Tax Avoidance and Firm Value: A Two-Stage Regression Analysis

Abstract: Enterprises engaged in tax avoidance activities, the purpose of which is either paying less tax or deferring tax payment. Therefore, the purpose of this study is to investigate the relationship between tax avoidance and firm value. This study used public listed companies on the Taiwan Stock Exchange over the period 2010-2017, based on empirical regression analysis to study the effects of tax avoidance behavior on firm value, and measured with effective tax rates as tax avoidance measures. The empirical results show that corporate tax avoidance will be reflected in the reduction of the effective tax rates (ETR) and the expanding of the book-tax differences (ETR), which will have a significant negative impact on the value of the enterprise, that is, the reduction of the effective tax rate enables the enterprise to pay less tax and raise the firm value. Moreover, when the financial income of enterprises is greater than the income from taxation, the higher the degree of corporate tax avoidance, the higher the enterprise value.

Keywords: Tax Avoidance, Effective Tax Rate (ETR), Book-Tax Difference (BTD), Firm Value

INTRODUCTION

Corporate tax avoidance through tax regulations and tax avoidance strategies, reduces the incidence of taxation or tax effect of deferred taxes. Tax avoidance is an important corporate strategy (Cai and Liu, 2009; Hanlon and Heitzman, 2010). Tax avoidance includes tax-free government bond debt interest held bonds, hybrid securities, transnational profit transfer or assignment policies, establishment of intangible asset holding companies and overseas development (Engel, Erickson and Maydew, 1999; Dyreng and Lindsey, 2009; Dyreng, Lindsey and Thornock, 2013; Brown, 2011). While many businesses will take advantage of opportunities for tax avoidance activities, many firms will not. Dyreng, Hanlon and Maydew (2008) indicate that in the United States under federal nominal tax rates of up to 35%, about 1/4 of companies will maintain a long-term effective tax rate of less than 20%; only about 1/4 of the actual tax rate is higher than 35%, and not just for a single year, but even for a decade, the United States tax rate was higher than that of most other developed countries, showing that many companies are not actively involved in tax avoidance (Markle and Shackelford, 2011).

But most companies use tax avoidance activities to reduce their effective tax rate. Robinson, Sikes and Weaver (2010) indicate that other companies view their tax department as a profit center instead of cost center; Armstrong, Blouin and Larcker (2012) point out that many companies will be encouraged to reduce their effective tax rate. Traditionally, it is believed that corporate tax avoidance represents wealth transfer from government to corporations, and that this should enhance firm value. Businesses engaged in tax planning will take into account their costs (implementation cost, reputation loss and potential punishment) and benefits. The advantages, such as saving tax expenditure, thereby reducing the tax burden on business, means more flexible use of funds, and will increase the company’s value. Past literature rarely explores the relationship between tax avoidance and firm value, and reveals some inconsistencies; therefore, this study used a large sample of Taiwan listed (TSE) and over the counter (OTC)-firms data for the period 2010-2017 and fixed effects regression model to examine the relation between tax avoidance and firm firm.
This study investigates the degree to which corporate tax avoidance activity is valued by investors in a large sample of Taiwan firms. The results of this study show that effective tax rates (ETR) signify higher firm value; tax savings enable the enterprise to have more funds, and also create greater enterprise value. This result supports the hypothesis of this research, as well as the results of Desai and Dharmapala (2009).

The paper proceeds as follows. Section II presents the literature views of corporate tax avoidance and hypothesis development. Section III describes the research design, data selection and the measure of corporate tax avoidance. Section IV presents the two-stage regression results. Section V presents the conclusion.

2. Literature Review and Hypotheses Development

2.1 Theories of Corporate Tax Avoidance

Corporate tax avoidance activity has two alternative perspectives on the motivations and effects of this activity. Several studies investigated corporate tax avoidance as an extension of other tax-favored activity, such as the use of debt. Graham and Tucker (2006) identify size and profitability as positively associated with the use of tax shelters, and argue that tax shelters serve as a substitute for interest deductions in determining capital structure. An alternative theoretical approach emphasizes the interaction of these tax avoidance activities and the agency problems inherent in publicly held firms. According to this view, obfuscatory tax avoidance activities can create a shield for managerial opportunism and the diversion of rents. Desai and Dharmapala (2006) and Desai et al. (2007) emphasize that corporate tax avoidance entails distinct costs, which may outweigh the benefits to shareholders, given the opportunities for diversion that these vehicles provide.

While the traditional view of corporate tax avoidance suggests that shareholder value should increase with tax avoidance activity, the alternative view provides a more nuanced prediction. Specifically, firm governance should be an important determinant of the valuation of purported corporate tax savings. While the direct effect of tax avoidance is to increase the after-tax value of a firm, these effects are potentially offset, particularly in poorly governed firms, by the increased opportunities for managerial rent diversion. Thus, the net effect on firm value should be greater for firms with stronger governance institutions.

2.2 Empirical View of Tax Avoidance Activities

Tax avoidance articles dating back to Scholes, Wilson and Wolfson (1990) were continued and developed in a number of relevant studies. First of all, there is good evidence that tax avoidance behavior is engaged in a variety of different tax strategies, from simple strategies, such as holding tax-exempt government bonds to complex strategies, such as debt to equity hybrid security, transnational profit transfer and allocation (cross-border avoidance strategies), establishment of intangible asset holding companies and overseas development (Engel, Erickson and Maydew, 1999; Dyreng and Lindsey, 2009; Dyreng, Lindsey and Thornock, 2013; Brown, 2011).

The purported growth in corporate tax avoidance activity has given rise to speculation concerning the motivations and effects of this activity. Past studies investigated corporate tax avoidance as an extension of other tax-favored activity, such as the use of debt. Graham and Tucker (2006) constructed a sample of firms involved in 44 corporate tax shelter cases over the period 1975-2000. They identify characteristics of size and profitability that are positively associated with the use of tax shelters and argue that tax shelters serve as a substitute for interest deductions in determining capital structure.

Another approach emphasizes the interaction of these tax avoidance activities and the agency problems inherent in publicly held firms. Desai and Dharmapala (2006) and Desai et al. (2007) form part of an emerging paradigm that emphasizes the links between firms’ governance arrangements and their responses to taxes. Desai and Dharmapala (2009) discuss the interaction between tax shelters and various forms of managerial opportunism, illustrating that straightforward diversion and subtle forms of earnings manipulation can be facilitated when managers undertake tax avoidance activity.

Many companies undertake tax avoidance activities; Armstrong, Blouin and Larcder (2012) point out that many managers are encouraged to reduce their companies’s tax burden. Robinson, Sikes and Weaver (2010) have shown that some enterprises view their tax department as a profit center instead of cost center. Dyreng, Hanlon and Maydew (2008) indicate that one-fourth of corporations will remain below the long-term effective tax rate of 20% in the USA, and that some one-fourth of enterprises with more than ten years of an effective tax rate higher than 35% avoid public scrutiny and criticism from others for tax avoidance activities (Markle and Shackelford, 2011).

2.3 Tax Avoidance and Firm Value

When an enterprise is engaged in tax planning, it will take into account both costs and benefits, with advantages such as saving tax expenditure, reducing the tax burden on business, and making more flexible use of funds to increase firm value. There have been many researches on corporate tax avoidance and tax evasion, aiming to influence the stock market. Ellert (1975) constructed a sample of firms involved in 566 corporate tax lawsuit cases over the period 1935-1971, and indicated that for the announcement of an indictment within one month, a company's share price showed significantly positive abnormal returns. Garbade,
William and Lawrence (1982) studied anti-trust lawsuits of 34 companies and the impact on their stock prices from 1937 to 1974; their study found that the average stock price rose in the 6% range. Bosch and Eckard (1991) examined federal indictment involving 127 companies and found stock prices impacted from 1962 to 1980, with the average excess return rate -1.08%, which estimated that only 13% could be attributed to the costs of litigation, and that the remaining present value of the loss was due to losing the monopoly profits. Karpoff and Lott (1993) investigated corporate fraud cases on stock price reaction from 1978 to 1987; they found that reporting irregularities did not cause significant negative abnormal returns.

Hanlon and Slemrod (2009) explored the news and stock prices of companies engaged in tax avoidance response. They found that when a company’s stock price falls, with tax avoidance news and activities as a negative event, although a share price reaction occurs, compared to the accounting incident response, it is much smaller. Gallemore, Maydew and Thommock (2014) also came to the same conclusion; their research revealed although information on corporate tax avoidance can make shares sink in the early event days, the stock will rebound to the level before the event occurred, as it is only a temporary effect.

2.5 Factors influencing corporate value

Corporate value is the expected free cash flow related to its weighted average cost of capital for the discount rate’s present value. It is closely related to enterprise financial decisions. Enterprise value for all enterprise stakeholders (including employees, shareholders, managers, creditors, governments, etc.) means access to satisfactory returns. Enterprise value determines a stock's value; in other words, the value also determines the stock price.

Besides, Tobin's Q is available to measure the market value of a firm. Many scholars believe that Tobin’s Q (company market value divided by the replacement cost of assets of the company) is one of the ideal measures of financial performance. The higher the Tobin's Q value, the higher the value of the enterprise (Lindenberg and Ross, 1981; Morck, Shleifer and Vishny, 1988; Chung and Pruitt, 1994).

Most scholars in tax-avoidance-related studies use the effective tax rate (ETR) as a measure of tax burden; for example: Stickney and McGee (1982) point out that high capital intensity enterprises and businesses with higher debt financing will result in a lower effective tax rate. Zimmerman (1983) studied the relationship between enterprise size and the effective tax rate, using empirical evidence from the United States 50 largest listed enterprises; compared to other enterprise, they had a higher effective tax rate. Porcano (1986) found that companies often use foreign tax credits and accelerated depreciation to reduce their tax burden, which means a lower effective tax rate.

Gupta and Newberry (1997) found that a firm's effective tax rate increased after the Tax Reform Act implementation in the USA. Larger size companies have a lower effective tax rate. In addition, they also found that debt financing and the effective tax rate signify a negative relationship, while profitability and an effective tax rate show a positive relationship. Mills, Erickson and Maydew (1998) and Graham and Tucker (2006) point out that enterprises have the ability to use more financing to reduce their tax burden. Chen’s (2002, 2003) empirical results show that firm size affects positive effective tax rates, profitability, capital intensity, and research and development expenditures, financial leverage, with a significant impact on an industry.

In addition, Hirschey and Weygandt (1985) explored the linkages among research and development spending, advertising and enterprise value and found that research and development and advertising expenses have a significant positive correlation with firm value. Peterson and Benesh (1983) found that when companies invest in a lot of equipment, it can reduce product cost and improve product quality. Therefore, they presumed that capital intensity will affect the value of enterprises. Miller’s (1977) empirical results show that higher debt ratios mean higher enterprise value because of the the
effects of debt tax shield, higher debt ratio, and equity multiplier will be larger. Friend and Lang (1988) believe that large enterprises can recruit good managers who know the market, helping to enhance corporate value. Imhof and Seavey (2014) got similar results, namely that larger companies can achieve better performance to enhance corporate value.

3. Research Design

3.1 Empirical Method

Based on the literature review, this study examines tax avoidance, enterprise value and tax havens under the influence of the established two stage regression model to verify the above-mentioned hypothesis.

**Stage I: Estimating the Tax Avoidance**

\[ TaxAvolt = \alpha_0 + \alpha_1 LEV_{it} + \alpha_2 RD_{it} + \alpha_3 CAPI_{it} + \alpha_4 ELEC_{it} + \alpha_5 SIZE_{it} + \alpha_6 ROA_{it} + \sigma_\varepsilon \]  

**Stage II: Estimating Firm Value**

\[ VALUE_{it} = \beta_0 + \beta_1 TaxAVOR_{it} + \beta_2 BODI_{it} + \beta_3 FAMILY_{it} + \beta_4 SIZE_{it} + \beta_5 ROA_{it} + \mu_\varepsilon \]  

Value refers to firm value; we use the Tobin’s Q to measure it. TaxAvo is measured by the effective tax rate (TaxAvo_ETR) or book-tax difference (TaxAvo_BTD). SIZE is the size of company. LEV is the ratio of long-term debt. RD is the rate of research and development. CAPI is the ratio of capital intensity. BODI is the ratio of independent director of the board. FAMILY is the dummy variable: 1 when the company belongs to a family business. ELEC is the dummy variable: 1 when the business belongs to the electronic industry. ROA is the rate of return on assets.

3.2 Measurement of Variables

3.2.1 Dependence Variable: Firm Value (VALUE)

Bernard (1995) investigated earnings, dividends and other information associated with the stock price and evaluated the different models. He found the Ohlson model too generalized and its features simplistic, its explanatory power weak, other than in its evaluation of the share price. However, most scholars use Tobin’s Q as a measure of financial performance; higher values also represent higher enterprise value (Lindenberg and Ross, 1981; Moreck, Shleifer and Vishny, 1988; Chung and Pruitt, 1994). Within the literature, using Tobin’s q to measure firm value has become standard since Demsetz and Lehn (1985).

3.2.2 Independence Variable: (Tax Avoidance) Effective tax rates (TaxAvo_ETR):

Previous scholars used effective tax rates (ETR) as a measure of corporate tax avoidance variables. ETR is most commonly used in the academic literature as a tax variable aggressiveness. Business used overseas business to decrease the tax burden. ETR is also able to capture this kind of tax avoidance (Lanis and Richardson, 2012). Therefore, this study uses the ETR to measure the result of tax avoidance behavior, and to verify the effects of corporate social responsibility on tax havens.

This study uses the current income tax expense divided by the net income before tax to measure the ETR. If business income tax expense is negative, then the effective tax rate is set to 0; if net income before tax is negative, the effective tax rate is set to 0. It is expected that the behavior of tax avoidance will decrease the tax burden and the ETR, as there is a negative relationship between ETR and the firm value.

**Book-tax differences (TaxAvo_BTD):**

Another measure of tax avoidance is the book-tax differences (BTD), for constructing a measure of corporate tax avoidance that takes as its starting point the gap between financial and taxable income. The difference between financial income reported from IFRS and to the tax authorities is the book-tax difference, which has attracted considerable interest in recent years and has been related to measuring corporate tax avoidance (Manzon & Plesko, 2002; Desai, 2003, 2005).

This study uses the permanent BTD divided by total asset to measure the TaxAvo_BTD. The total BTD is book income to deduct the tax income; the permanent BTD is total BTD to deduct the temporal BTD (which is deferred tax expense divided by the tax rate of 17%). It is expected that the behavior of tax avoidance will increase the book-tax difference; there is a positive relationship between BTD and firm value.

**3.2.3 Control Variables:**

**Firm size (SIZE):**

The political power hypothesis is that greater size companies have more resources to devote to tax planning or more tax incentives. But there are also opposing arguments; the political cost hypothesis posits that bigger enterprises attract more attention and supervision by the government (internal revenue service investigating opportunities to increase) or the public. Therefore, the corporate burden of paying taxes has become political cost. Zimmerman (1983) investigated the relationship between business size and the effective tax rate; he found that the top 50 largest listed enterprises in the USA had higher effective tax rates compared to other enterprises. Chen (2002, 2003) found a positive correlation between effective tax rates and firm size. This study uses firm size as the control variable, but did not expect the direction of the impact.

**The ratio of long-term debt (LEV):**

Graham (2000) studied the effects of debt-funded tax interest on corporate financial decisions; the empirical results show that the cost of debt interest tax to be deductible and lower taxes. Stieckney and McGee (1982) point out that companies with higher debt financing will have a reduced effective tax rate, but Graham and Tucker (2006) and Chen, Cheng and Shevlin (2010) believe that a higher debt ratio of
The ratio of research & development expense (RD):

Spending on research and development can be recognized as an expense when the period in the settlement of income tax declarations can be used as a tax deduction benefit, while also enjoying the recognition fee in advance. Companies with massive spending on research and development will also have more opportunities for tax avoidance (Hanlon, Mills and Slemrod, 2005). This study uses research and development spending as a control variable and expected a positive impact of this variable on tax avoidance.

The ratio of capital intensity (CAPI):

Stickney and McGee (1982) point out that business with higher capital intensity and higher debt financing will enjoy a lower effective tax rate. Mills (1998) also found that an intensive capital asset and tax avoidance have significant positive effects. This study measures capital intensity under the control variables and the expected impact of this variable on tax avoidance.

The ratio of independent director of the board (BODI):

Fama and Jense (1983) point out that in making decisions, objective independent directors can be measured in terms of overall enterprise monitoring, and protection of shareholders’ rights; they can suppress management’s speculative behavior. Desai et al. (2007) point out that good corporate governance can effectively limit the powers of the manager, such as misappropriated assets, and reduce the related tax avoidance activities. Lanis and Richardson (2011; 2012) indicate that outside directors (independent directors) inhibit tax avoidance activities. This study references Lanis and Richardson (2011, 2012) and employs independent directors as a control variable; the expected association between independent director of the board and tax avoidance is negative.

Family business (FAMILY):

Past research found that compared to family business, non-family businesses may engage in more tax planning; this study also takes this variable as the control and expected the impact variables were positively correlated with tax avoidance.

Electronic Industry (ELEC):

Different industries have different tax burdens due to the regulations and tax reduction policy. In Taiwan, due to the Government policy on rewarding scientific and technological industry investment, the electronics industry can receive more tax concessions compared to other industries and the average effective tax rate is lower than in other industries, so this study will include this as a control variable.

Return on assets (ROA):

Accounting value includes the rate of return on assets (ROA), rate of return on shareholders’ equity (ROE) and rate of return on investment (ROI). Some scholars believe that regarding the operating profits and losses or net income for the current period, the accounting profit on larger companies will be greater. Therefore, firm value through the rate of return on assets, return on equity and return on investment and other financial pointers are a basis for measuring (Waddock and Graves, 1997; Preston and O’Bannon, 1997).

3.3 Data and Sample Selection

We employ listed firms with a total of 11,398 firm-years in Taiwan from 2010 to 2017 as the research sample. All the financial data and relevant data used in this study were obtained from the Taiwan Economic Journal (TEJ) database. During the sample selection process, firms that were closed or went bankrupt are excluded. In addition, we exclude observations of financial and insurance industry from the sample because of a difference in their financial characteristics. Moreover, non-December year-end firms were excluded, and firms with insufficient financial statement data, missing variables, abnormal values, or extreme values are also excluded. A total of 9,103 firm-year observations were obtained.

4. EMPIRICAL RESULTS

4.1. Descriptive Statistics and Correlations

Table 1 shows the descriptive statistics for the dependent and independent variables; the mean (median) of Value (Tobin’Q) is 108.15% (83.56%). The mean (median) of TaxAvo_ETR is 11.18% (8.43%), which is below the statutory rate of 17%. The mean (median) of TaxAvo_BTD is 0.062 (0). According to the control variables, the mean (median) of SIZE is 15.229 (15.036). The mean (median) of LEV is 6.84% (1.17%) among companies with lower long-debt rates. The mean (median) of RD is 5.07% (1.48%) among companies with lower R&D expenditures. The mean (median) of CAPI is 13.94% (8.65%), which reflects the difference within samples. The mean (median) of BODI is 22.42% (29%) which coincides with the regulation of corporate governance. The mean of FAMILY is 0.62 which means that 62% of businesses belong to family-business. The mean of dummy variable of ELEC is 0.273, which means about 27.3% of businesses belong to high-tech electronic industry. The last one is the ROA; the mean (median) of ROA is 6.86% (6.39%).
Note 1: Variables definition: Value is the firm value, we use the Tobin’s Q to measure the value of firm. TaxAvo is effective tax rate (ETR) or book-taxdifference (BTD). SIZE is the size of company. LEV is the ratio of long-term debt. RD is rate of research and development. CAPI is the ratio of capital intensity. BODI is the ratio of independence director of the board. FAMILY is the dummy variable of 1 when the business belongs to high-tech electronic industry.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Min</th>
<th>Mean</th>
<th>Median</th>
<th>Std.dev</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>VALUE (%)</td>
<td>4.499</td>
<td>108.147</td>
<td>83.565</td>
<td>79.781</td>
<td>499.417</td>
</tr>
<tr>
<td>TaxAvo _ETR (%)</td>
<td>0</td>
<td>11.184</td>
<td>8.429</td>
<td>15.368</td>
<td>100</td>
</tr>
<tr>
<td>TaxAvo _BTD (%)</td>
<td>-165.683</td>
<td>0.062</td>
<td>0</td>
<td>6.171</td>
<td>99.275</td>
</tr>
<tr>
<td>LEV (%)</td>
<td>0</td>
<td>6.840</td>
<td>1.171</td>
<td>9.997</td>
<td>82.360</td>
</tr>
<tr>
<td>RD (%)</td>
<td>0</td>
<td>5.066</td>
<td>1.476</td>
<td>11.511</td>
<td>100</td>
</tr>
<tr>
<td>CAPI (%)</td>
<td>0</td>
<td>13.941</td>
<td>8.653</td>
<td>14.867</td>
<td>94.204</td>
</tr>
<tr>
<td>SIZE (log)</td>
<td>10.356</td>
<td>15.229</td>
<td>15.036</td>
<td>1.419</td>
<td>21.908</td>
</tr>
<tr>
<td>BODI (%)</td>
<td>0</td>
<td>22.420</td>
<td>29.000</td>
<td>16.058</td>
<td>40.000</td>
</tr>
<tr>
<td>FAMILY (0,1)</td>
<td>0</td>
<td>0.623</td>
<td>1.000</td>
<td>0.485</td>
<td>1.000</td>
</tr>
<tr>
<td>ELEC (0,1)</td>
<td>0</td>
<td>0.273</td>
<td>0.000</td>
<td>0.446</td>
<td>1.000</td>
</tr>
<tr>
<td>ROC (%)</td>
<td>-76.410</td>
<td>6.864</td>
<td>6.590</td>
<td>10.059</td>
<td>82.790</td>
</tr>
</tbody>
</table>

Note 2. All variables are defined in Note 1 of Table 1.

Table 2 shows the Pearson and Spearman correlations among the variables. From Pearson correlation coefficients analysis, the TaxAvo _ETR and the VALUE are positively related but not significantly (0.011, p=0.2753).

The TaxAvo _BTD and the VALUE are positive related and significantly (0.089, p<0.001), indicating that tax avoidance behaviors may increase the book-tax differences and the value of firm.

Among the control variables, the correlations among VALUE and RD, BODI, ELEC, ROA exhibit a significant positive relationship, implying that companies with higher R&D expenditure, higher ratio of independent directors and belonging to high-tech electronic industry will have higher firm value. The negative correlations among LEV, SIZE, CAPI and VALUE indicate that large firms or firms with more depreciated assets may have a lower firm value. Finally, the variance inflation factor (VIF) values are less than 2, which means that there is no collinearity between variables in this study.

4.2. Regression Results

According to the results of regressions of Eq. (1-2) in Table 3, the regression coefficients on TaxAvo _ETR exhibit significant negativity (-10.657, t=-8.60, respectively), which is consistent with our expection, suggesting that higher tax avoidance behavior is related to a lower effective tax rate. This means that the lower
effective tax rate will decrease the tax burden and increase the firm value.

<table>
<thead>
<tr>
<th>Table 3: Regression Results - Value_ETR</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{TaxAvo_ETR}_t = \alpha_0 + \alpha_1 \text{LEV}_t + \alpha_2 \text{RD}_t + \alpha_3 \text{CAPI}_t + \alpha_4 \text{ELEC}_t + \alpha_5 \text{SIZE}_t + \alpha_6 \text{ROA}_t + \sigma_t )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pred. Sign</th>
<th>Coefficients Estimate</th>
<th>t-Value</th>
<th>Pr&gt; t Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>-</td>
<td>11.139</td>
<td>6.18***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>LEV</td>
<td>-</td>
<td>-0.049</td>
<td>-2.83***</td>
<td>0.0047</td>
</tr>
<tr>
<td>RD</td>
<td>-</td>
<td>-0.063</td>
<td>-4.30***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>CAPI</td>
<td>-</td>
<td>-0.026</td>
<td>-2.30**</td>
<td>0.0215</td>
</tr>
<tr>
<td>ELEC</td>
<td>-</td>
<td>-0.034</td>
<td>-0.09***</td>
<td>0.9274</td>
</tr>
<tr>
<td>SIZE</td>
<td>+ / -</td>
<td>-0.040</td>
<td>-0.34***</td>
<td>0.7338</td>
</tr>
<tr>
<td>ROA</td>
<td>+</td>
<td>0.248</td>
<td>14.51***</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

F value = 51.91 (p < .0001)  Adj. R-Sq = 0.033  n=9,084

Note:
1. ***, **, * denote significance at the 1%, 5% and 10%, respectively.
2. All variables are defined in Note 1 of Table 1.

Regarding the regression results of control variables in Table 3, first of all, the coefficients on \( \text{LEV} \) are significantly negative (-1.629, \( t=19.33 \)), implying that companies’ higher long-term debt will decrease the value of firm. The coefficients on \( \text{BODI} \) and \( \text{ROA} \) are significantly positive (0.378, \( t=3.27 \); 3.866, \( t=19.92 \)), implying that companies with good corporate governance and profitability will increase the firm value. The coefficients on \( \text{SIZE} \) are significantly negative (-13.732, \( t=-10.35 \)), which is consistent with policy right hypotheses, implying that large firms have more power to improve their firm value.

4.3 Additional Analysis

In an additional analysis, this study uses the permanent BTD to measure the level of tax avoidance (\( \text{TaxAvo_BTD} \)). This study divides the \( \text{TaxAvo_BTD} \) into two groups.

<table>
<thead>
<tr>
<th>Table 4: Regression Results - Value_BTD&gt;0</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \text{TaxAvo_BTD}_t = \beta_0 + \beta_1 \text{LEV}_t + \beta_2 \text{RD}_t + \beta_3 \text{CAPI}_t + \beta_4 \text{ELEC}_t + \beta_5 \text{SIZE}_t + \beta_6 \text{ROA}_t + \mu_t )</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pred. Sign</th>
<th>Coefficients Estimate</th>
<th>t-Value</th>
<th>Pr&gt; t Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>-</td>
<td>405.203</td>
<td>16.17***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>TaxAvo_ETR</td>
<td>-</td>
<td>-10.657</td>
<td>-8.60***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>BODI</td>
<td>+</td>
<td>0.378</td>
<td>3.27***</td>
<td>0.0011</td>
</tr>
<tr>
<td>FAMILY</td>
<td>-</td>
<td>-6.087</td>
<td>-1.61</td>
<td>0.1080</td>
</tr>
<tr>
<td>SIZE</td>
<td>+ / -</td>
<td>-13.732</td>
<td>-10.35**</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>ROA</td>
<td>+</td>
<td>3.866</td>
<td>19.92***</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

F value = 98.18 (p < .0001)  Adj. R-Sq = 0.051  n=9,084

Note:
1. ***, **, * denote significance at the 1%, 5% and 10%, respectively.
2. All variables are defined in Note 1 of Table 1.
Tobin\_it = \beta_0 + \beta_1 TaxAvo\_BTD\_it + \beta_2 BODI\_it + \beta_3 FAMILY\_it + \beta_4 SIZE\_it + \beta_5 ROA\_it + \mu\_it \quad (2-2)\\

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pred. Sign</th>
<th>Coefficients</th>
<th>t-Value</th>
<th>Pr&gt; t Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>+</td>
<td>134.109</td>
<td>7.00***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>TaxAvo_BTD</td>
<td>+</td>
<td>10.261</td>
<td>3.98***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>BODI</td>
<td>+</td>
<td>0.473</td>
<td>5.06**</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>FAMILY</td>
<td>—</td>
<td>-9.576</td>
<td>3.10***</td>
<td>0.0020</td>
</tr>
<tr>
<td>SIZE</td>
<td>+ / -</td>
<td>-8.055</td>
<td>-8.06***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>ROA</td>
<td>+</td>
<td>6.707</td>
<td>33.68***</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

F value = 263.37 (p < .0001)  Adj. R-Sq = 0.2818  n=3,343

Note:
1. ***, **, * denote significance at the 1%, 5% and 10%, respectively.
2. All variables are defined in Note 1 of Table 1.

Firstly, the group of TaxAvo\_BTD\_it > 0 has the financial (book) income > tax income. When companies have more financial income but less book income, it means they will defer paying tax in the future and increase firm value. According to the results of regressions of Eq. (2-2) in Table 4, the regression coefficients on TaxAvo\_BTD\_it are significantly positive (10.261, t=3.98), which is consistent with our expectation, suggesting that higher tax avoidance behavior is related to lower tax income. This means that the deferred tax will decrease the tax burden and increase the value of firm.

On the other hand, the group of TaxAvo\_BTD\_it < 0 has financial (book) income < tax income. When companies’ tax income is higher than its financial income, it means they pay higher tax and it will decrease the firm value. According to the results of regressions of Eq. (3-2) in Table 5, the regression coefficients on TaxAvo\_BTD\_it are significantly positive (-24.092, t=-6.38), which is consistent with our expectation, suggesting that the greater tax burden will increase firm value.

### Table 5: Regression Results-Value_BTD<0

\( TaxAvo\_BTD\_it = \alpha_0 + \alpha_1 LEV\_it + \alpha_2 RD\_it + \alpha_3 CAPI\_it + \alpha_4 ELECT\_it + \alpha_5 SIZE\_it + \alpha_6 ROA\_it + \sigma\_it \quad (3-1) \)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pred. Sign</th>
<th>Coefficients</th>
<th>t-Value</th>
<th>Pr&gt; t Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>-</td>
<td>-11.259</td>
<td>-7.17***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>LEV</td>
<td>-</td>
<td>0.023</td>
<td>1.62</td>
<td>0.1053</td>
</tr>
<tr>
<td>RD</td>
<td>-</td>
<td>-0.040</td>
<td>-3.55***</td>
<td>0.0004</td>
</tr>
<tr>
<td>CAPI</td>
<td>-</td>
<td>0.001</td>
<td>0.12</td>
<td>0.9058</td>
</tr>
<tr>
<td>ELECT</td>
<td>-</td>
<td>-0.049</td>
<td>-0.17</td>
<td>0.8657</td>
</tr>
<tr>
<td>SIZE</td>
<td>+ / -</td>
<td>0.490</td>
<td>4.67***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>ROA</td>
<td>+</td>
<td>0.071</td>
<td>5.24***</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

F value = 19.23 (p < .0001)  Adj. R-Sq = 0.0328  n=3,229

### Table 6: Regression Results-Value_BTD<0

\( Tobin\_it = \beta_0 + \beta_1 TaxAvo\_BTD\_it + \beta_2 BODI\_it + \beta_3 FAMILY\_it + \beta_4 SIZE\_it + \beta_5 ROA\_it + \mu\_it \quad (3-2) \)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pred. Sign</th>
<th>Coefficients</th>
<th>t-Value</th>
<th>Pr&gt; t Value</th>
</tr>
</thead>
<tbody>
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<td>154.489</td>
<td>3.30</td>
<td>0.0010</td>
</tr>
<tr>
<td>TaxAvo_BTD</td>
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<td>-24.902</td>
<td>-6.38***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>BODI</td>
<td>+</td>
<td>0.276</td>
<td>1.31</td>
<td>0.1911</td>
</tr>
<tr>
<td>FAMILY</td>
<td>—</td>
<td>1.349</td>
<td>0.19</td>
<td>0.8458</td>
</tr>
<tr>
<td>SIZE</td>
<td>+ / -</td>
<td>-11.043</td>
<td>-4.09***</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>ROA</td>
<td>+</td>
<td>3.064</td>
<td>8.97***</td>
<td>&lt;.0001</td>
</tr>
</tbody>
</table>

F value = 25.38 (p < .0001)  Adj. R-Sq = 0.0364  n=3,229

Note:
1. ***, **, * denote significance at the 1%, 5% and 10%, respectively.
2. All variables are defined in Note 1 of Table 1.

Among the control variables, the results of regressions of Eq. (2-2) in Table 4 or Eq. (3-2) in Table 5 have the same findings.

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5. CONCLUSION

Many current scholars on tax evasion related to enterprise value present inconsistent research results and seldom discuss tax havens and firm value. This study used two-stage regression to estimate the level of tax avoidance behavior and firm value, and looked forward to robust results. In additional analyses, this study measured the effective tax rate (ETR) and the permanent book-tax differences (BTD) as two measures of corporate tax avoidance variables, and revalidated the relationship between tax avoidance and firm value. When companies exercising more tax avoidance behaviors will respect lower effective tax rates and higher book-tax differences it will positively correlate with firm value.

REFERENCES


