PARADIGMA
Scientific Studies on Science, Religion and Culture

Published by LPPM Universitas Islam 45 ---Vol. 20, No. 02, Year 2023, pp.274-289 ---
https://jurnal.unismabekasi.ac.id/index.php/paradigma
e-ISSN : 2775-9105, p-ISSN : 0853-9081 DOI : https://doi.org/10.33558/paradigma.v20i2.7081

Female CFO and Stock Price Crash Risk: Evidence from Indonesia

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Article history
Received :
(05-06-2023)
Revised :
(15-06-2023)
Accepted :
(12-07-2023)

ABSTRACT

Stock price crash risk in a company can be caused by corporate governance. Most studies report the main factor of the stock price crash risk is the tendency of management to hold bad news from investors or the public. This study aims to analyze whether the gender differences in the CFO factor, gender diversity, and also the number of boards of directors contribute to information transparency. The method used in this research is the Fixed Effects Model to reduce the problem of endogeneity. The research used a sample of listed companies in Indonesia on the Indonesia Stock Exchange's mains board during the 2019-2021 period. The results showed that the gender of the CFO and the number on the board of directors has a positive impact on the stock price crash risk. While the variable of gender diversity showed a negative impact on the dependent variable.

Keywords: Board of Directors, Corporate Governance, Gender Differences, Stock Price Crash Risk

INTRODUCTION

Literature finance (Harper et al., 2020a; Hong & Stein, 2003) stated that stock return is often defined with negative skewness, that is movement of stock price tends to direction negative. Last decade, a lot of research explored company assessment through stock price crashes and also the factors of it. (Feng et al., 2022; Murata & Hamori, 2021) investigated ESG rating and ESG disclosure factors on stock price crash risk in China, Japan, America, and Europe. Besides that, there was a study exploring the relationship between stock price crash risk and CSR in the energy industry in China by (Wu & Hu, 2019). One critical factor that causes stock price crash risk is the agency theory related to ownership and boards of directors. A lot of research has previously been discussed in various countries (Adam et al., 2020; Al Mamun et al., 2020; Andreou et al., 2016; Gao et al., 2017; Harper et al., 2020b; Kamardin et al., 2014; Putra, 2022). A study related to stock price crash risk was also found in Indonesia, Zachro & Utama (2021) provided that the busy directors' factor in the company did not influence significantly stock price crash risk, and also the company with ownership family tend to have stock price crash risk lower than a public company.

Agency Theory related to stock price crash risk represented through bad behavior of management to investors. The management has tended to withhold bad news to protect the stock in the capital market (Hutton et al., 2009a). When the bad news is already at the highest level, then management should disclose it to investors and the public. This incident will be accompanied by a movement in stock price to negative significantly, called a market crash risk by academic researchers. So, it could be said that the agency is one of the influencing factors significantly on the stock price crash risk, especially asymmetric information among managers and stockholders. Other studies have proven that one of the other factors is that management does window dressing on the financial statement(Hutton et al., 2009b; Putra & Aryanti, 2021).

Agency conflict could be reduced risk with the structure of good corporate

governance. Good governance means the company increases the quality of disclosed information and news related to the company to the public. The company also does the prevention of bad behavior managerial on financial statements (Alkurdi et al., 2019; An & Zhang, 2013; Z. Chen et al., 2022a). Many countries around the world have already done various types of reforms that could increase the number of directors to increase supervision of performance management since 1992 (Adams & Ferreira, 2009).

Women are considered more have high standard ethics, and comply with applicable regulations. The characteristics can avoid fraud as well as tend to avoid high risk (Betz et al., 1989; Cumming et al., 2015; Eckel & Füllbrunn, 2015; Liao et al., 2019). Besides that, women tend to have a unique method and more efficient work than men. Their level of effectiveness will be different. In general, women as a CEO in the company tend to be more democratic and collaborative so it can support creating a good atmosphere in the office. The effect is that all employees will be more productive. Psychologically, women are less self-confident than men. This condition makes women tend to avoid possible risks that give negative effects on the company or themselves. The study conducted by Ye et al., (2019) states that gender equality on the board of directors has a varied point of view and also can develop their ability to face more complex problems. Previous studies have explained that gender diversity in the board of directors can provide new perceptions in decision-making and positively influence the effectiveness of corporate governance, innovation, and creativity (Amin & Sunarjanto, 2016; Conyon & He, 2017; Perryman et al., 2016). The number of directors in a company depends on the size of the company. With the right amount of corporate governance, it can have a positive impact on stock performance.

The management of the company is closely related to the shareholders to protect the rights of the shareholders over the company. According to Li & Zeng, (2019), there is a negative effect between female CEOs and increased risk because the CEO has direct responsibility for shareholders and strives to fulfill this right. In contrast, the female CFO does not have directly responsible to shareholders. Although women tend to

prioritize emotionality, sometimes the aggressive nature will come out when needed like the male CEO. This aggressive nature can be reduced by encouragement from the female CFO in terms of risk management if the two work together properly and appropriately so that in the end it can reduce the company's stock price crash risk.

Indonesia as the 7th highest country in terms of the number of women in senior management positions, especially as the CEO and CFO, illustrates that gender diversity in the governance system in Indonesia is quite good. Referring to the agency theory by Jin & Myers, (2006) states that the stock price crash risk and information asymmetry between managers and shareholders have a strong relationship. Managers can control and manipulate company information to get personal abnormal returns or personal interests (Kothari et al., 2009). This behavior can only be done for the short term, until when the manager is forced to provide transparent information to the public. These events can occur in companies with gender-homogeneous management groups (Qayyum et al., 2021). Therefore, gender diversity which is an important attribute of the board of directors in mediating between crash risk and information asymmetry is taken into consideration in the research variable. Several studies related to gender equality on the board of directors of a company state that this can minimize the occurrence of information asymmetry by strengthening company transparency to the public, strengthening management oversight, and contributing by providing report verification standards (Cumming et al., 2015; Gul et al., 2011; Nguyen, 2020; Usman et al., 2019). Research conducted by Jebran et al., (2020) strengthens the hypothesis that an ideal number of directors, can reduce the occurrence of information asymmetry and have an impact on reducing the stock price crash risk.

RESEARCH METHOD

This research was conducted with a quantitative approach to analyze the relationship between the independent and dependent variables. Panel data in this study is secondary data that explored 260 companies with a 3-year time series, so data

has 780 observations. Data collection comes from the company's annual financial statements that have been audited and published in the 2019-2021 period along with data on share prices of related companies. Data were obtained from Thomson Reuters Data-stream and financial reports published by the Indonesia Stock Exchange as well as from the websites of associated companies. The method used in this study is the Fixed Effects Model, considered more appropriate when observing the effect of the dynamic relationship between the dependent and independent variables (Oyotode-Adebile et al., 2022). Meanwhile, data processing will use a panel data regression test on Stata. The research framework of this study is as follows:

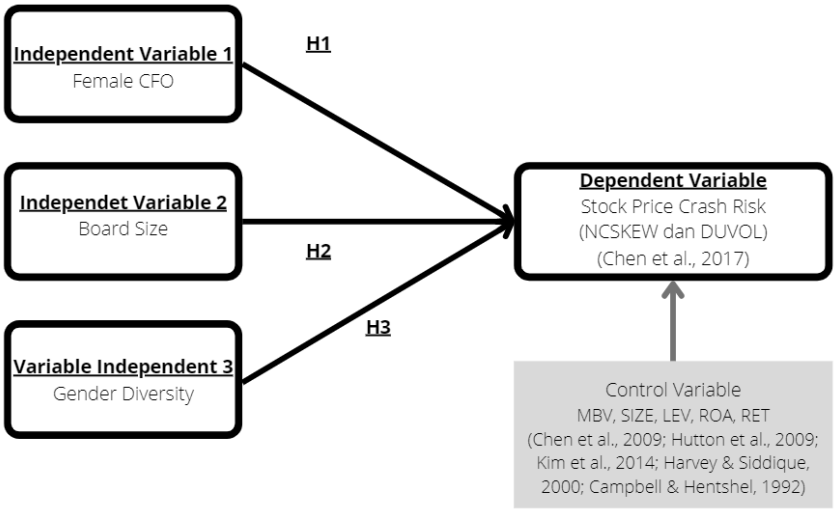

Figure 1. Research Framework

In this study, there are three types of variables used, namely the dependent variable, independent variable, and control variable. The dependent variable to be tested is the value of negative conditional skewness (NCSKW) and down-to-up volatility (DUVOL) which are proxies for the stock price crash risk. Meanwhile, the independent variables are female financial directors, the number of directors, and gender equality. The panel data research model used is as follows:

$$Crash\ Risk_{i,t} = \alpha + \beta_1 FemaleCFO_{i,t} + \beta_2 Boardsize_{i,t} + \beta_3 GenderDiversity_{i,t} + \varepsilon_{i,t} \quad (1)$$

The dependent variable in this study is the stock price crash risk of a company,

which is measured based on the model of (J. Chen et al., 2017). The tool is the negative coefficient of skewness (NCSKEW). For this measurement, it is necessary to calculate firm-specific weekly returns with the W notation. The NCSKEW value will display the skewness formed from the distribution of stock returns. Skewness with a long-left tail represents that the frequency of distribution of stock returns is more to the right and indicates that companies experience a higher stock price crash risk. Conversely, skewness with a long right tail indicates that the distribution of stock returns is more to the left and indicates a lower stock price crash risk. NCSKEW value at the company i in year t, using the following formula:

$$NCSKEW_{i,t} = (-1)\frac{n(n-1)^{\frac{3}{2}}\left(\sum w_{i,t}\right)^3}{(n-1)(n-2)\left(\left(\sum w_{i,t}\right)^2\right)^{\frac{3}{2}}} \quad (2)$$

Where the value of n refers to the number of trading weeks on the outstanding shares of a company i in year t. The higher the NSKEW value means the higher the stock price crash risk. Symbols of negative or positive values on NSKEW symbolize the direction of skewness which is more inclined to the left or right. Therefore, the higher the negative skewness value represents the distribution of returns with a positive slope due to the frequency of the distribution of returns which is more to the left. This indicates that stock price crash risk is lower and the opposite applies. The value of W is obtained from the regression between firm weekly return i in year t to market returns in year t, market lead, and market lag or with the expanded market model. Market model regression is performed to eliminate market effects on a given return. The formula used for the expanded market model regression is as follows to obtain weekly residual values from each company:

$$r_{i,t} = \alpha_{i,t} + \beta_1 r_{m,t-2} + \beta_2 r_{m,t-1} + \beta_3 r_{m,t} + \beta_4 r_{m,t+1} + \beta_5 r_{m,t+2} + \varepsilon_{i,t} \quad (3)$$

The value of ri,t is the return on stock of company i in week t, and rm,t is the return on market share in week t. Furthermore, the value of εi,t is defined as the

residual value of the regression and is the firm-specific return value. In the end, the value of Wi,t is obtained using the formula

$$W_{i,t} = \ln(1 + \varepsilon_{i,t}).$$

DUVOL stands for down-to-up volatility, which is the second measure used to calculate the stock price crash risk of a particular company (J. Chen et al., 2001). This calculation begins by categorizing the company's stock returns into up weeks or down weeks. A company with a firm-specific weekly return value lower than the average rate of return on shares in year t is categorized as down weeks. Conversely, if the firm-specific weekly return value of a particular company is higher than the average value of the overall stock return, then it is categorized as up weeks. Finally, the DUVOL value is obtained by formulating the logarithm of the standard deviation of down weeks divided by the logarithm of the standard deviation of up weeks, according to the following formula:

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

Where nu is the number of weeks of up weeks in year t at the company i. Meanwhile nd is the number of down weeks in year t at the company i.

RESULT AND DISCUSSION

Descriptive statistical tests in this study are listed in table below, which consists of the average, median, maximum, minimum, and standard deviation values of each variable.

Table 1. Descriptive Statistics

Variables	Observations	Mean	Median	Max	Min	Std. Dev.
Dependent Variables						
NCSKEW	777	0.0621	-0.0739	7.2223	-6.8928	1.4846
DUVOL	777	-0.0274	-0.0386	1.4976	-1.3637	0.2249
Independent Variables						
Female_CFO	777	0.2690	0.0000	1.0000	0.0000	0.4437
Board_Size	777	5.2716	5.00	13.00	2.00	2.1929

Gender_Diversity	777	0.1449	0.00	1.00	0.00	0.1861
Control Variables						
RET	777	1.3095	0.9722	31.1902	0.0863	1.7866
FIRMSIZE	777	29.0826	28.9883	34.4333	24.7442	1.8313
ROA	777	0.0630	0.0487	0.6896	-0.4308	0.0896
MBV	777	2.0281	1.0738	60.6718	0.1477	4.0649
LEV	777	0.5324	0.5423	0.9781	0.0035	0.2268

The dependent variable in this study is negative conditional skewness (NCSKEW), which is an indicator for measuring the stock price crash risk. The NCSKEW variable has an average of 0.0621 from the number of observations, the highest value is at 7.2223, the lowest is at -6.8928, and the middle value is at -0.0739. The standard deviation of the NCSKEW variable is 1.4846. A negative variable value indicates that the sample companies have a positively skewed return distribution, meaning that these companies have a relatively low risk of falling stock prices. Conversely, if the NCSKEW value is positive, it means that the company experiences a negatively skewed return or has a high risk of falling stock prices. This explains the average value of the NCSKEW variable, which means that the frequency of values is more on the right side so that the distribution has a negative slope. One of the causes of negative stock returns is the economic conditions in that country. This research used Indonesian companies from the 2019-2021 period, and 2020 is the year when Indonesia's economic condition declined due to the COVID-19 pandemic. These conditions allow businessmen to prioritize lowering their operational costs and there is an influence from the behavior of investors who prefer to save funds in low-risk financial instruments. As a result, the stock return received also decreased and tend to be negative. The second dependent variable is down-to-up volatility (DUVOL). The DUVOL variable has an average of -0.0274 from the number of observations, the highest value is at 1.4976, the lowest value is at -1.3637, and the median is at -0.0386. The standard deviation of the DUVOL variable is 0.2249. Based on this value, it illustrated that the level of volatility in Indonesia tends to be low. The average down weeks that occurred for each company were fewer than the up weeks.

There are three independent variables in this study, first is the number of boards of directors in a company. The average size of the board of directors in the research sample is 5 people, with the maximum value being 13 people and the lowest value being 2 people. The independent variable is gender diversity which is the percentage of the number of women on the board of directors to the number of directors. It had an average value of 0.14% with the highest value being 1% and the lowest being 0%. This meant that the companies in the average sample included at least one woman on the board of directors to contribute to company strategic decisions. The last independent variable is the female CFO, where this variable was a dummy type and had a value of 1 if the company has a female CFO and vice versa. This variable has an average value of 0.2690 with a median value of 0. This shows that many companies trust men to fulfill the position of the company's finance director.

The first control variable was the firm size, which is the size of the company by calculating the natural logarithm of the company's market capitalization. The firm size variable has an average of 29.0826, the highest value was 34.4333, and the lowest value was 24.7442 with a standard deviation value of 1.8313. The second control variable is RET, where this variable shows the returns provided by the company. The average value of this variable is 1.3095, the highest value is 31.1902, the lowest value is 0.0863, and the standard deviation of 1.7866. The third control variable is ROA where this value indicates the company's ability to generate profitability using a ratio that has an average value of 0.0630 with the highest value being 0.6896, the lowest value being -0.4308, and a standard deviation of 0.0896. The negative value in the ROA variable indicates that the company's total liabilities are greater than the company's total assets in a given year. The fourth control variable is MBV, namely, the market-to-book value has an average value of 2.0281, the highest value is 60.6718, the lowest value is 0.1477 and the standard deviation is 4.0649. The last control variable is LEV, where this value represents the company's debt level with an average value of 0.5324, the highest value is 0.9781, the lowest value is 0.0035, and the standard deviation is 0.2268. From this

average value, it can be shown that the companies in the sample have a low level of debt due to the low average leverage.

Table 2. Estimation Results

Independent Variables	NCSKEW			DUVOL		
	Coefficient	t-Stat	P-Value	Coefficient	t-Stat	P-Value
Female_CFO	+0.372	1.02	0.308	+0.054	0.99	0.321
Board_Size	+0.204	2.05	0.041	+0.031	2.09	0.037
Gender_Diversity	-0.439	0.37	0.710	-0.020	-0.11	0.91
FIRM_SIZE	-0.309	1.46	0.144	-0.094	-2.98	0.003
MBV	-0.015	0.33	0.739	-0.001	-0.23	0.819
RET	-0.062	1.64	0.101	-0.008	-1.45	0.148
ROA	-0.343	-0.26	0.739	-0.013	-0.07	0.947
LEV	-0.420	-0.34	0.736	-0.192	-1.03	0.305
Observations	777			777		
R-Squared	0.03			0.052		
F-Statistics	0.045			0.0005		

According to table 2, the probability value of the F-statistic for the NCSKEW model is 0.045 and 0.0005 for DUVOL. This value is less than the significance level of 0.05 so it rejects H0. It means that the independent variables and control variables simultaneously affect the stock price crash risk. The coefficient of determination (R-squared) shows how much the independent variable explains the dependent variable. In the NCSKEW model regression, the R-squared value is 0.03. Otherwise, 0.052 for DUVOL This means that the independent variables and control variables contribute to explaining the effect of the stock price crash risk of 3% (NCSKEW) and 5.2% (DUVOL). While the rest is influenced by other variables outside the model.

Discussion

The gender of the female CFO has a t-statistical value higher than 0.05, meaning that this variable has no significant effect on the stock price crash risk. The positive coefficient illustrates that the type of female CFO has a positive influence on the stock price crash risk. When a female CFO is in the position of the company's finance director, it can reduce stock price crash risk in the future. These results are consistent

with research conducted by (Wang & Fung, 2022) which stated that female CFO has more potential to reduce the risk. The number of directors in a company has a positive and significant impact with a positive coefficient. The greater the number of directors, the lower the stock price crash risk. This result is inconsistent with research by Andreou et al., (2016) that the variable size of the board of directors has a positive but not significant effect. The gender diversity variable has no significant effect on the model. The coefficient has a negative value, so the greater the percentage of gender diversity in a company, the less certain it will reduce the stock price crash risk. Qayyum et al., (2021) analyzed that the presence of women on a board of directors has a negative and statistically significant impact on the stock price crash risk.

The firm size variable has a negative and insignificant impact on the stock price crash risk for the NCSKEW variable. But, it has a significant negative impact on the DUVOL variable. This finding is not consistent with the argument by J. Chen et al., (2001); Qayyum et al., (2021); Suherman et al., (2021), where the firm size variable has a positive and significant impact on NCSKEW. The market-to-book-value (MBV) variable has a negative but insignificant impact on both the NCSKEW and DUVOL variables. Wang & Fung, (2022) has the identical finding that the MBV variable has a positive impact on the stock price crash risk. However, the research conducted by Z. Chen et al., (2022b); Hutton et al., (2009b) has the opposite results. The stock return, represented by the RET variable, has a negative and statistically insignificant impact on the dependent variable. A negative coefficient value means that when a company has a higher return, will produce a lower crash risk value in the future.

The results of this study are in contrast to the theory of the leverage effect, namely companies with lower returns can increase leverage, thereby reducing the stock price crash risk. The value of the return on assets of a company does not have a significant negative relationship to the both NCSKEW and DUVOL value of a company. So, a company that has a low ROA value will have a higher stock price crash risk tendency in the future because if a company's performance is optimal, it will have a lower crash

risk. This research is consistent with the findings by Hutton et al., (2009a); Wang & Fung, (2022). The last variable in this study is the level of corporate debt represented by LEV. The results of the study found that the LEV variable had a negative and insignificant impact on the NCSKEW and DUVOL variables (stock price crash risk). A company with low debt levels will increase the stock price crash risk. This finding is in line with the findings made by Andreou et al., (2016), Qayyum et al., (2021); Wang & Fung, (2022).

CONCLUSION

This research was conducted to determine the influence of gender equality, the number of directors, and the female CFO on the stock price crash risk in Indonesia, so the conclusions that can be drawn are as follows. The gender of the female CFO in the company does not have a significant impact on the stock price crash risk. The results are inconsistent with previous research. It can be caused by the average male financial director in Indonesia so the resulting variation in the data is less than optimal. In addition, theories regarding the characteristics of men who tend to take excessive risks cannot be generalized when there is a decline in economic conditions in Indonesia, such as COVID-19. Gender equality in a company represents the number of women who contribute to the company's strategic ranks, showing no influence. This can be caused by agency problems that can occur due to the existence of a homogeneous group that works together. Meanwhile, gender diversity cannot be statistically proven to positively impact a company's stock price crash risk in Indonesia. Small-scale companies with fewer than 4 directors tend to prefer men on the board of directors.

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