Trading on Tax Avoidance

by Jaden T. Wright

I. Introduction

Corporate tax avoidance has caused a lot of controversy among investors and analysts. While avoidance activities can range from relatively benign actions like accelerating depreciations and deferrals to more aggressive strategies such as income shifting and tax-haven operations (Hanlon & Slemrod, 2009; Wilson, 2009), tax avoidance of any form can be considered a transfer of wealth away from the government to a firm's shareholders. However, tax avoidance may also be costly for firms, as it increases confusion about companies' expected cash flows due to increased uncertainty about future tax savings (Blouin, 2014); decreases the transparency of the firm, making valuation and forecasting more difficult (Weber, 2009); and potentially raises concerns from regulatory bodies such as the Internal Revenue Service (IRS). Thus, whether tax avoidance is net positive for investors remains an open question.

The purpose of this study is to determine whether equity investors can generate abnormal returns from trading on the tax avoidance aggressiveness of publicly-traded firms. Given the inherent difficulty analysts and investors have in impounding tax information into stock prices (Weber, 2009; Powers, Schmidt, Seidman, & Stomberg, 2017), it is straightforward to assume that complex tax avoidance strategies can create profitable opportunities for investors. In particular, I hypothesize that aggressive tax-avoiding firms will generate positive abnormal returns as investors fail to immediately appreciate the cash flow savings this tax-avoiding strategy will produce. Additionally, based on the findings of studies such as Guenther, Matsunaga, and Williams (2017), I expect firms with greater amounts of uncertainty surrounding their tax rates (i.e. *tax risk*) to earn higher stock returns as a means of compensating equity investors for increasing the riskiness of the firm.

Previous work has predominantly focused on how tax avoidance affects the valuation of companies without necessarily attempting to identify whether tax-avoiding firms are mispriced. For example, Desai and Dharmapala (2009) find that tax avoidance does not increase a firm's value unless it is coupled with a strong corporate governance framework.[1] Kim, Li, and Zhang (2011) demonstrate that tax avoidance aggressiveness is associated with higher stock price crash risk, suggesting that tax aggressive firms may have lower valuations relative to less tax aggressive firms due to increased riskiness. However, the findings of Goh, Lee, Lim, and Shevlin (2016) show that tax avoidance causes firms to have a lower equity cost of capital, implying that they are actually less risky, and Guenther et al. (2017) suggest that tax avoidance does not contribute to firm risk, but rather it is the stability of tax avoidance aggressiveness that matters. In more recent work, Jacob and Schütt (2016) and Drake, Lusch, and Stekelberg (2017) show that tax avoidance increases a firm's value. This suggests that that investors positively value tax avoidance activities, but also demonstrate that increased tax risk, as measured by the volatility of a firm's tax rates, lowers investors' valuations, implying that uncertainty surrounding taxes harms shareholder value.

While the aforementioned papers show that tax avoidance aggressiveness and tax risk can affect the worth of a corporation, they do not demonstrate whether the stock market fully impounds this value-relevant information into a firm's share prices. Indeed, as my results show, it is possible to design simple trading strategies based on measures of a firm's tax avoidance aggressiveness and tax risk that generate economically meaningful profits.

Specifically, I show that tax aggressive firms produce higher returns than less aggressive firms. These results suggest that increased tax savings may have a positive effect on firm valuation. In some cases, the difference in returns amounted to over 800

[1] Firms with strong corporate governance exhibit balanced board control, unconcealed manager decision-making, and extensive information sharing to shareholders and analysts.

basis points (bps) a year. I find this to be a significant variable for making equity investment decisions. This refutes the findings of Guenther et al. (2017) that show tax avoidance levels are not associated with differences in returns. While these results are substantial, I follow previous consensus that tax avoidance aggressiveness should not be the sole measurement for firm valuation and, thus, I capture a risk component of tax avoidance.

With regard to avoidance volatility (i.e. *tax risk*), I find firms with higher tax risk to earn greater returns than low tax risk firms. I find tax risk to be a significant variable in the valuation of firms. Specifically, because aggressive tax avoidance seems to cause uncertainty in future cash flow, high tax avoidance yields higher levels of tax risk. It is the volatile firms that carry the highest returns with volatile effective tax rates earning over 700 bps more a year than less volatile effective tax rates. While Drake et al. (2017) show the mitigative effects of tax risk on valuation, I find a positive result of tax risk on firm return. Equity investors appear to be compensated for carrying more risk.

One inference that could be made is that these results follow a basic trend in which equity investors are compensated for holding more firm risk. I adjust for this relationship by controlling for systematic risk along with other performance variables. Even after controlling for the risk premium, I find firms with low tax risk and high rates earn very low returns, while firms that have low tax rates and high risk generate higher returns. I regress each portfolio against an asset pricing model to capture mispricing within tax aggressive firms. My results suggest that the market discounts firms with inconsistently low tax rates too much, leading to an undervaluation. These results support the idea that investors do not completely realize the tax cash savings of high tax-avoiding firms.

My research contributes to the literature by presenting a material trading strategy based on a firm's tax avoidance aggressiveness. I empirically show a mispricing between tax avoidance portfolios based on firms' returns. I further contribute to the encompassing research on tax avoidance and its relationship with firm valuation. The rest of the paper is structured in the following way: section two formulates my hypothesis; section three describes my research method and data; section four presents my results; and section five offers conclusions from the study.

II. Hypothesis Formation

The ability of investors to fully incorporate complex tax environments has been a subject of interest in recent literature. This study provides evidence of significant earning differentials between aggressive avoiding and non-aggressive avoiding firms. Investors often ignore firm-specific tax information and rely heavily on the statutory tax rate when making valuation decisions (Powers, Seidman, & Stomberg, 2015). Interim or even permanent tax fluctuations may be ignored when pricing a firm's stock. Kim, Schmidt, and Wentland (2015) find that analysts underreact to tax change components more than other earnings components of a firm. They attribute this underreaction to analysts' failure to fully recognize the difference between permanent and temporary effective tax rate changes. Clearly, there is evidence that a firm's tax environment may be overlooked in valuation. Both management and analyst accuracy in predicting effective tax rates have been shown to decrease as a firm's tax complexity increases (Bratten, Gleason, Larocque, & Mills, 2017). As the aggressive tax-avoiding firms operate in complexity and uncertainty with regards to future tax cash flow effectiveness, it can be assumed that aggressive-avoiding firms create more complex tax information environments. Given the inherent difficulty analysts and investors have in impounding tax information into the stock prices of complex tax-situated firms, I hypothesize that aggressive tax avoidance strategies can create profitable mispricing opportunities for investors.

> **H1:** Aggressive tax-avoiding firms generate positive abnormal returns.

This tax complexity refers, in part, to the uncertainty of future tax strategies or tactics having their desired effect. Avoidance activities can be challenged and overruled by U.S courts and, for an aggressive tax-avoiding firm, the effective rates can fluctuate period to period. This causes uncertainty in the tax savings and cash flows which is the tax

risk component of a firm. Guenther et al. (2017) found a positive relationship between tax risk and overall firm risk. Because investors are compensated for holding more risk, I assert that aggressive tax-avoiding firms follow this investment relationship.

> **H2:** Investors are compensated for holding firms with higher tax risk.

III. Data and Methodology

I follow Dyreng, Hanlon, and Maydew (2008) and Goh et al.'s (2016) definitions of tax avoidance to include all activities that lower a firm's tax liability and effective tax rate. I use predefined tax avoidance measures to capture the range of tax avoidance aggressiveness. Tax-avoiding activities can be permanent or temporary in nature, and it may be unclear which category it falls into when a firm implements it, which supports the idea that tax avoidance is often misunderstood.[2] Simone, Nickerson, Seidman, and Stomberg (2016) examine the ability of different tax avoidance measures to capture these strategies. They find permanent strategies to be the most easily detectable. When a firm participates in tax avoidance, the effect it has on a firm can usually be observed and measured. Differences arise between the amount of income and tax expense on a company's financial statements and its tax return. These differences can be described as book-to-tax differences (BTD). Firms involved in tax sheltering often have larger BTDs. The effective tax rate (ETR) refers to a firm's tax rate on taxable income.

I use Compustat to analyze company financial data for firm-years with positive pre-tax income over the period 1992–2015. Negative values of pre-tax income would distort the measurement variables and, though firms may have an operating loss during a period, this is not likely to persist in the long-run. Following prior studies, I exclude financial (SIC codes 6000-6999) and utility (SIC codes 4900-4999) firms. These types of firms are heavily regulated and have a variety of different tax regulations imposed upon them. I further censor ETR, CETR, and the 5-year CETR at 0 and 1. This removes outliers in the data that could skew the results. Also, the number of observations removed by this censoring is trivial. BTD and Permanent BTD variables are winsorized at 1 and 99 percent. Table 1 displays the sample of observations for the data. For certain variables, five consecutive years of observable tax measurements are required, which reduces the number of observations.

This research is formulated from previously established tax avoidance measurements. I use a variety of measurements to distinguish between low tax avoiders and high tax avoiders. Specifically, these measures identify firms that likely participate in tax avoidance and, based on the work of Simone et al. (2016), the type of tax strategy. I start by examining the ETRs of a firm. These rates indicate the level of tax expense a firm faces in relation to their pre-tax income. I follow the equation used by Simone et al. (2016) to study this variable.

$$ETR = \frac{txt}{pi}$$

where:

txt is total income tax expense and *pi* is pre-tax income. Recognizing that the effective tax rate is representative of the amount of tax a firm's income is subject to, we should see high tax-aggressive firms having a low effective tax rate, all things equal. This measurement is also known as the GAAP effective tax rate. This measurement shows permanent tax strategies but falls short in detecting temporary tax savings. Tests using ETR are vulnerable to errors caused by low levels of pre-tax income, differences in financial reporting related to tax reserves, and/

Table 1: Sample Selection

			5-Year		Permanent		σ5-Year				
	ETR	Cash ETR	Cash ETR	BTD	BTD	σETR	σCETR	CETR	σBTD	σPBTD
Compustat (1992-2015)	293,212	293,212	293,212	293,212	293,212	293,212	293,212	293,212	293,212	293,212
Eliminate Financials	(78,330)	(78,330)	(78,330)	(78,330)	(78,330)	(78,330)	(78,330)	(78,330)	(78,330)	(78,330)
Eliminate Utilities	(10,456)	(10,456)	(10,456)	(10,456)	(10,456)	(10,456)	(10,456)	(10,456)	(10,456)	(10,456)
Pretax Income > 0	(89,542)	(89,542)	(89,542)	(89,542)	(89,542)	(89,542)	(89,542)	(89,542)	(89,542)	(89,542)
Adjusted Observations	114,884	114,884	114,884	114,884	114,884	114,884	114,884	114,884	114,884	114,884
Tax Variable	(11,222)	(26,540)	(13,983)	(43,696)	(44,166)	(11,222)	(26,540)	(13,983)	(43,696)	(44,166)
Eliminate Duplicate Firm Years	(34,011)	(24,302)	(44,853)	(16,519)	(16,352)	(34,011)	(24,302)	(44,853)	(16,519)	(16,352)
Censor Between 0 & 1	(5,048)	(4,607)	(832)	-	-	(5,048)	(4,607)	(832)	-	-
Tax Sample	**64,603**	**59,435**	**55,216**	**54,669**	**54,366**	64,603	59,435	55,216	54,669	54,366
Risk Variable						(34,233)	(33,763)	(25,506)	(26,824)	(26,697)
Risk Sample						**30,370**	**25,672**	**29,710**	**27,845**	**27,669**

This table gives information about the sample selection used in the research. I start with a wide rang of firm years and eliminate observations that would disrupt or otherwise skew my data. For CETR5 and all tax risk measures, five consecutive years of observable tax measurements are required, which reduces the number of observations.

[2] Activities that recognize a tax benefit in a current period, with the benefit having to be repaid in a later one, are temporary activities. Under a permanent strategy, a firm uses a tax deduction activity that permanently lowers its effective tax rate.

or reinvested foreign earnings.[3] For this, the cash effective tax rate is more commonly used to capture the true aggressiveness of a firm's tax avoidance. Again, I apply Simone et al.'s (2016) CETR as a variable for tax avoidance.

$$Cash\ ETR = \frac{txpd}{pi}$$

where:

txpd is income taxes paid and *pi* is pre-tax income. This shows the actual amount of tax cash flow that a firm recognizes. These measurements can be positive or negative and can be greater than one, which would reflect tax payments exceeding pre-tax income, leading to the censoring of these variables. Analyzing monthly CETR measurements may capture alternative variables that affect CETR but may not be associated with tax avoidance. Because of this, I take multiple period averages to formulate results and smooth out the tax avoidance measure. Dyreng et al. (2008) develop a long-run tax avoidance measure for Cash ETR. Combining this with the research of Simone et al. (2016), I measure long-run tax avoidance as follows:

$$5\text{-}year\ Cash\ ETR = \frac{\sum_1^5 txpd}{\sum_1^5 pi}$$

Here, the five-year total income taxes paid is divided by the five-year total pre-tax income form the same period. This measurement is the preferred variable in prior tax avoidance studies.[4] Grouping firm-years together should lower the volatility of CETR over these five-year periods.

Another common way to measure tax avoidance is by looking at the BTDs of a firm. These are the differences between the income reported to capital markets and the IRS. Like ETR, this measure can capture many different aspects of tax avoidance. My use of this measurement is closest to that of Goh et al. (2016).

$$BTD = \frac{pi - \frac{txfo + txfed}{.35}}{at}$$

where:

pi refers to pre-tax income, *txfo* refers to foreign tax expense, *txfed* refers to federal tax expense, 0.35 is used as the statutory tax rate, and *at* refers to total assets. This tax measurement is used in the research of Desai et al. (2009) and Guenther et al. (2017). BTDs can be positive or negative and are often winsorized at 1 and 99 percent. They detect various tax avoidance strategies but may be impaired by low levels of assets in a firm (Simone et al., 2016). Frank, Lynch, and Rego (2009) develop an alternative calculation of BTDs intended to separate permanent and temporary differences. I utilize this as a further proxy for measuring tax avoidance within BTDs.

$$Permanent\ BTD = \frac{(pi - \frac{txfo - txfed}{.35}) - \frac{txdi}{.35}}{at}$$

Simply, this is the difference between total BTDs and temporary BTDs, where *txdi* is total deferred tax expense. Goh et al. (2016) use this measurement in detecting tax avoidance, and Simone et al. (2016) find that tests using total BTDs have the best ability to detect the effects of a hybrid tax avoidance strategy.[5] Permanent tax avoidance is best detected while studying a firm's ETR, and temporary strategies are most easily detected by analyzing Cash ETR.

Studies of tax avoidance ultimately deal with the question of tax risk and measure it as the volatility of a firm's tax rates. Following Drake et al. (2017), Guenther et al. (2017), and Jacob et al. (2015), I measure tax risk as the standard deviation of each of the aforementioned tax measurements. The volatility of these measurements represents the level of uncertainty in a tax strategy resulting in the desired tax savings. This tax uncertainty is well documented

[3] As Simone et al. (2016) explain: "U.S. multinationals that earn income abroad can choose to either defer U.S. taxation on qualified foreign earnings until they are repatriated back to the U.S. (which reflects a temporary strategy that does not affect ETR) or assert their intention to permanently reinvest these foreign earnings and avoid accruing the incremental U.S. tax (which reflects a permanent strategy that lowers ETR)."

[4] Studies such as Drake et al. (2017); Goh et al. (2016); Guenther et al. (2017); and Kim et al. (2011) use the long-run tax avoidance measure laid out by Dyreng et al. (2008).

[5] Simone et al. (2016) denote hybrid strategies as having both temporary and permanent components to it, such as income shifting that requires temporary deferral and generates permanent tax credits.

in the literature. Drake et. al (2017) assert that tax avoidance and tax risk should be mutually considered in valuation. Each tax risk variable is measured on a five-year rolling average to better capture long-run tax risk. Table 2 describes the correlation between the variables. My results indicate a positive relationship between tax risk and firm return, which is observed in the portfolio regressions.

My avoidance portfolios represent different levels of tax avoidance aggressiveness from one to ten. For ETRs, firms in portfolio one, *p*1, carry the lowest tax rates and are observed to be the most aggressive tax avoiders. Firms in portfolio ten, *p*10, carry the highest tax rates and are observed to be the least aggressive tax avoiders. This is reversed for BTD portfolios, as lower differences are associated with less aggressive tax avoidance. I sort firm years into these portfolios by measuring their tax rates and book-to-tax differences. Each measurement produces a robust distribution within each portfolio. The average measure of each portfolio is presented in Tables 3 and 4. As I will show, the highest returns are present in the most aggressive tax-avoiding portfolios. This type of relationship is consistent with the tax cash savings principle described by Goh et al. (2016).

Because my research seeks to analyze the influence of tax risk, I separate firms into portfolios by the level of tax volatility. This is measured as the standard deviation of each measurement over five-year periods. Firms in portfolio one, *rp*1, have the lowest level of avoidance volatility (lowest tax risk). Firms in portfolio ten, *rp*10, have the highest level of avoidance volatility (highest tax risk). Table 5 describes the measures of the tax risk portfolio allocation. I find the highest tax risk portfolios to produce the highest returns. As I will show in my regression analysis, this is still present after adjusting for systematic risk.

While portfolio sorts are helpful in determining whether expected returns vary based on a firm's tax rates or levels of tax risk, they fail to account for differences in expected returns due to the exposure to systematic risk. For example, if the return differential between portfolios sorted on tax risk is simply due to increased exposure to systematic risk, then investors cannot enjoy abnormal returns by investing in high tax risk portfolios and shorting low tax risk portfolios. To address these concerns, I regress the monthly returns of the portfolios, discussed in the section above, against the five-factor asset pricing model, developed in Fama and French's (2015) study, to control for variables that are widely accepted indications of stock performance.

For the risk component, I regress the returns of the tax avoidance portfolios in excess of the risk-free rate (assumed to be the return on the one-month Treasury bill) against the Fama-French five factors:

$$E(r_p) - r_{f,t} = \alpha_p + \beta_1(r_{m,t} - r_{f,t}) + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 RMW_t + \beta_5 CMA_t + \varepsilon_p$$

where:

MKT is the market risk premium, defined to be the return of the Center for Research in Security Prices (CRSP) value-weighted stock index minus the return of the one-month Treasury bill. *SMB* is a

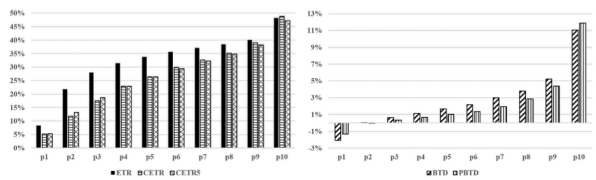
Table 2: Pairwise Correlation Table

*All effective tax rates are censored at 0 and 1, while BTD and Permanent BTD are winsorized at the 1 percent level. All standard deviations are based on five-year rolling averages.

	ETR	*Cash ETR*	*5-Year Cash ETR*	*BTD*	*Permanent BTD*	*σETR*	*σCETR*	*σ5-Year CETR*	*σBTD*	*σPBTD*
ETR	1.0000									
Cash ETR	0.4169	1.0000								
5-Year Cash ETR	0.3216	0.5389	1.0000							
BTD	-0.4258	-0.5021	-0.3809	1.0000						
Permanent BTD	-0.6049	-0.3006	-0.2389	0.6377	1.0000					
σETR	-0.1544	-0.1021	-0.0901	0.1395	0.1820	1.0000				
σCETR	0.1214	0.2451	0.2143	-0.1389	-0.0915	0.3458	1.0000			
σ5-Year CETR	0.0505	0.0058	0.0748	-0.0130	-0.0242	0.2490	0.3210	1.0000		
σBTD	-0.1115	-0.1183	-0.1925	0.2803	0.2292	0.2746	0.2547	0.2055	1.0000	
σPBTD	-0.1540	-0.2066	-0.3085	0.2770	0.3578	0.4205	0.1105	0.1667	0.5793	1.0000

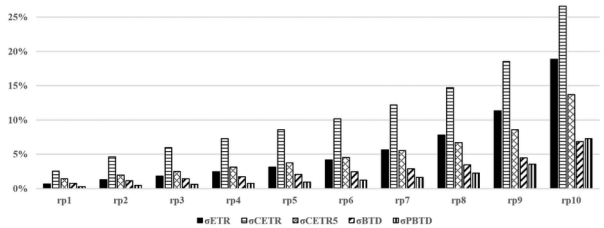
This table describes the correlation between the various tax variables used in my research. Tax rates and book-to-tax differences are negatively related, as low rates and high differences indicate high avoidance aggressiveness.

Tables 3 & 4: Portfolio Avoidance Levels



These two graphs depict the spread in tax aggressiveness across the portfolios. Firms with the highest tax rates (low tax avoidance aggressiveness) make up *p*10 while *p*1 contains firms with low tax rates (high tax avoidance aggressiveness). Because tax rates and book-to-tax differences are negatively correlated, *p*10 consists of the high aggressive tax-avoiding firms and *p*1 consists of low aggressive tax-avoiding firms.

Table 5: Tax Risk Levels



This graph shows the average volatility in the tax variables for each tax risk portfolio. *rp*1 contains firms with low volatility in their tax variables (low avoidance aggressiveness) and *rp*10 contains firms with high volatility in their tax variables (high avoidance aggressiveness).

well-diversified portfolio that is long on stocks with low market capitalizations and short sells assets with high market capitalizations. *HML* is a well-diversified portfolio that is long on value stocks (i.e. stocks with high book-to-market ratios) and short sells growth stocks (i.e. firms with low book-to-market ratios). *RMW* is a well-diversified portfolio that is long on stocks with robust operating profitability and short sells stocks with weak operating profitability. *CMA* is a well-diversified portfolio that is long on stocks that invest conservatively and short sells stocks that invest aggressively.

Data on the five factors and the risk-free rate are available on Ken French's website.[6] As my regression model features excess returns on the left-hand side and returns-based factors on the right-hand side, the vertical intercept of the regression (i.e. α_p) can be interpreted as Jensen's alpha (e.g., Jensen, 1968), a measure of the portfolio's performance above or below what the benchmark asset pricing model estimates the portfolio return ought to be, given its exposure to systematic risk as proxied by the Fama-French factors. Accordingly, Jensen's alpha can be used as a measure of the abnormal returns an investor can expect to earn in excess of the risk the portfolio carries. As the results show, this pricing model reveals abnormal returns for equity investment in aggressive tax-avoiding portfolios.

IV. Empirical Results

My research produces significant results for the portfolio analysis and residual regression analysis. I confirm tax avoidance aggressiveness to have positive results for equity investors. An analysis of the portfolio performance identifies useful information for equity trading. Table 6 identifies the monthly returns of each portfolio described above, while Table 7 indicates the statistical significance of the highest and lowest portfolios measured against the five-factor model.

Under ETR portfolio allocation, I find that firms with lower effective tax rates produce higher returns. *p*1 yields 804 bps more per year than *p*10. This supports Drake et al.'s (2017) finding that

Table 6: Portfolio Return

	ETR	CETR	CETR5	BTD	PBTD		αETR	αCETR	αCETR5	αBTD	αPBTD
p 1	2.14%	1.99%	2.05%	1.70%	1.45%	*rp* 1	1.31%	1.39%	1.24%	1.35%	1.28%
p 2	1.49%	1.56%	1.52%	1.64%	1.56%	*rp* 2	1.43%	1.22%	1.49%	1.40%	1.40%
p 3	1.42%	1.48%	1.49%	1.48%	1.62%	*rp* 3	1.58%	1.34%	1.55%	1.28%	1.33%
p 4	1.52%	1.60%	1.54%	1.54%	1.65%	*rp* 4	1.53%	1.62%	1.88%	1.43%	1.35%
p 5	1.35%	1.39%	1.59%	1.42%	1.48%	*rp* 5	1.35%	1.66%	1.51%	1.43%	1.27%
p 6	1.61%	1.40%	1.41%	1.42%	1.58%	*rp* 6	1.22%	1.31%	1.48%	1.61%	1.50%
p 7	1.61%	1.56%	1.51%	1.56%	1.28%	*rp* 7	1.45%	1.51%	1.50%	1.49%	1.59%
p 8	1.52%	1.53%	1.65%	1.42%	1.45%	*rp* 8	1.55%	1.48%	1.77%	1.49%	1.63%
p 9	1.60%	1.59%	1.38%	1.48%	1.63%	*rp* 9	1.54%	1.91%	1.51%	1.87%	1.62%
p 10	1.47%	1.72%	1.59%	1.38%	1.44%	*rp* 10	1.76%	1.56%	1.51%	1.67%	1.95%

This table shows the monthly returns for each portfolio described above. Portfolios of tax variables are sorted from *p*1 to *p*10, and portfolios of tax risk are sorted from *rp*1 to *rp*10.

Table 7: P-Values of Variable Regression

	Value Weighted Return *p* 1 - Value Weighted Return *p* 10					Value Weighted Return *rp* 1 - Value Weighted Return *rp* 10				
	ETR	CETR	CETR5	BTD	PBTD	αETR	αCETR	αCETR5	αBTD	αPBTD
MKT	0.056	0.014	0.066	0.392	0.281	0.253	0.085	0.861	0.091	0.373
SMB	0.756	0.000	0.075	0.378	0.047	0.418	0.000	0.002	0.329	0.007
HML	0.042	0.004	0.067	0.943	0.037	0.853	0.000	0.421	0.000	0.000
RMW	0.000	0.000	0.002	0.002	0.550	0.000	0.002	0.218	0.004	0.002
CMA	0.399	0.000	0.003	0.973	0.562	0.389	0.493	0.264	0.861	0.924

This data table indicates the p-values of the return differences between *p*1 and *p*10, as well as *rp*1 and *rp*10 regressed against the Fama-French five factor model.

aggressive tax-avoiding firms earn higher returns through tax savings. I also find that firms with more volatile ETRs earn higher returns than those with less volatile ETRs. *rp*10 outperforms *rp*1 by 540 bps a year. Intuitively, these firms may be compensating investors for higher levels of risk. The most volatile firms are situated in the low ETR portfolios, which describes the correlation between tax aggressive firms. The opposite holds true with the least volatile firms having the highest ETRs. Returns seem to increase more as a firm moves from *rp*1 to *rp*10 than they do as they move from *p*10 to *p*1. Based on this, I find the volatility of a firm's ETR to be a larger determinant of returns than the firm's ETR. However, the largest returns of the portfolios are earned by firms with low ETR.

Portfolio allocation on CETRs reaffirm the ETR tests. *p*1 earns a monthly return of 1.99 percent compared to a monthly return of 1.72 percent for *p*10. This leads to low CETR firms earning 324 bps more a year than high CETR firms. Highly volatile CETR firms also earn larger returns as *rp*10 outperforms *rp*1 by 204 bps a year. Smoothing this measurement out over a five-year average (CETR5) produces the same relationship. *p*1 outperforms *p*10, and *rp*10 outperforms *rp*1 by 552 bps and 324 bps a year, respectively.

Book-to-tax differences yield less of a significant result. In fact, portfolios allocated by BTD seem to behave the opposite of portfolios allocated by tax rates. *p*1, which consists of low avoiders, outperforms

[6] This site forms portfolios of firms based on a wide range of economic and firm-specific variables: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

*p*10, which are aggressive avoiders, by 384 bps a year. Firms with low BTDs earn, on average, higher returns than firms with high BTDs. Under this measurement, aggressive tax-avoiding firms are earning less returns than non-aggressive ones. BTD tax risk portfolios follow the same relationship as the others, where highly volatile BTDs yield the highest returns. Again, the returns seem to fluctuate more from the volatility than by the level of BTD. This supports the idea that tax risk is more influential than avoidance levels. Permanent BTDs are less descriptive, as no heterogeneity exists in returns for the PBTD portfolios. Higher returns do exist for volatile PBTDs, with *rp*10 yielding 804 bps more than *rp*1.

While examining the raw returns of portfolios sorted on tax avoidance aggressiveness is useful, it is insufficient due to the fact that it does not control for differences in systematic risk exposure across the portfolios. Regressing these portfolios against an asset pricing model allows me to adjust for factors that have been observed to be strong indicators of stock performance, including a systematic risk factor to capture mispricing. Table 8 describes the residual alphas within portfolios sorted on ETR and σETR along with the corresponding level of significance. The same allocation of portfolios exists with *p*1 representing low levels and *p*5 representing high levels. Firms with low tax risk but high rates earn very low alphas, but firms that have low tax rates and high risk generate very high alphas. The largest residual alpha is seen in *p*1 for ETR (low ETR) and *p*5 for σETR (high tax risk). Because alpha is a measure of excess, or abnormal, return over what an investor should receive, there is significant mispricing present in aggressive tax-avoiding firms. This seems to suggest that the market discounts firms with inconsistently low tax rates too much, leading to an undervaluation.

Table 8: Jensen's Alpha of Portfolios Sorted on ETR and σETR

		Portfolios Sorted on Effective Tax Rates				
		1 (Low ETR)	**2**	**3**	**4**	**5 (High ETR)**
Portfolios Sorted on Tax Risk	**1 (Low Tax Risk)**	0.52%	0.72%	0.31%	0.56%	0.10%
		0.075	*0.300*	*0.431*	*0.067*	*0.010*
	2	0.71%	0.69%	0.51%	0.47%	0.57%
		0.299	*0.349*	*0.747*	*0.444*	*0.381*
	3	0.75%	0.38%	0.55%	0.50%	0.48%
		0.198	*0.120*	*0.139*	*0.669*	*0.582*
	4	0.94%	0.63%	0.26%	0.65%	0.43%
		0.875	*0.113*	*0.055*	*0.101*	*0.092*
	5 (High Tax Risk)	1.65%	0.69%	0.92%	0.42%	0.54%
		0.053	*0.095*	*0.087*	*0.100*	*0.073*

This table represents portfolios sorted by both level of tax avoidance and level of tax risk in order to display where the largest mispricing is present. Monthly returns are given as percentages and the corresponding p-value of each regression is included below. I condense the sorting of portfolios to five instead of ten to better highlight the residual alpha values. The same correlation in portfolios exists.

Running this regression provides information about the types of firms that are earning these higher returns and are being mispriced. Highly profitable firms appear to make up a larger portion of the high ETR portfolio, yielding less return than lower profit firms. High profit firms may face more difficulty with avoiding taxes which places them in the lower return portfolio. These firms also seem to be present in the low tax risk portfolios. These results become inconsistent for book-to-tax differences, as profitable firms seem to have high BTDs. High CETR portfolios hold conservative investing firms. Growth stocks make up the higher return portfolios, which counteracts the tendency for value to outperform growth. Small-cap firms seem to carry more tax risk than large-cap firms and follow the tendency to outperform them. Further research of these relationships with tax aggressiveness is needed in order to better understand the types of firms that exhibit tax aggressiveness.

Because portfolios with higher tax risk outperform portfolios with lower tax risk, I find that investors are compensated for holding the tax risk of tax aggressive firms after adjusting for the risk premium. These results support my hypothesis and the tax risk effect on return framework offered by Guenther et al. (2017). Furthermore, adjusting for the various components of expected returns, I find residual levels of return that are most abundantly present within highly aggressive tax-avoiding firms. This undervaluation affirms my hypothesis that aggressive tax-avoiding firms generate positive abnormal returns. Based on the findings of Powers et al. (2015), Kim et al. (2015), and Bratten et al. (2017), this mispricing may be due to the inability of investors to fully implement the cash flows from tax savings of highly aggressive tax-avoiding firms.

V. Conclusion

In conclusion, this study empirically shows that equity investors can generate abnormal returns from trading on the tax avoidance aggressiveness of publicly-traded firms. My research contributes to the literature of corporate tax avoidance by indicating that not only are investors compensated for holding tax risk, but they can take advantage of mispricing within aggressive tax-avoiding firms. I offer further opportunity for research into firm-specific

characteristics of tax avoidance aggressiveness to develop a better understanding of tax avoidance. This paper and the findings of Goh et al. (2016), Jacob et al. (2016), and Drake et al. (2017) suggest that corporate tax avoidance is a net positive attribute in capital markets.

References

Bratten, B., Gleason, C. A., Larocque, S. A., & Mills, L. F. (2017). Forecasting taxes: New evidence from analysts. *The Accounting Review, 92*(3), 1–29.

Blouin, J. (2014). Defining and measuring tax planning aggressiveness. *National Tax Journal, 67*(4), 875–900.

De Simone, L., Nickerson, J., Seidman J. K., & Stomberg, B. (2016). How reliably do empirical tests identify tax avoidance? (Working paper 3446). Stanford, CA: Stanford Graduate School of Business.

Desai, M. A., & Dharmapala, D. (2009). Corporate tax avoidance and firm value. *Review of Economics and Statistics, 91*(3), 537-546.

Drake, K. D., Lusch, S. J., & Stekelberg, J. (2017). Does tax risk affect investor valuation of tax avoidance? *Journal of Accounting, Auditing & Finance,* 1–26.

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

Fama, E., & French, K. (2015). A five-factor asset pricing model. *Journal of Financial Economics, 116,* 1-22.

Frank, M. M., Lynch, L. J., Rego, S. O. (2009). Tax reporting aggressiveness and its relation to aggressive financial reporting. *The Accounting Review, 84*(2), pp. 467-496.

Goh, B. W., Lee, J., Lim, C. Y., & Shevlin, T. (2016). The effect of corporate tax avoidance on the cost of equity. *The Accounting Review, 91*(6), 1647-670.

Guenther, D. A., Matsunaga, S. R., & William, B. M. (2017). Is tax avoidance related to firm risk? *The Accounting Review, 92*(1), 115-36.

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

Jacob, M., & Schutt, H. H. (2015). Firm valuation and the uncertainty of future tax avoidance. Otto Beisheim School of Management, 1–48.

Jensen, M. (1968). The performance of mutual funds in the period 1945 - 1964. *Journal of Finance, 23*, 389-416

Kim, J. B., Li, Y., & Zhang, L. (2011). Corporate tax avoidance and stock price crash risk: Firm-level analysis." *Journal of Financial Economics, 100*(3), 639–662.

Kim, S., Schmidt, A. P., & Wentland, K. (2015). Analysts and taxes. *SSRN Electronic Journal,* 1–48.

Powers, K., Schmidt, A., Seidman, J., & Stomberg, B. (2017). Examining which tax rates investors use for equity valuation. Working Paper. *SSRN Electronic Journal.*

Powers, K., Seidman, J., & Stomberg, B. (Sept. 2015). Examining which benchmarks investors use to evaluate tax expense. *SSRN Electronic Journal,* 1–41.

Weber, D. (2009). Do analysts and investors fully appreciate the implications of book-tax differences for future earnings? *Contemporary Accounting Research, 26,* 1175-206.

Wilson, R. J. (2009). An examination of corporate tax shelter participants. *The Accounting Review, 84*(3), 969-99.

Appendix

Variable	Description
ETR	The effective tax rate is the tax rate a firm's income is subject to after allowable adjustments to taxable income have been made. Firms disclose this rate in the footnotes of their financial statements.
CETR	The cash effective tax rate is the amount of tax a firm pays relative to its taxable income. A firm's tax expense and amount actually paid are seldom equal.
CETR5	The five-year average of cash effective tax rate smooths out the tax rate that a firm has and gives a long-run look at its effect on return.
BTD	Book-to-tax difference is the difference in the amount of income a firm reports to its shareholders and the income reported to the IRS. This is scaled by total assets to account for differences in large and small capital firms.
PBTD	The permanent book-to-tax difference measures the permanent effect of BTDs, as normal BTDs reverse themselves and make it more difficult to differentiate between tax aggressive firms. For example, municipal bond interest and operating fees will permanently change a firm's book-to-tax difference.
Tax Risk	Tax risk is the volatility of each tax variable from period to period measured as the standard deviation of each level. Tax risk uses five-year rolling averages to capture the risk of high and low avoiders.