

Market Reaction to a Firm Environmental Performance Assessment Program (PROPER) Rank: An Indonesian Perspective.

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A Firm's Environmental Performance Assessment Program (PROPER) has been initiated by the Ministry of Environment program that aims to encourage companies to implement mindful environment management systems. This study aims to analyse the market's reaction to a public PROPER rank announcement. To test our hypothesis, we used manufacturing firms as our sample base. Those listed on the Indonesian Stock Exchange from 2012 to 2016 were analysed, in a total of 223 firm-year observations. This study used event study methodology. Market reaction was measured by abnormal return and trading volume activity. Our result shows that there is change in market reaction on the PROPER ranks announcement. We also document that there is no significant change in market reaction on firms that have "obedient" compared to "not obedient" levels. This study provides information for company management on implementing a new business strategy to improve its environmental performance.

Key words: *Market reaction, average abnormal return, trading volume activity, environment performance.*

Introduction

As complexity increases and the business environment changes, academics and professionals need to pay more attention to managing business risk (Arena et al., 2010; Bhimani, 2009; Bui & De Villiers, 2017). The business risk of the firm has been closely related to environmental issues. In general, companies are suspected to be playing a major role in the the main factors that lead to environmental damage. There has been massive pressure from various stakeholders (Bansal & Clelland, 2004). As the demand increases, a firm cannot be only

focused on profit (single-bottom line) but also emphasise the 3P triple-bottom-line, which are people, planet, and profit. In short, the increase in environmental awareness about damage caused by industry activities is resulting in a substantial additional amount of demand from society, social organisations, and even insistence from the government sector.

Various regulations have been posed by the government to mitigate the environmental problem caused by a company, such as regulations that correlates with a firms' responsibility toward the environment. Listed firms have been obliged to provide sustainability reports as stated in *Article 66 Verse 2 Law No. 40 the Year 2007* about Limited Liability Companies and *Government Law No. 47 the Year 2012* about Social and Environment Responsibility. Specifically, *Law No. 40, the Year 2007 Article 74* discusses a firm's social and environmental responsibility and aims to realise sustainable economic development. While improving life and environmental quality, actions will also benefit firms and other stakeholders. Aside from this, people from diverse professions, such as academics, politicians, and business leaders, are also starting to give their attention to environmental conditions that continuously worsen (Nasih et al., 2019; Ekawaty, 2019).

In this era, lots of firms in emerging countries decided to integrate sustainability values into their business strategy and benefited from their decision (Nidumolu et al., 2009; Prabowo et al., 2017). This phenomenon implies that firms are starting to become aware that disclosing environmental activities is an essential business strategy. Firm strategic management allows the firm to develop long-term objectives and to obtain a competitive advantage in the volatile and rapidly changing environment (Widiyanti et al., 2019).

Environmental activity disclosure has become a considerable part of a firm's annual reporting. This means that the firm already prepares a specific page for its environmental activity voluntarily in an annual report. This awareness indicates that the firm already implements good corporate governance, resulting in the possibilities of creating and providing a healthy and conducive firm environment (Irawati et al., 2019; Lubis et al., 2017). The Environmental Protection Agency (2009) and the California Air Resources Board (2010) also reveal that the current firm voluntarily discloses most of its environmental activity toward stakeholders. Nasih et al. (2019) describe that voluntary disclosure relating to CSR needs to be done by the firm in order to maintain the firm's image.

To improve awareness for firms conducting environmental management, the Indonesian government via the Environment Ministry have established the Firms' Environmental Performance Assessment Program (PROPER). The increase in environmental issues influenced PROPER's beginning inspired by other countries and obtaining Global appreciation. As an instrument alternative, PROPER is already being praised by various parties including the World Bank, United Nations, Tokyo University, and Harvard Institute

for International Development (Rakhiemah & Dian, 2009). PROPER is expected to become a solution for improving firm awareness for environmental health, especially for firms where business operate closely in relation to the environment.

On the other hand, any form of an announcement that contains information, especially that which provides benefits, it can also be trusted that it will likely result in a market reaction. Thus, as the PROPER rank is announced publically, it will influence the market to react according to its content, either up-ranked or down-ranked. The announcement has information that will provide either a positive or negative signal, and then the market will react in the form of price changes and share volume trading. Lyon et al. (2013) explain that market stakeholders will evaluate for every announcement that disclosed by the firm, which it will cause changes in shares trading transaction, such as changes in volume, price, bid/ask spread, and ownership proportion. Isnalitas & Narsa (2012) explain that CSR discloses affect the firm value as it can influence the investment decision making from stakeholders.

Prior studies examine the influences of the announcement of environmental performance rank toward market reaction. Lambert (2007) documented that investor does not react as is hypothesised from the Indonesia Sustainability Reporting Award (ISRA). Lyon et al. (2013) also show that firms that achieve a Green Company Award in China did not obtain higher shareholder value. In contrast, Cellier and Chollet (2016) found that there is a positive reaction on Vigeo Social Ratings, regardless of the assessment result is satisfying or not. Griffin and Sun (2013) also found those manager decisions in terms of voluntary green disclosure, resulting in positive returns as shareholders. Harymawan et al. (2019) also explained that there would be changes in share price when there is specific information disclosed.

This study aims to analyse the market reaction on when a firm makes a PROPER rank announcement. To test our hypothesis, we are using manufacturing firms as our sample from 2012 to 2016, which in total provide 223 firm-year observations. This study is conducted using event study methodology, using ordinary least square and Kruskal Wallis to test market reaction on the PROPER rank announcement. This research result shows that the PROPER rank announcement has a positive and significant correlation toward abnormal return and trading volume activity. This result implies that the announcement of PROPER rank is regarded as information that will be responded to by the market.

Furthermore, this study documents that there is no significant change in market reaction on firms that are "obedient" and "not obedient." This study contributes to the literature by clarifying how environmental performance rank announcements effect the market reaction. Also, this study can provide firms with information for consideration in terms of the implementation of a new business strategy to improve environmental performance.

The rest of this paper is structured as follow: Section 2 provides the research hypothesis development; Section 3 describes the variable operationalisation, sample and research model; Section 4 specifies the empirical model analysis, hypothesis test result and the sensitivity result and; Section 5 summarises the paper, which includes suggestions for future research.

Literature Review

Theoretical Framework

Information is essential for the investor and other stakeholders. With the availability of information, investor and stakeholders will obtain an overview of the current market condition and its future prediction. Investors use information for investment decision-making, in regard to this issue, for completeness, accuracy. Reliability of information also became an essential consideration. Information closely relates to Signalling Theory, which explains that executives who have better quality information will be motivated to disclose it toward the public in order to obtain market reaction that was realised by increases in share price (Ross, 1978). Some of the information that can become a signal is the announcement by firms from an annual report. The announcement that contains information will influence the market reaction. If the information contains positive signals, then the market will respond or react by an increase in the share price. While, if the information contains negative signals, the market will not respond or even worse, the share price will be decreased.

Besides provide a signal for externals, information disclosure also gives the impression that the firm has concern toward society. According to the impression management theory that was put forth by Schlenker (1980), a firm's environmental activity disclosure provides a good impression in order for a company to forge a good relationship with stakeholders, which is intended to maintain a reputation and image. Prior studies examine the relationship between environmental performance rank announcement toward market reaction. Lyon et al. (2013) show that firms that achieve a Green Company Award in China did not obtain higher shareholder value. This result implies that the Green Company Award, in general, can be trusted, and contrary responses from the market, will not form suspicion from the investor about that award. On the other hand, Callier and Chollet (2016) show that from 571 European firms from 2004 to 2009 there was a positive reaction on the Vigeo Social Rating announcement, regardless of whether the assessment result was satisfying or not. Following that result, Griffin and Sun (2013) found that CSR disclosure resulted in a positive return for shareholders. Besides that, shareholders' return in responding to voluntary CSR disclosure is different from the availability level of the information.

In Indonesia, the announcement of PROPER is considered information that will give a positive signal where the firm that obtains a high rank has a better prospective in the future;

in turn, it will attract more investors to invest in the firm. A positive signal from the PROPER announcement can be seen from the market reaction by observing the firm's share price and the increases in the firm's share sales volume. Instead, if the PROPER announcement has a negative signal, then there will be no market reaction, which means there are no changes in share price and also no change in the firm's share sales volume.

Market Reaction on Announcement of Firm PROPER's Rank

Signalling theory explains that executives have better quality information and will be motivated to disclose it toward the public in order to obtain a market reaction that is realized by increases in share price (Ross, 1978). The announcement that contains information will receive responses from the market. PROPER represent information that gives a positive signals where firms that obtain a high rank have better prospects in the future; then, it will attract the investor to invest in the firm. A positive signal from the PROPER announcement can be seen from the market reaction by observing the firm's share price and the increases in the firm's share sales volume.

Scout (2011) explains that in an efficient market, any form of an announcement that contains information will make the market react by increases or decreases of security's price in the capital market or via movement of share transaction. That premise is also applied to the PROPER announcement. If the PROPER announcement contains information for shareholders that will cause a market reaction then that will be shown as an abnormal return and trading volume activity. This perspective is similar to Griffin and Yuan's (2013) research, which states that there will be a positive market reaction on the environment and social activity conducted by a firm and manager decision to disclose its environment and social activities that are reflected by an abnormal return. Cellier and Chollet (2016) also explain that there is a positive market reaction on a firm's rank announcement, regardless of whether it is satisfying or not. Based on those explanations, we predict that there is a positive market reaction as a result of a firm's PROPER rank announcement.

Hypothesis: There is positive market reaction as result of a firm's PROPER rank announcement

Research Methodology

Sample and Data Source

This study uses manufacturing firms that were listed on the Indonesian Stock Exchange (IDX) and obtained either gold, green, blue, red, or black rank in the PROPER assessment from 2012 to 2016 which. Purposive sampling criteria were used for this study as follows:

Table 1: Sample Criteria Selection

No	Criteria	Sample
1	Manufacturing listed firms which participate in PROPER from 2012-2016	298
2	Sample that issue corporate action such as stock dividend, stock split, right issue or conduct another announcement	(75)
3	Research sample total	223
	Sample categorised as “obedient” (ranked gold, green, or blue)	188
	Sample categorised as “not obedient” (ranked red or black)	35

Research Period

This event study analysis utilized the market model, to estimate the period that aimed to construct an expected return and test period to observe an abnormal return. The estimation period for this study is 100 days before the test period, as the test period itself is five days after the announcement of PROPER.

Table 2: Research Period

Year	t_{-5}	t_0	t_{+5}	Estimation Period
2012	22 November	29 November	06 December	18 June - 21 November
2013	04 December	11 December	18 December	27 June - 03 December
2014	26 November	03 December	10 December	24 June - 25 December
2015	17 November	24 November	01 December	11 June - 16 November
2016	01 December	08 December	16 December	27 June - 30 November

Variable Operationalization

Firm’s PROPER Rank Announcement

PROPER represents an evaluation of obedience and performance in terms of business operations related to pollution control and environment damages as well as the management of hazardous waste. The announcement of a firm’s PROPER rank is the independent variable in this study. The colour of PROPER assessment categorises the environment management performance rank. PROPER has five colours that indicate the rank of the firm’s environmental management. The colour rank code in PROPER is sequentially from the best to worst as follows:

1. Gold: The best rank that is given to a firm which is in its production or rendering service process prioritising the natural environment consistently, and operating its business based

on ethical value and putting severe concern on the social and environmental conditions of society.

2. Green: This rank is given to a firm that implements environment management more than it is obliged to by regulation.
3. Blue: For a business that voluntarily implements environment management according to related regulation.
4. Red: Given for a firm that already conducts the environmental management that is still not fully compliant with the regulation.
5. Black: Given for a firm that intentionally conducts an act of negligence resulting in environmentally damaging and violating a regulation related to environmental responsibility.

In this study, a firm's rank will be measured by a value according to its rank. Each colour rank will have a different value - gold = 5, green = 4, blue = 3, red = 2, and black = 1.

Market Reaction

Market reaction is the dependent variable in this study. To measure market reaction, this study used abnormal return and trading volume activity.

Average abnormal return is residual from share average actual return (Leon et al., 2013). Average abnormal return calculated by the market model as it fit with the event study analysis went through a few steps as follows:

First, calculate the actual return:

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}}$$

where, R_{it} is the actual return, while P_{it} is the price of share securities. Next, we calculate the normal return or expected return by using this equation:

$$E[R_{i,t}] = \alpha_i + \beta_i \times R_{mt}$$

Where α_i is the intercept for securities and β_i is the systemic risk from securities, while R_{mt} is the market return index in the estimation period. Next calculate the abnormal return by:

$$AR_{it} = R_{it} - E[R_{it}]$$
$$AAR_t = \frac{\sum_{i-t}^N AR_{it}}{n}$$

Average Trading Volume Activity is share average comparison between share that is traded in the market within a certain period with the shares amount outstanding. Average trading volume activity used as proxy of shares trade volume which is used to see how an investor sees an announcement as a positive signal or negative one. Information contained in the announcement should be influencing the investment decision in context if compared to a normal trade (Beaver, 1968). Trading volume activity can be measured by as follows:

$$TVA_{i,t} = \frac{\sum \text{total firm shares that traded in period } t}{\sum \text{total firm shares outstanding in period } t}$$

Methodology

This study uses an event study approach. Data analysis technique in this study is using an ordinary least square by SPSS 22 to analyse the market reaction on announcement of the firm's PROPER rank. The regression equation used is as follows:

$$AAR_{i,t} = \alpha + \beta \times AS_{i,t} + e_{i,t}$$

(1)

$$ATVA_{i,t} = \alpha + \beta \times AS_{i,t} + e_{i,t}$$

(2)

Result and Discussion

Descriptive Statistic

Table 3 shows the descriptive statistics. Abnormal return (AAR) and trading volume activity (ATVA) and each variable has average -0.00194 and 0.00087, respectively. On average, the research sample has a blue rank in PROPER. The lowest rank from the research sample is red rank with a value of two, and the highest one is gold, with a value of five.

Table 3: Statistic Descriptive

	N	Minimum	Maximum	Mean	Std. Deviation
AS _{i,t}	216	2	5	2.94	0.607
AAR	216	-0.44495	0.03406	-0.00194	0.03094
ATVA	216	0.00000	0.01035	0.00087	0.00151

Heteroskedasticity Test

Table 4: Heteroskedasticity Test Result

Model	Sig.
AAR	0.160
ATVA	0.505

One of methods used to detect the heteroskedasticity is the Park Test that was developed in 1966. Heteroskedasticity test of AAR was done using the Park test, while for ATVA, we decided to use the Glejser Test. According to the Park Test output in Table 4, the t-test result shows that the significance value for the AAR variable and Glejser Test on ATVA is not significant. AAR significance is 0.157 (15.7%), while ATVA is 0.505 (50.5%), where both are more than 0.05, which means that they are not statistically significant. This result implies that the regression model proposed by this study does not have any heteroscedasticity issues.

Autocorrelation Test

Table 5: Autocorrelation Test Result

Model	Dl	Du	4-du	4-dl	D
AAR	1.77003	1.78829	2.22997	2.21171	1.998
ATVA	1.77003	1.78829	2.22997	2.21171	2.043

The Autocorrelation test was conducted to know if there is a strong correlation either positive or negative, or if there is no correlation between research variables in the regression model as time changes. We use the Durbin-Watson (DW) Test to tend the autocorrelation issue. Table 5 shows that the d value on the AAR variable is 1.998 and the d value on the ATVA variable is 2.043. According to the DW table it will retrieve a d_u value of two variables and is 1.788. Thus, it can be concluded that there is no autocorrelation issue as the d value lies between d_u value and $4-d_u$ value for both variables.

Main Analysis

Market Reaction on Firm's PROPER Rank

Table 6: Regression of Abnormal Return Analysis

Independent Variable	Regression Coefficient	Sig.
(constant)	0.020	0.057
AS _{it}	0.006	0.077
R Square	0.014	
F-statistic		0.077*
Sample amount	223	

p-values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

This study used an event study approach by using regression analysis to examine the effect of a firm's PROPER rank to abnormal return and trading volume activity. In testing effect of PROPER rank to abnormal return, we use the first regression model. Table 6 shows that the constant value of the regression model is -0.020. That amount implies that the average abnormal return will keep remaining constant if there is not any other variable effect. Coefficient of AS_{it} variable in which PROPER rank is 0.006. That value implies that for every ascension of PROPER rank, the value of AAR also increases by 0.006, *ceteris paribus*. The R² value shows that the regression model can explain the relationship between an independent and dependent variable with an amount of 1.4%. Table 6 also shows that market reaction that is proxied by abnormal return has a positive p-value 0.077 and is significant at 10%. That result indicates that the market positively responds to the announcement of the firm's PROPER rank through the abnormal return.

Table 7: Regression of Trading Volume Activity Analysis

Independent Variable	Regression Coefficient	Sig.
(Constant)	0.051	0.084
AS _{it}	0.00001	0.037
R Square	0.020	
F-statistic		0.037**
Sample amount	223	

p-values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

We also conducted a test for the effect of the PROPER rank to trading volume activity using the second regression model equation. Table 7 shows that the constant value of the regression model is 0.051. That amount implies that the average trading volume activity will keep remaining constant if there is not any other variable effect. Coefficient of AS_{it} variable in which PROPER rank is 0.00001. That value implies that for every ascension of PROPER

rank, then the value of ATVA also increased by 0.00001, *ceteris paribus*. R2 value shows that the regression model can explain the relationship between an independent and dependent variable with an amount of 1.4%. Table 7 also shows that market reaction that is proxied by trading volume activity has a positive p-value 0.037 and is significant at 5%. That result indicates that the market positively responds to the announcement of the firm's PROPER rank through the trading volume activity.

The announcement of the firm's PROPER rank has a positive effect and is statistically significant toward both abnormal return and trading volume activity, which means that the market responds as the announcement of the firm's PROPER rank is disclosed; thus, the hypothesis is accepted. This result indicates that the announcement of the firm's PROPER rank contains information, and the market will react to it (Lyon et al., 2013). The firm that prioritises its image tends to intentionally disclose their environmental performance and its PROPER rank in order to give the impression that the firm have a serious concern for society. These practices are as per Management impression theory.

Following Signalling theory, information disclosure by the firm toward external parties explains that high-quality firms will intentionally give signals toward the market. Research results that show positive market reaction at the announcement of the firm's PROPER rank indicate a positive signal, which results in increases of share price and trading volume activity. Besides that, the efficient market theory also explains in an efficient market, any form of an announcement that contains information will make the market react. The research result indicates that securities market efficiency in Indonesia is categorised as semi-strong. In a semi-strong market, the share price change is affected by market data and other information that is disclosed, including the firm's PROPER rank. Investors use the lag in the context of adjusting the share price toward newly disclosed information to gain profit, and this issue is reflected by market reaction through abnormal return and trading volume activity.

The results on this research support prior studies by Cellier and Chollet (2016), which explain that the Vigeo Rating announcement in Europe makes the market react. This result was also consistent with the theoretical framework and incomplete information (Merton, 1987), where there is a significant reaction as a result of the announcement that contains information. Lyon et al. (2013) also show that the changes in share volume suggest that in the test period [-1,1] an announcement of a green company award makes the market react.

Additional Test

Furthermore, we wanted to test the difference of market reaction on a firm that was classified as "obedient" (gold, green, or blue) with "not obedient" (red). To test that issue, we divided the sample based on those two categories. As in the research sample, no firm has a black rank

in PROPER; the comparison is only between gold, green, and blue with red rank. Differences were tested using a Kruskal Wallis Test that does not require a homogeneity of data.

Table 8: Kruskal Wallis Test Result for Abnormal Return

Variable	N	Mean	Asymp. Sig.
Obedient firms	188	112,53	
Not obedient firms	35	109,16	
<i>p-value</i>			0,776

Table 9: Kruskal Wallis Test Result for Trading Volume Activity

Variabel	N	Mean	Asymp. Sig.
Obedient firms	188	112,29	
Not obedient firms	35	110,44	
<i>p-value</i>			0,876

The Kruskal Wallis test result in Table 8 shows that the significance value is 0.776, which means that the *p-value* is shown by Asymp. Sig. value is more than $\alpha = 0.01$. That value means there is a no different effect of PROPER rank announcement between obedient firms and not obedient firms through price reaction. Besides that, difference tests were also conducted on the trading volume activity variable. The result of the Kruskal Wallis test on volume activity in Table 9 shows a *p-value* lower than $\alpha = 0.01$. This result means there is no different market reaction through trading volume activity between obedient firms and not obedient firms. Both test results show that the positive reaction of PROPER rank is not followed by differences in average abnormal return and average trading volume activity, both in obedient firms and not obedient firms. Besides that, a similar result on changes in share prices can come from an unbalanced sample amount between obedient firms and not obedient firms. The sample amount comparison is 85% from obedient firms and 15% from not obedient firms. This condition can cause no statistically differences between those two rank groups.

In the context of the firm's PROPER rank announcement, the market has received a positive signal by reacting to the PROPER announcement. Based on the signal theory, this phenomenon indicates that PROPER rank contains information. Nevertheless, based on semi-strong market efficiency theory, the market needs some time to adjust share price as new information is disclosed (Fama, 1970). During the test period five days before the PROPER announcement, the market already reacted toward that information, resulting in investors who did not consider the rank of PROPER classification, either it is obedient or not. Besides that, there are no firms that obtain a black rank five days after the announcement. This result indicates that the research samples considered already have sufficient awareness in the context of environmental responsibility.

The research result is similar to Cellier and Chollet (2016) who conclude there is a positive market reaction through share price, regardless of whether the rank announcement is satisfying or not. That there is no difference in reaction between satisfying and not in social activities shows that investors see all the ranks achieved by firms as good news. Thus, even the rank achieved is considered not satisfying, investors regard the firm as already voluntarily conducting social and environmental activities and disclosing them to society. This phenomenon implicates that regardless of the rank, there will be no differences in market reaction.

Conclusion

This study aims to investigate the effect of a firm's PROPER rank announcement in the period 2012 to 2016 to market reaction. We found that there was market reaction through abnormal return and trading volume activity in the dates between the PROPER rank announcement. This result shows that the PROPER rank announcement contains information and market use information that effects the value of the firm's share price and conducted share trades. Thus, this result shows that social and environmental rank is relevant to return.

In the PROPER color rank gold, green and blue are categorised as "obedient" while red is categorised as "not obedient". They did not experience differences in terms of market reaction when the PROPER rank was announced. The research result shows that both an abnormal return and trading volume activity do not show up any different reaction. This result is due to investors seeing a firm that has achieved a PROPER rank of either gold, green, blue, or red as a firm that is concerned with environmental issues. Red rank is presumed to be already satisfying as the firm already conducts environmental activities even if it is not completely adhering to the related regulation.

This research has some limitations, such as the unbalanced sample amount for the obedient firm (gold, green, and blue) and not obedient firm (red and black). We recommend that future research examine market reaction in each year and also employ samples from all industries so that it can be known that the PROPER rank announcement is responded to by the market, and provide graphics of changes per year. Besides that, also adding year period so the sample amount can be increased and support this research result is advised.

Acknowledgement

This paper is derived from Tiara Vindra Prasti's Undergraduate Thesis at the Faculty of Economics and Business, Universitas Airlangga, Surabaya, Indonesia. We are also grateful for the comments and insights of Fajar Kristanto Putra Gautama and Melinda Cahyaning Ratri.

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