

Financial distress and corporate income tax avoidance of firms in Vietnam

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ABSTRACT: This paper examines the impact of companies' financial distress forecasts on avoiding corporate income tax (CIT) through income adjustment and postponement of tax payments, the degree of CIT avoidance in the context before and after the global financial crisis in 2008-2009. Through the data of Vietnamese companies (2006-2014) and the GLS estimation methodology, the results of the study show that companies have increased tax avoidance when predicted to have financial distress. This study also found that after the global financial crisis 2008-2009, companies are predicted to reduce the CIT avoidance compared to the pre-crisis period. In addition, the size of firms' operations, the length of time in which firms listed on the stock exchange, are viewed by companies as advantages in avoiding CIT.

KEYWORDS: financial distress, corporate income tax, global financial crisis.

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1. Introduction

If evading corporate income tax is a legal offense, avoiding corporate income tax is understood to be a business that exploits the legal space of unclear corporate income tax legislation and regulations or changes in tax policy to minimize the required tax amount, which is not contrary to the laws, to reduce corporate expenditures (Atwood, Drake, Myers & Myers, 2012; Dharmapala & Hines, 2009). In the context of Vietnam's deepening integration into the world economy, domestic companies are greatly challenged by their competitors. When markets are exposed to unpredictable risks, companies may face the risk of financial distress and bankruptcy may occur. Before, the worst case happens to the company, the CFO, who directly controls the financial situation of the company, must make flexible financial decisions to manage the capital adequately and minimize the rising cost. From an objective standpoint, avoiding corporate income tax is part of the financial strategy of executives to save on operating costs, especially in times of crisis.

In Vietnam, there are quite a lot of studies on enterprise business law, tax avoidance and corporate income tax evasion (Lam Chi Dung & Phan Dinh Anh, 2009, Le Dat Chi & Le Tuan Anh, 2012, Nguyen Minh Ha & Bui Quang Trong, Nguyen Thi Canh & Pham Chi Khoa, 2014; Su Dinh Thanh, Bui Thanh Trung & Tran Trung Kien, 2015). However, no research has been found on the impact of financial distress forecast on avoiding corporate income tax. Based on this idea, the paper focuses on the following issues: (i) Applying the forecasting model to forecast the status of companies; (ii) verification of the impact of the forecast on corporate income tax evasion; (iii) How does the 2008-2009 global financial crisis (GFC) affect the avoidance of corporate income tax in relation to the financial distress?

2. Literature review

• *Theoretical background*

Ross, Westerfield & Jaffe (1999), Altman & Hotchkiss (2006) argues that there are many different perspectives on the company's financial status, such as consistently lower return on investment compared to return on equivalent investments in the market; or compared to cost of capital; or a company has lower revenue than cost. Financial distress is also defined as the status of the company violating contract terms by not paying due debts, so it is considered to be insolvent, leading to default and bankruptcy. Thus, different perspectives show that the financial distress goes from a failed state, when the firm's cash

flow is insufficient to meet current financial obligations (Altman et al., 2006) to the state of insolvency, when the business is difficult to pay due debts (Shrader & Hickman, 1993), and default, when the company violates the terms of the contract (Altman et al., 2006) and the worst case is the company applying for bankruptcy (Altman et al., 2006). To predict financial distress, Altman (1968) and Ohlson (1980) built models according to financial indexes that were largely based on data contained in financial statements of companies. Whereas Merton's KMV-Merton model (1974) uses market data for forecasting based on Black & Scholes (1973) pricing theory, which consider equity as an option on the value of a company's assets over a certain period of time. The model predicts the probability of the company at any given time.

On the corporate side, reducing the amount of tax payable without being against the law is considered a tax administration strategy by the directors. This strategy manifests itself through income adjustment. There are many methods of identifying income adjustments such as directly matching data in financial statements with related accounting records or based on differences of taxable income according to accounting standards and taxable income estimated tax authorities, which derives from differences in income and expenses determined on different bases. While accounting recognizes revenues and expenses on an accrual basis, subject to accounting standards and accounting policies that are consistent with companies' strategy, tax authorities determine the amounts of income and expenses based on companies corporate accounting on the basis of tax law. The items often exploited by companies are through adjusting the method of depreciation, interest adjustment, carry forward losses within the time allowed. Mills' (1998) study suggests that the greater the differences, the more clearly evident the increase in avoidance of corporate income tax.

- ***Review of empirical studies***

- Financial distress and tax avoidance*

Chen, Chen, Cheng & Shevlin (2010) has shown that companies often have incentives to avoid CIT when marginal benefits exceed marginal costs, even when companies operate under normal operating conditions. Companies that fall into the state of financial distress have fewer options, but they accept opportunities with higher risks and they have greater incentives to avoid taxation due to the desire to increase cash from tax savings. While companies are faced with rising costs of capital which reduces their ability to mobilize funding, past strategies that have been viewed as risky and expensive

have become more attractive and feasible due to benefits from tax evasion (Edwards, Schwab & Shevlin, 2013). Research by Richardson, Taylor & Lanis (2015) demonstrates that when firms are forecasted to face financial distress, they tend to increase avoidance of corporate income tax by promoting income adjustment based on differences in accounting income and taxable income or postpone tax payments to the following periods with in the time allowed by tax law. Indeed, taxes that are saved can help finance the company's short-term operations, to maintain credit rating, to remain in loan agreements, or even to have loan agreements or even reduce the risk of bankruptcy (Brondolo, 2009). According to studies across the world, the research team also expects that research in Vietnam will help reinforce the perception that when a company is predicted to fall into the state of financial distress, it will increase the avoidance of CIT by exploiting the gaps in tax policy to take advantage for itself.

Global financial crisis and corporate income tax avoidance

Campello, Graham, Harvey (2010) found that, during the 2008-2009 global financial crisis, financially constrained companies were planning to cut more investments, technologies, marketing and personnel than the companies have no financial restriction. The authors point out that, under financial constraints, companies are forced to use large amounts of cash in times of crisis that they have previously saved and cut their dividend payment plans. Ayers, Laplante & Mcguire (2010) found that firms with the lowest corporate bond ratings or lowered credit ratings due to the impact of economic shocks are more likely to have the unusually high difference between pre-taxed income and taxable income. Thus, during the global financial crisis 2008-2009, directors have an incentive to use more flexible tax planning strategies to reduce the payable corporate income tax and consider tax avoidance as an alternative plan for financial resources to maintain business operations and future cash flow. Brondolo (2009) found that when faced with financial distress during the post-2008 financial year (for example, bankruptcy), companies may be able to realize that risks (such as penalties) resulting from tax evasion is very small compared to the potential benefits (such as avoiding bankruptcy). Richardson et. al. (2015) showed that the Australian tax authority has provided much evidence of the relationship between the financial distress and tax avoidance. In addition, the authors also found that the crisis has a positive impact on avoiding CIT and the degree of impact of financial distress on avoiding CIT is higher during the global financial crisis.

3. Data and methodology

3.1. Data

The study uses data from non-financial companies listed on the Ho Chi Minh Stock Exchange and Hanoi for the period 2006-2014. The year of 2008 was excluded from the sample because it was the year of the global financial crisis 2008-2009. The research team removed companies which lacked data, so the final sample was a panel-data for 284 companies. Company data is taken from the database of Vietstock Securities Company, FPT Securities Company, cophieu68 website. The 1-year government bond yield data is derived from the International Financial Statistics (IFS) database.

3.2. Methodology

Based on the article by Richardson et. al. (2015), this study aims to test the impact of the financial distress forecasting effect on avoiding CIT and the degree of this relationship during the global financial crisis 2008-2009. The research steps are as follows:

Step 1: Forecast the company's financial distress by Merton's KMV - Merton model (1974). This is a model based on market data, taking into account the volatility of assets. This model has two assumptions:

Assumption 1: The total value of a company's assets follows the Brownian geometry motion.

$$dV = \mu_A V dt + \sigma_A dZ \quad (1)$$

Where: V is the total value of the company's assets; μ_A is the expected return on total assets; σ_A is the volatility of the value of the company's assets; Z is the exponentially Brownian motion

Assumption 2: The company has only one type of debt through discounted bond with a maturity time of T .

From these two assumptions, the equity market value (E) is treated as an option on the total value of the asset at the strike price of market value of the firm's debt with maturity of T . The value of E is determined from equation (2):

$$E = VN(d_1) - e^{-rT}DN(d_2) \quad (2)$$

D is the book value of the debt. T is the maturity date. This study also

assumes that the period until maturity is one year (Bharath & Shumway, 2004; Richardson et. al 2015). The variable r is the risk-free rate (the interest rate on government bond with one year maturity) and $N(.)$ is the probability function of cumulative normal distribution.

$$d_1 = \frac{\ln\left(\frac{V}{D}\right) + \left(r + \frac{\sigma_A^2}{2}\right)T}{\sigma_A\sqrt{T}} \quad \text{and} \quad d_2 = d_1 - \sigma_A\sqrt{T} \quad (3)$$

$$\sigma_E = \frac{V}{E} N(d_1) \sigma_A \quad (4)$$

Equation (4) calculates the standard deviation of equity. After obtaining V and σ_E from equations (1), (2), (3), (4), the probability of financial distress at time T , denoted $N(-d_2)$ (MERTON) is calculated from equation (5):

$$N(-d_2)\text{MERTON} = N\left(-\frac{\ln\left(\frac{V}{D}\right) + (\mu_A - 0.5\sigma_A^2)T}{\sigma_A\sqrt{T}}\right) \quad (5)$$

Because the company's total assets are the basic assets at risk, the value of the company does not use the risk-free rate r . To calculate the distance between financial distress (d_2) and the probability of financial distress (MERTON), this study replaced the risk-free rate r by the value μ_A (Bharath et al., 2004). Then, the formula to predict the probability of financial distress can be rewritten by equation (5). The higher the value of $N(-d_2)$ (MERTON) the greater the probability of occurrence. The cut off of the model is 0.5 (or 50%). Therefore, if the company has MERTON value $\geq 0,5$ then it is predicted to have financial distress and vice versa. The results from equation (1) to equation (5) are based on Bharath et al. (2004) and Haidar's Newton Raphson (2010) algorithm, data from equation (1) to (5) is processed through MATLAB software to calculate the probability of each company's probability of financial distress from time to time.

The KMV - Merton model has limitations that these two assumptions must be satisfied - all market information is reflected in stock prices and market efficiency.

Step 2: Estimate the impact of the financial distress forecast on avoiding CIT

The research uses step 1 results and performs step 2 from equation estimation (6):

$$CTA_{it} = \alpha_{0it} + \beta_1 MERTON_{it} + \beta_2 FAGE_{it} + \beta_3 SIZE_{it} + \beta_4 LEV_{it} + \beta_5 CINT_{it} + \beta_6 UNI_{it} + \beta_7 INVINT_{it} + \beta_8 THAV_{it} + \beta_9 MKTBK_{it} + \beta_{10-17} INDSSES_{it} + \epsilon_{it} \quad (6)$$

Dependent variable is CTA_{it} which measures corporate tax avoidance of a company i at time t . CTA (Corporate Tax Avoidance) is measured by these two methods.

Method 1: CTI avoidance is measured by income adjustment (BTG), based on the difference between accounting pre-tax profit and taxable income and total accrued accounting value.

This amount is due to the adjustment of temporary differences between the tax authorities and the accounting standards and derived from the income and expenses which are determined on a different basis.

Total accruals (TA) was studied by Healy (1985), DeAngelo (1986). While the income statement is based on the accrual basis at the time when the transaction occurred, including cash receipts and payments, cash flow statements are prepared on a cash basis, actual cash payment at the time (direct method). TA is also referred to as accrual accounting or non-cash accounting and is considered as a measure to estimate the BTG income adjustment component. However, not all TA can be adjusted to the will of the director. Healy (1985) and DeAngelo (1986) argued that TA consists of two parts: the non discretionary accruals and the discretionary accruals when the manager uses accounting methods for profit adjustment. Since the adjusted TA is not directly observed, it should be calculated by estimating the excess of the space equation in Desai & Dharmapala's (2006) tax policy. The paper uses a fixed effects model to explain the BTG component generated by income adjustment:

$$\frac{BTG}{A} = \beta_1 \frac{TA}{A} + \mu + \epsilon \quad (7)$$

BTG = Accounting profit before tax - (CIT expense on the CIT rate determined by laws)

TA = Profit after tax - Net cash flow from operating activities

Of which: A is total assets at the beginning of the year; μ is residuals and errors.

The residual result of equation (7) reflects the avoidance of CIT, with $CTA = \mu + \epsilon$. The higher the value of the BTG surplus, the greater the degree of CIT from the adjustment of income.

Method 2: The CTA is measured based on the actual tax rate (CASHETR). Dyreng, Hanlon & Maydew (2008) argued that the manager is aware of effective

tax planning to minimize the amount of tax paid. Real tax rates reflect tax avoidance strategies that delay tax payments to the following years, but do not affect CIT expenses in financial statements, thus providing an accurate estimate for avoiding CIT. The CASHETR variable is determined by the amount of CIT paid on the pre-tax accounting profit. According to Dyreng et. al. (2008), the lower the CASHETR, the higher the CIT evasion.

Independent Variables: MERTON measures the forecast of a company's financial distress according to Merton's KMV-Merton model (1974).

GFC: represents the time of the global financial crisis 2008-2009, which assumes a value of 1 if observed after 2008, otherwise zero. The purpose of the GFC is to verify the difference between tax avoidance before and after the crisis.

Controlling variables include: FAGE - the variable is calculated from the time a company is listed on the stock market, measuring the duration of the company on the stock market. Richardson et. al. (2015) argued that the longer a company is traded on the stock market, the easier it will be to adapt to the market rules; SIZE - variable represents the company size (logarithm of total assets). Richardson & Lanis (2007) argue that large companies are more likely to avoid taxation because they have superior economic and political power over smaller companies, thereby reducing the tax burden accordingly; LEV - financial leverage company (long-term debt divided by total assets). CINT - the net tangible fixed asset value of total assets. Stickney & McGee (1982) argued that LEV has the negative effect on CIT avoidance because it exploits the advantage of tax shields from interest payments. CINT also positive correlation with CIT avoidance because it is the result of accelerated depreciation expense based on asset life cycle; UNI - representing the company's unique characteristics is determined by the cost of goods sold divided by turnover (Titman, 1984); INVINT - ratio of inventory value to total assets; THAV - representing the company whose subsidiary company is headquartered at the place where the tax rate is preferable ("tax haven"); THAV - a dummy variable, given a value of 1 if the firm has a subsidiary in the Organization for Economic Co-operation and Development (OECD) country, otherwise 0. Dharmapala et al. (2009), Richardson et. al. (2015) argue that THAV is positively correlated with CIT avoidance because the company take advantage of this factor to minimize the total amount of tax payable; MKTBK - the ratio of the market value of equity to the book value of equity, which represents the market's assessment of the company's growth prospects; INDSEC - sector variables that control the CIT avoidance may vary from sector to sector. The study uses the Industry Classification Benchmark

(ICB) classification system, which covers 10 industry groups. The research team has removed the telecoms industry due to an insufficient number of observations. Therefore, the number of sectors is 9.

Step 3: Estimate the impact of financial distress and global financial crisis 2008 on CIT avoidance

$$CTA_{it} = \alpha_{0it} + \beta_1 MERTON_{it} + \beta_2 GFC_{it} + \beta_3 GFC * MERTON_{it} + \beta_4 FAGE_{it} + \beta_5 SIZE_{it} + \beta_6 LEV_{it} + \beta_7 CINT_{it} + \beta_8 UNI_{it} + \beta_9 INVINT_{it} + \beta_{10} THAV_{it} + \beta_{11} MKTBK_{it} + \beta_{12-19} INDSSES_{it} + \epsilon_{it} \quad (8)$$

Equation (8) examines the difference in the impact of the financial distress forecast to avoid CIT when the global financial crisis event occurred in 2008. The GFC coefficient indicates the average changes in CIT avoidance after 2008. Also, the study intends to compare the differences in the effect of financial distress forecasts on CIT avoidance before and after the 2008-2009 GFC, using the GFC*MERTON interaction. The coefficient of the interactive variable allows the author to test the change in the slope of the forecasted financial distress after 2008.

The regression results in Tables 3 and 4 were estimated in the study using fixed effects model. The Wald test finds that the model has heteroskedasticity. Thus, the study was finally estimated using the Generalized Least Squares (GLS).

4. Results

• *Descriptive Statistics*

Table 1 presents descriptive statistics of the variables used in the model. The average of tax evasion by companies is at 0.020 (0.019) and 0.230 (0.128) as measured by BTG and CASHETR. The minimum value of the CASHETR <0 variable is due to the difference in the taxable income between the accounting standards and taxation derived from earnings and expenses determined on different bases. The MERTON variable has a mean (median) value of 0.168 (0.007) indicating that, on average, companies predict a probability of financial distress after one year of 16.8%. The statistical description of the controlling variables also shows that the goodness of fit between the mean and the median is consistent with the normal distribution

• *Correlation coefficient matrix*

Table 2 shows the correlation between the variables used in the model. Correlation coefficients between variables were generally low, with a maximum correlation of

Table 1: Descriptive Statistics

Variables	Number of Observation	Mean	Median	Standard deviation	Min	Max
BTG ($\mu + \varepsilon$)	1979	0.020	0.019	0.014	-0.130	0.123
CASHETR	1984	0.230	0.128	1.082	-3.517	33.810
MERTON	1912	0.168	0.007	0.299	0.000	1.000
GFC	1988	0.857	1.000	0.350	0.000	1.000
FAGE	1988	5.525	6.000	2.770	0.000	15.000
SIZE	1987	13.050	12.983	1.487	9.364	18.321
LEV	1987	0.104	0.037	0.143	0.000	0.813
CINT	1987	0.255	0.202	0.204	0.000	0.976
UNI	1985	0.821	0.849	0.230	0.002	6.820
INVINT	1987	0.223	0.209	0.162	0.000	0.805
THAV	1953	0.018	0.000	0.133	0.000	1.000
MKTBK	1915	1.267	0.830	1.443	-5.183	17.279

0.568 indicating the correlation between FAGE and GFC, not exceeding 0.57. This suggests that there is no serious multi-collinearity problem between the explanatory variables in the model (Hair, Black, Babin & Anderson, 2006).

• *Empirical results*

Results of the impact of financial distress forecast on CIT avoidance

The results of estimating the impact of financial distress forecasts on tax avoidance are presented in Table 3, in which tax avoidance (CTA) is measured by BTG variables (column 2) and CASHETR (column 3). The regression coefficient of the MERTON variable has the positive (negative) relationship with the BTG (CASHETR) tax avoidance variable and is statistically significant at 5%. Specifically, the authors estimate the change in tax avoidance by an increase of 0.0012 units due to income adjustment when the financial distress is forecasted, while measured by the CASHETR real tax rate, MERTON coefficient is -0.0263. This result is consistent with Richardson et. al. (2015) and is consistent with the initial expectation of the paper that the financial distress forecasts have a positive impact on avoiding CIT. The results found that in normal operating conditions, Vietnamese companies also take advantage of the tax policy gap and, when financial distress predicted beforehand, they are more inclined to exploit the tax policy gap to reduce the amount of CIT payable as well as postpone the tax payment to the following years. Companies consider tax avoidance as an additional source of capital, offsetting financial hardship.

Table 2: Correlation coefficient matrix

	1	2	3	4	5	6	7	8	9	10	11	12
1. BTG	1											
2. CASHETR	0.022 (0.328)	1										
3. MERTON	0.009 (0.702)	0.002 (0.944)	1									
4. GFC	0.006 (0.789)	0.054 (0.016)	0.177 (0.000)	1								
5. FAGE	0.038 (0.091)	0.039 (0.082)	-0.049 (0.033)	0.568 (0.000)	1							
6. SIZE	0.039 (0.078)	-0.040 (0.076)	0.076 (0.001)	0.149 (0.000)	0.114 (0.000)	1						
7. LEV	-0.017 (0.441)	0.020 (0.370)	0.150 (0.000)	0.018 (0.416)	-0.117 (0.000)	0.345 (0.000)	1					
8. CINT	-0.076 (0.001)	0.004 (0.863)	-0.030 (0.195)	-0.064 (0.005)	-0.108 (0.000)	0.039 (0.08)	0.412 (0.000)	1				
9. UNI	0.003 (0.905)	0.003 (0.896)	0.171 (0.000)	0.035 (0.122)	0.029 (0.201)	-0.045 (0.044)	-0.04 (0.072)	-0.070 (0.002)	1			
10. INVINT	0.032 (0.150)	-0.009 (0.699)	0.122 (0.000)	0.033 (0.144)	0.031 (0.167)	-0.024 (0.286)	-0.237 (0.000)	-0.343 (0.000)	0.138 (0.000)	1		
11. THAV	-0.005 (0.810)	-0.009 (0.706)	-0.032 (0.165)	0.000 (1.000)	0.104 (0.000)	0.203 (0.000)	-0.054 (0.018)	-0.025 (0.279)	-0.014 (0.524)	0.016 (0.485)	1	
12. MKTBK	-0.003 (0.883)	-0.046 (0.047)	-0.283 (0.000)	-0.631 (0.000)	-0.385 (0.000)	0.008 (0.742)	-0.012 (0.588)	0.028 (0.213)	-0.169 (0.000)	-0.047 (0.041)	0.091 (0.000)	1

Table 3: The regression results for the effect of financial distress on CIT avoidance (Equation 6)

Variables	CTA (BTG)	CTA (CASHETR)
_cons	0.0108***	0.3137***
	(4.58)	(5.48)
MERTON	0.0012**	-0.0263**
	(2.28)	(-1.97)
FAGE	0.0001**	0.0117***
	(2.30)	(8.40)
SIZE	0.0004***	-0.0095***
	(3.73)	(-2.99)
LEV	-0.0019	0.0697
	(-1.44)	(1.95)
CINT	-0.0034***	-0.0189
	(-3.82)	(-0.87)
UNI	0.0006	-0.0029
	(1.17)	(-0.15)
INVINT	0.0001	0.0442*
	(0.07)	(1.80)
THAV	-0.0040****	0.0374**
	(-3.78)	(2.46)
MKTBK	0.0002	-0.0131***
	(1.20)	(-5.24)
INDSEC	Yes	Yes
Wald test (p.value)	0.000	0.000
Number of observations	1866	1872

Note: The z-statistic values in (), *, ** and *** are 10%, 5% and 1% significance levels, respectively.

In addition, some controlling variables also have implications for CIT avoidance but at varying levels. When tax avoidance is measured by BTG, the

regression coefficient of the FAGE variable is 0.0001. Consistent with Richardson et. al. (2015), the paper argues that companies with longer trading hours on the stock market often make greater use of CIT avoidance. The coefficient of FAGE variable (column 3) is 0.0117 in the case of tax avoidance, as measured by the actual tax rate. This can be explained by the fact that there is a difference between the concept of taxable income between accounting and taxation purpose derived from income and expenses determined on different bases. Business-size variables (SIZE) has an effect on avoiding CIT with coefficients of 0.0004 and -0.0095 respectively (1% significance level). The research team is consistent with Richardson et. al. (2015), Taylor & Richardson (2012) in finding that larger companies were more likely to engage in tax avoidance in order to reduce tax burden than smaller firms because large companies have superior economic and political power. In addition, the study found no evidence of corporate leveraged (LEV) and corporate (UNI) leverage effects on avoiding CIT. Similarly, the paper does not report the coefficient result of the INVINT variable, the MKTBK of the regression with a dependent variable of BTG. The coefficients for THAV are -0.0040 and 0.0374, respectively, although they are statistically significant, they have a negative effect on corporate income tax avoidance, unlike Richardson et. al. (2015), Taylor and Richardson (2012). This can be explained in the context of Vietnam, where the tax haven strategy is often used by multinational companies, while the majority of Vietnamese companies are small and medium-sized so that a few companies have subsidiaries in countries with preferential tax rates. In addition, the "tax havens" are now often taken over by the United States, the OECD because of the existence of illegal individuals and organizations, so Vietnamese companies need to be careful when exploit this benefit. The study finds that the coefficient of MKTBK in column 3 is -0.0131 when tax avoidance is measured by CASHETR, indicating that the higher the market assessment of the companies' growth, the stronger the tax avoidance.

Results of the financial distress effect and 2008-2009 global financial crisis on CIT avoidance

The GFC coefficients in columns 2 and 3 in Table 4 are statistically significant when CIT avoidance is measured by two methods. The results show that the 2008-2009 global financial crisis has the negative effect on avoiding corporate income tax of Vietnamese companies. The paper focuses on the regression results obtained in Column 2, when tax avoidance were made from the income adjustment (BTG surplus). The regression coefficient of the MERTON variable is 0.0127, indicating that firms with predicted financial distress will increase the CIT avoidance. This is inline with the initial expectation of the paper and

is consistent with Richardson et al. (2015). However, the GFC coefficient of -0.0023 shows that the level of CIT avoidance in the two periods before and after 2008 is different. The combination with the GFC * MERTON interactive variable coefficient of - 0.0110 (statistically significant 5%) is the basis for the team to conclude that in Vietnam, when firms are predicted to have financial distress. They still avoid CIT by exploiting the tax policy gap to adjust income, however, after 2008, companies with predicted financial distress will reduce the tax avoidance level compared to the time of forecasted financial distress in 2008. This result is different from that of Brondolo (2009), Richardson et al. (2015). The authors argue that after 2008 - when Vietnam stock market was in a very difficult period, most companies faced with financial difficulties and stagnant business prioritized on maintaining their operating position and stable relationships with customers and credit institutions. In addition, credit institutions refine their clients, industries, and sectors to support and control capital adequacy, the government has implemented policies that both remove difficulties for businesses, while at the same time increased control by sanctions. The corporate income tax policy has changed a lot so that the behavior of profit

Table 4: The relationship between financial distress, global financial crisis and CIT avoidance (equation 8)

Variables	CTA (BTG)	CTA (CASHETR)
_cons	0.0256***	0.2807***
	(2.60)	(4.85)
MERTON	0.0127***	-0.0899
	(2.63)	(-0.65)
GFC	-0.0023***	0.0393***
	(-3.78)	(2.64)
GFC*MERTON	-0.0110**	0.0580
	(-2.29)	(0.42)
FAGE	0.0005***	0,0103***
	(5.25)	(6.91)
SIZE	-0.0004	-0.0103***
	(-0.68)	(-3.20)

LEV	0.0017	0.0609*
	(0.86)	(1.68)
CINT	0.0009	-0.0181
	(0.63)	(-0.82)
UNI	0.0007	0.0078
	(1.62)	(0.37)
INVINT	0.0016	0.0538**
	(1.01)	(2.09)
THAV	-0.0119*	0.0292*
	(-1.87)	(1.71)
MKTBK	-0.0002	-0.0079**
	(-1.06)	(-2.48)
INDSEC	Yes	Yes
Wald test (p.value)	0.000	0.000
Number of observations	1866	1872

Note: The z-statistic values in (), *, ** and *** are 10%, 5% and 1% significance levels, respectively.

adjustment to avoid the CIT implemented by companies is limited and cautious. The results in column 2 also show that controlling variables such as operating time (FAGE), "tax haven" (THAV) affect corporate tax avoidance.

5. Conclusion

In order to evaluate the impact of financial distress forecasts on CIT avoidance in Vietnam for the period 2006-2014, the authors used the KMV - Merton model to estimate the probability of a firm's financial distress, CIT avoidance is measured by adjusting income and postponing tax payments to the following years. The results show that, when companies are forecasted in different situations of financial distress, such as financial difficulties or insolvency, managers have the incentive to increase tax avoidance to create temporary funds to the business by adjusting income or postponing the tax payment period. At the same time, the global financial crisis event occurred in 2008 has made companies to be more cautious in avoiding CIT; after 2008, firms with predicted financial distress keep conducting tax avoidance but at a lower level compared to the time of forecasted financial distress in 2008. In addition,

the length of time a company listed on the stock market is considered by the company as an advantage in avoiding CIT.

The empirical evidence of this study is an important scientific basis for tax policymakers, financial managers, and investors. For financial managers, recognizing and knowing how to tap into the gaps in legal taxation is a benefit to the business. But the boundary between legal avoidance and illegal tax evasion is quite fragile. If a firm regularly exploits taxation avoidance, then the boundary will sometimes be broken. When external shocks occur, together with the financial distress fluctuations, the business should consider prioritizing the choice between maintaining stable operations and avoiding tax avoidance. For investors, avoiding CIT is also a means of risk transfer between the representative and the shareholder so the company takes advantage of the exploitation during the period of financial distress (Eberhart & Senbet, 1993). Investors need to combine information from business reports, market reports from the tax authorities or the Securities and Exchange Commission to identify avoidance of CIT during a difficult financial period. If the tax is avoided regularly by the company, it is necessary to re-evaluate its true financial status to make a decision to adjust the portfolio. For macroeconomists, tax policy makers, tax authorities, avoiding taxes means reducing the budget and if companies use it regularly, it proves that many tax policies have loopholes which allows companies to use different methods to exploit. The research results show that financial distress is the main reason for firms to make tax evasion incentives, therefore, macroeconomic policy makers need to create favorable conditions for companies to diversify credit sources, develop bond markets to create more long-term financing channels for companies. Tax policymakers, as well as authorities must reinforce corporate confidence on corporate income tax policy in particular and tax policy in general, through simplification of tax procedures, tax returns, and tax administration according to international standards.

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