aggregated over purchase and sales transactions, gains when a stock price rises following a purchase are added to losses avoided when a stock declines after a sale. We aggregate profits of insiders' trades cumulated over all transactions at firm *i* for years *t* to *t*–2 ($INS\_PROFIT_{i,t}$). For firm-years without trades, *INS_PROFIT* is set to zero (Huddart and Ke 2007).

A concern with *INS_PROFIT* is that managers trade for numerous reasons unrelated to information. Cohen, Malloy, and Pomorski (2012) classify insiders as routine traders or non-routine traders depending on whether the insider makes regular sales in the same month each year, and the authors find non-routine (routine) trades earn positive (negligible) returns. Non-information based trading, such as trading for liquidity or diversification purposes, will add noise to our proxy for information asymmetry. To mitigate this concern, we follow Cohen et al. (2012) and identify trades that are most likely to be information-based trades (i.e., non-routine) using the prior three years of Thomson Reuters insider trading data. We measure *INS_PROFIT* using non-routine trades only.

We use idiosyncratic return volatility (*IDVOL*) to measure private information gathering. *IDVOL* is measured as the standard deviation of residuals from firm-specific regressions of daily returns on daily values of the three Fama and French (1993) factors and the Carhart (1997) momentum factor over years *t* to *t*–2 (Ang et al. 2006; 2009). Again, we multiply the measure by 100 to ease interpretation. Theoretical models of strategic trading (Glosten and Milgrom 1985) as well as French and Roll's (1986) evidence suggest that informed trading causes idiosyncratic stock return volatility. Moreover, Roll (1988) finds idiosyncratic stock returns primarily reflect the incorporation of private information into stock prices though informed trading, rather than through the incorporation of public information into stock prices. Therefore, idiosyncratic volatility provides a measure of a firm's private information flows (Armstrong et al. 2012).

To measure information uncertainty, we use dispersion in analyst forecasts (*AF_DISP*).[18] We measure *AF_DISP* as the standard deviation of the analysts' forecasts issued immediately before the

[18] We also examine the absolute value of analysts' forecast errors. The results (untabulated) remain both statistically and economically significant when we use this alternative measure.

quarter-end. Zhang (2006) uses dispersion in analysts' earnings forecasts to proxy for information uncertainty and presents evidence consistent with greater absolute earnings forecast errors resulting from information uncertainty. As such, we use analyst forecast dispersion as an *ex-ante* (before the earnings announcement) or expected measure of information uncertainty.

3.3 Research Design and Control Variables

Simultaneous System of Equations

To examine the information environment consequences of tax-motivated income shifting, we implement the following simultaneous system of equations where information environment (*IE*) and tax-motivated income shifting (*SHIFT*) are the endogenous dependent variables. We estimate the parameters of our system of equations using two-stage least squares (firm and time subscripts omitted):

$$IE = \alpha_1 SHIFT + \alpha_2 FOLLOW + \alpha_3 GEO\_CONC + \alpha_4 SIZE + \alpha_5 MTB + \alpha_6 AGE + \alpha_7 VOLUME + \alpha_8 \sigma(RET) + \alpha_9 MA + \alpha_{10} \sigma(VOLUME) + \alpha_{11} NGEOSEGS + \alpha_{12} \sigma(REV) + \alpha_{13} YEAR + \alpha_{14} IND + \tau \quad (6)$$

$$SHIFT = \beta_1 IE + \beta_2 PT\_ROA + \beta_3 LOSS + \beta_4 TA\_GAAP + \beta_5 BTD + \beta_6 FOR\_INC + \beta_7 SIZE + \beta_8 LEV + \beta_9 \sigma(REV) + \beta_{10} YEAR + \beta_{11} IND + \varphi \quad (7)$$

As previously discussed, our four measures for information environment (*IE*) are *LAMBDA*, *INS_PROFIT*, *IDVOL*, and *AF_DISP*. A positive coefficient on *SHIFT* (α_1) in equation (6) supports our hypothesis that tax-motivated income shifting is associated with a poorer information environment. In equation (6), we control for firm characteristics that affect the information environment (*IE*), such as firm size (*SIZE*), market-to-book ratio (*MTB*), and firm age (*AGE*). The average monthly trading volume from years *t* to *t*–2 (*VOLUME*) and its standard deviation (*σ(VOLUME)*) are included to control for the current liquidity of the security. We include the standard deviation of monthly returns from years *t* to *t*–2 (*σ(RET)*) to capture expected volatility and the standard deviation of sales revenue (*σ(REV)*) to capture operating volatility. We control for M&A activity (*M&A*) because M&A activity could be related to both

the ability to shift income and a firm's information environment. Lastly, we control for the number of geographic segments a firm discloses (*NGEOSEGS*).

Two-stage least squares estimation requires identifying variables that are exogenous to the dependent variable, but correlated with the independent variable. Identifying such variables is difficult, but we select the number of analysts following (*FOLLOW*), share volume (*VOLUME*), and geographic concentration (*GEO_CONC*) as the exogenous variables for equation (6). *GEO_CONC* is a revenue-based Herfindahl-Hirschman index following Bushman, Chen, Engel, and Smith (2004). For equation (7), we select pretax return on assets (*PT_ROA*) and whether the firm reports a loss in the current year (*LOSS*) as the exogenous variables. We select these variables because *a priori* we expect *FOLLOW*, *VOLUME*, *GEO_CONC*, *PT_ROA*, and *LOSS* to exhibit little or no correlation with the other endogenous variable in our system of equations. For example, we do not expect *FOLLOW* to be highly correlated with tax-motivated income shifting, and we do not expect *PT_ROA* to be highly correlated with information environment.

The dependent variable (*SHIFT*) in equation (7) is either *SHIFT_AVE* or *SHIFT_IV*. We include our measures of the information environment (*IE*) in equation (7) to reflect the endogenous relation between the information environment and tax-motivated income shifting. Although the motivation for H1 focuses on whether income shifting adversely impact firms' information environments, it is also plausible that managers of firms with poor information environments are better able to shift income without detection. A positive coefficient on *IE* would support this possibility.

Equation (7) also includes book-tax differences (*BTD*), which measure tax avoidance and contain information about earnings persistence (Hanlon 2005; Blaylock, Shevlin, and Wilson 2012). We include *TA_GAAP* to further control for the effects of aggressive tax avoidance on firms' information environments. Following Balakrishnan et al. (2012), *TA_GAAP* is industry-size-adjusted GAAP ETR and *BTD* is firm *i*'s average book-tax differences over years *t* to *t*–2.[19] We also add firm characteristics to

[19] As a robustness check, we replace *TA_GAAP* with *TA_CASH* (industry-size-adjusted cash ETR), and the results are qualitatively unaffected.

control for other factors that relate to firms' tax avoidance activities. We add the standard deviation of revenues ($\sigma(REV)$) to capture operating volatility. Because foreign earnings could be less transparent than domestic earnings, we control for foreign earnings (*FOR_INC*) to mitigate concerns that our measure of income shifting reflects the extent of foreign earnings. In all specifications, we include both year and industry (4-digit GICS) fixed effects, and we cluster standard errors at the firm level (Peterson 2009; Gow, Ormazabal, and Taylor 2010). Appendix A provides detailed definitions for all variables.

The Adoption of SFAS No. 131

Our second empirical strategy exploits the adoption of SFAS 131 to better identify the causal relation between income shifting and the information environment. We examine the effect of income shifting on firms' information environments around the adoption of SFAS 131 by estimating the following specification:

$$IE = \beta_1 SHIFT + \beta_2 NODISC + \beta_3 SHIFT * NODISC + \beta_4 CONTROL + YEAR + IND + \varepsilon \quad (8)$$

where *IE* and *SHIFT* are as previously defined. *NODISC* is an indicator variable equal to one if the firm discontinues geographic earnings disclosures after SFAS 131. Following Hope and Thomas (2008) and Hope et al. (2013), we classify a firm as a non-discloser (*NODISC* = 1) if the firm does not report earnings for at least two foreign segments in the first two years after the adoption of SFAS 131. The vector of control variables includes the covariates in our system of equations. We include year and industry fixed effects, and we cluster the standard errors at the firm level. Consistent with H3, we expect the coefficient on the interaction term (β_3) to be positive, because our measures are inversely related to the quality of the information environment.

4. Results

4.1 Descriptive Statistics and Correlations

Table 2 reports descriptive statistics for the dependent, income shifting, control, and cross-sectional test variables. The mean (median) of *LAMBDA*, the adverse selection component of the bid-ask spread, is 24 basis points (17 basis points). The mean value of *INS_PROFIT* is 1.038, which means the average firm in our sample is associated with $1.038 million of risk-adjusted insider trading profits. We

also find that some values of *INS_PROFIT* are negative. It is important to note that we do not view this as evidence that managers have less information than the market about the value of the firm. Rather, we view the firms with negative insider trading returns as firms with relatively low information asymmetry.

The mean (median) values for the five-year average foreign tax rate incentives (i.e., *FTR_AVE* and *FTR_IV*) are negative, suggesting that the average (median) firm-year exhibits an incentive to shift profits out of the U.S. for tax purposes. This finding suggests that outbound shifting incentives have dominated inbound shifting incentives for our sample firms over the estimation period. *SHIFT_AVE* is bounded below by zero by design. A value of zero indicates either that firms do not have an incentive to shift income or that we find no evidence of income shifting. Because the firm-year-specific coefficients on *FTR_AVE* from equation (3) capture abnormal foreign profitability, higher values of *SHIFT_AVE* reflect greater evidence of income shifting. Using the instrumental variable approach to capture income shifting (*SHIFT_IV*) produces similar descriptive statistics. Overall, our descriptive statistics suggest that our sample primarily consists of large, mature, and profitable firms, which is expected given our sample selection criteria and data requirements.

4.2 Validation of Income-Shifting Measures

We perform three validation tests to provide evidence that we are measuring tax-motivated income shifting. First, we examine the correlation coefficients between our measures of tax-motivated income shifting. If our four proxies measure the same underlying construct of tax-motivated income shifting, then they should be positively correlated. Untabulated results indicate that the correlations between our income shifting measures are positive and statistically significant at the 1% level. This evidence is necessary for our measure to capture the same underlying construct of interest, but not sufficient to conclude that the underlying construct is tax-motivated income shifting.

Next, to further the validity of our income shifting proxies, we explore whether our four income shifting measures are related to cash effective tax rates (cash ETRs) in a predictable manner. Tax-motivated income shifting reassigns income that is otherwise taxable in a high-tax jurisdiction to a low-tax jurisdiction. Therefore, income shifting by U.S. MNCs should reduce cash ETRs, and we predict a

negative relation between our measures and cash ETRs. In Table 3, we regress one-year and three-year cash ETRs on our measures of tax-motivated income shifting, fiscal year fixed effects, industry (4-digit GICS) fixed effects, and a vector of control variables. For our measures to capture tax-motivated income shifting, each must be negatively associated with cash ETRs. Consistent with this expectation, we find negative and statistically significant coefficient estimates in each of the four columns. The coefficient estimates are also economically significant. For example, in Column 4 the negative coefficient estimate of 0.03 on *SHIFT_IV* indicates that one standard deviation increase in *SHIFT_IV* is associated with an annual 1.45 percentage point decrease in three-year cash ETRs.

Third, we examine the time trend of our income shifting identification strategy and the magnitude of income shifting measures. Klassen and Laplante (2012) examine whether income shifting by U.S. MNCs increased from 1988 through 2009. For their sample of 380 firms, they estimate an additional $10 billion per year of income shifted out of U.S. at the end of their sample period relative to the beginning (pp. 1273-4). This equates to an additional $26 million of income per firm per year. Thus, we examine whether our tax motivated income shifting measure increases over our sample period, which exhibits significant overlap with that of Klassen and Laplante (2012). In this validation exercise, we estimate outbound and inbound shifting measures separately and plot them in the time series.

In Figure 1, we present the percentage of firms that exhibit evidence of *outbound* tax-motivated income shifting each year from 1995 through 2012. Consistent with evidence in Klassen and Laplante (2012), we find evidence that the prevalence of outbound income shifting increased in our sample between 1995 and 2012. In Figure 2, we present the time-series of the annual cross-sectional means of our two continuous *outbound* income shifting proxies, isolating only those firm-years with evidence of outbound income shifting. For a given fiscal year, the mean value reflects the intensity of outbound income shifting, conditional on the firm engaging in outbound income shifting in that year. Consistent with the intensity of outbound income shifting having increased over the sample period, and again consistent with the evidence of Klassen and Laplante (2012), we observe an upward trend from 1995 to 2012.

We present the percentage of firms that exhibit evidence of *inbound* tax-motivated income shifting in Figure 3 and the intensity of such income shifting in Figure 4. In sharp contrast to Figure 1 and Figure 2, evidence of inbound income shifting decreased during our sample period from 1995 through 2012. Moreover, the magnitude of inbound shifting among inbound shifters is lower than outbound shifting is among outbound shifters, especially in recent years. Overall, the trends we observe in these figures are consistent with the findings of both Collins et al. (1998) and Klassen and Laplante (2012).[20]

Collectively, the positive correlations between our measures of tax-motivated income shifting, the results of our cash ETR regression analysis, and the time-series trends enhance the validity of our measures as measuring the theoretical construct: tax-motivated income shifting. Moreover, our validation tests support a greater level of reliance on the ability of our measures to reflect whether firms engage in tax-motivated income shifting over our sample and hence on the consequences of engaging in such income shifting behavior.

4.3 Income Shifting and Information Environment

We present our main results from the system of equations in Table 4. Panel A and Panel B present the results of jointly estimating equations (6) and (7) when the income shifting measure is *SHIFT_AVE*. Panel A represents the second stage, where *SHIFT_AVE* is the fitted values from the first stage in Panel B. The coefficients on *SHIFT_AVE* in the information environment regressions (Panel A) are all significant in the predicted direction, consistent with H1. These results are consistent with income shifting increasing information asymmetry, private information gathering, and analyst forecast dispersion. Because of our two-stage approach, these findings imply that if the exogenous determinants of income shifting do increase income shifting, we would also expect to observe increases in information

[20] We also conduct our main information environment tests using outbound and inbound shifting measures separately. Results (untabulated) are consistent with H1 that both forms of income shifting adversely affect firms' information environments. The results are relatively stronger both in terms of significance level and economic significance for outbound shifting, consistent with outbound shifting being more prevalent than inbound shifting over our sample. Additionally, within inbound shifting only, our evidence for income shifting affecting the information environment is stronger when we focus on the first half of our sample, which again is consistent with inbound shifting being more common in the early years of our sample.

asymmetry, private information gathering, and analyst forecast dispersion, holding other determinants of firms' information environments constant.

Turning to the *SHIFT_AVE* regressions in Panel B, the coefficients on *LAMBDA*, *INS_PROFIT*, and *AF_DISP* are not statistically significant, while the coefficient on *IDVOL* is positive and marginally significant. Thus, the results in Panel A and B suggest that income shifting is associated with a poor information environment, but a poor information environment is not necessarily associated with income shifting. Panel B also indicates that aggressive tax avoidance (*TA_GAAP*) and pretax foreign income (*FOR_INC*) are positively associated income shifting, while operating volatility (σ(*REV*)) is negatively related to income shifting.

To assess the validity of our exogenous variables, we conduct tests of endogeneity using Wooldridge's Robust Score Test and of overidentifying restrictions using the Sargan-Hansen Test. For the test of endogeneity, the null is that the endogenous variable is in fact exogenous. Rejecting the null provides evidence of endogeneity, and leads us to the test of overidentifying restrictions. For the test of overidentifying restrictions, the joint null hypothesis is that the instruments are orthogonal to the error term and the excluded instruments are properly excluded. In Panel B, columns (1), (3), and (4), we fail to reject the null for the test of endogeneity. This result suggests that *SHIFT_AVE* is plausibly exogenous to *LAMBDA*, *IDVOL*, and *AF_DISP*. In column (2), for *INS_PROFIT*, we reject the null for the test of endogeneity; however, we retain the null hypothesis for the test of overidentifying restrictions. Although we reject the null for the overidentifying restrictions tests in columns (3) and (4), this result is not as concerning given the lack of evidence of regressor endogeneity.

Panel C and Panel D in Table 4 report results from our two-stage least square estimations when the income shifting variable is *SHIFT_IV*. The coefficients on *SHIFT_IV* in the information environment regressions in Panel C are positive and significant, consistent with H1. The coefficients on the control variables are consistent with those reported in Panel A, Table 4. In Panel D, the coefficients on the measures of information environment in the income shifting regressions are not significant. Thus, similar to Panel A and Panel B, these results suggest that income shifting is associated with a poor information

environment, but a poor information environment is not necessarily associated with income shifting. Again, the results of tests of endogeneity and overidentifying restrictions provide similarly comforting results that these tests are well-specified. Overall, the results in Table 4 provide strong support for our prediction that income shifting adversely affects firms' external information environments, but do not support the converse. Moreover, these results hold after controlling for tax aggressiveness and book-tax differences, suggesting that our underlying construct of income shifting is distinct from broader constructs of tax avoidance and tax aggressiveness.

To assess the economic significance of these results, we calculate the effect of a one standard deviation increase in income shifting on *LAMBDA*. The coefficient on *SHIFT_AVE* (*SHIFT_IV*) suggests that a one standard deviation increase in the fitted values of *SHIFT_AVE* (*SHIFT_IV*) is associated with a 40 (25) basis points increase in bid-ask spreads. These coefficients are equivalent to an average cost to traders between $22.05 and $34.96 million, which represents 86 to 136 basis points of total market capitalization.[21] By comparison, Daske, Hail, Leuz, and Verdi (2008, p. 1088) examine the economic effect of IFRS adoption and estimate that IFRS led to a bid-ask spread decline of 12 basis points, which the authors describe as economically significant.[22] The costs of an increased *LAMBDA* will be borne primarily by short-term investors who enter and exit positions often. Insofar as cash tax savings accrue primarily to long-term investors, short-term investors at shifting firms will experience higher trading costs, but receive relatively little benefit from the shifting.[23]

4.4 Cross-Sectional Variation: Domestic-Foreign Earnings Growth Gap

[21] We estimate the average cost to traders by taking α_1 as estimated from equation (6) times the standard deviation of predicted *SHIFT_AVE* and predicted *SHIFT_IV*, respectively. We divide by 100 to convert percentage to decimals. We then multiply that by the average monthly volume and average price per share for our sample. We multiply by 12 to annualize our estimate of the average cost to traders.

[22] In contrast to Daske et al. (2008), we examine the adverse selection component of the bid-ask spreads, rather than percentage bid-ask spreads. When using percentage bid-ask spreads as our information environment proxy and a similar set of control variables as Daske et al. (2008), we find statistically significant results. The economic magnitude of these results are slightly smaller than the results we find using the adverse selection component bid-ask spread, which may be attributable to percentage bid-ask spreads being a noisier measure of adverse selection.

[23] We use different measurement windows in our income shifting and information asymmetry proxies. The income shifting measures require five years of data, while we use three years of data to calculate *LAMBDA* and *IDVOL*. As a robustness check, we measure income shifting, information environment proxies, and control variables all using four and five years of data. The results (untabulated) are qualitatively similar under these alternative measurement windows.

Table 5 reports the results of testing the cross-sectional differences in the relation between income shifting and information asymmetry (H2). We partition the sample on the gap between a firm's domestic pretax earnings growth rate and its foreign pretax earnings growth rate. We use an indicator variable, *GROWTHGAP*, to identify firms with large differences in domestic and foreign earnings growth. *GROWTHGAP* is equal to one if, relative to firms in the same fiscal year, either (i) the three-year average of annual growth in pretax domestic income is in the top (bottom) quintile and three-year average of annual growth in pretax foreign income is in the bottom (top) quintile, or (ii) the three-year average of absolute annual growth in pretax domestic income is in the top (bottom) quintile and three-year average of absolute annual growth in pretax foreign income is in the bottom (top) quintile; and zero otherwise.

Next, we add *GROWTHGAP* and a term for its interaction with our income shifting proxies, *SHIFT_AVE* and *SHIFT_IV*, to the information environment regressions. We find positive and significant coefficients on the interaction terms reported in Panel A, Table 5 when *SHIFT_AVE* is the proxy of income shifting. We also continue to document a positive and significant main effect on *SHIFT_AVE*. Together, these results suggest that the effect of tax-motivated income shifting on a firm's information environment is more pronounced when the firm's growth rate gap between domestic and foreign earnings is larger.

Panel C, Table 5 presents results when the income shifting variable is *SHIFT_IV*. We continue to find positive and significant coefficients on the interaction terms as well as positive and significant main effects. The results suggest that the effect of tax-motivated income shifting on a firm's information environment is more pronounced when the gap between firms' domestic and foreign earnings growth rate is larger. Overall, the results from our simultaneous system of equations (Tables 4 and 5) support our hypotheses that tax-motivated income shifting adversely affects firms' information environments (H1) and that the negative effects of tax-motivated income shifting on a firm's information environment is more pronounced when the growth rate gap between domestic and foreign earnings is larger (H2). Moreover, we find limited evidence in support of an effect of the external information environment on income shifting.

4.5 Income Shifting and Information Environment around the Adoption of SFAS 131

In addition to our simultaneous system of equations, we use the adoption of SFAS 131 to identify the causal relation between income shifting and the information environment. Before SFAS 131, U.S. firms were required to disclose geographic earnings. The implementation of SFAS 131 effectively made this disclosure voluntary, and most firms chose to discontinue geographic segment disclosures (Herrmann and Thomas 2000). Insofar as geographic disclosures improve investors' ability to (or make it less costly to) identify the true source of earnings, we expect the adverse information environment effect of income shifting is more pronounced after firms stop disclosing geographic earnings. To test this hypothesis, we estimate equation (8) over the fiscal years t–3 through t+3, where a firm's initial adoption of SFAS 131 is year t (i.e., the first fiscal year beginning after December 31, 1997).[24] We drop the adoption year from our sample to mitigate the influence of any adoption period effects.

Table 6 presents regression results for equation (8). Specifically, Panel A (Panel B), Table 6 reports results when the income shifting variable is *SHIFT_AVE* (*SHIFT_IV*).[25] Consistent with H3, we find positive and significant coefficients on the interaction term between our income shifting proxies and non-discloser in both Panels. These results suggest that the adverse impact of tax-motivated income shifting on the information environment is concentrated in firms that stopped disclosing geographic earnings (i.e., when *NODISC* = 1) after the change in disclosure policy.

5. Supplemental Analysis and Robustness Checks

5.1 Tax Haven Initiation Tests

Because nondisclosure of geographic segments was common after SFAS 131 adoption, we use the initiation of tax haven disclosures as a supplemental test of the relation between income shifting and the information environment. Similar to our SFAS 131 tests, we conduct our analyses in a changes specification to mitigate concerns regarding reverse causality as well as omitted variables. This test has

[24] Results are qualitatively similar when we allow the sample period to span years t–5 through t+5.

[25] To have a measure of income shifting for all firms, including those that discontinue disclosure, we take the average of *SHIFT_AVE* (*SHIFT_IV*) over the pre-adoption period. Results are qualitatively unaffected when we instead take the value at t–1, t–3, or the largest value over the period t–3 through t–1.

the advantage of identifying a precise time period (i.e., the initial disclosure of a significant tax haven subsidiary) for each firm when we expect a change in income shifting and can test for an association with changes in the external information environment. Another benefit of this test is that initiation years for our sample firms are not clustered in calendar time. This test provides an alternative way of capturing tax-motivated income shifting: we identify such a change by using the initial listing of one or more significant subsidiaries in tax haven jurisdictions. The drawbacks of this test are that the proxy for income shifting may not correspond with actual entry into a tax haven and the tax haven may not be used to achieve income shifting.

We identify when firms first enter a tax haven using Exhibit 21 disclosures from Form 10-K filings. Exhibit 21 lists each significant subsidiary and its jurisdiction, which is often the location of incorporation. Following Dyreng and Lindsey (2009), we classify a country as a tax haven if two or more of the following organizations list the country as a tax haven: the OECD, the U.S. federal government in the Stop Tax Havens Abuse Act, the International Monetary Fund, and the Tax Justice Network. For these firms, we identify the year of initiation (year *t*) when at least one significant subsidiary that is in a tax haven country first appears in Exhibit 21, and we require that firms begin our sample period with no significant subsidiaries in a tax haven. We retain three years prior to initiation (year *t*–3 to year *t*–1) and three years after initiation (year *t*+1 to year *t*+3).[26] We then examine changes in our proxies of information asymmetry, private information gathering, and information uncertainty over years *t*–3 to *t*+3.[27]

[26] We check whether the firm continues to list at least one significant tax haven subsidiary in years *t*+1 through *t*+3. If the firm does not, we remove that observation from this analysis. Some firms remove tax havens outside of this window. A removal could represent a divestiture or a liquidation of the tax haven subsidiary. Alternatively, it could represent a strategic reporting decision. We include a control variable *MULTI* that is an indicator if a firm (i) reports a tax haven entry, (ii) continues to report the subsidiary throughout the five-year window from entry year *t* to year *t*+3, (iii) at some subsequent year no longer reports a tax haven subsidiary, and (iv) then reports a new tax haven subsidiary entry. *MULTI* takes a value of one for 17 percent of the firms in the haven entry sample. Our results are robust to restricting the tests to firms where *MULTI* is zero. In additional sensitivity analysis, we find our inferences are unchanged when considering various windows (i.e., one-year, two-year, four-year, and five-year) around the initiation year.

[27] In addition to the tax haven initiation tests, we also use tax haven counts as an alternative proxy of income shifting in our levels analyses. The results (untabulated) remain both statistically and economically significant when we use this alternative income shifting measure.

Table 7 presents regression results from the changes specifications. *POST* is equal to one for the years *after* the entry into a tax haven and zero for the years *before* the entry. Therefore, the coefficient on *POST* measures the average change in information asymmetry, private information gathering, and analyst forecast dispersion around when a firm first initiates operations in a tax haven country. We find haven entry is positively related to increases in *LAMBDA* and *IDVOL*, suggesting that information asymmetry and private information gathering both increase after firms initiate operations in tax haven countries. In the analyst forecast dispersion regression, the positive and statistically significant coefficient on *POST* suggests that information uncertainty increases after firms first enter a tax haven. Overall, the changes specifications support our primary findings and mitigate concerns about reverse causality and omitted variables.[28]

5.2 Do Managers Respond to the Information Environment Effects of Income Shifting?

The primary results of this study support the conclusion that tax-motivated income shifting leads to external information environment problems (i.e., higher information asymmetry, more private information gathering, and higher information uncertainty). In this section, we follow prior research and investigate whether managers take actions to reduce these negative consequences of income shifting (Guay, Samuels, and Taylor 2016). First, we explore whether firms engaging in income shifting are more likely to provide management earnings and sales guidance. We examine whether income shifting affects the likelihood of issuing management guidance in a Cox proportional hazard model. Results in Table 8, columns (1) and (2), for the exponentiated coefficients on our income shifting variables (*SHIFT_AVE* and *SHIFT_IV*) suggest that income shifting is related to a statistically and economically higher likelihood of issuing earnings forecasts. The coefficient on *SHIFT_IV* (1.263) suggests that one standard deviation increase in *SHIFT_IV* increases the probability of issuing earnings forecast by an economically

[28] Initiating a tax haven requires beginning operations in a new country, which may increase organizational complexity, and consequently, information asymmetry, private information gathering costs, and information uncertainty. To examine this alternative explanation, we conduct a counter-factual analysis. In the counter-factual analysis, we set the *POST* variable in Table 7 equal to one for a firm's initial entry into a *non-haven* country. To measure a firm's initial entry into a non-haven country, we use Exhibit 21 data, as described by Dyreng and Lindsey (2009). Inconsistent with the alternative explanation, the *POST* variable is not statistically different from zero in any of the four regressions.

meaningful 21.0% ((1.263-1) * 0.797). We report the results of sales guidance in columns (3) and (4) of Table 8. Similarly, we find income shifting is related to a higher likelihood of issuing sales forecasts.

Next, we examine whether issuing earnings forecasts reduces the information environment problems. Management forecasts can help investors better understand earnings growth and, hence, reduce information uncertainty, information asymmetry, and private information gathering costs. Therefore, we posit that the negative effects of income shifting on the information environment are lessened by management guidance. We add *EGUIDE*, an indicator variable for earnings guidance, and the interaction of *EGUIDE* and our income shifting proxies, *SHIFT_AVE* and *SHIFT_IV*, to the information environment regressions in equation (6). We report the results in Table 9. We find negative and significant coefficients on the interaction terms in both Panel A and Panel C, consistent with our prediction. Our findings suggest that management earnings guidance reduces the adverse effects of income shifting on the external information environment. Together, these results suggest that firms respond to information environment problems caused by income shifting by issuing management forecasts and that response minimizes the information environment costs of income shifting.

6. Conclusion

When U.S. multinational companies engage in income shifting, investors benefit from an increase in after-tax cash flows. Although an increase in after-tax cash flows benefits investors, the costs borne by investors when firms engage in tax-motivated income shifting are not well understood (Hanlon and Heitzman 2010). In this paper, we contribute to this understudied area of research by examining the information environment consequences of tax-motivated income shifting.

We argue that tax-motivated income shifting increases the complexity of the firms' operations and accounting information, resulting in a reduction in information quality. Our argument is consistent with the recent FASB Exposure Draft on income taxes, which suggests income shifting leads to significant information environment costs (FASB 2016). The FASB (2016, BC 21) notes, "The Board considered further country-level disaggregation," because, consistent with income-shifting adversely affecting the information environment, "users expressed a desire to have tax information related to

foreign income taxes at a more granular level… [because] such information would further their understanding of exposures to various countries and whether their current tax rate is sustainable." We posit and document that, relative to investors at firms with little or no income shifting, the investors at shifting firms will experience greater information asymmetry, greater private information gathering costs, and higher information uncertainty. Additional analysis reveals that the information environment effects of income shifting are most pronounced at firms with large differences between foreign and domestic earnings growth. Next, using SFAS 131 as a change to disclosure of geographic earnings, we demonstrate that the negative effect of income shifting on the information environment is concentrated in firms that stopped disclosing geographic information. The results of our SFAS 131 analysis clearly underscore the concerns expressed by the FASB about the need for more detailed disclosure.

Our study contributes to the accounting literature in three ways. First, we document economically significant costs associated with income shifting. Second, our analysis provides new insight into why firms do not fully utilize tax planning opportunities. Managers must consider the benefit of shifting an incremental dollar of income into a lower tax jurisdiction against the cost to the firm's information environment. Although it may still be optimal to shift significant amounts of income, our findings shed new light on why firms may not exploit all opportunities to shift income. Finally, our study provides future researchers with a method for measuring tax-motivated incoming shifting at the firm-year level using publicly available data.

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Appendix A. Variable Descriptions

Dependent Variables:

$LAMBDA_{i,t}$	The adverse selection component of the bid-ask spread (following Madhavan, Richardson, and Roomans 1997) for firm *i* over years *t* to *t-2*, multiplied by 100 for ease of interpretation;
$INS\_PROFIT_{i,t}$	Insider trading profit for the year, measured as the abnormal return on the stock over the six months following the trade multiplied by the value of the trade (in millions of dollars). For sales transactions, this value is multiplied by -1 so that losses avoided on sales have the same sign as gains on purchases. Following Huddart and Ke (2007), we estimate abnormal returns using the Fama and French (1993) three factors, plus a momentum factor (Carhart 1997). Each firm must have at least 120 trading day observations over the estimation window, which is 250 to 50 trading days prior to the trade date;
$IDVOL_{i,t}$	Idiosyncratic return volatility, measured as the standard deviation of residuals from firm-specific regressions of daily returns on daily values of three Fama-French (1993) factors, plus the momentum factor (Carhart 1997), over years *t* to *t-2*, multiplied by 100 for ease of interpretation; and
$AF\_DISP_{i,t}$	Dispersion of analyst earnings forecasts, measured as the standard deviation of analysts' quarterly earnings forecasts.

Income Shifting and Tax Rate Variables:

$SHIFT\_AVE_{i,t}$	Tax-motivated income shifting measure (adapted from Collins, Kemsley, and Lang 1998). This semi-continuous measure takes the absolute value of the firm-year specific coefficient on *FTR_AVE* if the following two conditions are met: (i) the firm-year specific *FTR_AVE* coefficient from equation (3) is negative, indicating that the foreign tax rate is inversely related to unexpected foreign profitability, and (ii) $FTR\_AVE_{i,t}$ is not equal to zero, indicating a tax rate-based incentive to shift income. If either condition is failed, the measure takes a value of 0;
$FTR\_AVE_{i,t}$	Incentive to shift income measured over five-year rolling windows (following Klassen and Laplante 2012), calculated as $\Sigma_{m=0}^{4} TE_{i,t-m} / \Sigma_{m=0}^{4} PTI_{i,t-m} - 1/5 * \Sigma_{m=0}^{4} STR_{US,t-m}$, where $TE_{i,t}$ is the tax expense reported by firm *i* for foreign jurisdictions for year *t* (TXFO+TXDFO), $PTI_{i,t}$ is the pretax income reported for firm *i* the foreign jurisdictions for year *t* (PIFO), and $STR_{US,t}$ is the top U.S. federal tax rate facing corporations for year *t*;
$SHIFT\_IV_{i,t}$	Tax-motivated income shifting measure (adapted from Collins, Kemsley, and Lang 1998). This semi-continuous measure takes the absolute value of the firm-year-specific coefficient on *FTR_IV* if the following two conditions are met: (i) the firm-year specific *FTR_IV* coefficient from equation (3) is negative, indicating that the foreign tax rate is inversely related to unexpected foreign profitability, and (ii) $FTR\_IV_{i,t}$ is not equal to zero, indicating a tax rate-based incentive to shift income. If either condition is failed, the measure takes a value of 0; and
$FTR\_IV_{i,t}$	Instrumental variables approach to income shifting incentive (following Klassen and Laplante 2012), measured as the fitted-values from a regression of FTR on three lagged values of *FTR*, with controls for return on sales (PI/SALE), industry fixed effects, and year fixed effects. $FTR_{i,t}$ is defined as ($TE_{i,t}$ /$PTI_{i,t}$) - $STR_{US,t}$.
$CASH\_ETR1_{i,t}$	One-year cash effective tax rate (ETR), measured as cash taxes paid (TXPD) scaled by pretax income adjusted for special items (PI - SPI);

$CASH\_ETR3_{i,t}$ Three-year cash ETR, measured as the sum of cash taxes paid (TXPD) over years *t* to *t*-2 divided by the sum of adjusted pretax income (PI - SPI) over years *t* to *t*-2;

Control and Cross-Sectional Variables:

$GROWTHGAP_{i,t}$ Indicator variable set equal to 1 if either (1) three-year average of annual growth in pretax domestic income is in the top (bottom) quintile, relative to firms in the same fiscal year, and three-year average of annual growth in pretax foreign income is in the bottom (top) quintile, relative to firms in the same fiscal year, or (2) three-year average of absolute annual growth in pretax domestic income is in the top (bottom) quintile, relative to firms in the same fiscal year, and three-year average of absolute annual growth in pretax foreign income is in the bottom (top) quintile, relative to firms in the same fiscal year. Variable is set to 0 otherwise. Averages are over years *t* through *t*-2. Domestic (foreign) earnings growth is the annual change in PIDOM (PIFO), scaled by lagged PIDOM (PIFO);

$PTROA_{i,t}$ Pretax income (PI) scaled by average assets (AT);

$LN\_ASSETS_{i,t}$ Natural logarithm of lagged total assets (AT);

$LEV_{i,t}$ Lagged long-term debt (DLTT) scaled by lagged assets (AT);

$NOL_{i,t}$ Indicator variable set to 1 if the firm has positive tax-loss carryforwards (TLCF), and 0 otherwise;

$\Delta NOL_{i,t}$ Ending balance of tax-loss carryforwards (TLCF) less the beginning balance, scaled by lagged total assets (AT);

$MTB_{i,t}$ Market-to-book ratio at the beginning of the year, measured as market value of equity (CSHO*PRCC_F) scaled by book value of equity (CEQ);

$PP\&E_{i,t}$ Net PP&E (PPENT) scaled by lagged assets (AT);

$DEP_{i,t}$ Depreciation expense (XDP) scaled by lagged assets (AT);

$EQINC_{i,t}$ Equity in earnings of unconsolidated subsidiaries (ESUB) scaled by lagged assets (AT);

$FOR\_INC_{i,t}$ Pretax foreign income (PIFO) scaled by lagged assets (AT);

$GEO\_CONC_{i,t}$ Revenue-based Herfindahl-Hirschman indices, calculated as the sum of the squares of each geographic segment's sales as a percentage of total firm sales, following Bushman, Chen, Engel, and Smith (2004);

$R\&D_{i,t}$ Research and development expense (XRD) scaled by lagged assets (AT);

$CASH_{i,t}$ Cash and cash equivalents (CHE) scaled by lagged assets (AT);

$FOLLOW_{i,t}$ Natural logarithm of one plus the number of analysts following the firm;

$AGE_{i,t}$ Natural logarithm of the difference between the first year when the firm appears in COMPUSTAT and the current year;

$VOLUME_{i,t}$ Natural logarithm of the average monthly trading volume (in hundreds) over years *t* to *t-2*;

$\sigma_{i,t}(VOLUME)$ Natural logarithm of the standard deviation of monthly trading volume over years *t* to *t-2*;

$\sigma_{i,t}(RET)$	Standard deviation of monthly stock returns over years *t* to *t-2*;
$M\&A_{i,t}$	Indicator variable equal to 1 if a firm engages in a merger or acquisition of at least one foreign or U.S. multinational target firm in the year, and 0 otherwise;
$NGEOSEGS_{i,t}$	Total number of geographic segments, with non-missing sales data, reported in Compustat Historical Segments;
$SIZE_{i,t}$	Natural logarithm of market value of equity (CSHO*PRCC_F) at the beginning of the year;
$\sigma_{i,t}(REV)$	Standard deviation of annual revenues (SALE) over years *t* to *t-4*, each scaled by the respective period's total assets (AT);
$LOSS_{i,t}$	Indicator variable equal to 1 if the firm has a pretax loss in the current year, and 0 otherwise;
$TA\_GAAP_{i,t}$	Industry-size adjusted GAAP ETR (following Balakrishnan, Blouin, and Guay 2012), measured as the mean GAAP ETR of the same industry-size portfolio firms less the firm *i*'s GAAP ETR, where GAAP ETR is the sum of total tax expense (TXT) over years *t* to *t-2* divided by the sum of pretax income (PI) over years *t* to *t-2*. Higher values indicate greater amounts of relative tax avoidance;
$BTD_{i,t}$	Absolute value of average book-tax differences, measured over years *t* to *t-2*. Book-tax differences are defined as pretax income less taxable income: $(PI_{i,t} - (TXFED_{i,t} + TXFO_{i,t}) / STR_t)/AT_{i,t-1}$, where STR_t is the top U.S. federal statutory tax rate faced by corporations in year *t*;
$INTANG_{i,t}$	Intangible assets (INTAN) scaled by lagged assets (AT);
$NODISC_{i,t}$	Indicator variable set equal to 1 if a firm omits disclosure of geographic subsidiaries after adoption of SFAS 131, and 0 otherwise. We follow the approach of Hope, Ma, and Thomas (2013) to define omission as not reporting earnings for at least two foreign segments in the first two years after SFAS 131;
$POST_{i,t}$	Tax haven entry, which is an indicator variable that takes a value of 1 for the years after a firm first discloses a tax haven subsidiary during our sample period, and 0 for the years prior first listing (i.e., begins the sample period with zero tax haven subsidiaries). Tax haven jurisdictions are determined using the criteria of Dyreng and Lindsey (2009), and subsidiary location data are drawn from Ex. 21 of forms 10-K;
$FOR\_DISC_{i,t}$	Indicator variable set equal to 1 if a firm provides disclosure of geographic subsidiaries, and 0 otherwise;
$MULTI_{i,t}$	Indicator variable equal to 1 if the firm has more than one tax haven entry during our sample period, and 0 otherwise;
$EGUIDE_{i,t}$	Indicator variable equal to 1 if management issues earnings-based forecasts for the reporting period, and 0 otherwise; and
$SGUIDE_{i,t}$	Indicator variable equal to 1 if management issues sales-based forecasts for the reporting period, and 0 otherwise.

Figure 1. Percentage of sample firms identified as engaging in outbound tax-motivated income shifting each year

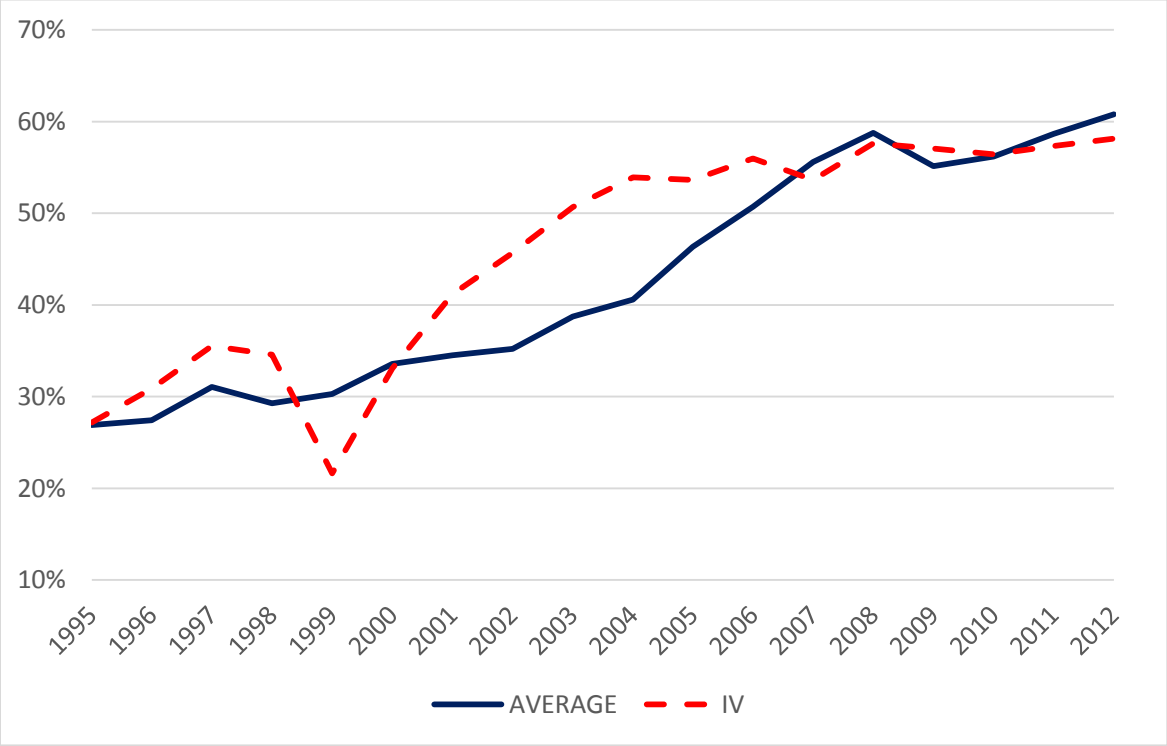

Figure 2. Time-series of annual cross-sectional means of outbound tax-motivated income shifting measures, including ONLY firms that shift income

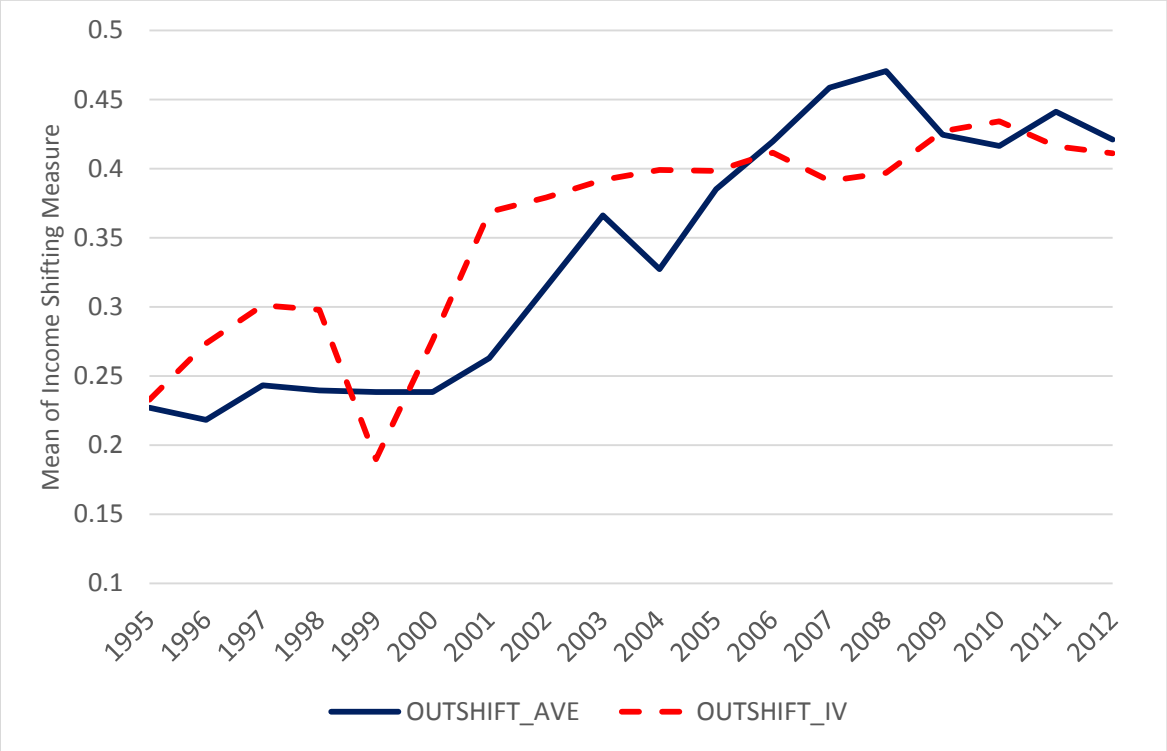

Figure 3. Percentage of sample firms identified as engaging in inbound tax-motivated income shifting each year

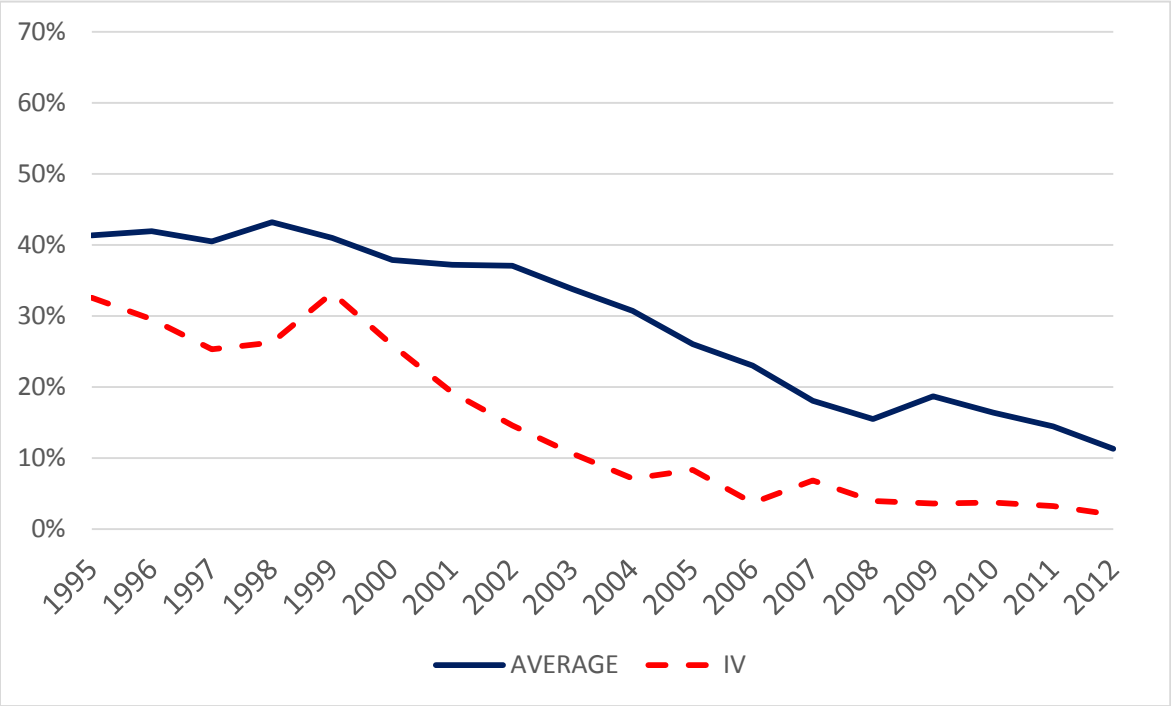

Figure 4. Time-series of annual cross-sectional means of inbound tax-motivated income shifting measures, including ONLY firms that shift income

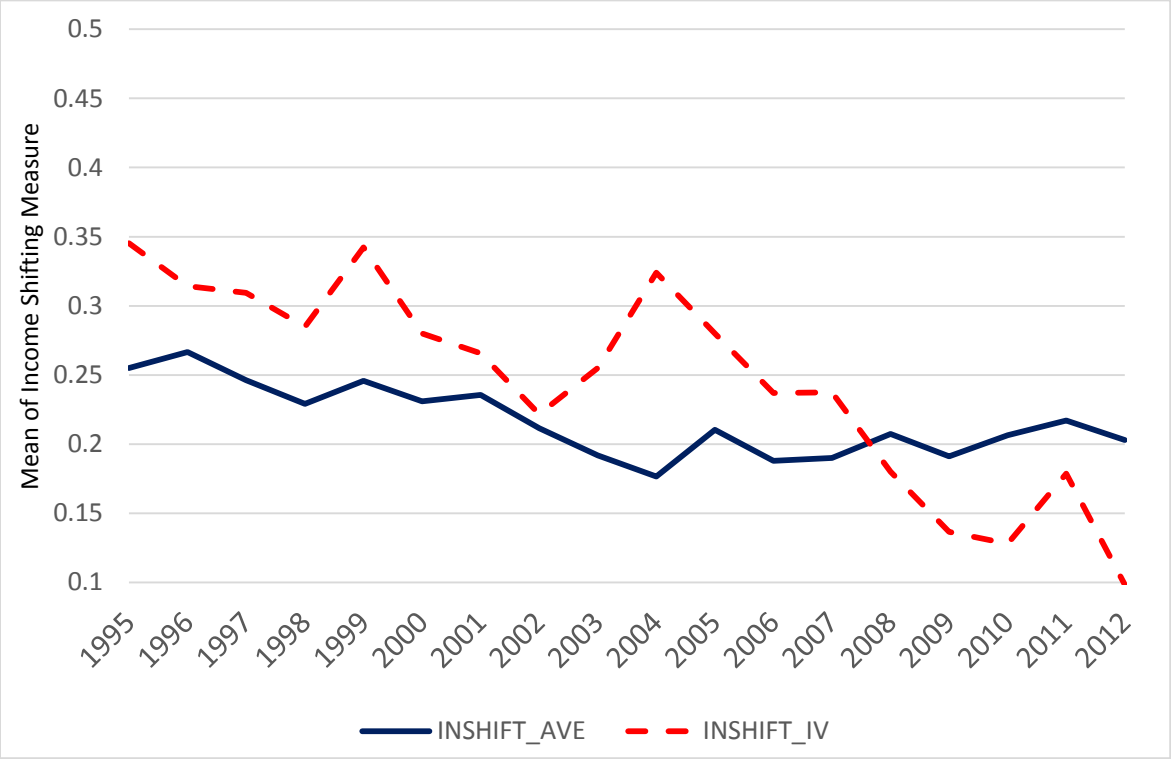

TABLE 1. SAMPLE SELECTION

Base Sample Construction:	**Firm Years**
Observations with geographic segment data available for current and five prior periods to estimate the firm-year-specific tax motivated income shifting measure based on Collins et al. (1998) and Klassen and Laplante (2012), removing firm-years with five-year cumulative domestic or foreign pretax losses	6,812
Remove firm-years in utilities (GICS group 5510) and financial services (GICS groups 4010-4040)	-116
Remove observations with insufficient CRSP and Compustat data to compute control variables	-10
Remove observations with insufficient CRSP Daily Stock File data to estimate average volume and standard deviations of returns and volume (at least 670 days of data in CRSP over three-year measurement period)	-54
Base Sample	**6,632**

Additional Sample Requirements (deleted from base sample):	
Delete observations with negative three-year cumulative and one-year pretax (PI - SPI) losses (to estimate *CASH_ETR1* and *CASH_ETR3*)	-99
Validation Test Sample	**6,533**
Delete observations with insufficient TAQ data to calculate the adverse selection component of bid-ask spreads	-2,211
Delete observations without a match in I/B/E/S to estimate *FOLLOW*	-428
Lambda Test Sample	**3,993**
Delete observations without a match in I/B/E/S to estimate *FOLLOW*	-701
Insider Trading Profits and Idiosyncratic Return Volatility Test Samples	**5,931**

Analyst Forecast Dispersion Tests:	**Firm Quarters**
Base Sample (in firm quarters)	26,528
Delete observations without an analyst following of at least three analysts (to estimate *AF_DISP*)	-4,431
Analyst Forecast Dispersion Test Sample	**22,097**

TABLE 2. DESCRIPTIVE STATISTICS

Income Shifting Proxies:	N	Mean	S.D.	Median	P10	P25	P75	P90
SHIFT_AVE	5,931	0.306	0.797	0.093	0.000	0.000	0.288	0.729
SHIFT_IV	5,931	0.263	0.482	0.098	0.000	0.000	0.306	0.746
Tax Rate Variables:								
FTR_AVE	5,931	-0.007	0.216	-0.035	-0.210	-0.123	0.048	0.172
FTV_IV	5,931	-0.054	0.091	-0.059	-0.160	-0.112	-0.002	0.050
CASH_ETR1	6,533	0.267	0.155	0.260	0.089	0.171	0.260	0.340
CASH_ETR3	6,533	0.268	0.128	0.266	0.115	0.194	0.266	0.337
External Information Environment (IE) Proxies:								
LAMBDA	3,993	0.243	0.795	0.172	-0.554	0.053	0.391	0.995
INS_PROFIT	5,931	1.038	7.828	0.000	-0.458	-0.026	0.283	2.128
IDVOL	5,931	2.085	0.872	1.896	1.196	1.452	2.498	3.278
AF_DISP	22,097	0.039	0.053	0.022	0.005	0.011	0.046	0.090
Cross-Sectional and Control Variables:								
GROWTH_GAP	5,931	0.086	0.280	0.000	0.000	0.000	0.000	0.000
PTROA	6,533	0.127	0.076	0.114	0.042	0.073	0.167	0.229
LN_ASSETS	6,533	7.389	1.746	7.364	5.084	6.165	8.551	9.748
LEV	6,533	0.198	0.152	0.190	0.001	0.071	0.293	0.391
NOL	6,533	0.363	0.481	0.000	0.000	0.000	1.000	1.000
ΔNOL	6,533	0.001	0.023	0.000	-0.006	0.000	0.000	0.010
MTB	6,533	3.441	3.008	2.617	1.244	1.743	4.041	6.426
PP&E	6,533	0.284	0.186	0.246	0.085	0.148	0.375	0.543
DEP	6,533	0.046	0.021	0.043	0.021	0.030	0.057	0.073
EQINC	6,533	0.001	0.004	0.000	0.000	0.000	0.000	0.004
FOR_INC	6,533	0.048	0.045	0.035	0.005	0.015	0.067	0.110
GEO_CONC	6,533	0.536	0.192	0.508	0.314	0.389	0.665	0.821
R&D	6,533	0.038	0.049	0.020	0.000	0.000	0.053	0.109
CASH	6,533	0.149	0.169	0.083	0.014	0.031	0.206	0.383
FOLLOW	22,097	2.355	0.746	2.398	1.386	1.792	2.944	3.296
AGE	5,931	3.293	0.639	3.466	2.398	2.773	3.871	4.007
VOLUME	5,931	11.405	1.730	11.446	9.190	10.226	12.597	13.674
σ(VOLUME)	5,931	10.509	1.586	10.521	8.491	9.444	11.625	12.580
σ(RET)	5,931	-2.358	0.411	-2.367	-2.888	-2.646	-2.089	-1.822
M&A	5,931	0.118	0.323	0.000	0.000	0.000	0.000	1.000
NGEOSEGS	5,931	4.053	2.357	4.000	2.000	3.000	5.000	6.000
SIZE	5,931	7.854	1.653	7.809	5.748	6.669	9.059	10.171
σ(REV)	5,931	0.183	0.152	0.143	0.053	0.086	0.232	0.360
LOSS	5,931	0.052	0.222	0.000	0.000	0.000	0.000	0.000
TA_GAAP	5,931	0.001	0.122	0.001	-0.104	-0.050	0.056	0.128
BTD	5,931	0.041	0.043	0.030	0.006	0.014	0.053	0.086
INTANG	2,396	0.088	0.112	0.042	0.000	0.000	0.136	0.268
NODISC	2,396	0.869	0.337	1.000	0.000	1.000	1.000	1.000
POST	2,916	0.508	0.500	1.000	0.000	0.000	1.000	1.000
FOR_DISC	2,916	0.673	0.469	1.000	0.000	0.000	1.000	1.000
MULTI	2,916	0.173	0.378	0.000	0.000	0.000	0.000	1.000

Note: This table presents descriptive statistics for the variables used in our analyses. The sample size varies based on the dependent variable of interest and contains as many as 6,533 firm-years (22,097 firm-quarters) over the period 1995 through 2012. Variable definitions are provided in Appendix A. All continuous variables are winsorized at the 1st and 99th percentile, except standard deviations which are winsorized at the 99th percentile only.

TABLE 3. INCOME SHIFTING PROXY VALIDATION

Tests of relation between cash effective tax rates and tax-motivated income shifting proxies

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*CASH_ETR1*	*CASH_ETR1*	*CASH_ETR3*	*CASH_ETR3*
Shift Proxy:	*SHIFT_AVE*	*SHIFT_IV*	*SHIFT_AVE*	*SHIFT_IV*
SHIFT PROXY	**-0.007*****	**-0.026*****	**-0.010*****	**-0.030*****
	(-3.206)	**(-3.826)**	**(-3.885)**	**(-3.807)**
PTROA	0.034	0.036	0.033	0.034
	(0.620)	(0.651)	(0.670)	(0.681)
LN_ASSETS	-0.006***	-0.006***	-0.009***	-0.009***
	(-2.871)	(-2.878)	(-4.045)	(-4.055)
LEV	-0.053**	-0.051**	-0.035	-0.034
	(-2.326)	(-2.207)	(-1.606)	(-1.522)
NOL	-0.012*	-0.012**	-0.010*	-0.011*
	(-1.951)	(-1.991)	(-1.719)	(-1.734)
ΔNOL	0.316***	0.315***	0.312***	0.310***
	(3.589)	(3.579)	(3.879)	(3.886)
MTB	0.065***	0.064***	0.050***	0.049***
	(4.434)	(4.413)	(3.875)	(3.845)
PP&E	-0.120***	-0.119***	-0.100***	-0.099***
	(-5.116)	(-5.067)	(-4.369)	(-4.322)
DEP	0.554***	0.518***	0.526***	0.497**
	(2.840)	(2.618)	(2.626)	(2.439)
EQINC	-0.549	-0.520	-0.269	-0.247
	(-0.723)	(-0.688)	(-0.367)	(-0.338)
FOR_INC	-0.274***	-0.266***	-0.182**	-0.178**
	(-3.561)	(-3.421)	(-2.474)	(-2.393)
GEO_CONC	-0.054***	-0.051***	-0.024	-0.022
	(-3.231)	(-2.974)	(-1.444)	(-1.278)
R&D	-0.326***	-0.308***	-0.317***	-0.302***
	(-4.323)	(-3.939)	(-4.393)	(-4.099)
CASH	-0.027	-0.026	-0.030	-0.029
	(-1.259)	(-1.200)	(-1.449)	(-1.432)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	6,533	6,533	6,533	6,533
Adjusted R-squared	0.108	0.108	0.160	0.160

Note: This table reports the regression results of testing the association between one-year (three-year) cash effective tax rates (ETRs) and the tax-motivated income shifting proxies. We control for other determinants of cash ETRs, including pretax return-on-assets (*PTROA*), the natural log of lagged total assets (*LN_ASSETS*), leverage (*LEV*), an indicator for net operating loss carryforwards (*NOL*), change in net operating loss carryforward (*ΔNOL*), book-to-market ratio (*BTM*), capital intensity (*PP&E*), depreciation expense (*DEP*), equity income in subsidiaries (*EQINC*), pretax foreign income (*FOR_INC*), geographical concentration (*GEO_CONC*), R&D expenses (*R&D*), and cash holdings (*CASH*). All control variables, except *NOL*, are winsorized at the 1st and the 99th percentile. All variables are defined in Appendix A. All models include fixed effects for fiscal year and for industry membership (unreported). *t*-statistics, based on standard errors clustered by firm, are below the coefficients. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 4. INCOME SHIFTING AND THE INFORMATION ENVIRONMENT

Panel A. Two-stage least squares estimation of external information environment proxies on predicted income shifting (SHIFT_AVE)

	(1) Coeff (t-stat)	(2) Coeff (t-stat)	(3) Coeff (t-stat)	(4) Coeff (t-stat)
Dependent Variable:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
SHIFT_AVE	**0.396*** **	**9.571*** **	**1.049*** **	**0.068*** **
	(2.938)	**(2.659)**	**(9.834)**	**(3.294)**
GEO_CONC	-0.095	0.381	0.176***	0.012
	(-1.245)	(0.614)	(3.749)	(1.471)
FOLLOW	-0.050	-0.101	-0.023	0.006
	(-1.137)	(-0.294)	(-1.048)	(1.482)
AGE	-0.076**	-0.597***	-0.082***	0.016***
	(-2.171)	(-2.869)	(-4.751)	(4.877)
MTB	-0.006	0.166**	-0.001	-0.003***
	(-1.206)	(2.441)	(-0.383)	(-6.342)
VOLUME	-0.351***	-1.405***	-0.063**	-0.005
	(-6.631)	(-4.058)	(-1.967)	(-1.066)
σ(VOLUME)	0.308***	1.351***	0.220***	0.004
	(6.579)	(4.051)	(8.810)	(1.220)
σ(RET)	-0.265***	1.920***	1.178***	0.040***
	(-3.413)	(4.531)	(27.844)	(8.612)
M&A	0.021	0.230	-0.015	-0.005***
	(0.720)	(0.659)	(-1.029)	(-2.587)
NGEOSEGS	0.001	0.003	-0.001	0.000
	(0.148)	(0.102)	(-0.145)	(0.086)
SIZE	-0.132***	0.760***	-0.252***	0.003
	(-4.018)	(3.095)	(-12.670)	(1.010)
σ(REV)	-0.223**	4.174**	0.358***	0.002
	(-2.371)	(2.418)	(6.157)	(0.226)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.538	0.067	0.851	0.182

TABLE 4 (continued)

Panel B. Two-stage least squares estimation of income shifting (SHIFT_AVE) on external information environment proxies

	(1) Coeff (t-stat)	(2) Coeff (t-stat)	(3) Coeff (t-stat)	(4) Coeff (t-stat)
Dependent Variable:	*SHIFT_AVE*	*SHIFT_AVE*	*SHIFT_AVE*	*SHIFT_AVE*
Info Environment (IE) Proxy:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
IE PROXY	**-0.007**	**-0.000**	**0.067***	**0.099**
	(-0.154)	**(-0.346)**	**(1.809)**	**(0.295)**
PTROA	0.006	0.173	0.166	0.131
	(0.018)	(0.682)	(0.664)	(0.481)
LOSS	0.013	0.029	0.002	0.031
	(0.154)	(0.515)	(0.035)	(0.576)
TA_GAAP	0.253*	0.194*	0.186*	0.214**
	(1.804)	(1.875)	(1.820)	(2.030)
BTD	0.432	0.616*	0.536	0.608
	(0.961)	(1.681)	(1.445)	(1.595)
LEV	0.111	-0.024	0.010	0.023
	(0.380)	(-0.118)	(0.053)	(0.110)
FOR_INC	2.164***	1.953***	1.911***	2.088***
	(3.237)	(3.423)	(3.411)	(3.613)
SIZE	0.032	0.020	0.034	0.021
	(0.959)	(1.065)	(1.613)	(0.950)
σ(REV)	-0.256*	-0.226**	-0.296***	-0.220**
	(-1.754)	(-2.131)	(-3.014)	(-2.065)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
Test of Endogeneity	0.061	24.049***	0.571	0.481
Test of Over-Identifying Restrictions	1.135	0.362	34.625***	183.097***
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.171	0.156	0.159	0.171

TABLE 4 (continued)

Panel C. Two-stage least squares estimation of external information environment proxies on predicted income shifting (SHIFT_IV)

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
SHIFT_IV	**0.485*****	**11.253*****	**0.562*****	**0.077*****
	(3.882)	**(3.239)**	**(6.705)**	**(4.775)**
GEO_CONC	-0.085	-0.405	0.108**	0.015*
	(-1.117)	(-0.561)	(2.302)	(1.789)
FOLLOW	-0.051	-0.154	-0.025	0.006
	(-1.153)	(-0.441)	(-1.094)	(1.391)
AGE	-0.073**	-0.738***	-0.096***	0.016***
	(-2.083)	(-3.369)	(-5.357)	(4.984)
MTB	-0.009	0.264***	0.004	-0.004***
	(-1.608)	(3.541)	(1.185)	(-6.542)
VOLUME	-0.347***	-1.468***	-0.074**	-0.004
	(-6.583)	(-4.174)	(-2.208)	(-0.962)
σ(VOLUME)	0.303***	1.427***	0.238***	0.003
	(6.529)	(4.207)	(9.010)	(1.037)
σ(RET)	-0.264***	2.004***	1.244***	0.040***
	(-3.399)	(4.736)	(27.623)	(8.706)
M&A	0.020	0.193	-0.015	-0.005***
	(0.687)	(0.561)	(-1.041)	(-2.664)
NGEOSEGS	0.001	0.020	0.000	-0.000
	(0.118)	(0.568)	(0.132)	(-0.004)
SIZE	-0.129***	1.007***	-0.231***	0.002
	(-3.985)	(3.662)	(-11.326)	(0.733)
σ(REV)	-0.223**	1.084	0.208***	-0.006
	(-2.410)	(0.720)	(3.453)	(-0.759)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.540	0.074	0.840	0.191

TABLE 4 (continued)

Panel D. Two-stage least squares estimation of income shifting (SHIFT_IV) on external information environment proxies

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*SHIFT_IV*	*SHIFT_IV*	*SHIFT_IV*	*SHIFT_IV*
Info Environment (IE) Proxy:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
IE PROXY	**0.001**	**-0.001**	**0.025**	**0.234**
	(0.049)	**(-1.117)**	**(1.022)**	**(0.626)**
PTROA	0.319	0.429**	0.420**	0.429**
	(1.295)	(2.154)	(2.130)	(2.083)
LOSS	0.165***	0.128***	0.117***	0.122***
	(2.850)	(2.864)	(2.773)	(2.884)
TA_GAAP	0.189***	0.145**	0.142*	0.148*
	(2.630)	(2.017)	(1.939)	(1.924)
BTD	0.406	0.723**	0.692**	0.763**
	(1.266)	(2.313)	(2.219)	(2.336)
LEV	0.173	0.118	0.130	0.125
	(0.918)	(0.830)	(0.922)	(0.827)
FOR_INC	2.179***	1.563**	1.548**	1.656**
	(2.769)	(2.501)	(2.487)	(2.576)
SIZE	0.018	0.018	0.023	0.018
	(1.003)	(1.281)	(1.476)	(1.198)
σ(REV)	-0.263**	-0.143*	-0.172**	-0.151*
	(-2.483)	(-1.828)	(-2.219)	(-1.848)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
Test of Endogeneity	0.038	24.446***	0.043	0.130
Test of Over-Identifying Restrictions	1.175	0.926	35.340***	220.853***
Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.260	0.229	0.230	0.244

Note: This table presents the results of the two-stage least squares (2SLS) estimation of the relation between our two tax-motivated income shifting proxies and our four information environment proxies. In Panels A and B, we present the results from 2SLS estimation using *SHIFT_AVE* as the income shifting proxy and each of the information environment proxies: *LAMBDA* (column (1)), *INS_PROFIT* (column (2)), *IDVOL* (column (3)), and *AF_DISP* (column (4)). Panel A reports the second stage with fitted *SHIFT_AVE* values from the first stage in Panel B. In Panels C and D, we present the results from 2SLS estimation using *SHIFT_IV* as the income shifting proxy and the respective information environment proxies. Panel C reports the second stage with fitted *SHIFT_IV* values from the first stage in Panel D. Panel B (Panel D) reports the results of the test of endogeneity and the test of overidentifying restrictions for the models with *SHIFT_AVE* (*SHIFT_IV*). All variables are defined in Appendix A. All models include fixed effects for fiscal year and for industry membership (unreported). *t*-statistics, based on standard errors clustered by firm, are below the coefficients. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 5. INCOME SHIFTING AND THE INFORMATION ENVIRONMENT: DOMESTIC-FOREIGN EARNINGS GROWTH DIFFERENTIAL

Panel A. Two-stage least squares estimation of external information environment proxies on predicted income shifting (SHIFT_AVE), growth gap interaction

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
SHIFT_AVE	**0.735*****	**12.055*****	**0.880*****	**0.082*****
	(8.215)	**(3.969)**	**(8.445)**	**(4.879)**
GROWTHGAP	0.114**	2.038	0.111***	-0.004
	(2.031)	(1.282)	(2.998)	(-0.970)
SHIFT_AVE x GROWTHGAP	**0.236*****	**1.892*****	**0.092***	**0.041*****
	(5.708)	**(3.122)**	**(1.820)**	**(3.041)**
GEO_CONC	-0.066	0.438	0.138***	0.015*
	(-1.237)	(0.702)	(2.984)	(1.783)
FOLLOW	-0.051**	-0.132	-0.024	0.006
	(-1.999)	(-0.386)	(-1.087)	(1.395)
AGE	-0.072***	-0.632***	-0.089***	0.016***
	(-3.954)	(-3.011)	(-5.041)	(4.966)
MTB	-0.009**	0.174**	0.001	-0.004***
	(-2.419)	(2.379)	(0.202)	(-6.544)
VOLUME	-0.343***	-1.376***	-0.071**	-0.004
	(-11.447)	(-4.006)	(-2.157)	(-0.939)
σ(VOLUME)	0.300***	1.337***	0.232***	0.003
	(10.350)	(4.018)	(8.980)	(1.014)
σ(RET)	-0.260***	2.018***	1.212***	0.041***
	(-7.376)	(4.762)	(27.720)	(8.674)
M&A	0.019	0.208	-0.016	-0.005***
	(0.680)	(0.595)	(-1.079)	(-2.659)
NGEOSEGS	0.000	0.008	-0.000	0.000
	(0.085)	(0.225)	(-0.006)	(0.000)
SIZE	-0.141***	0.726***	-0.240***	0.002
	(-8.686)	(2.975)	(-11.981)	(0.666)
σ(REV)	-0.143*	2.961*	0.342***	-0.005
	(-1.939)	(1.913)	(5.730)	(-0.652)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.543	0.066	0.846	0.183

TABLE 5 (continued)

Panel B. Two-stage least squares estimation of income shifting (SHIFT_AVE) on external information environment proxies

	(1) Coeff (t-stat)	(2) Coeff (t-stat)	(3) Coeff (t-stat)	(4) Coeff (t-stat)
Dependent Variable	*SHIFT_AVE*	*SHIFT_AVE*	*SHIFT_AVE*	*SHIFT_AVE*
Info Environment (IE) Proxy	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
IE PROXY	**0.004**	**-0.000**	**0.046**	**0.088**
	(0.193)	**(-0.095)**	**(1.497)**	**(0.261)**
PTROA	0.124	0.190	0.185	0.151
	(0.686)	(0.813)	(0.806)	(0.555)
LOSS	0.031	0.046	0.026	0.031
	(0.461)	(1.003)	(0.505)	(0.588)
TA_GAAP	0.286***	0.173*	0.169*	0.240**
	(2.818)	(1.927)	(1.902)	(2.259)
BTD	0.485	1.332*	1.241*	0.549
	(1.562)	(1.837)	(1.705)	(1.440)
LEV	0.117	-0.018	0.005	0.044
	(1.128)	(-0.098)	(0.029)	(0.212)
FOR_INC	1.852***	1.661***	1.641***	1.919***
	(5.468)	(3.165)	(3.162)	(3.408)
SIZE	0.025**	0.015	0.025	0.023
	(2.560)	(0.930)	(1.346)	(1.027)
σ(REV)	-0.303***	-0.257***	-0.304***	-0.236**
	(-3.057)	(-2.681)	(-3.369)	(-2.227)
GROWTHGAP	0.017	0.017	0.017	0.012
	(0.784)	(0.664)	(0.661)	(0.463)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.174	0.158	0.159	0.176

TABLE 5 (continued)

Panel C. Two-stage least squares estimation of external information environment proxies on predicted income shifting (SHIFT_IV), growth gap interaction

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
SHIFT_IV	**0.472*****	**12.801*****	**0.618*****	**0.073*****
	(5.296)	**(3.661)**	**(4.872)**	**(3.436)**
GROWTHGAP	0.079	2.604**	0.155**	0.022*
	(0.785)	(2.035)	(2.153)	(1.963)
SHIFT_IV x ***GROWTHGAP***	**0.101*****	**4.031****	**0.097***	**0.037****
	(4.420)	**(2.081)**	**(1.850)**	**(2.244)**
GEO_CONC	-0.095*	0.159	0.092**	0.012
	(-1.792)	(0.245)	(1.978)	(1.462)
FOLLOW	-0.051**	-0.120	-0.027	0.006
	(-1.985)	(-0.350)	(-1.170)	(1.523)
AGE	-0.074***	-0.673***	-0.097***	0.016***
	(-4.078)	(-3.169)	(-5.397)	(4.857)
MTB	-0.008**	0.219***	0.003	-0.003***
	(-2.132)	(2.924)	(0.997)	(-6.323)
VOLUME	-0.348***	-1.412***	-0.076**	-0.005
	(-11.571)	(-4.078)	(-2.281)	(-1.064)
σ(VOLUME)	0.304***	1.380***	0.238***	0.004
	(10.438)	(4.123)	(8.994)	(1.223)
σ(RET)	-0.264***	2.003***	1.237***	0.040***
	(-7.453)	(4.734)	(27.673)	(8.524)
M&A	0.020	0.211	-0.015	-0.005***
	(0.737)	(0.605)	(-1.044)	(-2.612)
NGEOSEGS	0.001	0.012	0.001	0.000
	(0.185)	(0.352)	(0.145)	(0.097)
SIZE	-0.126***	0.815***	-0.229***	0.003
	(-7.829)	(3.233)	(-11.374)	(0.965)
σ(REV)	-0.259***	2.890*	0.162***	0.002
	(-3.596)	(1.870)	(2.668)	(0.227)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.539	0.066	0.841	0.191

TABLE 5 (continued)

Panel D. Two-stage least squares estimation of income shifting (SHIFT_IV) on external information environment proxies

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*SHIFT_IV*	*SHIFT_IV*	*SHIFT_IV*	*SHIFT_IV*
Info Environment (IE) Proxy:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
IE PROXY	**-0.006**	**-0.001**	**0.030**	**0.229**
	(-0.875)	**(-0.989)**	**(1.064)**	**(0.609)**
PTROA	0.364	0.366*	0.357*	0.438**
	(1.596)	(1.952)	(1.920)	(2.122)
LOSS	0.159***	0.125***	0.110***	0.122***
	(2.944)	(3.104)	(2.893)	(2.883)
TA_GAAP	0.245***	0.173**	0.171**	0.161**
	(3.137)	(2.413)	(2.365)	(2.088)
BTD	0.430	1.835***	1.777***	0.735**
	(1.387)	(2.871)	(2.783)	(2.263)
LEV	0.181	0.123	0.137	0.135
	(1.089)	(0.987)	(1.097)	(0.899)
FOR_INC	1.772**	1.156**	1.143**	1.575**
	(2.389)	(2.022)	(2.004)	(2.455)
SIZE	0.016	0.014	0.020	0.019
	(0.989)	(1.078)	(1.498)	(1.256)
σ(REV)	-0.169	-0.045	-0.077	-0.159*
	(-1.473)	(-0.427)	(-0.844)	(-1.949)
GROWTHGAP	0.100***	0.081***	0.077**	0.096***
	(2.989)	(2.796)	(2.233)	(2.749)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.239	0.213	0.214	0.247

Note: This table presents the result of estimating our two-stage least squares (2SLS) model with an indicator variable for extreme differential in foreign versus domestic earnings growth rates *(GROWTH_GAP*) and an interaction between *GROWTH_GAP* and our income shifting proxies. In Panels A and B, we present the results from 2SLS estimation using *SHIFT_AVE* as the income shifting proxy and each of the information environment proxies: *LAMBDA* (column (1)), *INS_PROFIT* (column (2)), *IDVOL* (column (3)), and *AF_DISP* (column (4)). Panel A reports the second stage with fitted *SHIFT_AVE* values from the first stage in Panel B. In Panels C and D, we present the results from 2SLS estimation using *SHIFT_IV* as the income shifting proxy and the respective information environment proxies. Panel C reports the second stage with fitted *SHIFT_IV* values from the first stage in Panel D. All variables are defined in Appendix A. All models include fixed effects for fiscal year and for industry membership (unreported). *t*-statistics, based on standard errors clustered by firm, are below the coefficients. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 6. SFAS 131 GEOGRAPHIC SEGMENT DISCLOSURE TESTS

Panel A. Geographic segment disclosure changes around SFAS 131 and the relation between income shifting (SHIFT_AVE) and the external information environment

	(1)	(2)	(3)	(4)
	Coeff.	Coeff.	Coeff.	Coeff.
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
NODISC	0.126	1.728*	0.009	0.001
	(1.424)	(1.897)	(0.088)	(0.229)
SHIFT_AVE	1.473***	0.638	0.020	0.009
	(2.946)	(0.610)	(0.184)	(1.550)
NODISC* x *SHIFT_AVE	**1.589****	**8.699****	**0.167*****	**0.016*****
	(1.994)	**(2.177)**	**(4.081)**	**(2.601)**
TA_GAAP	0.181	3.619	0.038	0.010**
	(0.527)	(1.413)	(0.375)	(2.100)
SIZE	-0.060	0.155	-0.405***	0.000
	(-0.676)	(0.304)	(-7.242)	(0.205)
MTB	0.011	0.311	-0.013*	-0.000
	(1.040)	(1.552)	(-1.934)	(-1.261)
LEV	0.082	-1.694	0.340*	0.029**
	(0.205)	(-0.668)	(1.902)	(2.379)
INTANG	-0.106	3.971	-0.239	-0.037**
	(-0.163)	(1.390)	(-1.186)	(-2.570)
R&D	-1.387*	0.744	1.174**	0.056
	(-1.923)	(0.086)	(2.471)	(1.357)
AGE	0.026	-1.483**	-0.074**	0.001
	(0.312)	(-2.057)	(-2.170)	(0.470)
PTROA	0.972*	16.711**	-1.620***	-0.140***
	(1.803)	(2.180)	(-4.951)	(-5.811)
GEO_CONC	-0.094	-1.115	-0.091	0.002
	(-0.593)	(-0.783)	(-0.807)	(0.187)
FOR_INC	-1.199	-18.714	-0.960	-0.046
	(-0.959)	(-1.605)	(-1.484)	(-0.874)
LOSS	0.068	-0.391	0.143	0.024***
	(0.516)	(-0.276)	(1.353)	(3.337)
VOLUME	0.245***	2.079**	-0.158*	-0.005
	(4.021)	(2.353)	(-1.669)	(-1.641)
σ(VOLUME)	-0.552***	-1.303	0.477***	0.007***
	(-4.410)	(-1.307)	(9.576)	(3.164)
FOLLOW				0.012***
				(3.601)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	496	1,684	2,396	7,622
Adjusted R-squared	0.790	0.052	0.666	0.340

TABLE 6 (continued)

Panel B. Geographic segment disclosure changes around SFAS 131 and the relation between income shifting (SHIFT_IV) and the external information environment

	(1)	(2)	(3)	(4)
	Coeff.	Coeff.	Coeff.	Coeff.
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
NODISC	0.394**	1.205	0.214**	0.004*
	(2.343)	(1.501)	(2.331)	(1.797)
SHIFT_IV	0.846***	2.646***	-0.014	0.014***
	(2.973)	(3.214)	(-0.218)	(3.825)
NODISC x ***SHIFT_IV***	**0.866*** **	**5.492*** **	**0.214*** **	**0.024*** **
	(3.034)	**(2.903)**	**(4.923)**	**(5.994)**
TA_GAAP	0.255	4.080	0.038	0.009*
	(1.069)	(1.589)	(0.375)	(1.867)
SIZE	-0.056	0.117	-0.402***	0.000
	(-0.685)	(0.238)	(-7.236)	(0.146)
MTB	0.012	0.307	-0.013*	-0.001
	(1.185)	(1.552)	(-1.892)	(-1.433)
LEV	-0.012	-1.945	0.337*	0.028**
	(-0.031)	(-0.747)	(1.882)	(2.189)
INTANG	-0.005	3.850	-0.234	-0.036**
	(-0.008)	(1.376)	(-1.164)	(-2.469)
R&D	-1.400**	2.364	1.221***	0.047
	(-1.984)	(0.268)	(2.631)	(1.080)
AGE	0.055	-1.463**	-0.079**	0.001
	(0.632)	(-1.977)	(-2.342)	(0.461)
PTROA	0.797	16.231**	-1.633***	-0.137***
	(1.508)	(2.144)	(-4.991)	(-5.916)
GEO_CONC	-0.030	-0.917	-0.067	0.002
	(-0.184)	(-0.610)	(-0.593)	(0.164)
FOR_INC	-1.023	-16.859	-0.992	-0.051
	(-0.745)	(-1.460)	(-1.546)	(-0.970)
LOSS	0.076	-0.372	0.140	0.024***
	(0.578)	(-0.265)	(1.326)	(3.448)
VOLUME	0.244***	2.157**	-0.161*	0.007***
	(4.159)	(2.382)	(-1.712)	(3.174)
σ(VOLUME)	-0.565***	-1.373	0.479***	-0.005
	(-5.236)	(-1.350)	(9.728)	(-1.629)
FOLLOW				0.012***
				(3.791)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	496	1,684	2,396	7,622
Adjusted R-squared	0.791	0.054	0.667	0.343

TABLE 6 (continued)

Note: This table presents the results of estimating the relation between income shifting and the information environment around adoptions of SFAS 131. We include *NODISC* to capture firms that discontinue disclosure of geographic segments after adoption. Our tests span *t*-3 to *t*+3, excluding the year of adoption (year *t*). *SHIFT_AVE* (*SHIFT_IV*) is the average of the respective income shifting proxy over the period *t*-3 to *t*-1. Panel A (Panel B) presents results using *SHIFT_AVE* (*SHIFT_IV*) as the income shifting measure of interest. All variables are defined in Appendix A. All models include fixed effects for fiscal year and for industry membership (unreported). *t*-statistics, based on standard errors clustered by firm, are below the coefficients. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 7. TAX HAVEN INITIATION TESTS

	(1) Coeff (t-stat)	(2) Coeff (t-stat)	(3) Coeff (t-stat)	(4) Coeff (t-stat)
Dependent Variable:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
POST	**0.140*****	**0.070**	**0.116*****	**0.284****
	(3.293)	**(0.597)**	**(2.898)**	**(2.073)**
FOR_DISC	-0.027	-0.342**	-0.119**	-0.384**
	(-0.589)	(-2.036)	(-1.992)	(-2.015)
BTD	0.000	-0.001*	0.001***	0.000
	(0.757)	(-1.801)	(5.667)	(1.328)
SIZE	-0.038	0.042	-0.662***	-0.180
	(-1.045)	(0.534)	(-19.694)	(-1.079)
MTB	-0.022***	-0.027	-0.010	0.032
	(-3.573)	(-1.560)	(-1.379)	(1.353)
LEV	0.211	-0.095	1.123***	-0.241
	(1.510)	(-0.311)	(5.797)	(-0.668)
INTANG	-0.171	0.194	-0.282*	-0.320
	(-1.095)	(0.569)	(-1.829)	(-0.956)
R&D	-0.174	-1.942***	-0.875*	-2.774
	(-0.498)	(-2.601)	(-1.958)	(-1.118)
AGE	-0.028	0.152**	-0.039	0.180
	(-0.721)	(2.111)	(-1.061)	(1.024)
PTROA	-0.011	-0.823*	-1.599***	-1.727
	(-0.060)	(-1.788)	(-7.592)	(-1.078)
FOR_INC	-1.462**	1.730	0.761	-1.186
	(-2.092)	(1.322)	(1.406)	(-0.976)
GEO_CONC	0.171	-0.209	-0.112	-1.047
	(1.391)	(-0.789)	(-0.913)	(-1.004)
LOSS	0.111*	0.073	0.430***	0.015
	(1.681)	(0.378)	(5.665)	(0.253)
VOLUME	-0.555***	0.082	-0.482***	
	(-8.224)	(0.539)	(-6.681)	
σ(VOLUME)	0.114**	-0.185	0.832***	
	(2.014)	(-1.268)	(13.629)	
σ(RET)	20.256***	2.227		
	(7.816)	(0.381)		
MULTI	0.086	0.025	0.021	-0.265
	(0.933)	(0.191)	(0.304)	(-1.059)
FOLLOW				0.091
				(0.905)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	2,230	2,439	2,916	9,497
Adjusted R-squared	0.597	0.016	0.668	0.028

TABLE 7 (continued)

Note: This table presents the results of changes in firms' information environments after initiation of operations in a tax haven jurisdiction. We limit the tests to firms that begin our sample period with no disclosed tax haven subsidiaries and later disclose at least one tax haven subsidiary. We include three years prior to and three years after first disclosure. *POST* is set to one (zero) for the years after (prior). We regress our proxies of information environment, *LAMBDA*, *INS_PROFIT*, *IDVOL*, and *AF_DISP*, on *POST* and other control variables. The coefficients on *POST* capture the changes in information environment proxies after firms disclose tax haven subsidiaries. All other variables are defined in Appendix A. All models include fixed effects for fiscal year and for industry membership (unreported). *t*-statistics, based on standard errors clustered by firm, are below the coefficients. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 8. MANAGERIAL GUIDANCE AND INCOME SHIFTING

	(1) Hazard (z-stat)	(2) Hazard (z-stat)	(3) Hazard (z-stat)	(4) Hazard (z-stat)
Dependent Variable:	*EGUIDE*	*EGUIDE*	*SGUIDE*	*SGUIDE*
Shift Proxy:	*SHIFT_AVE*	*SHIFT_IV*	*SHIFT_AVE*	*SHIFT_IV*
SHIFT PROXY	**1.263****	**1.177****	**1.179****	**1.216***
	(2.430)	**(2.307)**	**(1.991)**	**(1.916)**
GEO_CONC	0.478**	0.457**	0.531**	0.513**
	(-1.991)	(-2.116)	(-2.155)	(-2.287)
FOLLOW	1.913***	1.899***	2.134***	2.141***
	(5.639)	(5.504)	(6.897)	(6.944)
ROA	10.233***	8.539***	2.431	2.085
	(3.082)	(2.871)	(1.347)	(1.111)
LOSS	1.648*	1.652*	1.490	1.510*
	(1.679)	(1.697)	(1.632)	(1.698)
SIZE	0.815**	0.816**	0.908	0.905
	(-2.497)	(-2.442)	(-1.383)	(-1.422)
AGE	1.256***	1.260***	0.901	0.910
	(2.790)	(2.806)	(-1.472)	(-1.324)
MTB	0.965	0.968	1.014	1.017
	(-1.356)	(-1.234)	(0.791)	(0.953)
LEV	0.454**	0.440**	0.501**	0.491**
	(-2.122)	(-2.207)	(-2.192)	(-2.237)
σ(REV)	1.393	1.495	1.946***	2.083***
	(1.178)	(1.444)	(2.941)	(3.304)
VOLUME	0.810	0.794	0.688***	0.675***
	(-1.325)	(-1.451)	(-2.771)	(-2.920)
σ(VOLUME)	0.959	0.974	1.027	1.040
	(-0.275)	(-0.172)	(0.199)	(0.290)
σ(RET)	0.382***	0.380***	0.623***	0.612***
	(-5.234)	(-5.278)	(-3.069)	(-3.200)
M&A	0.796	0.807	1.173	1.171
	(-1.384)	(-1.291)	(1.252)	(1.246)
NGEOSEGS	0.899**	0.896**	0.902**	0.902**
	(-2.210)	(-2.254)	(-2.552)	(-2.559)
TA_GAAP	0.661	0.687	1.421	1.501
	(-0.807)	(-0.729)	(0.810)	(0.942)
BTD	1.272	1.228	1.971	1.957
	(0.216)	(0.184)	(0.793)	(0.767)
FOR_INC	2.637	1.855	0.936	0.686
	(0.601)	(0.382)	(-0.049)	(-0.278)
Firm Clustered SE	Y	Y	Y	Y
Log Pseudolikelihood	-1,810.45	-1,813.11	-2,226.77	-2,228.99
Wald Chi-squared	226.82***	223.52***	150.29***	151.22***
No. of Observations	1,971	1,971	2,655	2,655

TABLE 8 (continued)

Note: This table presents the results of estimating a Cox Proportional Hazard Model for earnings guidance (*EGUIDE*) in columns (1) and (2) and management sales guidance *(SGUIDE*) in columns (3) and (4). *EGUIDE* (*SGUIDE*) is an indicator variable that equals one in the first period in which managers offer earnings (sales) guidance, based on data from Thomson Reuters I/B/E/S Guidance file. The number of observations in these tests differ from our primary analyses the fact that all observations for a firm are censored (or "dropped") once its managers provide guidance. All other variables are defined in Appendix A. *z*-statistics, based on standard errors clustered by firm, are below the hazard ratios. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 9. INCOME SHIFTING AND THE INFORMATION ENVIRONMENT: MANAGEMENT EARNINGS GUIDANCE RESPONSES

Panel A. Two-stage least squares estimation of external information environment proxies on predicted income shifting (SHIFT_AVE), management earnings guidance interaction

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
SHIFT_AVE	**0.509*****	**11.084*****	**0.944*****	**0.080*****
	(3.532)	**(3.980)**	**(9.095)**	**(4.364)**
EGUIDE	-0.170*	-2.724***	-0.088*	-0.019***
	(-1.811)	(-2.878)	(1.731)	(-4.269)
SHIFT_AVE* x *EGUIDE	**-0.319****	**-2.184****	**-0.103****	**-0.014*****
	(-2.035)	**(-2.080)**	**(-1.964)**	**(-3.997)**
GEO_CONC	0.213*	0.474	0.158***	0.014*
	(1.715)	(0.746)	(3.411)	(1.764)
FOLLOW	-0.023	-0.171	-0.022	0.007*
	(-0.351)	(-0.488)	(-0.984)	(1.667)
AGE	0.028	-0.617***	-0.087***	0.016***
	(0.562)	(-2.935)	(-4.949)	(4.909)
MTB	0.005	0.169**	0.000	-0.004***
	(0.536)	(2.314)	(0.136)	(-6.547)
VOLUME	-0.139**	-1.374***	-0.067**	-0.004
	(-2.296)	(-4.006)	(-2.053)	(-0.945)
σ(VOLUME)	0.070	1.326***	0.228***	0.004
	(1.301)	(3.997)	(8.916)	(1.087)
σ(RET)	0.038	2.035***	1.203***	0.039***
	(0.410)	(4.722)	(27.774)	(8.567)
M&A	0.089	0.205	-0.014	-0.005**
	(1.541)	(0.585)	(-1.008)	(-2.470)
NGEOSEGS	-0.000	0.007	-0.000	-0.000
	(-0.006)	(0.208)	(-0.073)	(-0.041)
SIZE	0.052	0.730***	-0.244***	0.002
	(1.349)	(2.935)	(-12.146)	(0.706)
σ(REV)	-0.282*	2.913*	0.335***	-0.006
	(-1.705)	(1.879)	(5.759)	(-0.808)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.542	0.066	0.847	0.179

TABLE 9 (continued)

Panel B. Two-stage least squares estimation of income shifting (SHIFT_AVE) on external information environment proxies

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*SHIFT_AVE*	*SHIFT_AVE*	*SHIFT_AVE*	*SHIFT_AVE*
Info Environment (IE) Proxy:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
IE PROXY	**-0.001**	**-0.000**	**0.053**	**0.094**
	(-0.015)	**(-0.137)**	**(1.364)**	**(0.279)**
PTROA	0.080	0.203	0.198	0.127
	(0.268)	(0.860)	(0.852)	(0.466)
LOSS	0.025	0.033	0.012	0.030
	(0.349)	(0.706)	(0.234)	(0.561)
TA_GAAP	0.257**	0.192**	0.186**	0.216**
	(1.994)	(2.007)	(1.967)	(2.058)
BTD	0.557	0.677*	0.597	0.612
	(1.162)	(1.796)	(1.564)	(1.605)
LEV	0.095	-0.024	0.004	0.027
	(0.354)	(-0.128)	(0.024)	(0.129)
FOR_INC	2.079***	1.876***	1.848***	2.086***
	(3.246)	(3.435)	(3.433)	(3.610)
SIZE	0.023	0.017	0.029	0.022
	(0.722)	(1.003)	(1.519)	(0.983)
σ(REV)	-0.275**	-0.240**	-0.296***	-0.218**
	(-2.083)	(-2.529)	(-3.294)	(-2.061)
EGUIDE	-0.030	-0.037	-0.041	-0.030
	(-0.623)	(-1.202)	(-1.342)	(-0.884)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.168	0.153	0.155	0.171

TABLE 9 (continued)

Panel C. Two-stage least squares estimation of external information environment proxies on predicted income shifting (SHIFT_IV), management earnings guidance interaction

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
SHIFT_IV	**0.601*****	**11.020*****	**0.563*****	**0.045****
	(4.316)	**(3.223)**	**(4.073)**	**(2.119)**
EGUIDE	-0.119*	-3.077***	-0.074*	-0.018**
	(-1.781)	(-3.158)	(-1.778)	(-2.052)
SHIFT_IV x ***EGUIDE***	**-0.308****	**-2.332****	**-0.073****	**-0.008*****
	(-2.431)	**(-2.032)**	**(-1.968)**	**(-2.606)**
GEO_CONC	0.128	0.090	0.085*	0.010
	(1.016)	(0.137)	(1.804)	(1.304)
FOLLOW	-0.021	-0.159	-0.021	0.007*
	(-0.314)	(-0.454)	(-0.926)	(1.787)
AGE	0.016	-0.665***	-0.101***	0.015***
	(0.316)	(-3.118)	(-5.599)	(4.783)
MTB	0.015	0.215***	0.007**	-0.003***
	(1.546)	(2.845)	(2.035)	(-6.312)
VOLUME	-0.154**	-1.421***	-0.077**	-0.005
	(-2.545)	(-4.101)	(-2.275)	(-1.059)
σ(VOLUME)	0.085	1.382***	0.242***	0.004
	(1.556)	(4.121)	(9.067)	(1.289)
σ(RET)	0.031	2.012***	1.247***	0.039***
	(0.333)	(4.709)	(27.639)	(8.447)
M&A	0.095	0.203	-0.013	-0.004**
	(1.644)	(0.581)	(-0.906)	(-2.372)
NGEOSEGS	0.001	0.013	0.001	0.000
	(0.115)	(0.374)	(0.166)	(0.036)
SIZE	0.078**	0.823***	-0.234***	0.003
	(2.001)	(3.187)	(-11.253)	(1.000)
σ(REV)	-0.297*	2.893*	0.220***	-0.000
	(-1.753)	(1.870)	(3.583)	(-0.029)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.539	0.066	0.839	0.192

TABLE 9 (continued)

Panel D. Two-stage least squares estimation of income shifting (SHIFT_IV) on external information environment proxies

	(1)	(2)	(3)	(4)
	Coeff	Coeff	Coeff	Coeff
	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Dependent Variable:	*SHIFT_IV*	*SHIFT_IV*	*SHIFT_IV*	*SHIFT_IV*
Info Environment (IE) Proxy:	*LAMBDA*	*INS_PROFIT*	*IDVOL*	*AF_DISP*
IE PROXY	**-0.003**	**-0.001**	**0.035**	**0.232**
	(-0.153)	**(-1.051)**	**(1.258)**	**(0.619)**
PTROA	0.344	0.410**	0.400**	0.427**
	(1.502)	(2.143)	(2.113)	(2.072)
LOSS	0.157***	0.108***	0.094**	0.122***
	(2.875)	(2.696)	(2.413)	(2.867)
TA_GAAP	0.235***	0.216***	0.212***	0.149*
	(2.976)	(2.763)	(2.698)	(1.932)
BTD	0.460	0.870***	0.816**	0.765**
	(1.476)	(2.659)	(2.550)	(2.343)
LEV	0.177	0.127	0.145	0.127
	(1.039)	(1.011)	(1.147)	(0.837)
FOR_INC	1.867**	1.304**	1.286**	1.655**
	(2.450)	(2.175)	(2.150)	(2.572)
SIZE	0.016	0.016	0.024*	0.019
	(0.942)	(1.191)	(1.763)	(1.217)
σ(REV)	-0.154	-0.041	-0.076	-0.151*
	(-1.315)	(-0.393)	(-0.830)	(-1.838)
EGUIDE	-0.033	-0.031	-0.033	-0.011
	(-0.940)	(-1.150)	(-1.235)	(-0.515)
Year FE	Y	Y	Y	Y
Industry FE	Y	Y	Y	Y
Firm Clustered SE	Y	Y	Y	Y
No. of Observations	3,993	5,931	5,931	22,097
Adjusted R-squared	0.236	0.206	0.208	0.244

Note: This table presents the result of estimating our two-stage least squares (2SLS) model with an indicator variable for managerial earnings guidance (*EGUIDE*) and an interaction between *EGUIDE* and our income shifting proxies. In Panels A and B, we present the results from 2SLS estimation using *SHIFT_AVE* as the income shifting proxy and each of the information environment proxies: *LAMBDA* (column (1)), *INS_PROFIT* (column (2)), *IDVOL* (column (3)), and *AF_DISP* (column (4)). Panel A reports the second stage with fitted *SHIFT_AVE* values from the first stage in Panel B. In Panels C and D, we present the results from 2SLS estimation using *SHIFT_IV* as the income shifting proxy and the respective information environment proxies. Panel C reports the second stage with fitted *SHIFT_IV* values from the first stage in Panel D. All variables are defined in Appendix A. All models include fixed effects for fiscal year and for industry membership (unreported). *t*-statistics, based on standard errors clustered by firm, are below the coefficients. ***, **, and * represent statistical significance at the 1%, 5%, and 10% levels, respectively.