Environmental Performance Analysis of Mining Companies in Indonesia with SEM-PLS

Moch Bisyri Effendi
STIE Perbanas Surabaya, Accounting Department, Surabaya, Indonesia
Email: bisyri@perbanas.ac.id

***Abstract*—This study aims to determine the pattern of relationship of environmental performance, environmental disclosure and financial performance. Environmental performance measured by using PROPER, Environmental disclosure measured based on the use of 34 items disclosure by G3 GRI (2006) and financial performance measured by using ROA, ROE and NPM indicators. The sample of this research is mining company listed in Indonesia Stock Exchange in 2011-2015. The statistical method used in this research is Structural Equations Modeling - Partial Least Square (SEM-PLS). The analysis used in SEM-PLS is the outer model (Confirmatory Factor Model, Explanatory Factor Analysis) and Inner Model with boostrapping methods. Outer model in this study using Confirmation Factor Analysis (CFA). CFA results indicate that indicators that are able to measure the financial performance of mining companies in Indonesia is ROA and ROE. Meanwhile, environmental disclosure and environmental performance variables are not analyzed using Confirmatory Factor Analysis because they are measured with one indicator. Results of this study indicates that hypothesis 1 is accepted. In other word, environmental disclosure has a positive effect to financial performance. Hypothesis 2 is accepted, environmental performance has a positive effect on the disclosure of the environment. Moreover, hypothesis 3 is accepted, environmental performance has a financial performance. Hypothesis 4 is accepted, that is, environment disclosure has a mediation effect on the relationship of environmental performance and financial performance.**[1]

***Index Terms*—environmental performance, financial performance and environmental disclosure.**

I. Introduction

Environment is an aspect that is often discussed in economic activity, this is due to its impact on damage to ecosystems around the company. To avoid this, all economic activities must consider the environmental aspects. One of the economic behavior that is often used as the cause of environmental problems is the company. Environmental disclosure that is included in environmental reporting is part of CSR (corporate social responsibility). Such reports may be included in the financial statements in the form of sustainability reporting. The report is a form of corporate responsibility for the operations performed by the company. IAI in PSAK (1998: 1) implicitly suggests disclosing responsibility for environmental and social issues, ie companies may also present additional reports, such as environmental reports, value-added reports, especially for industries where environmental factors hold an important role for an industry that considers employees to be an important reporting group.

The number of companies that are still less aware of the impact of its activities to make the government enact environmental reporting rules for corporate and community agencies began to pay attention to environmental sustainability. According to the Environmental Protection and Management Act no. 32 of 2009 which regulates the various matters concerning the protection of the environment and the management of the environment in terms of activities related to the environment and in terms of development. The Government of Indonesia not only provides efforts in the prevention and prevention by using the law, but the government of Indonesia also gives an appreciation in the form of PROPER (Environmental Performance Assessment Program) [1].

Companies whose businesses are directly related to the environment, such as manufacturing companies, have voluntarily disclosed their environmental performance information in a sustainability report or incorporated into a special section of the annual report that companies typically disclose environmental information in the responsibility section social on reference [2], obtained that environmental performance and firm size have an influence on environmental performance and firm size have an impact on environmental disclosure on reference [2].

The company's annual report consists of mandatory disclosure and voluntary disclosure. Voluntary disclosure arises because of the public awareness of the surrounding environment, the success of the company is not only in profit but also determined by the company's concern for the community around the company on reference [3].

Company activity has a very wide impact that is for the economy, environment and even social life. Thus, companies must have responsibility for these three effects on reference [4]. Accounting as a tool of accountability has a function as a primary control tool of corporate activity. Management's responsibilities are not limited to managing funds into the company to investors and

Manuscript received December 9, 2017; revised March 11, 2018.

doi: 10.18178/joams.6.1.45-49

creditors, but also covering the impact of the companies on the environment on reference [5].

II. Literature and Hypothesis

A. Environmental Disclosure

Environmental disclosure is the disclosure of information in the company's annual report relating to the environment on reference [6]. Environmental disclosure according to the Ministry of Environment is a term often used by a company or organization to disclose environmental, audited (or audited) data about environmental risks, environmental impacts, policies, strategies, targets, costs, liabilities, or environmental performance to parties with an interest in connection with information that aims to improve relationships with institutions or organizations [1]. Measurements in this study is measured using GRI (Global reporting initiative). The number of CSR disclosure items according to the GRI 4 index are 91 items consisting of economy (9 items), environment (34 items), labor practices (16 items), human rights (12 items), community (11 items) and responsibility for the product (9 items). While in this study only use an environmental performance indicator (34 items) consisting of:

TABLE I. GRI STANDARD

No	Aspect	Item
1.	Material	1. Material used by weight or volume 2. Percentage of material used which is the recycled input material
2.	Energy	3. Energy consumption in the organization 4. Energy consumption outside the organization 5. Energy intensity 6. Reduced energy consumption 7. Reduced energy demand on products and services
3.	Water	8. Total water harvest by source 9. Water sources significantly affected by water retrieval 10. Percentage and total volume of water recycled and reused
4.	Biodiversity	Operational locations owned, rented, managed within, or close to, protected areas and areas with high biodiversity values outside the protected area A description of the significant impacts of activities, products, and services on biodiversity in protected areas and areas with high biodiversity values outside protected areas Habitats that are protected and restored the total number of species in the iucn red list and species in the list of national protected species with habitats in operational-affected areas, based on the extinction risk level
5.	Emission	11. Direct greenhouse gas (grk) emissions (coverage 1) 12. Indirect energy greenhouse gas (grk) emissions (coverage 2) 13. Other indirect greenhouse gas (grk) emissions (coverage 3) 14. GHG emission intensity (grk) 15. GHG emission reduction (grk) 16. Emissions of ozone depleting substances (bpo)
		17. Nox, sox, and other significant air emissions
6.	Eflun and waste	18. Total water discharged based on quality and purpose 19. Total waste weights by type and disposal method 20. The total amount and total volume of the spill is significant 21. The weight of waste deemed hazardous according to the provisions of the conventions basel2 annex i, ii, iii and viii which are transported, imported, exported or processed, and the percentage of waste transported for international delivery 22. Identity, size, protected status, and biodiversity value of water bodies and associated habitats significantly affected by waste water and runoff from the organization
7.	Products and services	23. Levels of mitigation of impacts on the impact of the confusion of products and services 24. Percentage of products sold and packaging reclaimed by category
8.	Obedience	25. Monetary value of significant fines and total amount of non-monetary sanctions due to non-compliance with environmental laws and regulations
9.	Transportation	Significant environmental impacts of the transport of products and other goods as well as materials for the organization's operations, and the transport of labor
10.	Etc	Total environmental protection expenditures and investments by type
11.	Assess supplier of environmental bag	26. Percentage of filtering of new suppliers using environmental criteria 27. Significant actual and potential negative environmental impacts in the supply chain and actions taken
12.	Mechanism of environmental complaints	28. Number of complaints about environmental impacts submitted, addressed and resolved through formal complaint mechanisms

Source: Ministry of enviroment

B. Environmental Performance

PROPER is a Corporate Performance Rating Program in Environmental Management developed by the Ministry of Environment since 1995 to encourage companies to improve their environmental management on reference [7]. The Government of Indonesia not only provides prevention and mitigation efforts by using laws but also gives appreciation to companies that have provided environmental improvement efforts. Appreciation is in the form of Proper (Environmental Performance Appraisal Program). The proper rating criterion consists of five levels represented by color, ie gold for the best, green, blue, red, and black for the worst. Proper is given to companies that have done social and environmental responsibility on reference [7].

TABLE II. PROPER RATING CRITERIA

Color Rating	**Definition**
Gold (5)	For businesses and / or activities that have consistently demonstrated environmental excellence in the production or service process, as well as conducting ethical and responsible business to the community.
Green (4)	For businesses and / or activities that have undertaken environmental management beyond the required compliance with the implementation of the environmental management system and they have utilized resources efficiently and carried out their social responsibilities well.
Blue (3)	For businesses and / or activities that have undertaken environmental management efforts, which are required in accordance with prevailing laws and regulations.
Red(2)	Environmental management efforts but not in accordance with the requirements as stipulated in the laws and regulations.
Black (1)	For its business and / or activity, has deliberately committed an act or negligence resulting in pollution or environmental damage, as well as violation of applicable laws and / or does not implement administrative sanctions.

Source: Report of PROPER 2015

C. Financial Performance

Reference [8] defines that "Performance is a tangible behavior that everyone displays as work performance generated by employees in accordance with its role in the company". According to reference [9]."Performance comes from the definition of performance, there is also a definition of performance as a result of work or performance, but in fact performance has a broader meaning, not just the work but including how the work process takes place. Reference [10], performance can be interpreted as achievements achieved by the company in a certain period that reflects the level of the company's health. Based on some of these opinions performance is a performance achievement achieved by the company for the work that has been done. Reference [11] defines financial performance is the ability of a company in using capital owned effectively and efficiently in order to obtain maximum results. From this understanding, the company's financial performance is the result of various decisions made continuously to achieve certain financial objectives which the company needs to involve the cumulative and economic impacts of the financial decisions and consider them using comparative measures. One of the ratios that measures financial performance is the profitability ratio.

Profitability is a measure used to determine the company's ability to generate profits. The more detailed information submitted by managers in providing information to the stakeholders, the higher the level of profitability. This is to convince stakeholders in the company. Reference [12] defines profitability ratios as a company's ability to earn profit through all available sources, such as sales activities, cash, capital, number of employees, and number of branches. The higher the profitability the more funding sources the manager has to fund the process of environmental disclosure. Profitability affects the efficiency and effectiveness of the use of a company's assets, because this ratio measures the company's ability to generate profits based on the use of assets owned by the company. There are several profitability ratios that are often used in research, namely Return on Assets, Return on Equity, Net Profit Margin and Gross Profit Margin. Hypothesis that can be formed based on the literature review above is as follows:

H1: Environmental disclosure has a significant effect on Financial Performance

H2: Environmental performance has a significant effect on environmental disclosure

H3: Environmental performance has a significant effect onFinancial Performance

H4 : Environmental Disclosure has mediating effect on the relationships of Environmental performance to Financial Performance

III. RESEARCH METHODOLOGY

This research is quantitative research to know the influence of environmental performance variable to financial performance and influence of environmental performance to financial performance through environmental disclosure. The data of this research is secondary data obtained from the annual report of mining companies listed on the stock exchange in the period of 2012-2015. Data collection technique is done by documentation technique. Research variables used in this study include endogenous variables namely environmental disclosure and financial performance while the exogenous variable is environmental performance. The environmental disclosure variable aside from endogenous variables also as intervening variable. The method used in this research is Structural Equation Modeling-Partial Least Squares (SEM-PLS). SEM-PLS method consists of 2 methods, namely outer model and inner model. In this study the relationship of indicators to latent variables are reflexive so that the outer model analysis in this study using Confirmatory Factor Analysis method. Inner model analysis in this study using SEM-PLS method so that parametric assumptions do not become limits to see the relationship between latent variables. Data processing is done by using SMART-PLS 3.0 program.

IV. Discussion and Result

The results of Confirmatory Factor Analysis from the three latent variables in this study indicate that two of the three latent variables are not performed Confirmatory Factor Analysis because the indicator that measures its variables is only one indicator. Confirmatory Factor Analysis performed on financial performance variable. Confirmatory Factor Analysis Result indicates that Financial performance indicators are not able to measure the financial performance variable, that is, NPM because the value of Loading factor below 0.7 which causes AVE value of financial performance variable less than 0.5 and the value of composite reliability is less than 0.7. Furthermore, the NPM indicator is removed from the model. Result of Confirmatory Factor Analysis of financial performance variable after NPM indicator is dropped, got the value of AVE more than 0,5 and composite reliability> 0,7. Therefore, it can be concluded that ROE and ROA able to measure variable of financial performance well and precise. The results of outer model by using Confirmatory Factor Analysis method of financial performance variable includes convergent validity, discriminant analysis and reliability validity support the conclusion of outer model presented in Appendix. Furthermore, inner model analysis is done to determine the relationship between latent variables and to conclude the research hypothesis accepted or rejected by looking at the value of t-statistics. The results of inner model analysis for inter-latent variables as follows:

TABLE III. Inner Model

	Original Sample (O)	T Statistics (|O/STERR|)	Information
ED ->FP	0,339568	2,083987	Signifikan
EP ->ED	0,417996	3,102247	Signifikan
EP ->FP	0,490622	2,849123	Signifikan

Source: Processed results by SMART-PLS

The result of Inner model analysis is as follows:

H1: Environmental disclosure has a significant effect on Financial Performance

The results of the first hypothesis test show that the relationship of environmental disclosure variable to the financial performance shows the coefficient value of the path of 0.339568 with a statistical value of 2.083987 that greater than 1.96. From the above results it can be concluded that environmental disclosure significantly affects the financial performance (Hypothesis 1 is accepted) and which means that any change in the increase of environmental disclosure will affect the change of the increase of financial performance and vice versa.

H2: Environmental performance has a significant effect on environmental disclosure

The results of the second hypothesis test show that the relationship of environmental performance variable to the environmental disclosure shows the coefficient value of the path is 0.417996 with a statistical value of 3.102247 that greater than 1.96. From the above results it can be concluded that environmental performance is significantly affects the environmental disclosure (Hypothesis 2is accepted), which means that any change in the increase of environmental performance will affect changes in the increase of environmental disclosure and vice versa.

H3: Environmental performance has a significant effect onFinancial Performance

The results of the third hypothesis test show that the relationship of environmental performance variable on the financial performance shows the value of path coefficient of 0.490622 with a statistical value of 2.849123 that greater than 1.96. From the above results it can be concluded that environmental performancehas significantly affects on the financial performance (Hypothesis 3 accepted) which means that any change in the increase of environmental performance will affect changes in the increase of financial performance and vice versa.

H4 : Environmental Disclosure has mediating effect on the relationships of Environmental performance to Financial Performance

The results of the first, second and third hypothesis testing are accepted. This shows that the relationship of environmental disclosure variable significantly influences the financial performance, environmental performance significantly influences the environmental disclosure, and environmental performance significantly influences the financial performance. Furthermore, the mediation test is conducted to see mediation effect of environmental disclosure variable on the relationship of environmental performance variable to the financial performance variable. The method used is the method of VAF method with the condition of all significant pathways. The above results show all significant paths with a t-statistic value of each path> 1.96. The magnitude of effect / value of path coefficient can be seen in the picture as follows:

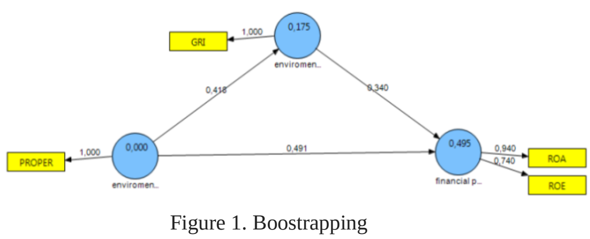

Figure 1. Boostrapping

Source: Processed results by SMART-PLS

From the image above path coefficient can count the value of VAF with the following formula:

VAF = Indirect Influence / Total Influence

The value of indirect influence of performance environmental to the financial performance is 0.418 * 0.340 = 0.14212 while the direct influence of performance environmental to the financial performance is 0.491. VAF values between 20% and 80%, it can be concluded that variables from the calculation of VAF is 0.2244 or 22, 44%. VAF value between 20% and 80% and called partial mediation. It can be concluded that the variable of environmental disclosure mediate the relationship of environmental performance variable to the financial performance variable.

V. Conclusions, Limitations and Suggestions

The results of this study indicate that the environmental performance and environmental disclosure variables are not analyzed using Confirmatory Factor Analysis due to environmental performance and environmental disclosure measured by one indicator. Confirmatory Factor Analysis on financial performance variable eliminates one indicator that is, NPM. Indicator that is able to measure financial performance is ROA and ROE. The result of the research shows that the influence of significant inter-variable between environmental disclosure to financial performance, performance against environmental disclosure and environmental performance on financial performance. The environmental disclosure variable mediates the relationship of environmental performance variable to the financial performance variable. The sample in this study is limited only to companies engaged in the mining industry listed on the Indonesia Stock Exchange, so that the results of the research can only be generalized to the mining company. For further research, it is advisable to look at the Sustainability Report of the companies to be a reference in assessing and measuring environmental disclosure of each company.

Acknowledgment

The authors wish to thank to God, my wife for full support, and to all my colleague in STIE Perbanas Surabaya Indonesia for the information regarding opportunities in research publications. This work was supported by internal research funding of STIE Perbanas Surabaya, Indonesia.

References

[1] Ministry of Environment 2012. Socialization of PP No. 27 of 2012 About Environmental Permit. March 16, 2012. from: (www.menlh.go.id, On access March 27, 2017)

[2] M. Julianto and J.Sjarief, "Effect analysis of environmental performance, profit management, company size, And Profitability to environmental disclosure in manufacturing companies listed In Indonesia stock exchange, " *Jurnal Akuntansi: Riset dan Artikel Akuntansi*, vol. 9, no. 2, 2016.

[3] M. Indriastuti, "The influence of corporate characteristics on environmental disclosure practices," *Jurnal Riset Bisnis Indonesia*, vol. 8, no. 1, pp. 35 – 42, 2012.

[4] F. Z. AuliaandL. Agustina, "The influence of corporate characteristics, environmental performance, and media coverage on environmental disclosure," *Accounting Analysis Journal*, vol. 4, no. 3, 2015.

[5] D. Suhardjanto and N. D. Permatasari, "The influence of corporate governance, ethnicity, and educational background on environmental disclosure: Empirical study on listing companies in Indonesia stock exchange," *KINERJA*, vol 14, no. 2, pp151-164. 2010.

[6] I. B. Suratno, D. Mutmainah, "Effect of environmental performance on environmental disclosure and economic performance (Empirical study on manufacturing company listed on Jakarta stock exchange period 2001-2004), " *Simposium Nasional Akuntansi IX* (Padang).2006.

[7] Ministry of Environment 2012. Socialization of PP No. 27 of 2012 About Environmental Permit. March 16, 2012. from: (www.menlh.go.id, On access March 27, 2017)

[8] V. Rivaiand and D. Mulyadi, *Leadership and Organizational Behavior,* Jakarta: Rajawali Pers.2009.

[9] M. A. Kuncoro and R. Effendi, "The influence of company's environmental performance on corporate environmental disclosure level the influence of environmental performance on company's environmental disclosure," *KINERJA*. vol. 2, no. 3, 2016.

[10] F. Winarni and G. Sugiyarso, "*Financial management"*, Yogyakarta: Media Pressindo.2005.

[11] S. Munawir, *Financial Statement Analysis*, Eedition 2nd. Yogyakarta:Liberty. 2002.

[12] S. S. Harahap, *Critical Analysis of Financial Statements*, Edition 1st. Jakarta: PT Rajagrafindo Persada. 2007.

Moch Bisyri Effendi born in Surabaya, Indonesia on 16th Februari 1985. He graduated from Airlangga University in Indonesia, with bachelor degrees in economic statistics in 2006. After graduation he continued the study to isntitut teknologi Sepuluh Nopember (ITS) in Surabaya Indonesia, with a master degree in statistics in 2011.He is a full-time lecturer at STIE Perbanas Surabaya, Indonesia, where he researches and work for international affairs since 2014