Tax Comparability and Corporate Tax Behavior

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Abstract

I examine whether tax comparability or tax liability comparability affects a U.S. firm's tax behavior. I find that, on average, higher tax comparability is associated with a lower level of tax aggressiveness. I also find that this relation between tax comparability and aggressive tax planning is more pronounced for firms with less IRS attention and a more uncertain information environment. A battery of sensitivity analyses, including alternative comparability and tax planning measures and a difference-in-differences design around an exogenous comparability-increasing shock, confirms that the above findings are robust to both endogeneity and measurement error concerns. My study implies that higher tax comparability discourages firms' incentives for aggressive tax planning.

Keywords: tax comparability, aggressive tax planning, deterrence effect

1. Introduction

Suppose Firm A's tax liability is more comparable to peer firms' than Firm B's tax liability. Is Firm A less likely or more likely to engage in aggressive tax planning than Firm B? This study aims to answer this question by examining the implications of tax comparability or tax liability comparability (henceforth, "comparability" is often used for brevity) for corporate tax planning behavior.

Recently, a growing body of research provides empirical evidence on the usefulness of financial statements comparability and asserts that comparability improves firms' information environment, thereby enhancing investors' valuation judgment and exerting influence on managers' policy making (e.g., De Franco, Kothari, & Verdi, 2011; Kim, Kraft, & Ryan, 2013; Choi, Choi, Myers, & Ziebart, 2019). However, the extent to which tax comparability affects the magnitude of tax planning by U.S. firm managers has not been examined in the literature. This paper fills this void by investigating the role that tax comparability plays in the tax avoidance game between taxpayers and tax authorities.

Tax planning is broadly defined as the reduction of explicit taxes and represents a continuum of tax planning strategies that spans from perfectly legal positions on the left end while tax aggressiveness resides further to the right, and sheltering resides at the most aggressive end of the continuum (see Figure 1 of Lisowsky, Robinson, & Schmidt, 2013). (Note 2) Maydew (2001) calls on researchers to focus on the role of information and uncertainty in tax planning research. Responding to these calls, I examine the role that tax (liability) comparability plays in corporate tax planning.

I posit that tax liability comparability assists tax authorities in comparing a firm's tax liability with its peers', thus allowing tax authorities to better evaluate a firm's tax liability and tax-relevant transactions by providing more reliable benchmarks. Given this, managers of firms with a more comparable tax liability tend to be less inclined to take tax planning practices (the deterrence hypothesis). Alternatively, a more comparable tax liability could lead a firm to engage in more aggressive tax-planning policies (the triggering hypothesis), as it can use the tax positions of comparable firms as a defense to justify its aggressive tax planning strategy. Additionally, with various tax filings and disclosures in the U.S., it is also possible that tax comparability may not have an incremental effect on tax authorities' evaluations and managers' tax planning. Therefore, whether and how tax comparability affects the level of tax avoidance is an open question.

To examine this question, I develop a tax comparability measure based on tax-related financial statement information and primarily use two effective tax rates (ETRs) that are most commonly used in tax literature as tax planning measures. After controlling for the factors relevant to tax planning, I find that a more comparable tax liability is

associated with a less aggressive tax position, which is consistent with the deterrent hypothesis of comparability on aggressive tax planning. The results are not sensitive to alternative measures of tax comparability and tax planning, and several sensitivity analyses, including a difference-in-differences analysis, confirm that the results are robust. Finally, I find that the negative association between comparability and aggressive tax planning is more pronounced for smaller firms and those with large bid-ask spreads, whereas it is less pronounced after the enactment of Schedule M-3. Overall, my findings suggest that tax comparability plays an informative role in discouraging firms from engaging in aggressive tax planning. I further demonstrate that this role is particularly pronounced in firms with more asymmetric information environments and those to which the IRS pays less attention.

This paper makes several contributions to the literature. First, this paper is the first to analyze the implications of tax liability comparability, a unique cross-firm feature of tax information, for the magnitude of tax avoidance among U.S. firms. Second, although the peer effect and comparability are conceptually different, my study has implications for the literature on the peer effect in corporate tax avoidance behavior. Several studies have examined the peer effect, defined as the spread or imitation of a certain behavior among peers, on a firm's level of tax planning (e.g., Brown, 2011; Brown & Drake, 2014). (Note 3) Given the empirical evidence of peer effects in tax avoidance, the findings of this study suggest that, on average, a firm's greater tax income comparability discourages the firm from mimicking the aggressive tax avoidance behavior of its peer firms, resulting in a decrease in the level of tax avoidance. Third, more broadly, my study suggests an answer to a question raised by Weisbach (2002): Why is there not more tax sheltering? I suggest that the informative role of tax comparability tends to discourage firms from aggressive tax planning, which can provide practical guidance for tax authorities and policymakers in designing tax rules and tax sheltering models.

2. Background and Hypothesis Development

2.1 Background

Corporate tax compliance depends on the probability of investigation, penalties, risk-aversion preferences, and given tax rates (Allingham & Sandmo, 1972; Hanlon & Heitzman, 2010). Various firm-level characteristics also affect corporate tax planning (e.g., Shackelford & Shevlin, 2001; Dyreng, Hoopes, & Wilde, 2016; Kubick, Lynch, Mayberry, & Omer, 2015). Gupta and Newberry (1997) document that GAAP effective tax rates (ETRs) are associated with firms' capital structure, asset mix, and performance. Rego (2003) finds that the scale of international operations provides more opportunities for tax avoidance and lower GAAP ETRs. The role of the tax department, tax directors, and the type of tax preparers also influence tax decisions (e.g., Dyreng, Hanlon, & Maydew, 2010; Robinson, Sikes, & Weaver, 2010; Armstrong, Blouin, & Larcker, 2012). Some studies find a positive relationship between aggressive tax positions and aggressive financial reporting (e.g., Frank, Lynch, & Rego, 2009; Wilson, 2009; Lisowsky, 2010).

A growing body of research shows empirical evidence on the effect of financial statement comparability on financial analysts, capital market investors, and firm managers. (Note 4) For example, Kim, Li, Lu, and Yu (2016) find that more comparable financial statements discourage managers from bad news hoarding and thus reduce investors' perceptions of a firm's future crash risk. I extend the notion of comparability to tax literature and examine how tax comparability influences the firms' tax avoidance behavior.

2.2 Tax Comparability and Tax Planning: Hypothesis Development

In addition to the tax return itself (Form 1120) and Schedule M-3 that requires a more detailed reconciliation of book income to taxable income on the corporate federal tax return, the IRS also gathers information from sources such as Form 5471 and 5472 for foreign affiliates and Form 3800 for tax credits. Tax planning generally involves a firm's plan of intended transactions to draw specific tax treatment and depends on the disclosure of relevant facts concerning the tax treatment of the transactions. Most aggressive tax strategies, such as transfer pricing, may entail a complex structure of transactions (Goh, Lee, Lim, & Shevlin, 2016). Despite the above disclosure related to tax returns, tax authorities may still expend considerable effort investigating potentially relevant transactions related to tax planning, as they do not have as much information about such transactions as firm managers do. (See the example of Starbucks in Appendix A). (Note 5)

Meanwhile, several publicly available IRS documents outline the role that managerial disclosure should play in the decision to audit a tax return and the conduct of that audit (Graham, Raedy, & Shackelford, 2012, footnote 9). In this regard, the tax authority continues to seek tax-related information to complement its enforcement missions or clarify private information (Bozanic, Hoopes, Thornock, & Williams, 2017). (Note 6) Tax-related information disclosure enables the tax authority to understand firms' actual activities and detect tax evasion. For example, Gupta, Mills, and

Towery (2014) find that both firm-level state income tax expense and aggregate state-level income tax collections increased surrounding the adoption of FIN 48, which requires firms to disclose income tax risks.

Tax liabilities from comparable firms enable the tax authority to make sharper inferences about similarities and differences in tax-relevant information across firms. They can thus serve as a substitute for a firm's information regarding tax liability, thereby enlarging the quantity of the firm's tax-relevant information. (Note 7) Using comparable peers as a benchmark to interpret a firm's tax-relevant transactions, the tax authority can better evaluate the credibility of the firm's filed information, reduce the processing costs associated with such information, and enhance the monitoring process for the firm's tax planning. (Note 8) The tax authority's enhanced understanding of tax-related transactions plays a crucial role in constraining taxpayers' capacity and incentives to engage in aggressive behavior to reduce tax, as their ex-ante detection risk and cost of tax avoidance increase with comparability.

However, it is also possible that more comparable tax liability leads a firm to engage in more tax-avoiding policies (the triggering hypothesis). For example, a firm can use the aggressive tax planning behavior of comparable firms as a legitimate excuse to justify its tax avoidance strategy, as tax comparability-related information based on financial statements is publicly available to both the IRS and managers. Furthermore, tax comparability may increase the tax directors' incentive to reduce taxes if it facilitates the comparison of their performance, ability, and strategies in tax planning with those of their peer firm's tax directors. It is also possible that comparability has no significant impact on tax detection and tax planning because of the various tax return filings and disclosures in the U.S. In sum, whether and how an average firm's tax comparability is associated with its tax planning level is an empirical question.

3. Research Design

3.1 Measurement of Tax Comparability

De Franco et al. (2011) propose a financial statement comparability measure based on how a firm reports its book income more similarly or differently in its financial statements, given a set of economic events. Following the spirit of De Franco et al. (2011), I proxy for the tax liability reporting system as a mapping from economic events to pre-tax income, which can be presented as follows:

$$\text{Pre-tax Income}_i = f_i(\text{Economic Events}_i) \quad (1)$$

In Equation (1), $f_i()$ proxy for the tax liability reporting system of firm i. For a given set of economic events, if two companies make similar pre-tax income, they are considered to have a comparable tax liability reporting system. I use the pretax income-based measure instead of the taxable income-based measure to proxy for tax liability comparability for the following reasons. First, the actual taxable income reported on the tax return is not publicly available; therefore, tax literature typically uses financial statement accounts to estimate the annual taxable income. However, this estimation is problematic (see Hanlon 2003). More importantly, the calculation of the taxable income-based comparability requires quarterly taxable income-related accounts, which are substantially missing or biased if assumed to be zero. Second, the pre-tax and taxable income accounts often overlap in the U.S., particularly in the fundamental accounts related to sales and costs (Hanlon & Heitzman, 2010). Pre-tax income information is also provided in financial statements that auditors, investors, and other stakeholders can scrutinize. Therefore, pre-tax income provides a relevant and reliable benchmark for actual taxable income, allowing tax authorities to utilize and compare both pieces of information. (Note 8) I use stock returns as a proxy for the net effect of economic events. For each firm i in each year, I first estimate the following equation using the 16 previous quarters of pretax income and related stock returns:

$$\text{Pre-tax Income}_{it} = \alpha_i + \beta_i \text{Return}_{it} + \varepsilon_{it} \quad (2)$$

Return is the stock return during the quarter t. Corresponding to the return measure, Pre-tax Income in Equation (2) is the quarterly pre-tax income deflated by the beginning-of-period market value of equity. The estimated coefficients of $\hat{\alpha}_i$ and $\hat{\beta}_i$ represent the tax liability reporting system for firm i. Similarly, I estimate $\hat{\alpha}_j$ and $\hat{\beta}_j$ for firm j ($i \neq j$). I then use the estimated coefficients for firm i and firm j to predict their pretax income, holding economic events (i.e.Return_{it}) constant.

$$E(\text{Pre-tax Income})_{iit} = \hat{a}_i + \hat{\beta}_i \text{Return}_{it} \quad (3)$$

$$E(\text{Pre-tax Income})_{ijt} = \hat{a}_j + \hat{\beta}_j \text{Return}_{it} \quad (4)$$

$E(\text{Pre-tax Income})_{iit}$ is the predicted pretax income of firm i given firm i's function and firm i's return in quarter t, while $E(\text{Pre-tax Income})_{ijt}$ is the predicted pretax income of firm j given firm j's function and firm i's return in quarter t. Next, I calculate the mean absolute difference between $E(\text{Pre-tax income})_{iit}$ and $E(\text{Pre-tax income})_{ijt}$ over the previous 16 quarters. I measure tax comparability between firm i and firm j ($COMP_{ijt}$), after multiplying -1 to the

predicted pre-tax income difference between firm i and firm j. By construction, a higher value of $COMP_{ijt}$ indicates a more comparable pair of firms i and j. Specifically, $COMP_{ijt}$ is calculated using the following equation:

$$COMP_{ijt} = -\frac{1}{16} * \sum_{t-15}^{t} \left| E(\text{Tax income}_{iit}) - E(\text{Tax income}_{ijt}) \right| \quad (5)$$

$COMP_{ijt}$ is computed for each firm i - firm j combination (i≠j) for J firms (from j=1 to J) within the same two-digit SIC (Standard Industrial Classification) industry. Then, I rank all the values of $COMP_{ijt}$ for each firm i. To construct a firm-year specific measure of comparability, I first define $COMP\_Ind_{it}$ as the industry median $COMP_{ijt}$ for firm i for all J firms in the same two-digit SIC industry as firm i for quarter t. Additionally, I define $COMP\_m4_{it}$ as the average of the highest four values of $COMP_{ijt}$ for firm i across all J firms in the same two-digit SIC industry as firm i, for quarter t.

3.2 Measures of Tax Planning

I primarily use measures based on the effective tax rate (ETR) that capture the consequences of relatively broad tax avoidance activities and have been commonly used in the literature (e.g., Gupta & Newberry, 1997; Callihan, 1994). (Note 9) First, GAAP ETR ($GAAP\_ETR_{it}$) is the most widely used in literature (Graham, Hanlon, Shevlin, & Shroff, 2014). It is calculated as total tax expense (TXT) per dollar of pre-tax book income (PI), i.e., $GAAP\_ETR_{it} = TXT_{it} / PI_{it}$ for firm i in fiscal year t. The second ETR-based measure is Cash ETR ($CASH\_ETR_{it}$), which is computed as cash tax paid (TXPD), divided by pre-tax book income (PI) minus special items (SPI), i.e., $CASH\_ETR_{it} = TXPD_{it} / (PI_{it} - SPI_{it})$. (Note 10) The use of cash taxes paid is beneficial because it avoids tax accrual effects present in the current tax expense in the numerator of GAAP_ETR. Also, unlike GAAP ETR, cash ETR reflects both permanent and temporary book-tax differences, incorporates the tax benefits associated with employee stock options, and is unaffected by changes in valuation allowances or tax cushions (Hoopes, Mescall, & Pittman, 2012). However, it could mismatch the numerator and denominator if cash taxes paid include taxes paid on earnings in a different period. Also, cash taxes paid over a short period include payments to (and refunds from) the IRS and other tax authorities upon settling tax disputes that arose a year ago (Dyreng, Hanlon, & Maydew, 2008). Therefore, I employ the long-run cash ETR (Long_ETR) as the second ETR measure (e.g., Gallemore & Labro, 2015). (Note 11) The long-run cash ETR is calculated as the sum of five-year cash tax paid, divided by the sum of five-year pre-tax book income (PI) less special items (SPI).

3.3 Sample Selection and Descriptive Statistics

My empirical analyses utilize financial and market return data from Compustat and CRSP, respectively, from 1981 to 2015. (Note 12) Following prior literature, I exclude utilities (SIC codes 4900-4949) and financial companies (SIC codes 6000-6999), holding firms, American Depository Receipts (ADRs), and limited partnerships (De Franco et al., 2011). After requiring my main and control variables to be available, the final sample contains 25,290 firm-year observations when I use GAAP ETR as the tax planning measure. Table 1 reports the sample selection procedures. When I use long-term ETR to measure tax planning, the sample has 14,493 observations due to the longer data horizon required for its calculation.

Table 1. Sample Selection Procedures

Procedure	Firm-year Obs.	Different Firms
Initial sample: Firm-year observations with valid data on Compustat (1981-2015).	373,307	35,098
Excluding utilities (SIC codes 4900-4949), financial companies (SIC codes 6000-6999), and penny stocks.	213,529	25,483
Excluding holding firms, American Depository Receipts (ADRs), and limited partnerships.	199,069	23,681
Retain observations whose fiscal year ends in March, June, September, or December with valid data on both Compustat and CRSP.	130,999	15,846
Retain firm-year observations with non-missing tax comparability measures.	53,981	6,032
Retain firm-year observations with non-missing dependent and control variables.	25,290	3,927

Table 2. Descriptive Statistics

Panel A. Summary Statistics

Variable	N	Mean	STD	10%	25%	Median	75%	90%
Panel A: Tax Planning								
GAAP_ETR	25,290	0.290	0.192	0.000	0.155	0.339	0.391	0.450
Long_ETR	14,493	0.249	0.371	-0.002	0.135	0.266	0.356	0.445
Panel B: Tax comparability								
COMP_Ind	25,290	-2.875	2.041	-5.070	-3.290	-2.260	-1.690	-1.320
COMP_m4	25,290	-3.516	2.469	-6.480	-4.520	-2.900	-1.790	-1.180
Panel C: Other Explanatory Variables								
ΔTLCF	25,290	0.033	0.174	-0.025	0.000	0.000	0.006	0.104
NOL	25,290	0.485	0.500	0.000	0.000	0.000	1.000	1.000
ROA	25,290	0.062	0.182	-0.109	0.012	0.080	0.151	0.232
LEV	25,290	0.181	0.210	0.000	0.006	0.126	0.274	0.436
PPE	25,290	0.313	0.246	0.060	0.126	0.251	0.426	0.672
INTAN	25,290	0.119	0.191	0.000	0.000	0.029	0.164	0.372
R&D	25,290	0.054	0.096	0.000	0.000	0.014	0.071	0.152
ESUB	25,290	0.001	0.006	0.000	0.000	0.000	0.000	0.003
PIFO	25,290	0.013	0.033	0.000	0.000	0.000	0.012	0.051
MB	25,290	2.662	3.387	0.785	1.180	1.882	3.086	5.231
ΔSALE	25,290	0.119	0.323	-0.135	-0.015	0.079	0.191	0.375
MVE	25,290	5.590	2.038	2.941	4.046	5.505	6.991	8.301
EMP	25,290	1.253	1.159	0.120	0.324	0.879	1.856	3.036
CASH	25,290	0.200	0.264	0.010	0.030	0.102	0.275	0.518
DA	25,290	-0.004	0.085	-0.097	-0.047	-0.005	0.035	0.088

Panel B. Spearman (Pearson) Correlation Coefficients

		(1)	(2)	(3)	(4)
(1)	GAAP_ETR	1.00	0.36***	0.26***	0.21***
(2)	Long_ETR	0.15***	1.00	0.19***	0.17***
(3)	COMP_Ind	0.25***	0.11***	1.00	0.60***
(4)	COMP_m4	0.23***	0.10***	0.76***	1.00

Table 2, Panel A, provides summary statistics of the variables used in my analyses. All continuous variables are winsorized at the top and bottom 1% level. Panel B presents the Spearman (Pearson) correlation coefficients above (below) the diagonal for the variables used in the multivariate tests. The variables are defined in Appendix B. Superscripts ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively.

Table 2 presents the descriptive statistics. Panel A contains the summary statistics of ETR tax measures consistent with those in the extant literature. The mean (median) values of the two ETR measures, GAAP_ETR and Long_ETR are 0.290 (0.339) and 0.249 (0.266), respectively. The standard deviations of all tax planning measures indicate substantial variations across firm-year observations. Panel B reports the descriptive statistics of comparability measures. The mean and median of tax comparability, COMP_Ind (COMP_m4), are -2.875 and -2.260 (-3.516 and -2.900), respectively. Control variables in Panel C are also within a similar range to those of prior studies. Table 2, Panel B tabulates the Spearman (Pearson) correlation coefficients above (below) the diagonal for the variables used in the empirical analyses. The correlations between the ETR tax measures are significant. Both Spearman and Pearson correlations of COMP_Ind and COMP_m4 with the two measures of effective tax rate are positive and significant.

4. Empirical Analyses

4.1 Tax Comparability and Tax Planning

4.1.1 Baseline Model

To examine whether tax comparability is negatively associated with tax planning, I first estimate the following OLS or Tobit regression models for firm *i* and year *t*:

$$TAXP_{it} = \beta_0 + \beta_1 COMP_{it-1} + \sum \beta_k Controls_{it-1} + \text{Year Fixed} + \text{Industry Fixed} + \varepsilon_{it} \quad (6)$$

The dependent variable, TAXP, represents one of the two ETR measures (i.e., GAAP_ETR and Long_ETR). COMP represents the measures of comparability (i.e., COMP_Ind and COMP_m4). The deterrence hypothesis expects the coefficient of COMP (β_1) to be positive, whereas the triggering hypothesis predicts it to be negative. The COMP measures are lagged variables designed to help address the potential concerns of reverse causality and simultaneity.

Following prior studies (Zimmerman, 1983; Gupta & Newberry, 1997; Graham & Tucker, 2006; Wilson, 2009), I control for the change in loss carry forward (ΔTLCF), a loss carry forward indicator (NOL), and return on assets (ROA), because firms reporting smaller taxable income tend to have weaker incentives to engage in aggressive tax planning. I include leverage (LEV) because debt interest payments work as a tax shield. Since firms with high capital intensity tend to have larger book-tax differences due to greater depreciation expenses, I control for property, plant, and equipment (PPE). I control for intangible assets (INTAN and R&D) and equity income in earnings (ESUB) because the differential tax treatments of intangible assets and consolidated earnings under the equity method may facilitate tax deficiency. Since firms with international operations may have more opportunities to shift income between jurisdictions with higher and lower tax rates, I control for foreign activities (PIFO).

I control for growth opportunities (MB and ΔSALE) because high-growth firms tend to invest in tax-favored assets. In addition, I account for firm size using the market value of equity (MVE) and the number of employees (EMP), as larger firms have higher comparability and attract higher IRS attention (Bozanic et al., 2017) and face a higher IRS audit probability (Hoopes et al., 2012). I control for cash holding ratio (CASH) (Hoi, Wu, & Zhang, 2013) and add modified Jones' (Dechow, Sloan, & Sweeney, 1995) discretionary accruals (DA) (Phillips, 2003; Frank et al., 2009). (Note 13) I also control for lagged corresponding ETR measures because annual ETR measures exhibit some persistence over time. I include year-fixed effects to control for macroeconomic effects arising from various tax or disclosure-related regulations. Finally, industry fixed effects account for the variation of tax planning across industries. (Note 14) I do not use either a firm-fixed effect or a change design because the comparability is measured on a backward rolling basis over the prior 16 quarters' time series, and thus, it does not yield sufficient within-firm variations in comparability. (Note 155) The detailed definitions of the variables are provided in Appendix B.

4.1.2 Empirical Results

Table 3 contains the results from estimating the model in Equation (6) when one of the two ETR measures is used. Columns (1) and (3) present the results when the comparability is measured as COMP_Ind, and columns (2) and (4) contain the results when the comparability measure is COMP_m4. The estimated coefficients for COMP_Ind and COMP_m4 using the two ETR measures are all positive and significant at the 1% level. For example, for GAAP_ETR, the estimated coefficients on COMP_Ind and COMP_m4 are 0.0064 and 0.0047, respectively. These coefficients are also economically meaningful. For instance, a one standard deviation increase in COMP_Ind (COMP_m4) elevates GAAP_ETR by 1.31 (1.16) percent. This indicates that the role of comparability in reducing tax planning is economically substantial, given the sample mean values of GAAP_ETR (29.0%). The results for the control variables are generally consistent with those of prior studies. Overall, the results in Table 3 imply that a high tax liability comparability helps deter corporate managers from engaging in aggressive tax planning.

Table 3. Effects of Tax Comparability on Effective Tax Rates

	GAAP_ETR		Long_ETR	
	(1)	(2)	(3)	(4)
COMP_Ind	0.0064***		0.0095***	
	(8.89)		(5.10)	
COMP_m4		0.0047***		0.0072***
		(8.41)		(4.89)
ΔTLCF	-0.0591***	-0.0597***	-0.0718*	-0.0746*
	(-8.33)	(-8.41)	(-1.82)	(-1.89)
NOL	-0.0485***	-0.0494***	-0.0564***	-0.0571***
	(-15.71)	(-15.95)	(-6.76)	(-6.80)
ROA	0.1594***	0.1597***	0.1099***	0.1102***
	(18.62)	(18.65)	(3.29)	(3.31)
LEV	0.0194***	0.0177***	0.0071	0.0045
	(2.98)	(2.72)	(0.33)	(0.21)
PPE	-0.0247***	-0.0237***	-0.0688***	-0.0665***
	(-3.40)	(-3.26)	(-3.05)	(-2.95)
INTAN	0.0112	0.0142*	0.0132	0.0189
	(1.43)	(1.81)	(0.67)	(0.96)
R&D	-0.1069***	-0.1035***	-0.2210***	-0.2255***
	(-6.44)	(-6.23)	(-3.28)	(-3.34)
ESUB	-0.0882	-0.1066	0.0535	0.0590
	(-0.43)	(-0.52)	(0.09)	(0.10)
PIFO	-0.1671***	-0.1651***	0.2575**	0.2582**
	(-3.90)	(-3.88)	(2.43)	(2.44)
MB	-0.0013***	-0.0014***	-0.0020**	-0.0019**
	(-3.92)	(-4.07)	(-2.26)	(-2.25)
ΔSALE	0.0268***	0.0268***	0.0112	0.0115
	(7.80)	(7.80)	(0.68)	(0.69)
MVE	0.0028**	0.0034***	-0.0124***	-0.0115***
	(2.29)	(2.81)	(-3.82)	(-3.57)
EMP	0.0025	0.0020	0.0140***	0.0128***
	(1.28)	(1.00)	(2.95)	(2.67)
CASH	-0.0428***	-0.0418***	-0.0444**	-0.0433**
	(-8.33)	(-8.14)	(-2.33)	(-2.27)
DA	-0.0264**	-0.0261**	0.0385	0.0379
	(-2.12)	(-2.09)	(0.84)	(0.83)
lag_GAAP_ETR	0.2739***	0.2763***		
	(24.45)	(24.72)		
lag_Long_ETR			0.2102***	0.2109***
			(8.55)	(8.58)

Intercept	0.2371***	0.2313***	0.3485***	0.3432***
	(24.44)	(24.41)	(13.61)	(13.78)
Year Fixed	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
# of obs. (N)	25,290	25,290	12,908	12,908
Adj.R^2	0.3137	0.3127	0.0927	0.0922

This table reports the regression results for the effects of comparability on effective tax rates. The variables are defined in Appendix B. ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively. The *t*-statistics in parentheses are based on the standard errors clustered at the firm level.

4.2 Tax Comparability and Tax Sheltering

Although the incidences of a tax audit adjustment from the IRS and a tax shelter position disclosed in public directly reflect the most aggressive tax avoidance strategies, empirical studies based on them are limited due to the small sample size and limited access to confidential IRS data. Following Kim, Li, and Zhang (2011) and Hoi et al. (2013), I use Wilson's (2009) sheltering probabilities as another type of tax planning measure to examine the effect of tax comparability on highly aggressive tax planning. (Note 16) Wilson's (2009) sheltering probabilities ($SHELTER_{it}$) are calculated as: $SHELTER\_1_{it}$ = -4.86 + 5.20*BTD_{it} + 4.08*DA_{it} - 1.41*LEV_{it} + 0.76*log$(AT)_{it}$ + 3.51*ROA_{it} + 1.72*$FOREIGN_{it}$ + 2.43*$R\&D_{it}$. BTD is pretax book income (PI) less taxable income, scaled by lagged assets. Taxable income is calculated as described above. DA is discretionary accruals from the modified Jones model (Dechow et al., 1995) or the performance-adjusted modified cross-sectional Jones model (Kothari, Leone, & Wasley, 2005), which is found to be positively related to tax aggressiveness in prior literature (Frank et al., 2009). LEV is leverage for the firm; log(AT) is the logarithm of total assets (AT); ROA is pretax earnings, scaled by total assets; FOREIGN equals 1 for firm-years that report foreign income and zero otherwise; and R&D is research & development, scaled by total assets.

Once I obtain $SHELTER_{it}$, I rank $SHELTER_{it}$ each year and create an indicator variable to capture firms with a high sheltering probability (e.g., Rego & Wilson, 2012). $SHEL1_{it}$ = 1 if the firm's estimated $SHELTER\_1_{it}$ is in the top quartile of the sheltering probability distribution in that year t, and 0 otherwise. Following Wilson (2009), I also use another tax sheltering probability model: $SHELTER\_2_{it}$ = -4.3 + 6.63*BTD_{it} -1.72*LEV_{it} + 0.66*log$(AT)_{it}$ + 2.26*ROA_{it} + 1.62*$FOREIGN_{it}$ + 1.56*$R\&D_{it}$. The main difference from the first sheltering model is that discretionary accruals (DA) are not used to obtain $SHELTER\_2_{it}$. Again, I define the $SHEL2_{it}$ = 1 if the firm's estimated $SHELTER\_2_{it}$ is in the top quartile of the probability distribution in that year t, and 0 otherwise.

Table 4. Effects of Tax Comparability on Tax Sheltering

	SHEL1		SHEL2	
	(1)	(2)	(3)	(4)
COMP_Ind	-0.0672***		-0.0621***	
	(-3.60)		(-3.49)	
COMP_m4		-0.0430***		-0.0294*
		(-2.61)		(-1.84)
Intercept	-10.3474***	-10.2530***	-10.0467***	-9.8909***
	(-17.97)	(-17.87)	(-17.81)	(-17.60)
Controls	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
# of obs. (N)	14,470	14,470	14,491	14,491
Adj./Pseudo R^2	0.6185	0.6182	0.6085	0.6081

This table reports the regression results for the effects of tax comparability on tax sheltering. The variables are defined in Appendix B. ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively. The z-statistics in parentheses are based on the standard errors clustered at the firm level.

Equation (6) is estimated using a logit model where the dependent variable TAXP represents SHEL1 or SHEL2. In the context of the deterrence hypothesis, I expect the coefficient of COMP (β_1) to be negative. Table 4 reports the logit model estimation results when SHEL1 (columns (1)&(2)) and SHEL2 (columns (3)&(4)) are used as the dependent variable. As reported in columns (1)-(4), the estimated coefficients on COMP_Ind and COMP_m4 are all negative and statistically significant. Overall, the results in Table 4 suggest that a high tax comparability reduces firms' tax sheltering activities.

4.3 Alternative Tax Planning Measures: Uncertain Tax Benefits

In this section, I examine the sensitivity of the results using an alternative tax planning proxy used in the recent literature: uncertain tax benefits (UTB). UTB proxy for the accounting reserve for future tax contingencies, and the amounts are disclosed by firms under Financial Accounting Standards Board Interpretation No. 48 (FIN 48) issued in 2006. A higher UTB balance represents more uncertainty in the firm's tax liability and is thus likely indicative of a higher degree of tax avoidance (Lisowsky, 2010) or a result of undertaking weaker tax positions (Hoi et al., 2013). (Note 17) I calculate this aggressive tax planning measure as log(1+TXTUBEND) where TXTUBEND represents the year-end UTB obtained from Compustat and denote it as LUTB. I estimate Equation (6) using LUTB as the dependent variable TAXP. (Note 18) Table 5 reports estimation results. Consistent with previous findings, the association between tax comparability and UTB is negative and significant, suggesting that as a firm's tax comparability increases, its uncertain tax benefits decrease.

Table 5. Effects of Tax Comparability on Uncertain Tax Benefits

	Uncertain Tax Benefits (LUTB)	
	(1)	(2)
COMP_Ind	-0.0416***	
	(-3.84)	
COMP_m4		-0.0235***
		(-2.62)
Intercept	-2.4615***	-2.3810***
	(-14.45)	(-14.16)
Controls	Yes	Yes
Year Fixed	Yes	Yes
Industry Fixed	Yes	Yes
# of obs. (N)	4,578	4,578
Adj./Pseudo R^2	0.6932	0.6915

This table reports the regression results for the effects of tax comparability on uncertain tax benefits (LUTB). The variables are defined in Appendix B. ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively. The t-statistics in parentheses are based on the standard errors clustered at the firm level.

4.4 Alternative Measure for Tax Comparability

My main tax comparability measure, calculated using pre-tax income, could deviate from actual taxable income or tax liability. Therefore, I employ an alternative measure for tax liability comparability. Using Firm A's pre-tax income and post-tax income reported in its financial statements, I compute the firm's pre-tax and post-tax comparability, respectively, as a function of common economic events using the approach of De Franco et al. (2011). Post-tax income is calculated on an accrual basis (i.e., pre-tax income less income tax expense) because data on the cash-basis quarterly income tax paid is not available in Compustat. Then, I obtain their difference by subtracting post-tax comparability from pre-tax comparability. Similarly, I can obtain Firm B's comparability difference between pre-tax income and post-tax income by subtracting the post-tax comparability from the pre-tax comparability. If firm A's comparability difference between pre-tax income and post-tax income is larger (smaller) than firm B's comparability difference between pre-tax income and post-tax income, it would suggest that firm A's tax liability is less (more) comparable to its industry peers than firm B's tax liability. Therefore, a larger deviation of post-tax comparability from its pre-tax comparability implies lower comparability of tax liability. Finally, I multiply the deviation by (-1) to ease the interpretation of test results. I refer to this measure as the alternative tax liability comparability (COMP_Ind_Alt and COMP_m4_Alt) measure. A larger COMP_Ind_Alt (COMP_m4_Alt) represents a higher tax liability comparability.

Table 6. Effects of Alternative Comparability Measures on Tax Planning

	GAAP_ETR		Long_ETR	
	(1)	(2)	(3)	(4)
COMP_Ind_Alt	0.0125***		0.0292***	
	(5.70)		(4.74)	
COMP_m4_Alt		0.0054***		0.0180***
		(3.32)		(3.63)
Intercept	0.1948***	0.1992***	0.2818***	0.2876***
	(21.43)	(22.01)	(11.76)	(12.27)
Controls	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
# of obs. (N)	25216	25216	12870	12870
Adj.R^2	0.3113	0.3105	0.0928	0.0920

This table reports regression results for the effect of comparability on tax planning using the alternative comparability measure. The t-statistics in parentheses are based on the standard errors clustered at the firm level. The variables are defined in Appendix B. ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively.

I replicate all previous tests after replacing COMP_Ind (COMP_Ind_Alt) with COMP_Ind_Alt (COMP_m4_Alt). Table 6 presents the regression results using COMP_Ind_Alt and COMP_m4_Alt. The estimated coefficients on COMP_Ind_Alt and COMP_m4_Alt are significantly positive for all ETR measures. Overall, the results in Table 6 are consistent with prior measures, suggesting that my findings are robust when using the alternative measure of tax liability comparability.

4.5 Additional Robustness Tests

In this section, I conduct a battery of additional robustness tests. First, instead of defining COMP using the industry median and the highest four values of $COMP_{ijt}$ for firm i for all J firms in the same two-digit SIC industry as firm i for quarter t (i.e., $COMP\_Ind_{it}$ and $COMP\_m4_{it}$, respectively), I define COMP using the industry mean and the highest ten values of $COMP_{ijt}$ for firm i for all J firms in the same two-digit SIC industry as firm i for quarter t (i.e., $COMP\_mean_{it}$ and $COMP\_m10_{it}$, respectively). Table 7, Panel A, presents the results using these two alternative definitions of industry peers. Additionally, to mitigate the concern of serial correlation problems that may arise from including lagged dependent variables, I repeat the prior regressions in Table 3, excluding the lagged dependent variables, and report the results in Table 7, Panel B. The results in both Panel A and Panel B demonstrate that my findings are robust to these checks.

Table 7. Robustness Checks on the Association between Comparability and Tax Planning

Panel A. Using Alternative Definitions of Industry Peers for Comparability

	GAAP_ETR		Long_ETR	
	(1)	(2)	(3)	(4)
COMP_mean	0.0052***		0.0092***	
	(6.86)		(4.57)	
COMP_m10		0.0059***		0.0094***
		(8.76)		(5.41)
Intercept	0.2366***	0.2369***	0.3580***	0.3518***
	(23.33)	(24.53)	(12.96)	(13.80)
Controls	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
# of obs. (N)	25290	25290	12908	12908
Adj.R^2	0.3121	0.3134	0.0922	0.0928

Panel B. Excluding the Lagged Dependent Variables

	GAAP_ETR		Long_ETR	
	(1)	(2)	(3)	(4)
COMP_Ind	0.0091***		0.0113***	
	(10.31)		(5.60)	
COMP_m4		0.0066***		0.0089***
		(9.81)		(5.75)
Intercept	0.3285***	0.3209***	0.4321***	0.4281***
	(31.65)	(31.55)	(17.26)	(17.41)
Controls	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
# of obs. (N)	25290	25290	14493	14493
Adj.R^2	0.2608	0.2587	0.0557	0.0552

This table reports the results of robustness tests. Panel A presents the results when alternative comparability is used as the independent variable, and Panel B presents the results when excluding the lagged dependent variables. Other variables are defined in Appendix B. ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively. The t-statistics in parentheses are based on the standard errors clustered at the firm level.

Next, I investigate the sensitivity of my results to the inclusion of additional control variables that were not initially included in the primary models, either to maintain a reasonable number of observations or to avoid multicollinearity. First, I consider corporate governance and managerial incentive variables (e.g., Desai, Foley, & Hines, 2008; Badertscher, Katz, & Rego, 2013). The separation of ownership and control has influenced the corporate tax system, as firm managers' rent-seeking activities are often masked by tax planning (Jensen & Meckling, 1976). Absent agency conflicts, managers would maximize their after-tax wealth by reducing tax liabilities. However, too aggressive tax planning or tax sheltering can elicit negative sanctions and penalties (Crocker & Slemrod, 2005; Hoi et al., 2013). Following Desai and Dharmapala (2006) and Kovermann and Velte (2019), I first add G index, institutional ownership, and high-quality audits as corporate governance controls. Because managers' equity-based incentives could also affect tax planning (Rego & Wilson, 2012), I also control for aggregate delta and vega of both option and stock across all top five managers and the CEO's equity ownership. Second, some measures of earnings quality or attributes other than discretionary accruals (DA) could be potential sources of greater tax comparability. I

thus alternately substitute total accruals, the performance-adjusted discretionary accruals, and Dechow and Dichev's (2002) accrual quality for DA in the regression. Third, I also control for analyst forecast accuracy and dispersion, volatility in earnings, and firm complexity (e.g., segments) because firm opacity or complexity can increase the opportunity for aggressive tax planning and decrease tax liability comparability. Fourth, I control for the correlation between the focal firm's return and its industry peers, as I use the firm's return as an economic event in measuring comparability, which could affect the comparability itself, regardless of the corporate tax reporting system. Finally, I account for the case in which firms mimic the tax planning levels of their benchmark firms. Following Kubick et al. (2015), I control for the prior year's average tax planning of the product market leader firms, which is measured using the industry-adjusted price-cost margin. The untabulated results, which include these additional variables, show that including these control variables in the regressions does not alter the documented association between tax liability comparability and aggressive tax planning. I also conduct a sensitivity analysis using various alternative sample periods and find that the main results remain unchanged. (Note 19)

5. Endogeneity and Extensions

5.1 Exogenous Comparability Shock in the Software Industry

Tax comparability refers to the comparability of an established tax liability reporting system (i.e., a cross-firm attribute) and is measured using predetermined historical variables over a long past period based on a firm's and its peers' pre-tax income. A change in one firm's one single period (e.g., the current period) tax reporting policy is unlikely to affect tax liability comparability in the short run, although it could make the tax reporting system less comparable over the long term. Nonetheless, one can argue that my results are affected by reverse causality or simultaneity.

To address the endogeneity concern, I employ a difference-in-difference (DID) design, using an amendment in accounting standards for Software Revenue Recognition as an exogenous shock to tax comparability. In October 2009, the FASB issued Accounting Standard Update (ASU) 2009-14, which amends the scope of Accounting Standard Codification (ASC) 985-605-15. Determining revenue recognition for the software industry is challenging due to the nature of sales transactions for software firms (Zhang, 2005), which may lead managers to make subjective valuation judgments when estimating expected future cash flows. This industry-specific amendment is ideal for capturing an exogenous shock on tax liability comparability for firms in the software industry, as it provides guidance for more consistent and unified revenue recognition across firms, making their pre-tax income more comparable among peers in the software industry.

I identify firms in the software industry using the four-digit Standard Industrial Classification (SIC) system as the treatment group and obtain matched control groups in other industries. I use firms in SIC 3570, 3576, 3577, 7371, 7379, 7377, 3572, 3575, 5045, 3571, 3500, 5734, 5045, and 7372 as treatment firms, because software revenue recognition in ASC 985 also addresses the idea of recognizing revenue when software and hardware components operate in conjunction with each other. Control firms consist of firms from other industries that are matched with treatment firms based on firm size and market-to-book ratio. I create an indicator variable (TREAT) that equals one if a firm falls into the treatment group and zero otherwise. I first check whether the amendment caused the differential comparability-change effect on their treatment firms and find that taxable income or tax liability comparability of the software industry significantly increased after the passage of this amendment whereas that of the control firms did not over the same period and this difference is statistically significant at the 1% level.

It is possible that the amendment caused software firms to change their revenue recognition policies, which would have affected pretax income and, in turn, non-conforming tax planning measures. To avoid this case, I use Conf_ETR as the tax planning measure rather than the non-conforming measures for this DID analysis.). Conf_ETR is calculated as cash taxes paid (TXPD) divided by net cash flows from operating activities (OANCF). (Note 20) POST is an indicator variable that equals one for the period after (or since) 2009 and equals zero before 2009. I either (1) drop observations in 2009 to alleviate any confounding effects that occurred during the transition period or (2) include 2009 because many firms have elected earlier applications. Then I estimate the following equation:

$$\text{Conf\_ETR}_{it} = \alpha + \beta_1 \text{TREAT} + \beta_2 \text{POST} * \text{TREAT} + \sum \beta_i \text{Controls}_{it-1} + \text{Year Fixed} + \text{Industry Fixed} + \varepsilon_{it} \quad (7)$$

The same set of control variables (i = 3 to 18) is used as in Equation (6). The year-fixed effects subsumes the main effect of POST. I control for industry fixed effects, which are constructed based on two-digit SIC codes and therefore do not absorb the treatment group indicator (TREAT). Panel A of Table 8 presents the results when 2009 is excluded, and Panel B reports the results when 2009 is included as part of the post-amendment period (i.e., POST = 1). The estimated coefficient on POST*TREAT is positive and significant for all four models. These results are consistent

with the deterrence hypothesis that firms in the software industry become less aggressive in tax planning following the issuance of ASU 2009-14, an exogenous shock that increases comparability.

Table 8. An Exogenous Comparability Shock in the Software Industry and Conforming Effective Tax Rates

	(A) Sample excluding year 2009		(B) Sample including year 2009	
	(1)	(2)	(3)	(4)
TREAT	-0.1196**	-0.1221**	-0.1170**	-0.1196**
	(-2.16)	(-2.08)	(-2.36)	(-2.28)
POST		-0.0514**		-0.0604**
		(-2.16)		(-2.41)
POST* TREAT	0.0766**	0.0831**	0.0798**	0.0851**
	(2.07)	(2.21)	(2.30)	(2.37)
Intercept	0.1354*	0.2196***	0.1462**	0.2227***
	(1.77)	(3.46)	(2.06)	(3.75)
Controls	Yes	Yes	Yes	Yes
Year Fixed	Yes	No	Yes	No
Industry Fixed	Yes	Yes	Yes	Yes
# of obs. (N)	1,478	1,478	1,628	1,628
Adj./Pseudo R^2	0.0900	0.0718	0.0970	0.0793

This table reports the results from the difference-in-differences regression that examines the effect of a comparability-increasing shock on conforming ETR (Conf_ETR). Panel A presents the results when the year 2009 is excluded, and Panel B presents the results when 2009 is included. POST = 1 if the firm's calendar year ≥ 2009 and 0 if the firm's calendar year < 2009. TREAT = 1 if the sample falls into the treatment group (i.e., software industry firms) and 0 for the control group. Other variables are defined in Appendix B. ***, **, and * denote significance at the 1%, 5%, and 10% levels (two-sided), respectively. The t-statistics in parentheses are based on the standard errors clustered at the firm level.

The amendment occurred in 2009, which overlaps with the Global Financial Crisis period (2007-2009). Although there is no apparent reason that the crisis has any differential effect on software industry firms (i.e., treatment firms) compared to firms in other industries, I conduct a difference-in-differences test only for a sub-period spanning the financial crisis (i.e., 2008 (POST=0) versus 2009 (POST =1)) after matching treatment and control firms only by size (to maintain a reasonable number of observations). When I replicate Table 8, the coefficient on POST*TREAT remains significantly negative ($p < 0.05$). Finally, I perform a pseudo-analysis by shifting ASU 2009-14 backward or forward for five years and find no noticeable changes in Conf_ETR over the period. This DID analysis suggests that such a change in tax behavior is at least partially attributed to the change in tax liability comparability.

5.2 Cross-Sectional Analysis

Prior literature has documented a positive association between uncertainty regarding a firm's fundamentals and tax planning (e.g., Phillips, 2003; Rego & Wilson, 2012). To further support the deterrence hypothesis, I perform cross-sectional tests. When the IRS's attention to a firm is not high, the firm should be more aggressive in tax planning. In this case, the marginal effect of tax liability comparability in deterring aggressive tax behavior will be larger. When a firm's information environment is poor (i.e., less transparent), the total quality and quantity of information available to the tax authority or outsiders are limited. Under such circumstances, the marginal value of tax liability comparability in curbing taxpayers' incentives to engage in aggressive tax-reducing activities will be more critical. Therefore, I predict that the marginal effect of comparability in dampening tax planning can be stronger (1) when IRS attention towards a firm is weaker and (2) when a firm's information environment is poor.

5.2.1 Firm Size

Following the literature, I first assess the level of IRS attention and information environment using firm size (MVE). Firm size is one of the most important determinants of IRS' audit probability (Hoopes et al., 2012) and audit selection into the IRS's Coordinated Industry Case (CIC) program (Ayers, Seidman, & Toweryt, 2019). Bozanic et al. (2017) consistently provide evidence suggesting that IRS attention increases with firm size. Furthermore, prior studies have documented that small firms may have more opaque information environments (e.g., Diamond & Verrecchia, 1991; Drobetz, Gruninger, & Hirschvogl, 2010). I classify firms into two groups: (1) firms in the 1st

quartile of the distribution of MVE (i.e. smallest size group), defined as firms with low IRS attention and high information opacity (ID=1) and (2) other firms that are in the 2nd to 4th quartiles of the distribution of MVE (ID=0). I then estimate the following regression model:

$$TAXP_{it} = \beta_0 + \beta_1 COMP_{it-1} + \beta_2 ID_{it-1} + \beta_3 ID_{it-1} * COMP_{it-1} + \sum \beta_k Controls_{it-1} + Year\ Fixed + Industry\ Fixed + \varepsilon_{it} \quad (8)$$

I use the same set of controls (i = 4 to 19) as in Equation (6). In the context of the deterrence hypothesis, I expect the coefficient on ID*COMP (β_3) to be positive. The results shown in Table 9, Panel A, are consistent with my prediction. For example, for GAAP_ETR in columns (1) and (2), the coefficients on ID*COMP_Ind and ID*COMP_m4 are both positive and statistically significant. The effect of COMP_Ind on GAAP_ETR for small firms (ID = 1) is twice that for other firms (ID = 0). In sum, the results in Panel A of Table 9 suggest that the deterrence effect of comparability on tax planning is more apparent in small firms.

Table 9. Cross-Sectional Analysis on the Relation between Tax Comparability and Tax Planning

Panel A. Firm Size (ID = 1 for small firms)

	GAAP_ETR		Long_ETR	
	(1)	(2)	(3)	(4)
COMP_Ind	0.0044***		0.0068***	
	(5.30)		(3.33)	
COMP_m4		0.0034***		0.0047***
		(5.51)		(3.09)
ID	0.0103*	0.0080	0.0228	0.0294*
	(1.88)	(1.47)	(1.41)	(1.83)
ID*COMP_Ind	0.0059***		0.0089**	
	(4.67)		(2.47)	
ID*COMP_m4		0.0045***		0.0091***
		(4.39)		(2.93)
Intercept	0.2442***	0.2410***	0.3472***	0.3412***
	(21.48)	(21.61)	(11.92)	(11.98)
Controls	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
# of obs. (N)	25290	25290	12908	12908
Adj./Pseudo R^2	0.3146	0.3135	0.0931	0.0928

Panel B. BA spread (ID = 1 for large BA)

	GAAP_ETR		Long_ETR	
	(1)	(2)	(3)	(4)
COMP_Ind	0.0055***		0.0053**	
	(6.03)		(2.11)	
COMP_m4		0.0036***		0.0046**
		(5.35)		(2.48)
ID	-0.0031	0.0005	0.0327**	0.0346**
	(-0.63)	(0.10)	(2.20)	(2.47)
ID*COMP_Ind	0.0021		0.0108***	
	(1.52)		(2.71)	
ID*COMP_m4		0.0028**		0.0094***
		(2.54)		(3.06)
Intercept	0.2485***	0.2421***	0.3205***	0.3205***
	(23.14)	(23.22)	(11.13)	(11.44)
Controls	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
# of obs. (N)	22491	22491	11740	11740
Adj./Pseudo R^2	0.3151	0.3142	0.0893	0.0891

This table reports the regression results for cross-sectional analyses on the relation between comparability and tax planning. ID is an indicator variable, which equals 1 if a firm is within the 1st quartile of firm size distribution (Panel A) or the top 4th quartile of bid-ask spread distribution (Panel B). Other variables are defined in Appendix B. ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively. The t-statistics in parentheses are based on the standard errors clustered at the firm level.

5.2.2 Bid-ask Spreads

I alternatively measure a firm's information environment using the average bid-ask spread (BA_Spread), which reflects market liquidity of the firm's securities. Furthermore, low-liquidity stocks may attract less attention from market investors and the IRS. BA_Spread is calculated as the monthly average of bid-ask spreads over the prior 12 months. I again classify firms into two groups: (1) firms in the top (i.e., 4th) quartile of the distribution of BA_Spread, defined as firms facing high information asymmetry (ID=1), and (2) other firms that are in the 1st to 3rd quartiles of the BA_Spread distribution (ID=0). I then estimate equation (8) after replacing the firm size-based ID indicator with the spread-based ID indicator. Panel B of Table 9 reports the results. Specifically, the coefficients on ID*COMP_Ind and ID*COMP_m4 are both positive and mostly statistically significant for GAAP_ETR in columns (1) & (2) and for Long_ETR in columns (3) & (4), respectively. Overall, the results in Table 9 support my prediction that the negative association between tax liability comparability and aggressive tax planning is more salient for firms with low IRS attention and a poor information environment.

5.3 Schedule M-3 and Information Environment

In December 2004, Schedule M-3 became mandatory in the annual corporate tax filing. It requires most publicly traded or privately held firms with assets of at least $10 million to disclose a detailed reconciliation of book income to taxable income. Donohoe and McGill (2011) state that Schedule M-3 is one of the most important new sources of information for the U.S. Treasury and IRS in the last 40 years. Hope, Ma, and Thomas (2013) indicate that Schedule M-3 provides greater transparency and a uniform organization in book-tax data at the time of return filing. Because the tax-relevant accounting disclosure improves after Schedule M-3, I predict that Schedule M-3 weakens the marginal impact of taxable income or tax liability comparability on tax planning. To examine this, I estimate the

following equation:

$$TAXP_{it} = a_i + \beta_1 FSC\_Indmd + \beta_2 POST * FSC\_Indmd + \sum \beta_i Controls_{it-1} + Year\ Fixed + Industry\ Fixed + \varepsilon_{it} \quad (9)$$

I define the year after 2004 as *POST* = 1 and before 2004 as *POST* = 0. Again, I use the same set of controls (*i* = 3 to 18) as in Equation (6) along with year and industry fixed effects. The year-fixed effects subsumes the main effect of *POST*. The results reported in Table 10 are consistent with my prediction that the effect of tax liability comparability is less pronounced after the activation of Schedule M-3. This evidence lends additional credence to the deterrence hypothesis in that the deterrence effect of a firm's tax liability comparability on its tax planning is less pronounced when information asymmetry in tax liability between the IRS and the firm is small.

Table 10. The Impact of Schedule M-3 on the Relation between Tax Comparability and Tax Planning

	GAAP_ETR		Long_ETR	
	(1)	(2)	(3)	(4)
COMP_Ind	0.0079***		0.0153***	
	(8.22)		(4.56)	
COMP_m4		0.0056***		0.0102***
		(7.79)		(3.90)
POST	-0.0063	-0.0020	0.0208	0.0370*
	(-0.74)	(-0.23)	(0.91)	(1.67)
POST*COMP_Ind	-0.0027**		-0.0093**	
	(-2.33)		(-2.48)	
POST*COMP_m4		-0.0018*		-0.0048
		(-1.94)		(-1.59)
Intercept	0.2390***	0.2294***	0.3180***	0.2994***
	(25.86)	(25.95)	(11.78)	(11.80)
Controls	Yes	Yes	Yes	Yes
Year Fixed	Yes	Yes	Yes	Yes
Industry Fixed	Yes	Yes	Yes	Yes
# of obs. (N)	25290	25290	12908	12908
Adj./Pseudo R^2	0.3138	0.3128	0.0932	0.0923

This table presents the results from the regressions that examine the impact of Schedule M-3 on the relationship between comparability and tax planning. POST equals 1 if the calendar year falls after 2004 and 0 before 2004. Other variables are defined in Appendix B. ***, **, and * represent significance at the 1%, 5%, and 10% levels (two-sided), respectively. The t-statistics in parentheses are based on the standard errors clustered at the firm level.

6. Discussion and Conclusions

This paper examines whether tax comparability affects the extent of U.S. firms' aggressive tax planning. Based on various tax planning measures that vary in their level of aggressiveness in tax avoidance, I find that firms with a higher tax comparability are less inclined toward aggressive tax planning. This result is consistent with the notion that more comparable tax liability enhances the quality and quantity of information available to the tax authority, thereby dampening managers' incentives for tax planning. Furthermore, the negative association between comparability and tax avoidance level is more salient among firms with poor information environments. A battery of sensitivity analyses confirms that the above findings are robust to concerns about both endogeneity and measurement error.

The implications of my findings are twofold. First, on the academic side, examinations of corporate tax planning should be interpreted differently depending upon the level of tax comparability because a more comparable tax liability is likely to discourage firms' incentives for aggressive tax planning. Managers, as the primary decision-makers in firms' tax planning, should discipline their tax aggressiveness if their tax comparability or the industry-wise comparability is relatively high. Second, from a regulatory perspective, my findings have practical

implications for tax authorities and policymakers in setting tax policies. For example, the effect of tax comparability may be taken into account when designing a model for tax auditing or tax shelters to improve the model's predictability. If a firm's tax comparability significantly declines compared to prior years or to that of other peer firms, the IRS may need to pay closer attention to this firm, as low comparability tends to increase detection costs and conceal tax aggressiveness for this firm. It would be helpful for tax authorities to track the dynamics of firms' tax comparability. Additionally, the importance of tax comparability for tax authorities should be emphasized when the firms' information environment becomes more uncertain. One limitation of this study is that the data needed to calculate the actual tax liability and tax avoidance measures is incomplete and/or limited. As tax return information is not publicly available, these measures are estimated mainly based on financial statement information. An interesting area for future research would be to use more tax return data and recent sheltering cases to examine the relationship between tax comparability and aggressive tax avoidance.

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Notes

Note 1. How the IRS knows you didn't report income?

…..IRS agents like to compare gross income for your business to those as reported by similar business ……. If your business generates lots of gross income but little or no profit and takes large deductions for travel and other expenses, expect plenty of questions from the IRS.

By Ray Martin, MONEYWATCH, CBS News, August 7, 2015, 5:30 AM

https://www.cbsnews.com/news/how-the-irs-knows-you-didnt-report-income/

Note 2. Tax evasion or Tax fraud refers to the illegal non-reporting or misrepresentation of facts on a tax return, which is subject to substantial penalties (Murphy & Higgins, 2016).

Note 3. For example, Hong, Ryou, and Srivastava (2023) document that financial statement comparability promotes the harmonization of tax strategies among peer firms. My study is different from Hong et al. (2023) in that 1) their study examines the effect of financial statement comparability whereas my study focus on the tax comparability which may provide direct information about tax liability for IRS; 2) their study measures the similarity of tax strategies among peer firms whereas I examine the net impact of deterring effect and triggering effect on the average level of tax avoidance.

Note 4. Examples of these studies are De Franco et al. (2011), Brown and Kimbrough (2011), Kim et al. (2013), Kim et al. (2016), Campbell and Yeung (2017), Zhang (2018), and Choi et al. (2019).

Note 5. Early tax forms, such as Schedule M-1 and Form 5471, failed to provide necessary information to the tax authority to identify complex business transactions related to tax avoidance (Mills & Plesko, 2003).

Note 6. Bozanic et al. (2017) term "IRS attention" as the IRS's acquisition of 10-Ks from EDGAR and show evidence of substantial IRS attention to financial statements.

Note 7. In the case of Starbucks in Appendix A, if Starbucks is comparable to its peers (e.g., McDonald's, Dunkin' Brands, Chipotle Mexican Grill, etc.) in reporting taxable income, the tax accountant may have some clue whether the profits on which tax is paid are fairly stated.

Note 8. Taxable income is typically estimated by summing current federal tax expense (TXFED) and current foreign tax expense (TXFO), each divided by the statutory tax rate (STR), and then subtracting the change in net operating loss carryforwards (TLCF). If the current federal tax expense is missing, then it is calculated by subtracting deferred taxes (TXDI), state income taxes (TXS), and other income taxes (TXO) from total income taxes (TXT). The quarterly variables of TXFED, TXO, TXS, TXFO, and TLCF are not available in the Compustat Database.

Note 9. I limit effective tax rates to the range [0, 1] because negative denominators lead to undefined effective tax rates, which can obscure the inferences about a firm's tax avoidance (Hoi et al., 2013; Gallemore & Labro, 2015).

Note 10. Special items are excluded from pre-tax book income because they can be large and introduce volatility in the one-year ETR.

Note 11. Firms that conduct upward earnings management but keep constant tax may produce low ETRs, but earnings management through accruals should reverse over the long run.

Note 12. The sample ends in 2015 to avoid the potential impacts of several tax reforms that occurred before the COVID-19 pandemic. One is the Protecting Americans from Tax Hikes Act, enacted on December 18, 2015, and the other is the Tax Cuts and Jobs Act (TCJA) debate during 2016-2017. As the most significant reform in the U.S. tax code in recent decades, TCJA became effective starting January 1, 2018.

Note 13. Gallemore and Labro (2015) find that a firm's ability to reduce its effective tax rate is positively associated with its internal information quality, implying that firms with high-quality internal information are better positioned to complete the tax documentation process effectively and identify transactions that generate tax benefits more easily.

Note 14. The use of industry-year fixed effects does not alter the results. Assuming the lagged tax planning ($TAXP_{it-1}$) and unobserved firm-level effect are correlated, I also estimate equation (6) using the Arellano and Bond (1991) estimator and find a similar result on the effect of comparability on tax avoidance.

Note 15. Nonetheless, when I use a firm-fixed effects model using the test years only with the non-overlapping-period comparability measures (i.e., 1983, 1987, 1991, 1995,…, 2011, 2015), the results are consistent with those reported in Tables 3-5.

Note 16. Lisowsky (2010) extends Wilson's (2009) sheltering model by including more predictors. When I use

Lisowsky (2010)'s model, the results are not sensitive, despite a significant decline in the sample period and available observations.

Note 17. However, tax planning will not be well captured in the UTB if a manager adopts tax avoidance strategies with the primary purpose of increasing accounting earnings (Hanlon & Heitzman, 2010).

Note 18. I do not control for the lagged LUTB because outstanding uncertain tax positions, by nature, accumulate uncertain tax positions over multiple years. Thus, the inclusion of the lagged LUTB causes multicollinearity between the lagged LUTB and the comparability measures.

Note 19. For example, because SFAS No. 109, enacted in 1994, requires an asset and liability approach for financial reporting of income taxes, I repeat the previous tests for the sample period from 1994 to 2015, as in Gallemore and Labro (2015), and find that my main results remain similar.

Note 20. Although Conf_ETR is not perfectly conforming, it is more likely conforming than other ETR measures because it preempts the effect of accrual-based earnings management and measurement error in the denominator of ETR. This measure is generally available only after 1987-1988 due to the availability of OANCF in Compustat.

Appendix A

Example of Starbucks

Starbucks paid nearly as much corporation tax in 2015 as it did in its first 14 years in the UK, after bowing to pressure to scrap its complex tax structures. However, it still faced criticism for a lack of transparency that makes it hard to determine whether it is paying a fair amount of tax on its Frappuccino and espressos……. The tax contribution for 2015 was only slightly less than the £8.6m it paid over the 14 years after its 1998 UK debut, despite £3bn worth of sales in that time. Starbucks became the poster child for corporate tax avoidance in 2012 after details of its meagre tax contribution emerged. It was accused of using artificial corporate structures to shift profits out of the UK into lower tax jurisdictions. The furore prompted a deal with HMRC to waive tax deductions and pay £20m in voluntary corporation tax over two years, including £11.2m last year. Starbucks has also shut down a UK company named Alki that was part of a labyrinthine network designed to cut taxes at its former European office. Elements of its European tax structure were ruled unlawful by the European commission in October, with millions of euros of fines expected to follow.

Tax accountant Richard Murphy said it was impossible to know if Starbucks was still aggressively avoiding tax until accounts for its European parent company, Starbucks EMEA, are published.

"The company is declaring a profit and appearing to pay a fair tax rate on it but the fact is I have no clue whether the profits on which tax is paid are fairly stated." "So I have no clue what royalties are being paid to related companies, what use Starbucks is still making of tax havens and whether as a result fair tax is being paid on fairly stated profits in the UK ."If companies like Starbucks are going to claim to pay fair tax they have to realize it's a lot more complicated than calculating a percentage tax rate. It's showing that the profit is right that is now the critical issue and Starbucks are nowhere near doing that."

Dec.15, 2015. Rob Davies. www.theguardian.com

Appendix B

Variable Definitions

(A) Tax Planning Measures (TAXP)	
GAAP_ETR	GAAP ETR, defined as the total tax expense per dollar (TXT) of pre-tax book income.
Long_ETR	Long-run cash ETR, calculated as the sum of five-year cash tax paid divided by the sum of five-year (pretax income – special items).
SHEL1	Equals 1 if the firm's estimated SHELTER_1 is in the top quartile in that year, and 0 otherwise. SHELTER_1 is obtained from Wilson's (2009) sheltering probability model (1): SHELTER_1 = -4.86 + 5.20* BTD + 4.08*DA - 1.41*LEV + 0.76*log (AT) + 3.51*ROA + 1.72* FOREIGN INCOME +2.43*R&D.
SHEL2	Equals 1 if the firm's estimated SHELTER_2 is in the top quartile in that year, and 0 otherwise. SHELTER_2 is obtained from Wilson's (2009) sheltering probability model (2): SHELTER_2 = -4.30 + 6.63* BTD - 1.72*LEV + 0.66*log (AT) + 2.26*ROA + 1.62* FOREIGN INCOME +1.56*R&D.
LUTB	The level of uncertain tax benefits (UTB), measured as log(1+ TXTUBEND). Compustat item TXTUBEND presents the year-end UTB balance.
(B) Tax comparability (COMP)	
COMP	The absolute difference in the predicted values from a regression equation of firm i's pretax income per share on firm i's return using the estimated coefficients from firm i's and j's regression equations, respectively. For J firms (from j=1 to J) in the same two-digit SIC industry as firm i, COMP is computed for each firm i - firm j combination (i≠j). The details of the measurement are explained in Section 3.1 of the text.
COMP_Ind	The median of COMP values for firm i for all J firms in the same two-digit SIC industry.
COMP_m4	The mean of the four highest COMP values for firm i for all J firms in the same two-digit SIC industry.
COMP_Alt	Pre-tax income comparability minus post-tax income comparability, multiplied by (-1). Post-tax income comparability is calculated after replacing pre-tax income with post-tax income.
COMP_Ind_Alt	The median of alternative COMP values (COMP_Alt) for firm i for all J firms in the same two-digit SIC industry.
COMP_m4_Alt	The mean of the four highest alternative COMP values (COMP_Alt) for firm i for all J firms in the same two-digit SIC industry.
(C) Other Explanatory Variables	
ΔTLCF	Change in loss carry forward (TLCF) scaled by lagged assets (AT).
NOL	Equals 1 if the loss carry forward (TLCF) is positive at the beginning of the year.
ROA	Return on assets, measured as pretax income (PI) scaled by lagged assets (AT).
LEV	Leverage for the firm, measured as long-term debt (DLTI) scaled by lagged assets (AT).
PPE	Property, plant, and equipment (PPENT) scaled by lagged assets (AT).
INTAN	Intangible assets (INTAN) scaled by lagged assets (AT).
R&D	Research and development expense ratio, measured as research and development expense (XRD) scaled by lagged assets (AT). Missing values in XRD are set to 0.
ESUB	Equity income in earnings (ESUB) scaled by lagged assets (AT).
PIFO	Foreign income (PIFO) scaled by lagged assets (AT). Missing values in PIFO are set to 0.
MB	Market-to-book ratio at the beginning of the year, measured as the market value of equity (PRCC_F × CSHO) scaled by the book value of equity (CEQ).

ΔSALE	Changes in sales (SALE) scaled by lagged sales.
MVE	Natural logarithm of the market value of equity (PRCC_F × CSHO) at the beginning of the year.
EMP	The natural logarithm of the number of employees (EMP).
CASH	Cash holdings, defined as cash and marketable securities (CHE) divided by lagged assets (AT).
DA	Discretionary accruals, computed by using the modified Jones model (Dechow et al., 1995) and including lagged ROA as an additional regressor, scaled by lagged assets.