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OPAQUE FINANCIAL REPORTS AND STOCK PRICE CRASH RISK IN INDONESIA

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Abstract

Stock price crash risk is explained in perspective of corporate governance which refers to the lack of information disclosure. This research investigates the effects of opaque financial reports on stock price crash risk of Indonesia-listed firms from 2005 to 2008.The results show that the degree of crash risk is high. Analyses of binary outcome models, which are controlled by company characteristics, show that crash risk is higher in firms with more opaque financial reports. These results of analysis validate the findings of Hutton et al. (2009) so consistent that insiders or managers hide bad news or negative information when submitting poor financial reports.

Keywords: Stock price crash risk, Opaque financial reports, Bad news

Abstrak

Risiko *crash* harga saham dapat dijelaskan dalam perspektif tata kelola perusahaan yang mengacu pada kurangnya keterbukaan informasi. Penelitian ini meneliti efek dari laporan keuangan "buram" pada risiko *crash* harga saham di perusahaan Indonesia yang terdaftar dari tahun 2005 hingga 2008. Hasil penelitian menunjukkan bahwa tingkat risiko *crash* adalah tinggi. Analisis dengan menggunakan model hasil *binary,* yangdikendalikan oleh karakteristik perusahaan, menunjukkan bahwa risiko *crash* lebih tinggi pada perusahaan dengan laporan keuangan yang "buram". Hasil ini analisis memvalidasi temuan Hutton et.al. (2009) begitu konsisten bahwa orang dalam atau manajer yang menyembunyikan berita buruk atau informasi negatif ketika menyampaikan laporan keuangan yang buruk.

Kata kunci: *Stock price crash risk,* Laporan keuangan "buram", Berita buruk

JEL Classification Code: G3

1. Research Background

This research investigates the stock price crash risk of listed firms in Indonesian growing market. This topic of stock price crash risk is generally an interesting study since the collapse of stock price has made investors worry and often a deep concern of the public. In addition, the daily movement of the stock market tends to be more susceptible to falling prices than otherwise, the large price increases. US stock market statistics show that nine out of ten movements of the day that is the biggest in the *S&P 500*index from the 1950s until 2000s was price drop (Chen, Hong, and Stein, 2001). Meanwhile, textbooks on international investment and financial management often describes that growing markets face a greater investment risk in addition to the return which is also relatively higher. Stock price crash risk is likely to occur frequently in Indonesian growing market.

Recently, the study on stock price crash is attributed with various issues on foreign investor protection including the disclosure of corporate information. Jin and

Myers (2006) developed a model showing that the corporate opacity predicts stock price crash when the accumulation of corporate's specific negative information is known publicly. In the sample of countries, they find that some opacity measures have positive impact on the stock price crash. Consistent with this, Hutton, Marcus, and Tehranian (2009) showed that opaque financial reports have positive impact on the stock price crash risk in US firms sample. Financial report that is presented with less description on the conditions and performance of the firm characterizes non-transparent financial reports or opaque financial reports. Thus, stock price crash has a perspective explanation of good corporate governance.

The issue on the availability of firm information for external parties is a significant concern for the firm and Indonesian stock market. Since 1996, listed firms have been required to disclose information to the public in compliance with the regulations of *Bapepam-LK* (Indonesian Capital Markets and Financial Institution Supervisory Agency).Disclosure shall not only for the purpose of compliance to legal requirements. The Indonesian general guidelines of Good Corporate Governance 2006 states that firms shall take the initiative to disclose, in the manner which is accessible and understandable, not only any problems that is required by the laws and regulations but also information which is important for the decision-making by shareholders, creditors, and other stakeholders. Unfortunately, the enforcement of the regulations on corporate governance in Indonesia is ranked the lowest among 10 developing countries in Asia, as published by The McKinsey Quarterly, 2004. Lack of financial reporting practices in Indonesia has also become a concern in recent decades. Craig and Diga (1998) reported that accounting transparency of Indonesian firms is the lowest among five ASEAN developing countries.

The research problem is expressed in the following questions:

1. To what extent the degree of stock price crash risk in Indonesia?
2. Does the firm with more opaque financial reporting experience have higher stock price crash risk?

This research is aimed to investigate the effect of opaque financial reports to stock price crash risk in Indonesian firms.This research extends the study of Hutton, Marcus, and Tehranian (2009) in the US stock market to the study in Indonesian growing market.Tests on different stock market is necessary because the study by Salteh and Babazadeh (2012) in the Tehran Iran stock market found gave different results than those of Hutton et al..They argued about the lack of information, the lack of attention to the firms' financial reports, and the lack of professional analysts. In addition, this research expressed the contribution that the study on stock price crash risk is still relatively new in the field of finance. The results of this research provide the latest insights regarding the stock price crash in Indonesian firms.This research also has a contribution to the methodology related to measurement using daily data.In the past, studies on stock price crash risk were made by calculation based on weekly or monthly data.This research also adds the factor of US dollar exchange rate changes in the the market model that is underlying the calculation of the stock price crash risk.

2. Research Methods

This Research takes sample from the firms listed in Indonesia Stock Exchange (IDX) in a period of four years, from2005 through to 2008. All active firms in that a given year are not under delisting process and those that are listed for the first time are the prospective samples. All banks and other financial institutions which are included in the financial sector were excluded from the samples. Firms whose

financial reports are not found or its presentation of the required portion found incomplete, are also excluded from the samples. In addition, the firms with the least frequency of stock transactions are also excluded from the samples. The acceptance criteria is defined by the number of trading days which is more than 30 stock exchange trading days per annum to make it a quite accurate market model estimation.

The measurement of research variables requires data about the firms and other necessary data. The first source of data is the statistic of daily trading of firm stocks, namely: the price or stock returns and trading volume, as well as the daily Composite Stock Price Index (CSPI). The second data source is the annual financial reports of each firm in the sample during the period 2004 to 2008. The third data source is various announcements of corporate actions obtained from the Indonesia Stock Exchange publication, such as: the announcement of stock split, stock dividend, stock bonus, right issue, and so forth. The fourth data source is the daily data on foreign exchange denominated in US dollars.

Stock price crash risk is defined as the possibility of an extreme or large negative firm-specific return. This variable is measured with reference to the study made by Hutton, Marcus, and Tehranian (2009) which was also followed by Salteh and Bahazadeh (2012). This research develops two things: measure the daily data and apply the expanded market model equation. Initially, the following expanded market model equation is estimated by using OLS multiple linear regression based on daily time series for each stock per annum:

$$r_{i,t} = \alpha_i + \beta_1 r_{m,t-2} + \beta_2 r_{m,t-1} + \beta_3 r_{m,t} + \beta_4 r_{m,t+1} + \beta_5 r_{m,t+2} + \beta_6 k_{us,t-2} + \beta_7 k_{us,t-1} + \beta_8 k_{us,t} + \beta_9 k_{us,t+1} + \beta_1\ k_{u9,t+2} + \varepsilon_{i,t}$$

where:

- $r_{i,t}$is the return of stock *i* on day *t*.
- $k_{us,t}$is the change (return) of US Dollar exchange rate on day *t*.
- $r_{m,t}$is a daily market return, which is calculated by using the Composite Stock Price Index (JCI) as a market index.
- $\varepsilon_{i,t}$ is the residual return of stock *i* on day *t*.

The next procedure is to calculate the daily residual returns, $\varepsilon_{i,t}$,on each day per firm in the sample. The firm's residual return on a given day is sought by calculating the difference between the actual return (return of a stock on a particular day) and return prediction (predicted return from the expanded equation for market model estimation). The results of residual calculation are used to calculate the firm-specific daily return as follows:

$$\text{Firm-specific daily return}_{i,t} = \ln(1 + \varepsilon_{i,t})$$

where:

- $\varepsilon_{i,t}$ is the residual return of stock *i*on day *t*.

Finally, the stock price crash is formulated as a binary variable as follows:

$$CRASH_{i,t} \begin{cases} = 1, \text{if one or more firm} - \text{specific daily return exceeds 3.09} \\ \text{standard deviations below the mean} \\ = 0, \text{if not} \end{cases}$$

where:

- $CRASH_{i,t}$means crash event occurred to firm *i*in year *t*.

- Firm-specific daily return is ln (1+ $\varepsilon_{i,t}$).
- The mean is the average of firm-specific daily returnat firm *i*in year *t*.

A firm is identified as having crashwhen on a certain day, its firm-specific daily return falls below 3.09 standard deviation from the average of its firm-specific daily return in one year.The limit of 3.09 is chosen to be applied in order to generate a frequency of 0.1 percent (or 1: 1,000) in normal distribution.The procedure will produce a *CRASH* observation per firm per year (firm-years).

Next, the proxy for financial reporting opacity is the absolute value of discretionary accruals resulting from the modified Jones model (*ADACC*). *ADACC* proxy refers to the study of Dechow, Sloan, and Sweeney (1995) which has developed a measurement of earnings management that was originally proposed by Jones (1991). The proxy is also applied in the research on the quality of financial reporting such as Bergstresser and Philippon (2006) and Yu (2008). Researchers have distinguished total accruals into two, namely: normal accruals (or referred to as nondiscretionary accruals) and abnormal accruals (or referred to as discretionary accruals). Normal accruals are the components which are independent from the management control. Meanwhile, abnormal or discretionary accruals are the freedom in management control and become a proxy for earnings management. Discretionary accruals cannot be observed directly from the financial reports, for which the measurement is estimated using a model.

The following cross-sectional OLS regression equation is initially estimated for firm-years on each industry (sector) which are classified according to the Indonesia Stock Exchange (IDX), namely:

$$\frac{ACC_{i,t}}{Assets_{i,t-1}} = \alpha_0 \frac{1}{Assets_{i,t-1}} + \beta_1 \frac{\Delta Rev_{i,t}}{Assets_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t}$$

where:

- $ACC_{i,t}$ is the total accruals (net income minus operating cash flow) for firm *i* in year*t*.
- $Assets_{i,t}$ is the total assets.
- $\Delta Rev_{i,t}$ is the change in sales revenue.
- $PPE_{i,t}$ is gross property, plant, and equipment.

Furthermore, to each firm, the normal accruals components of its total accruals are computed by using the three parameters, namely:

$$NonDiscAcc_{i,t} = \alpha_0 \frac{1}{Assets_{i,t-1}} + \beta_1 \frac{\Delta Rev_{i,t} - \Delta AR_{i,t}}{Assets_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{Assets_{i,t-1}}$$

with additional information:

- $Non\ DiscAcc_{i,t}$ is normal accruals (or nondiscretionary accruals).
- $\Delta AR_{i,t}$ is the change in accounts receivables.

Then, the discretionary accruals is computed as follows:

$$DiscAcc_{i,t} = \varepsilon_{i,t} = \frac{ACC_{i,t}}{Assets_{i,t-1}} - NonDiscAcc_{i,t}$$

with additional information:

- $DiscAcc_{i,t}$ is discretionary accruals for firm i in year *t*.

The computation may result in discretionary accruals (*DiscAcc*) values with a positive or negative sign. *DiscAcc* value with a positive sign indicates an income-

increasing manipulation (e.g. on Teoh, Welch and Wong, 1998). On the contrary, *DiscAcc* with a negative sign value suggests the occurrence of an income-decreasing manipulation (e.g. Jones, 1991). In certain years, firm's managers or insiders have incentives to manage earnings report either ascending or declining. In good years, firm's managers or insiders can hide some profit; while in the bad years, the firm can manage the increase in profit (Yu, 2008). Since this research does not state a direction of profit manipulation that should have happened in ex-ante, thereforethe size which is applied in this study is the absolute value of discretionary accruals which isalso known as unsigned discretionary accruals in Hribar and Nichols (2007).

Finally, the absolute value of discretionary accruals is calculated as:

$$ADACC_{i,t} = \left| DiscAcc_{i,t} \right|$$

The procedure will produce an *ADACC* observation for firm-years. Based on the foregoing description, it is interpreted that the greater the *ADACC* value, the more opaque or less transparent the firm's financial reports.

Some firm characteristics are used as control variable in this research with regard to previous studies. Leverage is expected to have a negative relationship with the stock price crash risk. The high leverage will increase the investors' attention on the firm due to the increasing financial risk, therefore, it may reduce the accumulation of negative information that results in lesser occurrence of crash events. Firm with less crash events is also able to set a higher debt level. Leverage (*LEV*) of firm *i* in year *t* is formulated as:

$$LEV_{i,t} = \frac{\text{Total liabilities}_{i,t}}{\text{Total assets}_{i,t}}$$

Market-to-book ratio is expected to have a negative relationship with the stock price crash risk. Firms with greater growth opportunities may be more transparent or less willing in limiting the distribution of specific-firm information to external investors. Therefore, the stock price crash risk is expected to decline with higher market-to-book ratio of the firm. Market-to-book (*MB*) of firm *i* in year *t*is formulated as:

$$MB_{i,t} = \frac{\text{Market value of equity}_{i,t}}{\text{Book value of equity}_{i,t}}$$

Stock trading volume can be expected to be negatively related to stock price crash risk. More active stocks are more familiar with stock price changes so that it is not shocking. This research measures the volume (*VOL*) by calculating relatively to the total stock trading volume of all firms listed on the Indonesia Stock Exchange (IDX) as follows:

$$VOL_{i,t} = \frac{\text{Volume of share trading}_{i,t}}{\text{Total volume of share trading in IDX}_{t}}$$

The firm's size can be expected to have negative association with the crash risk because the more firm-specific information revealed in a large company would be likely to reduce the stock price crash risk. The size or measure of firm (*SIZE*) is expressed as:

$$SIZE_{i,t} = \text{Ln}(\text{Market value of equity}_{i,t})$$

Measurement of the entire research variables will produce panel data both across firms and annual time series. The research hypothesis testing on stock price

crash risk is made by estimating equation with panel data for firm *i* in year *t* as follows:

$$CRASH_{i,t} = \alpha + \beta_1 ADACC_{i,t} + \beta_2 LEV_{i,t} + \beta_3 MB_{i,t} + \beta_4 VOL_{i,t} + \beta_5 SIZE_{i,t} + \varepsilon_{i,t}$$

where:

- Stock price crash is measured by using *CRASH* as a binary variable.
- *ADACC*as a proxy for opacity of financial reports.
- Four control variables: *LEV*i.e. the firm's leverage ratio, *MB* i.e. market to book ratio, *VOL* i.e. the degree of stock trading volume, and*SIZE* i.e. the natural logarithm of equity market value.

CRASH dependent variable is a binary variable which can take only two possible values either 0 or 1. This research estimates the stock price crash risk equation by applying two binary outcome models, namely: 1) probit model, and 2) logit model. Regression analysis on the binary variable is made in accordance with the econometric standards, and the equation estimation is performed by using STATA statistical computer program (Cameron and Trivedi, 2009). The results of the estimation equation are used to test the research hypothesis H1. Coefficient $\beta_1$is expected to have a positive sign and significant to follow the research hypothesis H1. Meanwhile, the coefficient of the five control variables is expected to havea negative sign for$\beta_2$up toβ_5.

3. Results and Discussion

Table 1 presents the descriptive statistics for the research variables of the full sample. The number of firms included in the final sample is 275. The time period of this research starts from 2005 to 2008. During the four-year reseach period, the total number of observations in this reseach is 860firm-years.

The independent variables in this research are opaque financial reports that are proxied by *ADACC*. Table 1shows that the absolute value of discretionary accruals which are estimated on the basis of industry (*ADACC*) has an average of 0.0861. The A*DACC* values are positive, which in this case is in line with the absolute value measurement method. In addition, the average value of leverage ratio (*LEV*) is 0.6265 or 62.65 percent. This statistics indicates that in average the firms have a book value with total liabilities greater than the total book value of their equity. The average of market-to-book (*MB*) is 1.8770. MB with positive value of more than one indicates that market in general valuing the firms' equity higher than their book value. The relative size of the number of stock trading volume to the total volume of all trading in IDX, *VOL*, has an average value of 0.2448 percent. The firm size (*SIZE*) that is calculated in logarithmic transformation has an average of 13.0754.

The dependent variable is the *CRASH*. Still shown in Table 1, the *CRASH*average is 0.7733 in the variables that are measured binarily. In other words, 77.33 percent of firm-years observation experienced one or more timesfirm-specific daily returnexceeding the threshold of 3.09 standard deviations below the average value. It means thatthe stock price crash riskin Indonesian firms is high. Study on firm-specific crash is still relatively new, and unfortunately there is no comparative statistics in Indonesia. Therefore, it needs further exploration.

To add a description of the stock price crash, Table 2 Panel A shows the crash frequency distribution of the entire 860 firm-years observation. 22.67 percent of the observation has no crash, 28.37 percent hasonecrash, 20.58 percent has two crashes, 12.67 percent has three crashes, and the rest has more than three crashes even up to eight crashes. Meanwhile, frequency descriptive statistics,which is defined as the

opposite of crash frequency, is the jump frequency, that is, the frequencyof firm-specific daily returnwith positive extreme value exceeding 3.09 standard deviation above the mean value. Table 2 Panel B demonstrates only 4.42 percent of the observations has no jump, 15.47 percent hasonejump, 23.49 percent has two jumps, 24.88 percent has three jumps, and the rest has more than three jumps even up to nine jumps. The statistical results suggest that abnormal return in Indonesian stock market is extremenot only on the negative side but also on the positive side.

It is interesting to begin the analysis of hypothesis testing with statistical comparison of the variables. Table 3 demonstrates a comparison of the mean value of the five research variables between group of observation that has no crash (*CRASH* = 0) and the group of observation that has one or more crashes (*CRASH* = 1). The mean value and the median value of *ADACC* is found to be higher in *CRASH* = 1 (i.e. mean = 0.0880 and median = 0.0610) compared with *CRASH* = 0 (i.e. mean = 0.0799 and median = 0.0569). Meanwhile, the mean value and the median of *LEV* is lower in *CRASH* = 1 (ie average = 0.5402 and median = 0.5189) compared with *CRASH* = 0 (i.e. mean = 0.9210 and median = 0.5437). Likewise, the mean value and the median value of *MB*, *VOL*, and *SIZE* are lower in the observation group with stock price crashes. These results seem in line with the expectations in the theoretical study.

Next is a statistical hypothesis testing that is made with a regression analysis using binary outcome models against *CRASH*. The following hypothetical statement refers to the research hypothesis:

H_0: $\beta_1 = 0$

H_1: $\beta_1 > 0$

Table 4 presents the results of the analysis. There are two models shown, i.e.in the Logit and Probit Regression columns. In the logit regression column, the *ADACC* coefficient is positive and significant at 10 percent level (i.e.*b* = 1.7197 and *p*-value = 0.055). This is in line with the expectation that the coefficient will have a positive sign in according with the research hypothesis. These results lead the conclusion to support the research hypothesis H1, thatopaque financial reports increase the exposure to stock price crash risk.

Likewise, in the Probit Regression column in Table 4, the *ADACC* coefficient is positive and significant at 10 percent level (i.e. *b* = 0.9644 and *p*-value = 0.059). This is consistent with the research hypothesis which is expecting a coefficient with a positive sign. These results lead to the conclusion that supports the research hypothesis H1, that opaque financial reports increase the exposure to the stock price crash risk.

The results of this research agree with the findings of Hutton, Marcus, and Tehranian (2009) and the study of Jin and Myers (2006). These findings extend the results of the study of Hutton et al. in the United States that it is also applicable in the Indonesian firms. These results are consistent with the opinion that firm's insider or managers hide bad news or negative information when the firm submits unqualified or non-transparent financial reports.Opaque financial reportshide negative information, anyhow, when they are accumulated and simultaneously revealed to the public they will lead to stock price crash.

In addition, Table 4 in both models shows that all of the four control variables have coefficient signs that do not deviate from the expection. The relationship between leverage ratio (*LEV*) and stock price crash riskis negative and significant at 10 percent level in both models.Market-to-book (*MB*) variable has a negative sign as the expectation but not significant in both models. The relationship between trading volume (*VOL*) andstock price crash riskis negative and significant at 5 percent level

in both models. Finally, the coefficient of firm's size (*SIZE*)is negative as the expectation and significant at 1 percent level.

4. Conclusion

This research investigates stock price crash risk in listed firm sin the growing Indonesian market. The results of the analysis show a high occurrence of stock price crash riskin Indonesia-listed firms. This research also examines the effect of opaque financial reportsagainst stock price crash risk. The regression analysis with binary outcome models provides results that lead to a conclusion which supports the research hypothesis, that is,opaque financial reports increase the exposure to stock price crash risk. Poor corporategovernancethrough the delivery of un qualified financial reports increases the risk of unexpected changes in stock price for the investors.

Based on the results of this study, it is advisable to make further research on the stock price crash in Indonesian firms. Stock price crash is relatively new topic in finance that it provides more space for exploration in future research. Further research on stock price crash can be more interesting considering that the term of crash is rather an extreme way of thinking than it is in general.

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Appendix

Table 1. Descriptive Statistics on Full Sample (N = 860)

Variable	Mean	Std. Dev.	Min	Max
CRASH	0.7733	0.4190	0.0000	1.0000
ADACC	0.0861	0.0970	0.0001	1.1487
LEV	0.6265	2.4885	0.0025	72.7397
MB	1.8770	6.6582	-24.1899	130.6006
VOL	0.2448	0.7749	0.0000	11.6449
SIZE	13.0754	2.0213	8.2746	19.1367

Table 2. Crash andJumpFrequency Distribution

A. CrashFrequency		B. Jump Frequency	
#	Proportion	#	Proportion
0	0.2267	0	0.0442
1	0.2837	1	0.1547
2	0.2058	2	0.2349
3	0.1267	3	0.2488
4	0.0977	4	0.1756
5	0.0384	5	0.0977
6	0.0163	6	0.0291
7	0.0035	7	0.0047
8	0.0012	8	0.0058
		9	0.0047

Table 3. Comparison between No Crash Event and Crash Event

	***CRASH* = 0 (no crash)**		***CRASH* = 1 (crash event)**	
Variable	Mean	Median	Mean	Median
ADACC	0.0799	0.0569	0.0880	0.0610
LEV	0.9210	0.5437	0.5402	0.5189
MB	2.6160	1.2058	1.6603	0.9627
VOL	0.4316	0.1506	0.1900	0.0128
SIZE	13.9084	13.7823	12.8311	12.6983

Table 4. Regression against *CRASH*

Variable	Expected Sign	Logit Regression		Probit Regression	
		Coefficient	***p*-value**	**Coefficient**	***p*-value**
ADACC	+	1.7197	0.055	0.9644	0.059
LEV	-	-0.3645	0.091	-0.2049	0.099
MB	-	-0.0072	0.271	-0.0037	0.302
VOL	-	-0.2045	0.045	-0.1211	0.039
SIZE	-	-0.2743	<0.001	-0.1609	<0.001
Constant		5.1531	<0.001	3.0363	<0.001
N		860		860	
Prob> chi^2		<0.001		<0.001	

Note : This logitregression column presents the estimation results of logit models in the coefficient value that is followed by *p*-value for a one-sided test. Probit Regression column presents the estimation results of the probit model on the coefficient value that is followed by *p*-value for a one-sided test.