

Effective Tax Planning and Stock Crash Risk

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Abstract

Firms design tax planning strategies to generate a lower payment; indirectly, the results stimulate higher valuation because of lower non-capital expenditure. In mainstream research using developed market data, tax planning stimulates crash risk because the activities are considered to hide bad news and information asymmetry to investors. Using Indonesia stock exchange data, one of the emerging stock markets, firms with effective tax planning strategies tend to have less crash risk. However, when firms report higher profitability, tax planning generates a higher probability of future crash risk. Our findings contribute to behavioral aspects in the stock market and taxation.

Index Terms— behavior, crash risk, stock market, tax planning.

I. INTRODUCTION

This paper examines whether tax avoidance have effects on crash risk. Despite empirical research in this area present evidence that tax avoidance stimulates crash risk in developed markets [1]–[3], there are lacks evidence show the same phenomena in emerging markets [4].

Tax is one of important sources of income for countries and it also a substantial expense for companies. In minimizing the tax expense, firms tend to apply tax avoidance activities by taking advantage of loopholes in tax regulations. From management perspective, tax management is expected to be synchronized with the organization's goals, maximizing profits and value. Efforts to minimizing tax payment pose several risks to the company. Management decisions can be motivated by the fulfillment of personal interests. Managerial opportunistic behavior causing the transfer of wealth from shareholders to management [5]. Based on this view, tax avoidance should be negatively reacted by market participants indicated by crash risk.

On the other hand, [6] stated that it is hard to imagine a managing director having an individual influence on tax avoidance, because

they usually are not a tax expert. It is understandable that the director affects the corporate's strategies, but tax avoidance activities are different issues. As long as tax avoidance activities is considered to boost stock value, it can be added to their mission. In developing countries, the agency conflict is on the relationship between majority and minority shareholders. When CEO is part of majority shareholders, the corporate policies align with maximizing value. Then, tax avoidance as one of corporate policies should give benefit to the firms.

Shareholders delegate tasks to management aimed at minimizing their tax obligations [7]. Other argument, [8] discuss that the purpose of effective tax planning is not only reducing tax payments, but also maximizing profits and firm value [9]. It means, tax avoidance are creating value strategy trough reducing tax payments to tax authorities [10]. Actually, positive cash flows from tax-saving activities create positive sentiments in the market [11], so tax avoidance should boost firm value and also reduce the probability of stock crash risk.

Crash risk is a serious issue to investors because it has implications for risk management and investment decision making [12]. The main

cause of crash risk is due to the management tendency to hoard information that is unfavorable to external parties [13]–[17]. When management withholds bad information and when bad information accumulates over a long period of time, the company's stock price will be overvalued so that when the information is released to the market, stock price experiences crash [18].

Several studies present that tax avoidance does not affect future risk and uncertainty [7], [19]. [19] show that lower effective tax rates (ETR) are not related to higher corporate risk. The studies indicate that tax avoidance irrelevant to risk.

Indonesian stock market may produce different findings from developed countries [4]. The impact of tax avoidance is puzzling because it is still a debate about whether tax avoidance efforts undertaken by management affect future risks.

Some empirical studies give evidence that tax avoidance positively affect crash risk in developed markets [1], [2]. Our research complement the literatures of tax avoidance and crash risk in emerging markets. Using Indonesian stock market, one of less efficient markets with thin trading, we provide contextual aspects that contribute to enriching the impact of tax avoidance on crash risk in emerging markets. The condition of the Indonesian market is different from that of developed markets, partly because the quality of corporate governance is relatively lower than that of developed countries. The main focus of investors is to protect their wealth and tax avoidance is considered as an appropriate effort to preserve it. The findings of this study provide a different perspective compared to research in developed countries.

This paper consists of five parts. The second part discusses literature review. Methodology to examine the hypothesis is presented in the third section. Next section presents the results. The part deals with conclusions, implications, and limitations.

II. LITERATURE REVIEW

There is a conflict of interest between shareholders and the government as one of the company's stakeholders. This conflict is escalated with the higher profits earned by the company. On the one hand, the government demands high tax payments from companies, but on the other hand, shareholders want profits to be distributed as dividends or reinvested to increase potential returns in the future.

[20] suggest three dimensions that need to consider in effective tax planning. When management can control three dimensions: parties, taxes, and costs, tax behavior becomes more rational and more easily predicted. Therefore, the tax management performed is expected to be aligned with the organization's goals: maximizing profits in the short term and maximizing value in the long term [8].

[21] define tax avoidance as a series of tax planning activities carried out by management to reduce the company's tax expense [22]. Tax avoidance is an effort to save tax that does not violate the tax law provisions. In the perspective of traditional theory, tax avoidance is considered as an activity to reduce tax payments to transfer state welfare to investors [1], [23]. Therefore, the tax paid to the government must be calculated carefully. From a investors' point of view, it is clear that the tax is considered a cost and reduces the amount of cash available to the company and investors. Hence, companies and investors naturally try to avoid taxes [24]. Here, tax avoidance serves as a value-enhancing activity to the company's value. Investors appreciate the importance of tax avoidance and they consider that this is an essential activity [4].

Thus, investors accept the consequences of tax avoidance carried out by management as long as managers act on behalf of their interests and the benefits expected to be obtained are above the previously predicted costs [22]. Tax avoidance is a reflection of a sustainable strategy of effective tax planning, that is minimizing cash outflows. However, non-opportunist managers should use tax avoidance strategies as an effort to minimize risk [7].

In this study, we focus on stock price crash risk in evaluating market perception, a risk where the stock price drops drastically in a short time [5]. The risk is very crucial for stockholders. The stock price crash is caused by the release of large amount of negative surprise at once [12], [18]. [25] provide evidence that positive media reports reduce the likelihood of crash risk because there is more positive information about a company. Maintaining positive information for the firms is important, effective tax planning is part of those information.

The company's goal is to maximize profit and increase value. In other words, investors want the company to perform tax avoidance optimally. An aggressive tax planning strategy will make the company's shares more attractive so that information about tax avoidance becomes a positive sentiment in the market [26]. In the context of the Indonesian state, enforcement of regulations and laws is still relatively low so that tax avoidance is seen as a benefit rather than a risk. Based on this description, the hypothesis is formulated as follows.

H1: Tax avoidance reduces crash risk

III. RESEARCH DESIGN

Our study discusses tax planning effectiveness and crash risk. Using firms listed in Indonesia Stock Exchange, one of emerging markets data, we analyze four years observation period from 2016 to 2019. In this study, the dependent variable is stock price crash risk which uses a negative skewness (NSKEW) proxy which refers to [1]. This measure is well established in the empirical literature and describes an asymmetric distribution of returns. A negative value for skewness indicates data that tends to the left. NSKEW is calculated by taking the third negative moment of the weekly return for each year, then normalizing it by dividing it by the cube of the weekly standard deviation of returns. The NSKEW calculation formula for company *i* year *t* is as follows:

$$r_{i,w} = \beta_0 + \beta_{1,j}r_{m,w-1} + \beta_2r_{s,w-1} + \beta_{3,j}r_{m,w} + \beta_{4,j}r_{s,w} + \beta_{5,j}r_{m,w+1} + \beta_{6,j}r_{s,w+1} + \varepsilon_{i,w}$$

$r_{i,w}$ is the daily return of company *i* in week *w*, r_m is the composite index of the Indonesian stock exchange which represents the market return, and r_s is the weekly industry return. We capture the factor of non-synchronous trading by considering market lead and lag in the regression. In order that the distribution is symmetrical (normally distributed), we transform residual ($\varepsilon_{i,w}$) from the regression into $W_{i,w} = \ln(1 + \varepsilon_{i,w})$. $W_{i,w}$ is firm-specific return.

Next, we calculate NSKEW for a given firm in a fiscal year by taking the negative of the third central moment of firm-specific weekly return scaled by the sample variance of firm-specific weekly returns raised to 3/2 [27]:

$$NSKEW_{i,t} = -[n(n-1)^{3/2} \sum w_{i,t}^3] / [(n-1) - (n-2)(\sum w_{i,t}^2)^{3/2}]$$

We also use down to up volatility or DUVOL_{t+1} as representation of crash risk. Following [28] and [1] we compute DUVOL:

$$DUVOL_{i,t} = \log \left[\frac{\left[(n_u - 1) \sum_{down} W_{i,t}^2 \right]}{\left[(n_d - 1) \sum_{up} W_{i,t}^2 \right]} \right]$$

Where n_u and n_d are the number of up and down days over the fiscal year *t*. DUVOL is obtained from the natural logarithm of the ratio of the standard deviation of down weeks divided by the standard deviation of up weeks. The higher the DUVOL value, the higher the crash risk.

The third measure of stock crash risk is CRASH. CRASH is a categorical variable for the probability of a firm-specific weekly return that is extremely negative. Following [18] and [14], a company's specific weekly return is classified in the crash category if in one year the company has experienced a specific return that is lower than 3.2 times the standard deviation of the company's specific average return for a year. Form firm that includes in CRASH category, we give dummy = 1, and zero otherwise.

Tax avoidance activities will be more appropriate when measured in the long term

[21]. The calculation of tax avoidance in the long term will eliminate the permanent difference so that it will be more precise in describing the tax avoidance activities carried out by the company. The independent variable in this study is the long-run effective tax rate (LETR) developed by [21]. LETR is measured using a measurement period of three years to mitigate the existence of survivorship bias related to a horizon longer than three years. LETR calculations require at least three consecutive years of data. Thus, the LETR sample includes ETR for three years. A lower ETR indicates a higher level of tax avoidance. The LETR calculation formula is as follows.

$$LETR_{i,t} = \frac{\sum_{t=1}^n Tax\ expense_{i,t}}{\sum_{t=1}^n Pretax\ income_{i,t}}$$

here are several control variables used in this study to control the characteristics of the company that might affect the risk of falling stock prices. The control variables used are firm size (SIZ), firm age (AGE), leverage (LEV), audit quality (BIG4), profitability (ROA and ROE), intangible asset ratio (INT) and market to book ratio (MBV).

The equations of the research model in this study are as follows:

$$NSKEW_{i,t} = \beta_0 + \beta_1 LETR_{i,t-1} + \beta_2 DACC_{i,t-1} + \beta_3 SIZ_{i,t-1} + \beta_4 MBV_{i,t-1} + \beta_5 FNC_EXP_{i,t-1} + \beta_6 INST_OWN_{i,t-1} + \beta_7 AGE_{i,t-1} + \beta_8 ROA_{i,t} + \varepsilon_{i,t}$$

Detailed information regarding the definition and measurement of all variables can be seen in Table 1.

Table 1. Variables' definition

Variables	Definition
Dependent Variable	
NSKEW	Negative skewness of firm's specific return. NSKEW is the probability that the stock experiencing extreme negative return.
DUVOL	Down to Up Volatility.
CRASH	CRASH category for firm i year. CRASH is a categorical variable, one if the stock categorized as CRASH and zero

otherwise.

Independent Variable

LETR Long-run effective tax rate. Lower LETR means higher level of tax avoidance and vice versa.

Control Variables

DACC Discretionary accruals by Modified Jones Model (Dechow et al., 1995).

SIZ Company size as measured by the natural logarithm of total assets in company.

MBV Market to Book Value measured from the market value of company divided by book value of company equity.

FNC_EXP Total board of directors with accounting or finance background divided by total board of directors.

INST_OWN The proportion of share ownership owned by the institutional investors.

AGE The age of the company as measured by the difference between year t-1 and the year the company was founded.

ROA Profitability as measured by net income divided by total assets

IV. RESULT AND DISCUSSION

Table 2. Sample selection

Descriptions	Firm-years
Firms listed on the IDX	2,414
Firms whose shares trade less than 90% of the trading days in a year	(974)
Firms in the financial industry sector	(226)
Firms with incomplete data and whose financial reporting date are not ended on December 31	(278)
Firm years with extreme values	(56)
Total observations	880

The total firm years listed on IDX from 2016 to 2019 were 2,414. Of all these firm years, 40% of shares are not actively traded and around 10% are firms engaged in the financial industry. Firms with incomplete data must be eliminated. Although our research period is 2016-2019, the firm must have been listed on the IDX for the previous four years since we need to calculate the long term ETR. We also eliminate companies with extreme values because they will affect the research results.

Table 3. Descriptive Statistics

	Mean	Std. Dev.	Min	Max
NSKEW _t	-0.253	1.046	-3.288	4.109
DUVOL _t	0.077	0.583	-3.957	3.343
CRASH _t	0.180	0.382	0.000	1.000
LETR _{t-1}	0.203	0.713	-8.597	6.124
DACC _{t-1}	0.001	0.150	-1.911	1.671
SIZ _{t-1}	15.247	1.671	5.140	19.658
MBV _{t-1}	2.868	6.926	-2.370	91.810
FNC_EXP _{t-1}	0.427	0.259	0.000	1.000
INST_OWN _{t-1}	0.131	0.226	0.000	0.966
AGE _{t-1}	13.970	8.986	0.000	37.000
ROA _t	0.042	0.340	-5.849	7.269

The descriptive statistics in Table 3 show the mean value of NSKEW is -0.253. This value is lower than the mean NSKEW in developed markets [1], [2], [5], suggesting that firms-year in our sample are less crash-prone than those previous studies in developed markets. However, in our study, the mean DUVOL value was higher than in previous studies. The average CRASH value is 0.180, showing that 18% of our sample experienced firm-specific weekly returns falling more than 3.2 standard deviations below the average return at least once in a year. LETR shows an average of 0.203, which means that on average the firm years in our sample are able to maintain their ETR at a fairly low level of 20.3% in the long run.

We run pearson correlation (untabulated). The three crash risk measures, namely NSKEW, DUVOL and CRASH, are significantly correlated with each other. LETR, as a variable

of interest in this study, has a weak correlation with NSKEW and does not show a correlation with DUVOL and CRASH. LETR is positively correlated with NSKEW, which indicates that companies with a high level of tax avoidance (lower LETR) have a lower crash risk. Firm size is negatively correlated with MBV and the proportion of financial expertise on board. These conditions show that the larger the company's size, the growth rate slows down, and there is a smaller proportion of financial expertise on the board. The correlation results also show that the company's size increases with the company's increasing age. Pearson correlation indicates that no independent variables are strongly correlated with one another, so there is no potential for multicollinearity in the model.

Table 4. Regression Analysis

Variables	NSKEW _t		DUVOL _t	
	(1)	(2)	(3)	(4)
	Coef.	t-stat	Coef.	t-stat
	-	-	-0.234	-
	0.955**	2.78		1.22
Constant	*	7		9
LETR _{t-1}	0.091**	1.85	0.052*	1.89
		4	*	7
DACC _{t-1}	0.414**	1.77	0.104	0.80
		9		2
SIZ _{t-1}	0.043**	1.96	0.021*	1.69
		8	*	8
MBV _{t-1}	0.017**	3.32	0.006*	2.15
	*	1	*	2
FNC_EXP _{t-1}	0.173	1.20	-0.057	-
		8		0.73
				8
INST_O	-0.068	-	0.031	0.35
WN _{t-1}		0.46		9
		1		
AGE _{t-1}	-	-	-0.001	-
	0.007**	1.63		0.60
		6		0
ROA _t	0.197**	1.87	0.194*	3.34
		3	**	8
F-test	3.575***		3.195***	
Adj. R ²	0.032		0.029	
N	880		880	

One tailed test. *, **, *** represent significant level at 1%, 5% and 10%, respectively.

Our paper tests the effect of tax avoidance activities (LETR) on crash risk, which is represented by three different proxies, NSKEW, DUVOL and CRASH to produce more robust findings. Table 4 describes the results of the regression test. Column 1 uses NSKEW as dependent variable. Coefficient LETR is positive and significant at 5% level. H_1 is supported. Some control variables are statistically significant. DACC, SIZ, MBV and ROA positively affect crash risk. Younger companies tend to experience crash risk.

Column 2 in Table 4 present the regression using DUVOL as dependent variable. The results present evidence that lower tax avoidance (or higher LETR) generates more crash risk. It is positive and significant at 5% level. H_1 is also supported using DUVOL as dependent variable. Firms with lower LETR tend to have less crash risk. The finding suggest that market participants consider that firms management use tax avoidance to boost firms value rather than destroying it. Our evidence supports the hypothesis, and it implicitly suggests that tax avoidance activities carried out by management effectively are evaluated by investors as positive information. The results have the same idea with the perspective of traditional theory, which views that tax avoidance activities optimally provide benefits for investors in transferring wealth from the government to them. Reducing tax payments minimize cash flows and maximize firms' value. The aggressive tax planning is considered as positive sentiment in the market because management, because managers save more cash flow and enhance company value [26].

Table 5. Regression Analysis: Alternative Measure of Crash Risk

	CRASH _{t+1}	
	Coef.	z-stat
Constant	0.107	0.126
LETR _{t-1}	0.240*	1.873*
DACC _{t-1}	0.192	0.341
SIZ _{t-1}	-0.099*	-1.806*
MBV _{t-1}	0.016	1.476

FNC_EXP _{t-1}	0.280	0.812
INST_OWN _{t-1}	-0.461	-1.077
AGE _{t-1}	-0.023**	-2.201**
ROA _t	-0.272	-0.945
LR statistic	21.316***	
McFadden R ²	0.026	
N	880	

*, **, *** represent significant level at 1%, 5% and 10%, respectively.

In Table 5, CRASH is used as a proxy for crash risk. Using logistic regression test, we find that LETR positively affect crash risk. Using another dependent variable, H_1 is still supported. Our evidence indicates that the robust evidence in presenting the impact of tax avoidance to crash risk. Lower LETR (or higher level of tax avoidance) produce less crash risk. Conversely, higher LETR (or lower lever of LETR) tend to generate more stock price crash risk. Expanding the analysis, we also present other additional analysis by considering BIG4 as representation of audit quality. In Table 6, we re-examine the data by splitting the sample into several sub-samples based on their previous ROA. The results of the regression test shows that firms with $ROA_{t-1} > 10\%$, LETR has a negative effect on crash risk. It means, for companies that reports higher profitability in the last period, lower LETR (or higher tax avoidance) stimulate higher crash risk. When firms with higher ROA_{t-1} conducting tax avoidance, investors consider it as bad news. For companies with $ROA_{t-1} < 0$ (untabulated), tax avoidance is not able to affect crash risk. Audit quality as proxied by BIG4 can suppress the probability of crash risk, although only at a moderately significant level.

Overall, our results support [7]. They discuss that for non-opportunist managers, aggressive tax planning will lead to increased shareholder wealth. Conversely, when firms report $ROA > 10\%$, the results support tax avoidance studies in developed countries [1], [5], [19]. Tax avoidance activities carry negative news to the market then investors negatively reacted by producing more crash risk.

In developed markets, tax avoidance producing more crash risk, because stockholders presume that managers use lower tax rate as a mask to

hide bad news [1]. In this study, we have contrary arguments that tax avoidance activities are efficient decision because minimizing tax payment increase the firm's value, because manager is part of majority shareholders. In turn, the higher firm's value leads to decrease in stock crash risk. Our higher profitable sample presents same evidence as articles using developed markets data. Contextually, the results are similar to those countries only for firms with higher profitability.

Table 6. Sub-sample Analysis for ROA_{t-1} > 10%

Variable	Dependent variable: NSKEW _t	
	Coef.	t-stat
Constant	-1.497**	-2.064
LETR _{t-1}	-1.179*	-1.648
DACC _{t-1}	-0.489*	-1.440
SIZ _{t-1}	0.111**	2.441
ROA _t	0.119	0.940
BIG4 _{t-1}	-0.431*	-1.517
BIG4*LETR	1.089	1.004
F-test		2.262**
Adj. R ²		0.041
N		177

One tailed test. *, **, *** represent significant level at 1%, 5% and 10%, respectively.

V. CONCLUSION

This study aims to provide empirical evidence regarding the effect of tax planning on the risk of stock crashes. We believe that management strategy directly affects investors' welfare. Our results show that the higher tax expense reap adverse reactions from market participants. They view that lowering tax payment is an effort of maximizing stockholders' welfare.

Using the data from a country of emerging markets, our results are different from the evidence of the tax avoidance studies in the developed stock exchanges. Tax avoidance is considered a tool for management to hide bad news in US [1], China [3] and France [2]. Consequently, lowering tax expense cause crashes in the future.

This study contributes to research in the fields of taxation and stock market. Our study

provides empirical evidence on how tax planning in emerging stock exchanges. In Indonesia stock exchange, as one of the emerging markets, effective tax planning that results in lower tax rate payments is considered an effective strategy to save company resources for the benefit of shareholder wealth. Non-opportunist managers, as the part of majority shareholders, use tax avoidance strategies as an effort to minimize risk.

This study has limitations which are also avenues for future research. In this study, we use one tax planning measure, namely the long-term effective tax rate. For further studies, other tax planning measures can be added to produce more robust results. Second, the result is different from findings of firms in the developed market. Therefore, research comparing the effect of tax planning between two different markets is an urgent matter to do

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